Royal Danish Ministry of Foreign Affairs **DANIDA**

Institutional Roles and Linkages
Guideline Based on Experiences in Three Water Management Areas

Integrated Water Resources Management
Strategies, Guidelines and Pilot Implementation in Three Water Management Areas, South Africa

Department of Water Affairs and Forestry
South Africa

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Umgeni Water

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FINAL REPORT

Name: Institutional Roles and Linkages: Phase 1 Report Guideline - Experiences in Three WMAs Carl Bro a/s. Umgeni Water. February 2004 **Category:** Situation Assessment	**Purpose:** To identify progress in the process toward the establishment of IWRM and to describe the current duties and functions of DWAF and other institutions in the Water Management Area with regards to the management of water resources **Target Group:** DWAF, IWRM Project Consultants and implementers in the Water Management Areas		Name	Date	Signed
		Prepared			
		Checked			
		Approved			

List of Abbreviations

CBO	Community Based Organisation
CLC	Coordination and Liaison Committee (for CMA Establishment)
CMA	Catchment Management Agency
CMC	Catchment Management Committee
CMF	Catchment Management Forum
CMS	Catchment Management Strategy
DANIDA	Royal Danish Ministry of Foreign Affairs
DEAT	Department of Environmental Affairs and Tourism
DLA	Department of Land Affairs
DME	Department of Minerals and Energy
DOA	Department of Agriculture
DOH	Department of Health
DPLG	Department of Provincial and Local Government
DTI	Department of Trade and Industry
DWAF	Department of Water Affairs and Forestry
EMP	Environmental Management Plan
IDP	Integrated Development Plan
IGF	Intergovernmental Forum
IWRM	Integrated Water Resources Management
NEMA	National Environmental Management Act
NGO	Non-Governmental Organisation
NWA	National Water Act
NWRS	National Water Resources Strategy
SALGA	South African Local Government Association
WC/WDM	Water Conservation and Water Demand Management
WMA	Water Management Area
WMI	Water Management Institution
WSA	Water Services Authority
WSDP	Water Services Development Plan
WUA	Water User Association

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1 INTRODUCTION

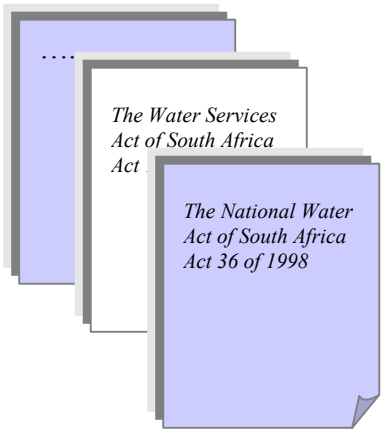
South Africa has made provision through the National Water Act [1] as well as elements of the Water Services Act [2], Municipal Structures Act [3] and Municipal Systems Act [4] for the implementation of a new and challenging framework for Integrated Water Resources Management (IWRM). IWRM may be defined as a process that promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner, and without compromising the sustainability of vital ecosystems[5]. A feature of the approach followed in South Africa, 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 are 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 and Provincial policies and laws as well as district and local municipality by-laws, guide these institutions.

To further assist the process, the DWAF has produced a series of guideline documents (1-13) and discussion documents on the development, management and relationships of the different 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 areas Water Management Areas: 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.



2 PURPOSE, SCOPE AND PROCESS

This study supplements other studies that have been carried out by the Department of Water Affairs and Forestry in South Africa. The main purpose of this document is to discuss the institutional roles, responsibilities and experiences to date in the implementation of IWRM in three Water Management Areas (WMAs), namely, the Olifants-Doorn (WMA 17), Crocodile West & Marico (WMA3) and the Mvoti-Mzimkulu (WMA11). These three areas were identified as pilot study areas to be supported by the DANIDA-DWAF IWRM project.

All life and all economies depend on water. This interdependence calls for integration in the management of the natural system with human systems. The Dublin IWRM Principles[5] provide guidance through four areas:

- ✧ Water resources are precious and scarce and need to be protected and managed holistically
- ✧ Water management should be participatory in nature, involving local communities in decisions that affect their livelihoods
- ✧ Women need to be involved in water management decision-making
- ✧ Provision for all basic human needs has to be made, and then full cost pricing needs to be implemented to encourage sustainable use.

To succeed in IWRM, three fundamental elements to be in place [5], namely:

- ✧ Creation of an enabling Environment
- ✧ Definition of institutional roles and functions
- ✧ Establishment of management Instruments

These principles and elements have been incorporated into South African legislation in the form of the National Water Act and related legislation. This document further examines these elements in the context of existing legislation, policy and practise in the pilot WMAs.

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 synthesised and are presented in the document as progress toward IWRM.

3 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 3.1.

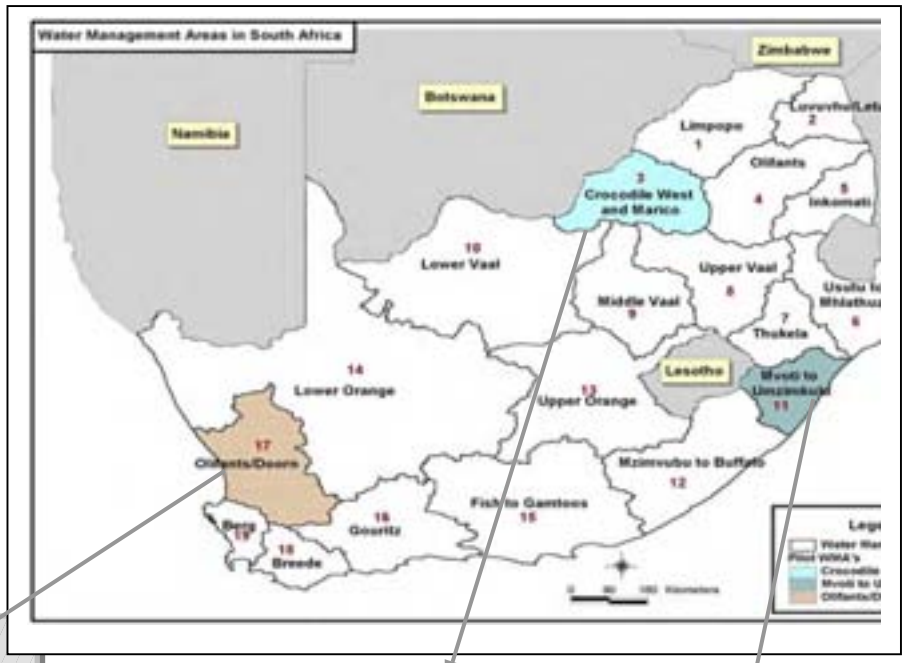


***Figure 3.1**: Water Management Areas in South Africa and the three pilot WMAs*

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.

4 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*.

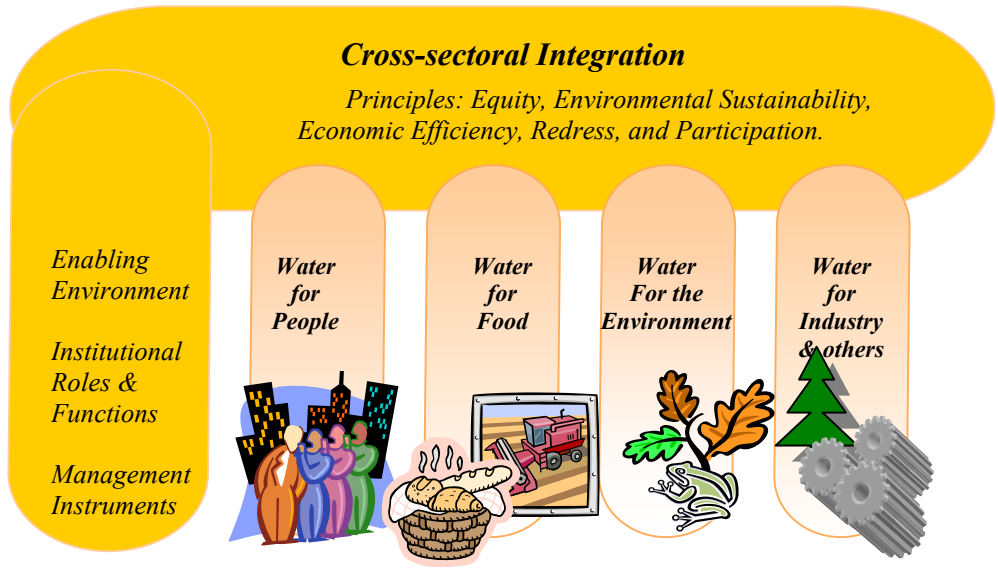
Water Services Provision

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.*

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 [5]. Maximum benefit and sustainability will be achieved through sectoral integration and availability of these support elements.

Figure 4.1 further depicts this integration, adapted from the GWP[5] and forms the essence of IWRM as enshrined in the National Water Act of South Africa.

Figure 4.1: *IWRM Comb, modified after GWP, 2000 [5]. 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.*



5 CREATING AN ENABLING ENVIRONMENT FOR IWRM

Successful implementation of IWRM requires policies and legislation to be harmonised in all spheres of government. Complementary and crucial to this are accountability, good governance, a committed civil society and institutions that have the capacity to implement the relevant policies.

Table 5.1 presents the main components of South African legislation relevant to IWRM. A synopsis of the key elements of this legislation that enables stakeholders to play their respective roles in the development and management of water resources is presented in **Appendix 1.**

The most recent thinking of the sector in terms of water services, however, has been publication of *A Strategic Framework for Water Services* (DWAF, 2003). This framework, while providing a synopsis of the water services legislation in South Africa, also briefly demonstrates the linkage between water services and water resources management.

Table 5.1: Legislation Relevant for Implementation of IWRM.

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 (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)

6 INSTITUTIONS INVOLVED IN IWRM AND THEIR BROAD ROLES AND RESPONSIBILITIES

IWRM 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 effective collaboration it is necessary to: -

- *Identify roles and responsibilities for each institution, and*
- *Develop strategies and plans for collaboration of these, to avoid duplication while ensuring all gaps are addressed.*

The organisational framework 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. However, the impact of human decisions and activities on land also clearly affect the receiving water resource and therefore, IWRM requires consideration of land-use regulation as well as activities around waste generation.

Water Services Institutions are institutions assuring potable water supplies to all communities in South Africa. This usually starts with the abstraction of the raw water from rivers, dams and streams and the treatment, distribution and reticulation of water to local communities for household or industrial use. These institutions are also involved in the removal and treatment of wastewater before the effluent is returned to the environment.

Facilitators are organisations and institutions from civil society that are not necessarily statutory yet play a significant role in the management of water resources either directly lobbying for and providing knowledge for the management and protection of the water resource itself, or indirectly by supporting sustainable development and/or conservation of the natural environment.

Conflict Resolution Bodies, such as the Water Tribunal, are in place to provide a forum for civil society to appeal a regulatory decision regarding water allocation or water rights. Conflict resolution bodies also intervene when there is conflict between two or more organisations regarding a water resource.

Organisations in South Africa that fall into each of the above categories are presented schematically in Figure 6.1.

Figure 6.1: *Institutions Involved in IWRM and Their Broad Functional Categories*

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;

7 IWRM FUNCTIONS AND EXPERIENCES IN PILOT STUDY AREAS

The relationships and linkages between institutions revolve around their functions. The DWAF is currently departmentally organised around the functional framework described in Table 7.1. For the purposes of this document, IWRM relationships are explored in the sections that follow in terms of these functions.

Table 7.1: *IWRM Functions, as adopted from DWAF Strategy Document* [6]

INSTITUTIONAL SUPPORT AND DEVELOPMENT ***WRM-WS Interface: Implement Short-Term Institutional Development And Long-Term Support.***	✧ *Establish WMIs* ✧ *Delegate/assign powers and functions* ✧ *Facilitate establishment of participatory bodies* ✧ *Build capacity*	✧ *Provide technical support/interventions* ✧ *Coordinate activities* ✧ *Audit Institutions*
POLICY & STRATEGY DEVELOPMENT ***WRM-WS Interface: Align Strategies And Planning***	✧ *Policy, Legislation & Regulations* ✧ *Guidelines, methodologies & Procedures* ✧ *Strategic Financial and Business Planning*	✧ *NWRS* ✧ *CMS* ✧ *RDM* ✧ *Pricing Strategy* ✧ *Public Safety* ✧ *Audit Strategy*
WATER USE REGULATION ***WRM-WS Interface: Work Synergistically And Develop Partnerships***	✧ *Registration* ✧ *Authorise Water Use* ✧ *Enforce compliance* ✧ *Dam Safety*	✧ *Water user charge billing and collection* ✧ *Cooperative agreements* ✧ *Audit water use regulation*
PHYSICAL IMPLEMENTATION ***WRM-WS Interface: Work Together To Promote Partnerships Around Wise Use***	✧ *Water Resources Infrastructure Development* ✧ *Water Resources System Operation and Maintenance* ✧ *Water Conservation and Demand Management*	✧ *Water Resources Rehabilitation* ✧ *Flood and Drought Management Activities* ✧ *Emergency Response* ✧ *Audit Physical Interventions*
INFORMATION MANAGEMENT ***WRM-WS Interface: Develop Shared Toolkits And Databases.***	✧ *Data Acquisition* ✧ *Information System Design* ✧ *Data and Information Storage and Management*	✧ *Information generation and dissemination* ✧ *Assessment and evaluation* ✧ *Support for complex knowledge product*

7.1 INSTITUTIONAL SUPPORT AND DEVELOPMENT

7.1.1 Background

It is generally acknowledged and accepted that large-scale institutional change is required to implement IWRM. To do this effectively the National Water Act had enabled establishment of Water Management Areas and Institutions in South Africa. These changes and realignment of institutional arrangements are designed to improve the effectiveness, share the costs, risks and benefits of water resources management initiatives in a Water Management Area, while at the same time increasing the awareness and involvement of stakeholders in resource protection measures. To effect changes in a collaborative manner, consideration must be given to the political and functional mandates and accountability, financial and contractual issues, and human resources issues. As with all other services, involvement of private actors, whether corporate or non-corporate, need to be enabled, but implementation has to be within the public sector development paradigms and mandates.

Equally important is the definition of coordinating mechanisms. Institutional development is not only about the creation of formally constituted organisations, but more importantly, process instruments need to be developed to ensure that coordination takes place between institutions to effect IWRM.

Role-players from all water use sectors need to align themselves around the management of a geographically defined area. However, some functions of IWRM are not necessarily seen as water management functions, including:-

- *Land-use management, where the activities associated with resource use and waste production must be considered in the light of impacts on water resources in a catchment*
- *Coastal zone management, where the integration of freshwater and coastal zone management needs to take place*
- *Technology development, where developments benefiting human systems, also need to be considered for potential impact on water use.*

Thus, institutional arrangements need to be put into place to ensure that ministries, directorates and departments responsible for these functions are partners in the IWRM process.

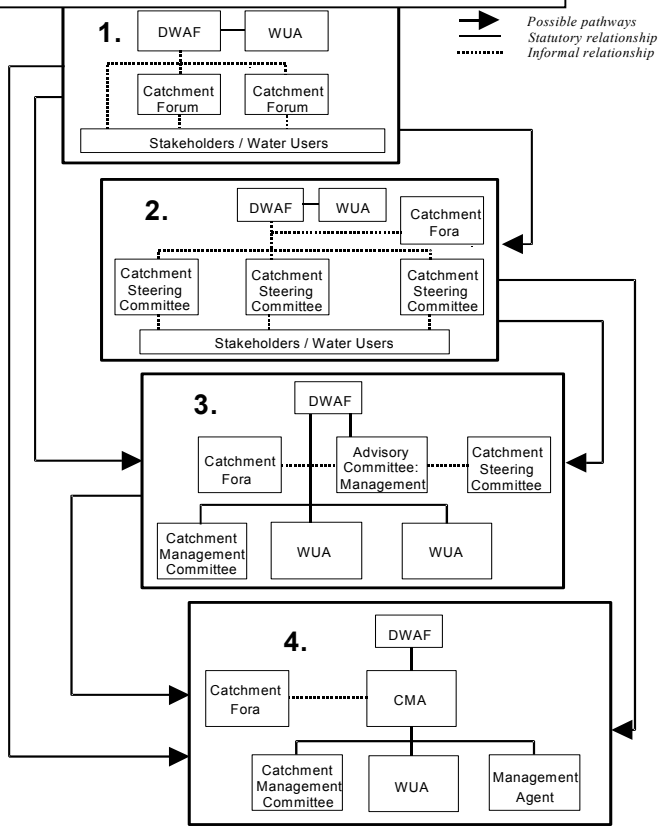
In an attempt to address the need for such partnerships at a Water Management Area level, the National Water Act, Water Services Act and related policies makes provision for the following statutory and non-statutory institutions:

- ***Catchment Management Agencies***
- ***Catchment Management Committees***
- ***Water User Associations***
- ***International Water Management Bodies***
- ***Water Services Institutions***
- ***Catchment Management Forums***
- ***Advisory Committees***

Figure 7.1.1 shows a generic evolution and linkages for some of these institutions [5]. A detailed description of these is provided in DWAF Reports [7,8]. This section will look at linkages and relationships between these institutions in the pilot WMAs and highlight some of the issues that need clarification.

In defining relationships between the different institutions at local level, it will be found that, while they may have unique characteristics,

Figure 7.1.1: *A generic model for institutional development and possible relationships.*



they will also have over-lapping jurisdictions in terms of objectives and spatial distribution. Conflicting opinion could cause friction, as roles cannot always be clearly defined in legislation. It is thus important that these organisations work collaboratively and synergistically towards the same regional development goal. The DWAF Strategic Plan for Water Resources (2001-2005) identifies these goals as:

- *Ensuring water for water dependent economic activity*
- *Ensuring water to support equitable social development*
- *Ensuring the protection of water-based ecosystems*
- *Ensuring the wise use and collection of charges for water used*
- *Developing and empowering staff*
- *Contributing to effective waste management.*

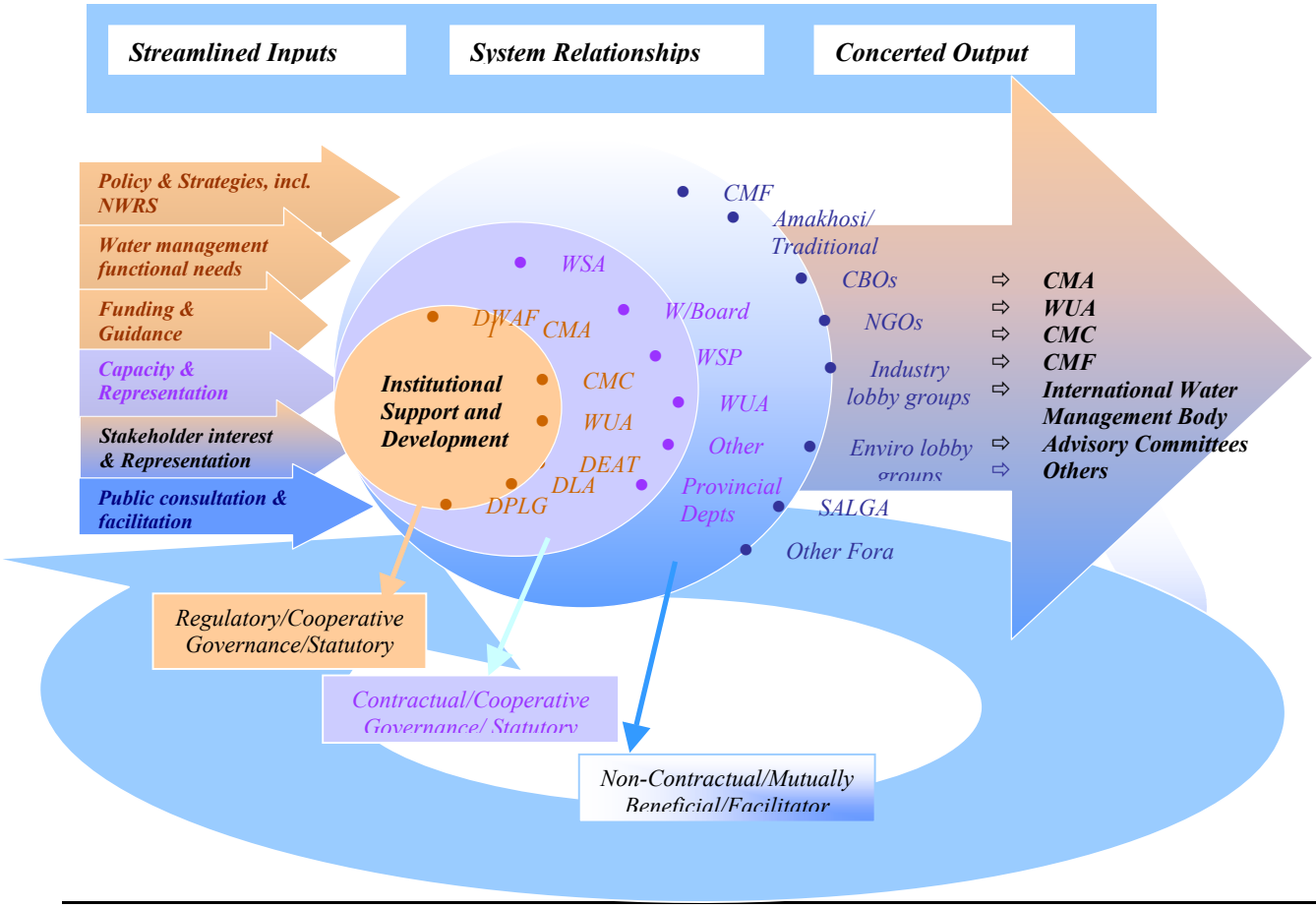
Clearly these goals have to converge with the goals of other organisations to ensure the desired development takes place.

Relationships must be forged with a range of Governmental and Non-governmental institutions. The establishment of the CMA Process Advisory Committees provides a vehicle for developing and coordinating such relationships. Relationships may be statutory, contractual, non-contractual or mutually beneficial in nature, as defined below.

- ***Statutory*** *relationships are based on assignment or delegation of powers, duties or functions between statutory organisations.*
- ***Contractual*** *relationships are based on a formal agreement between the CMA and a services provider (public/private).*
- ***Non-Contractual/ Mutually Beneficial*** *relationships exist between an organisation and other stakeholders providing the opportunity for public participation in decision-making.*

A schematic model for arrangements around institutional development is presented in Figure 7.1.2 and shows the inputs and outputs in the institutional development process.

Figure 7.1.2: Schematic showing inputs, outputs and institutions that need to have linkages around institutional development for IWRM



Strategies are required to bring institutions together around water resources management functions. While, the National Water Act and Water Services Act assign roles and functions to the Water Management Institutions, the National Water Resource Strategy (NWRS) sets out the ways in which we aim to achieve integrated water resources management in South Africa. The NWRS describes the policies, strategies, plans and procedures by which this will be done.

Mechanisms for funding the establishment and management of statutory institutions and the facilitation of public consultation are the responsibility of the regulatory authorities, while funding and guidance of non-statutory institutions depends on the goodwill of all the stakeholders. The development of capacity within the latter institutions has been largely supported by DWAF at both the National and regional level as well as existing water services institutions such as the larger water boards.

DWAF is charged with the responsibility for policy development and regulation of institutional development for water resources and has to drive and co-finance the process of CMA establishment in Water Management Areas. Other regulators, e.g. for waste management and land development, will participate and cooperate to ensure overlapping institutional functions are used constructively and gaps in functions addressed.

While it is recognised that Water Services Institutions, play a pivotal role in the Catchment Management Agency development process together with other statutory stakeholders, greater attention is required in the definition of all functions around the interface of water resources management and water services management. As discussed, the development of relationships should focus not only on development of new institutions for water management, but also in putting mechanisms in place that will allow convergence of functions of existing institutions with that of water management institutions.

Other stakeholders that do not have statutory water management functions serve a key role in the process as facilitators and/or represent other interest groups who are beneficiaries, to ensure that a balance between social, environmental and economic development is realised. The presence of such stakeholders will give the process credibility and support during physical implementation. These stakeholders, post CMA establishment, will continue to play a role in future activities as they are likely to retain the institutional memory and knowledge of the WMA and any unique issues identified during the process that need to be taken forward.

7.1.2 Experiences From the Pilot WMAs

Refer to the individual WMA reports for more information, as may be required [9,10,11].

Institutional development approaches differed from one Water Management Area to another, being driven by local issues, financial resources and the level of stakeholder drive and involvement. As part of this process therefore, information from the three pilot WMAs was collected through: interviews with various officials from different institutions, attendance at stakeholder meetings, review of minutes of CMF and CMA proposal development meetings, participation in CMA initiatives, adaptation of existing information and other means.

The sections that follow describe in concise format the major processes followed to date toward the establishment of the CMAs in the Mvoti to Mzimkulu, the Crocodile Marico & Marico and the Olifants-Doorn WMAs. Current and proposed water management institutions in these Water Management Areas are depicted schematically.

Institutional development experiences from WMA 11: Mvoti to Mzimkulu

The CMA Establishment Process in WMA 11 was initiated formally in July 2001, as a joint project with the other two WMAs in KwaZulu-Natal, WMAs 6&7.

The process followed included:

- ⇨ *Initiation and introduction of the process at a series of public meetings held at three locations in the WMA in September 2000;*
- ⇨ *Appointment of a consultant to develop the situational assessment component of the proposal;*
- ⇨ *Presentation of the situational assessment and election of the Proposal Development Working Group at a second set of public meetings in February 2001;*
- ⇨ *Development of a proposal to establish the CMA between May 2001 and September 2002. A consultant undertook this with guidance from the Proposal Development Working Group. Draft 3 (of 4 drafts) of the proposal was consulted with the stakeholders at a pubic meeting in July 2002;*
- ⇨ *The proposal was submitted to the Minister of Water Affairs & Forestry in October 2002;*
- ⇨ *Feedback from the CMA Proposal Evaluation Committee (CMEC) was that the proposal met a lot of expectations and was aligned with DWAF policies. Some areas, however, still required improvement.*

Refer to WMA11 report for more detailed information.

Figures 7.1.3a & 7.1.3b depict the current CMA development process and proposed CMA Representational & Operational Structures, respectively [12].

Figure 7.1.3a: The CMA development process in WMA 11

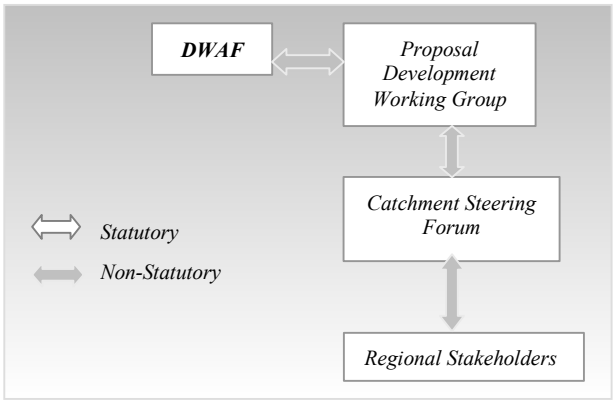
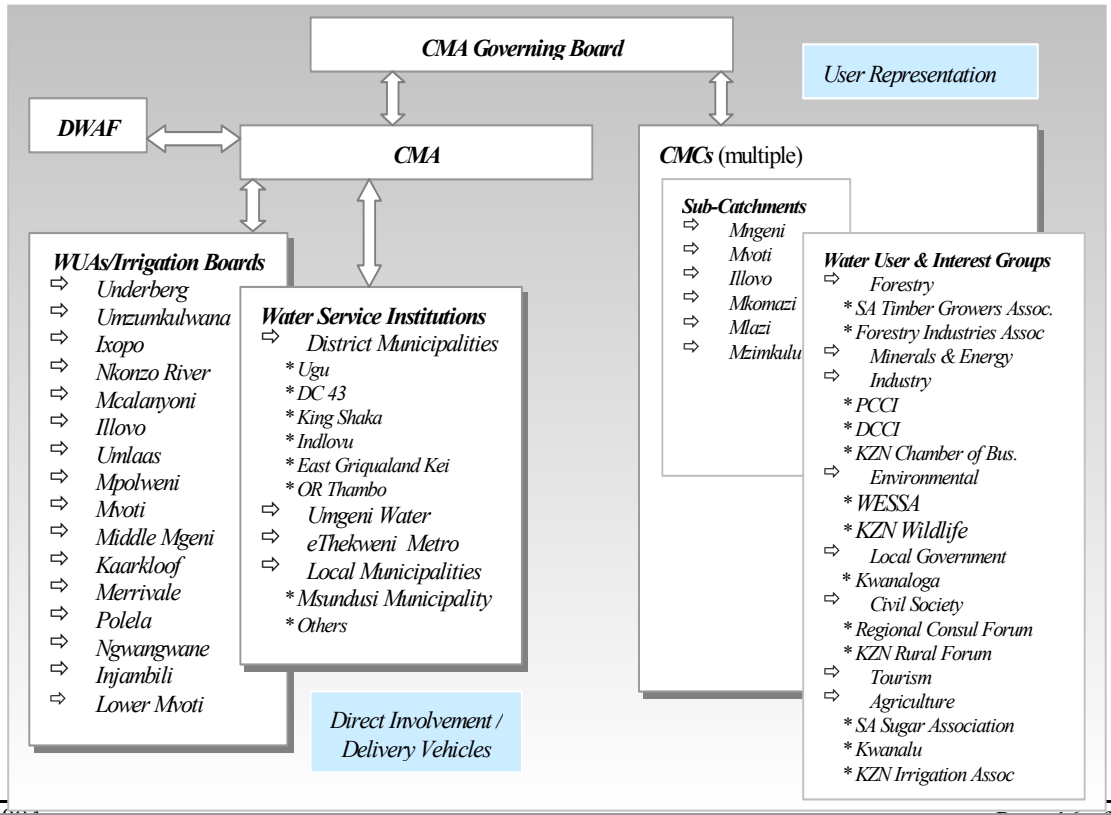


Figure 7.1.3b: Proposed CMA structures and linkages in WMA11



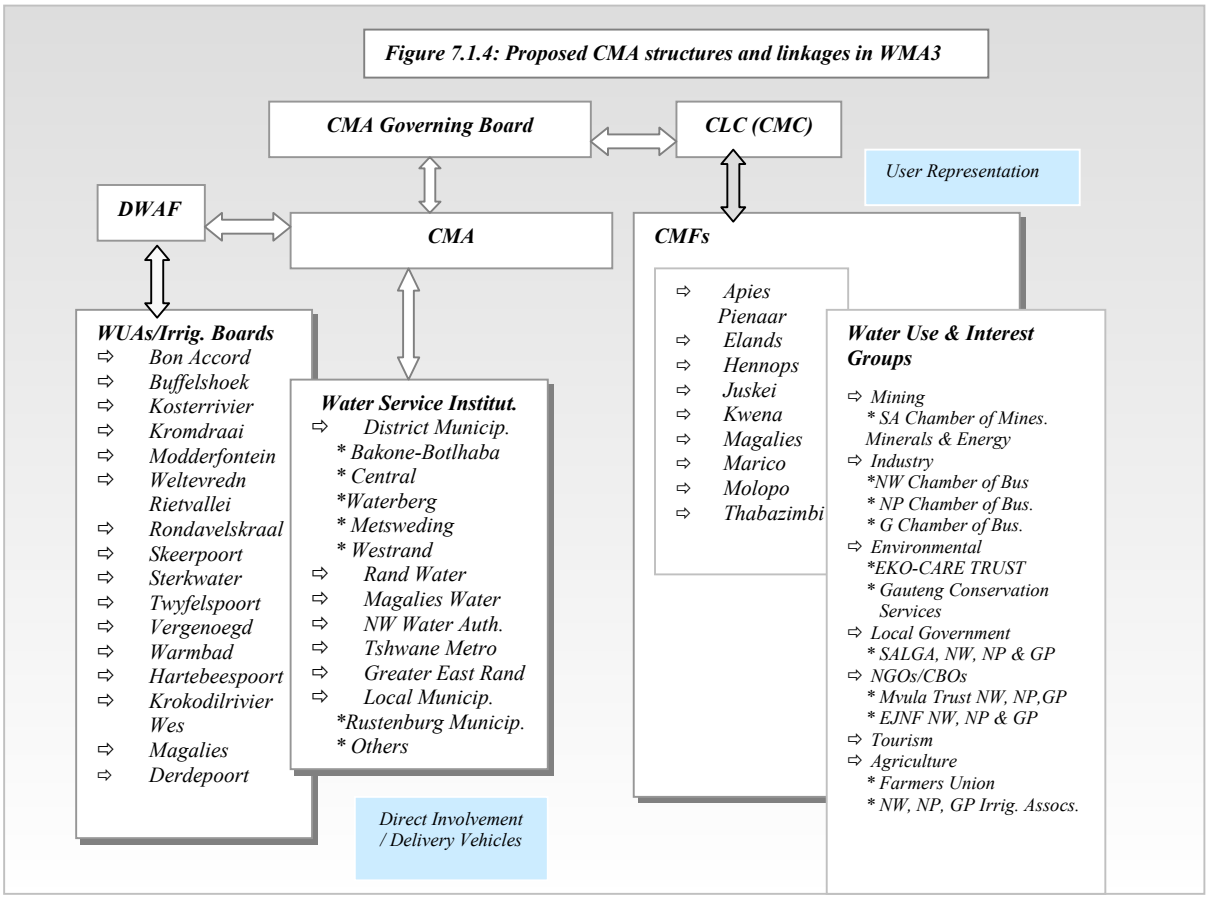
Institutional development experiences from WMA 3: Crocodile West & Marico

The CMA establishment process in WMA 3 was initiated formally in June 2001 with the Coordination and Liaison Committee (CLC) playing a key role in facilitation of stakeholder participation at forum level and undertaking administrative issues such as development of the situational assessment and financial viability reports, as well as the proposal document itself. The proposed future role of the CLC was coordination and assumption of CMC responsibilities.

The process included:

- ⇨ *Appointment of consultants to prepare the situational assessment and financial viability components (2000)*
- ⇨ *Formulation of the Coordination and Liaison Committee (CLC) (2001)*
- ⇨ *Development of a proposal to establish the CMA (September 2001)*
- ⇨ *Workshop of proposal document with Theme Teams (October 2001)*
- ⇨ *Revised document presented at a full CLC meeting (November 2001)*
- ⇨ *Draft proposal submitted to DWAF, Directorate Catchment Management.*
- ⇨ *Submission to Minister of Water Affairs & Forestry (early 2002)*
- ⇨ *Establishment of Advisory Committee to advise Minister re: CMA Governing Board (anticipated in 2004)*

Figure 7.1.4 depicts the proposed linkages to the CMA in WMA3.



Institutional development experiences from WMA 17:Olifants Doorn WMA 17

- ⇨ *The first CMA institution was established when the Vredendal Irrigation Board successful converted to the Lower Olifants River Water Users Association (LORWUA) through Ministerial approval in 1999.*
- ⇨ *Early in 2000 DWAF Regional Office(RO) Western Cape set about planning a CMA development and public participation process*
- ⇨ *A consultant was appointed to champion the process and the initial broad base public meetings "roadshow" initiated*
- ⇨ *This process resulted in the establishment of eleven 'wall to wall' forums covering the whole WMA*
- ⇨ *In parallel and supported by a separate champion from the DWAF RO the remaining irrigation boards are being converted to Water User Associations.*
- ⇨ *In November 2001 representatives from all the forums, irrigation boards, LORWUA, District & Local Municipalities, CBO and NGOs were individually invited to a Public Meeting. The meeting was in the form of a workshop allowing all institutions an opportunity to provide input, exposure to the network and issues from each area. In addition DWAF explained the proposal development process and a Reference Group (comprising 73 people) was elected. The task of the reference group was to guide development of the CMA proposal and act as a "bridge" between the broader stakeholder base and consultant drafting the proposal.*
- ⇨ *Between January 2002 and July 2003, the proposal was developed in a methodical manner, with each draft taken back for input from the forum meetings through Reference Group representatives.*
- ⇨ *On completion, the Proposal was submitted to DWAF for consideration.*
- ⇨ *In July 2003 two representatives were recommended for appointment to the Advisory Committee.*
- ⇨ *Between July 2003 & February 2004 coordinated input was obtained on recommendation for the composition of the CMA Board.*

Figure 7.1.5a: Interim structures and linkages in WMA17

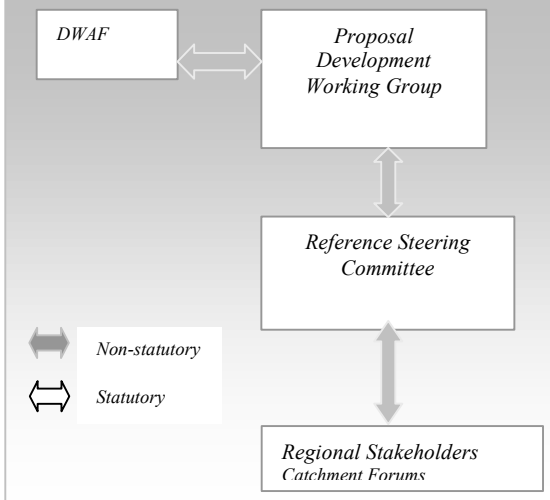
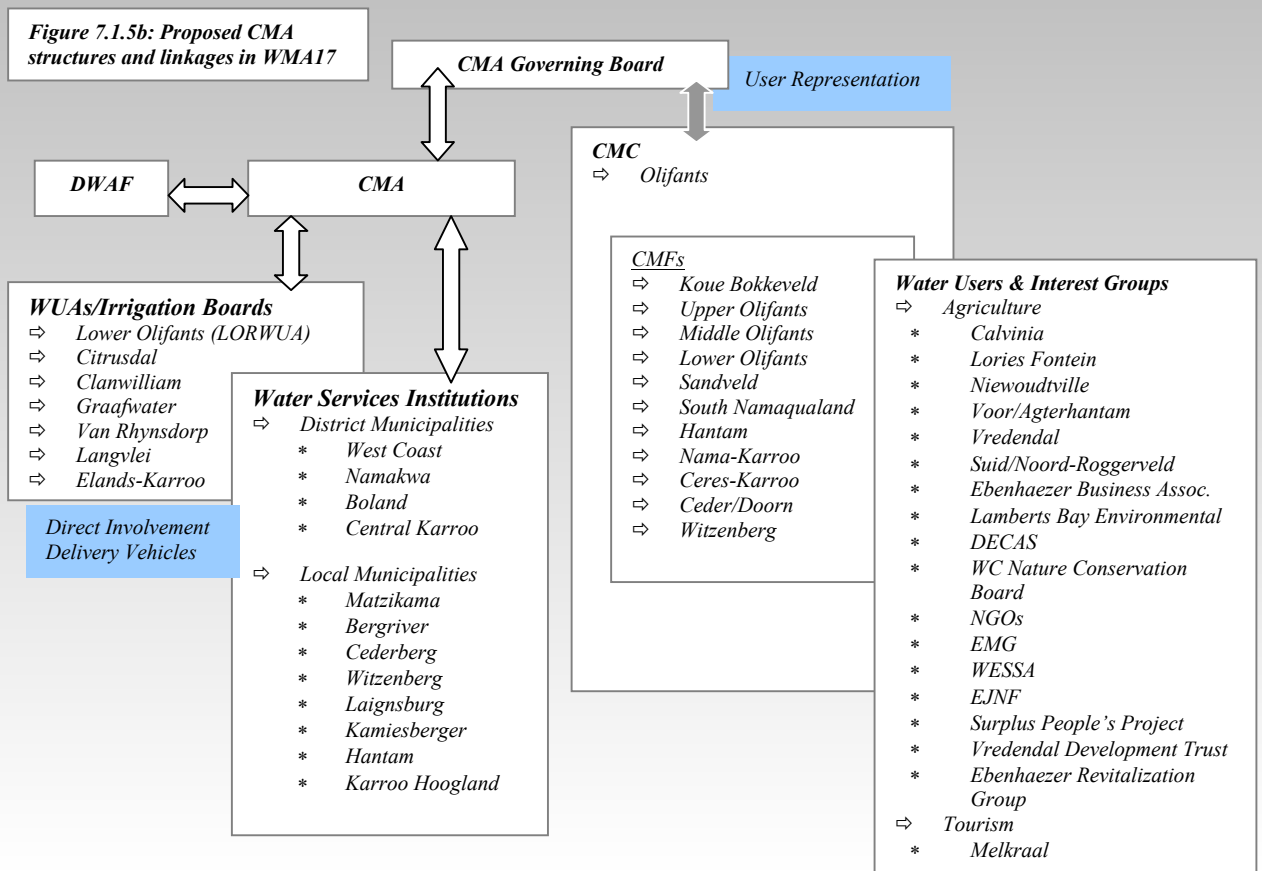


Figure 7.1.5b: Proposed CMA structures and linkages in WMA17



7.1.3 Discussion

Planning for IWRM development

A key component of every successful venture is adequate planning and a clearly documented process that has inherent flexibility to evolve as the process unfolds.

The planning aspects in the three WMAs varied considerably. The process followed in the Olifants-Doorn catchment unfolded in an orderly and anticipated manner. This might have been due to the co-incident initiation of the IWRM project, which provided dedicated resources in terms of project management, and which complemented the regional office intentions for WMA 17 in terms of institutional development. The experiences in WMA 3 and WMA 11 were somewhat different. In WMA 11, CMA Institutional development was initiated as early as 1997 with the development of e.g. the Msundusi Catchment Management Forum, making realignment then necessary. An inclusive planning process that builds on existing initiatives is also important. In WMA 11, the experience gained over the four years was not properly built on when the CMA process was initiated with the result that energy was lost to the process as a whole.

The CMA establishment process is a resource hungry process requiring sufficient resources to be allocated to ensure success. A further requirement is consistency. The staff at the DWAF Regional Office in the Olifants-Doorn Catchment as well as the appointed consultant who guided the Public Participation process remained constant throughout, with the result that a methodical consecutive process had been followed. Unfortunately this was not the case in WMA 11 where the DWAF resource driving the initiative left during the process.

Recommendation for improvement is therefore for DWAF to ensure that there are sufficient or a critical mass of resources involved in the process to ensure continuity when individuals leave.

Lessons learnt from the initial stages of the CMA establishment process

- ✧ *Enough preparatory work needs to be done by DWAF regional office personnel with support from Head Office on policy, planning, resources and mapping out the administrative processes.*
- ✧ *The region needs to have well drawn out project roll out plans including communication and stakeholder engagement plans. A decision may need to be taken to outsource certain functions without compromising the growth and capacity building of DWAF personnel and the sustainability of the project.*
- ✧ *The stakeholder involvement process must be clearly understood and internalised before rushing into implementation so that the process remains credible, has impact, and vital missing links are brought on board*

IWRM champions

Catchment Management Agencies (CMAs) are constituted specifically to champion water resources management and to ensure a participatory approach to water management in each Water Management Area (WMA).

The DWAF regional office has an important role to play in terms of institutional support, coordination and auditing. The support relates to technical assistance in order to give effect to IWRM.

The DWAF Head Office would largely be inclined towards policy and strategy development. {More details on DWAF institutional models and roles can be found in the report DWAF, 2001[13]}.

What is important is that the IWRM principles are promoted and championed in each WMA.

In the Mvoti to Mzimkhulu WMA the DWAF Regional Office had largely driven the CMA process. Involvement in the processes with other stakeholders gave the Regional Office an insight into the dynamics of institutional issues that would be vital to give consideration to when providing support to the future CMA.

It was noted that consultants to the Crocodile

West & Marico WMA drove a significant part of the CMA development process for that WMA. While this had advantages of efficient and timeous delivery within tight schedules, the disadvantage was apparent loss of control or ownership over the intellectual knowledge of the process, which could lead to weakening of the support role that the Regional Office would need to play in future. It was also a possibility that DWAF could pay more than once for the same information if outsourcing were not carefully managed.

The Western Cape DWAF Regional Office appointed a dedicated manager to the Olifants Doorn WMA. His responsibility was to coordinate all catchment management related activities in that WMA including the management of the consultant appointed to establish the forums. One concern, however, was the capacity of the Regional Office to sustain the forums. The DWAF Regional Office Catchment Management Coordinator for WMA 17 also championed the CMA proposal development process.

Stakeholder Involvement and Institutional Development and Support.

The National Water Act requires stakeholders to work collaboratively to develop a proposal for establishing a CMA in a particular WMA. The process must take cognisance of the stakeholder demographic profile and physical characteristics of the WMA. CMA viability and possible institutional arrangements must also be outlined.

For practical purposes there is a need to identify stakeholders in terms of "who does what" in the Water Management Area to ensure that all the role-players and interest groups can participate in the proposal development process and in the formulation of the Catchment Management Agency.

Stakeholder involvement and lessons learnt in WMA 11 - Mvoti to Mzimkhulu

This process started with identification of stakeholders - drawn from four sectors of society, namely, government and public sector, parastatal and utility sector, private sector, and civil society - to generate a comprehensive stakeholder list and prepare a strategic 'map' for engagement. The stakeholders were defined as organisations and individuals who have an interest in the water resources in the WMA - some direct and others incidental interest. The process undertook to engage as many stakeholders as possible in the process.

Large adverts and information inserts were placed in several newspapers within the Water Management Area, both in Engish and in Zulu, and announcements made on the Ukhozi FM radio-station regarding the initial workshops, introduction to the IWRM project and to initiate the development of the Proposal toward the establishment of the CMA. A rural outreach programme was instituted to target traditional leaders and women's groups, while environment interests were represented at all levels through WESSA and 'KZN' Wildlife. Other stakeholders including, the local Water Board - Umgeni Water, and Irrigation Boards e.g Umlass Irrigation Board, had been instrumental in establishing and sustaining some of the CMFs.

A CMA establishment steering committee was elected to oversee the process. This committee elected a core group called the Proposal Development Working Group, which was responsible for coordinating the CMA establishment process. Consultants were appointed for putting together a situational assessment report, CMA viability report and the proposal document.

The CMA Proposal has not yet been approved and one of the reasons given for the delay was the issue of adequate stakeholder participation. The CMA Proposal Evaluation Committee (CMEC) identified the need for further involvement from previously disadvantaged individuals, rural groups and persons from the Eastern Cape. The regional shortfall is not surprising as communities have for many years been separated along Provincial Boundaries and Tribal Homeland boundaries. Capacity building will be required for distant communities to understand the role they may play in a largely KwaZulu-Natal based organisation. The issue of transport costs is also a concern common to all WMA initiatives. This was partially addressed, in that, reimbursement for transport costs was

provided to those who attended meetings. Communication networks to disseminate information will also need to be improved.

The support to Catchment Management Forums in this area has been in the form of voluntary input from various organisations such as the Water Board, certain Irrigation Boards and Local Municipalities. Representation from these groups has been adequate but more limited from the broader community.

Several applications by Irrigation Boards have been submitted to DWAF to convert to WUAs but none have had approval as yet. It is recommended that the approval process be streamlined and/or the applicants be kept appraised about the processes being followed.

Stakeholder involvement and lessons learnt in WMA 3 - Crocodile West & Marico

External consultants have largely driven the institutional development process in this catchment. A Coordinating and Liaison Committee (CLC) was established, which played a significant role in the interface between the DWAF consultant and the stakeholders at forum level. The CMA establishment process tended to follow pathway '2' as reflected in the DWAF institutional development model (Fig 7.1.1).

Nine catchment management forums were established mainly around local water quality or quantity concerns. Several forums thrived with these institutions, which were run along business principles. As the Proposal Development Process evolved it became evident that some forums required additional support, which was provided by the DANIDA IWRM programs for Champions Development and Project Cycle Management.

As with the other pilot studies it was observed that the involvement of women in all aspects of this institutional process has been limited.

In WMA 3 the initial representation by District and Local Municipalities was extremely poor. Several reasons had been put forward:

- ✧ There were no proper plans for communication and stakeholder involvement
- ✧ The municipal sector was inundated with new legislative requirements with insufficient capacity and resources to consider all requirements.
- ✧ Many of the attendees who did attend did not have either the mandate to make decisions on behalf of the Municipalities nor the means to feedback information through the municipal lines.

While the operation and structural arrangements of the Coordinating and Liaison Committee in WMA3 were considered sound and effective and enabled the WMA to achieve great milestones in a short space of time, the lack of adequate involvement of marginalized groups remained a concern.

Stakeholder involvement and lessons learnt in WMA 17 - Olifants Doorn

The process in WMA 17 was well-supported by external resources through the appointment of services providers for Public Participation and Institutional Support, as well as the provision of dedicated resources from the DWAF Regional Office.

A broad stakeholder base was established and evaluated for all aspects of inclusiveness. This stakeholder base, which considered geographic spread, was also used to define a framework of 'wall-to-wall' catchment management forums.

The model followed for the CMA development process was closely associated with and built on the development of the other water management institutions in the WMA. This had the benefit of the participants in the forums and water user association being able to relate well to the CMA development process, enhancing both the potential CMA and defining their role in water management in the newly developed institutions.

The relationship of the forums to the overall process and the key role that they were expected to play in terms of the establishment of the Catchment Management Agency was defined upfront. To ensure that previously disadvantaged individuals understood the need

for the process, capacity building interventions were introduced. The stakeholders included representation from current water management institutions, agriculture and industry, farm workers unions, emerging farmers, businesses, conservation organisations, NGOs and government representatives from all tiers. This stakeholder base was used to elect a large Reference Group to facilitate the CMA development process. The process in this WMA was made easier, in a sense, in having a largely homogenous base both culturally and politically, in that ninety percent of the stakeholders are Afrikaans speaking with agriculture being the dominant focus area.

Several areas of competing jurisdiction were identified with little guidance and definition from legislation. One example was the confusion in WMA 17 between the authorities of the Matzikama Municipality, a Water Services Authority, vis-à-vis LORWUA a large established WUA. Paucity of resources in Municipalities made it difficult to attend to these issues.

A further example was the West Coast District Municipality (WCDM), which had budgeted for involvement of staff in the development of Water Management Institutions in its area of responsibility, however, a district municipality could be involved in several Forums and Water user associations and ensuring attendance at all meetings was difficult. The WCDM has six WUAs and eight CMFs in its area of jurisdiction in WMA 17. In addition, the District Municipalities straddles and will have responsibilities in the Berg WMA as well.

A second area of concern existed between the authorities of Catchment Management Forums relative to Water User Associations, where geographical areas overlap. The goals of Water User Associations may not necessarily be in the catchments' interest. One example is the utilisation of floodplains for crops and the cutting of reed-beds in the wetlands, due to bird species from the wetlands causing damage to farmer's crops grown adjacent to the wetland. The destruction of wetlands is a concern to the Catchment Management Forums and to water resource interests in general.

A further issue is the size of a Water User Association. There is little information on how large these institutions should be, what is manageable and how do members displaced in distant farming environment and interest, work together. The composition and transformation of Water User Associations to include emerging farmer's interests was the subject of a study carried out by the International Water Management Institute[14]. It identified that the existing institutions do not represent the latter interests and intervention was required to improve the situation. There is thus a need to develop models for WUAs to refer to.

Perceived gaps to be addressed

- In WMA 11, participation from marginalized groups was poor for various reasons: DWAF did not have sufficient resources for the process; most CMFs were neglected and thus lost momentum; the regional office tended to dominate the process and as a result many stakeholders were not sure of their roles and responsibilities.

- For WMA 3, wider stakeholder participation had not been adequately addressed. Important stakeholders such as rural communities, traditional leaders, and other government sectors were not part of the CMA process.

- In WMA 17, there was confusion with regards to the timing and possible duplication of responsibilities, as well as gaps in the period before the CMA became functional. The smaller institutions were being established with roles and responsibilities and the regional office was being absorbed into these newly developed institutions.

- A consultant appointed by DWAF had largely championed forum establishment in WMA 17. While this had allowed for uniformity of approach, it was not clear as to how the CMFs will be sustained. The forum meetings had also become a focus for emerging farmers to air issues around security of tenure, adequate housing, access to productive land,

social impacts associated with imported labour, etc. While many of the issues were not directly water related, they had the potential of polarising forum meetings. There was thus is a need for skills development in areas of conflict resolution and forum facilitation. A further issue was the need for a source of funding for the secretariat, as this WMA did not have resources of e.g. large business, as may be the case in other WMAs.

- There is little guidance on how autonomous CMAs may be. The CMAs would need to work within the frameworks of other Government Departments at District, Provincial and National level. There is a need to develop the capacity within these departments to think spatially in terms of the Water Management Area and to respond to issues of concern by the CMA in a collaborative manner.

Lessons learnt

- *CMFs should be used as the entry point for institutional development and a participatory approach to water management.*
- *Stakeholders must be encouraged to own the process and recruit other relevant participants.*
- *The natural environment/ resource must be considered as a core pillar in the sustainability of all development.*
- *A rural outreach programme has advantages of understanding core local issues and incorporating the appropriate stakeholder mix, but requires deployment of adequate and dedicated human resources for success.*
- *In the stakeholder identification process, language preference must be taken into consideration, as it has a bearing on participation and capacity building initiatives.*
- *Stakeholder engagement may be a long and complicated process if not approached in a systematic and adaptive way.*
- *The training of community mentors (champions) in aspects of both institutional management and water science, can significantly broaden capacity at local level so that more people feel comfortable with being involved. This training in turn supports people development.*
- *The CMA process should be aligned to existing DWAF guidelines and be implemented in the spirit of the NWA and IWRM principles. Innovative ideas would need to be adopted to optimise resource use, increase participation and passion for forum work and resource conservation, and make forums or reference groups focused and effective.*
- *Running forums as income generating entities run on tight business principles must be undertaken in a balanced manner with other sustainability pillars. Focusing purely on financial issues causes conflict on who should benefit, who should be the office bearers, accountability issues and violation of applicable legislation.*
- *Cultural identity tends to encourage groupthink and dictate the operation and focal issues within the CMF. Integration across cultures, which is core to learning & growth, will therefore require strong facilitation to accommodate all interests and perspectives.*
- *A common concern to all the Water Management Areas is the support base for the expansion and future sustainability of Catchment Management Forums.*
- *Considerable support is required at Municipal level to understand the interrelationships between Water Resources Management and Water Services. In addition, clearly defined responsibilities need to be documented and information disseminated to both CMA or Regional DWAF and Municipal structures.*
- *The ability to close the feedback loop for information dissemination is assumed in the whole CMA process. Large distances, poor communication infrastructure, poverty, politics and protection of interests are all impediments to the process. Without these being addressed the legitimacy of many of the Public Participation processes may be questioned.*
- *All areas differ greatly in terms of resources and requirements, and flexibility in approach will thus be a requirement to effect IWRM in all places.*

Addressing gender bias

The responsibility for day-to-day management of water resources in communities has traditionally rested with women. With the development of formal water reticulation systems, men have predominantly taken on the decision-making in terms of water resources planning and development. The knowledge of day-to-day problems encountered in managing catchment water resources and possible solutions therefore is vital to the planning and development process. To ensure effective solutions, attention must therefore be given to eliminate gender bias and ensure a balanced input into decision-making.

Gender issues in the Mvoti to Mzimkhulu WMA

Gender mainstreaming has not received attention in this WMA, as a result, participation by women has been poor. Lack of attendance or active participation in meetings by women is common, such that, the probability of making the wrong water management decisions is high. Although there has been a rural outreach programme in place, there is still no noticeable impact in this regard. One reason could be lack of continuity and communication with stakeholders as DWAF has had few resources to deploy on the ground and drivers had exited the programme.

Gender issues in the Crocodile West Marico WMA

In this WMA, representation issues were addressed by designated groups being targeted for positions of influence in forums and the Coordination And Liaison Committee, with the result that women held thirty three percent of these positions. The process involved securing assistance from local councillors to identify and contact relevant communities, enlisting traditional leaders to encourage community participation, and holding meetings at villages to elect representatives. However, over time the input of women dwindled and has since been identified as a concern.

Gender issues in the Olifants Dooring WMA

The Olifants Doorn catchment is conservative in that most representatives on forums are male. Unlike other Water Management Areas most of the water management issues revolves around irrigation of farms. Both in the commercial farming sector and amongst the emerging farmers, decision-making is predominantly the 'prerogative' of men. However, many of the innovations to cope with the water quality problems associated with surface and ground water abstraction in small isolated rural communities are frequently dealt with by women.

Several initiatives were put in place to increase women involvement. One example is the Capacity Building Program, where training was provided for forum members to carry out secretarial duties, with such training targeted at women members of the forum. In addition, the consultants appointed to Champion the Public Participation Process were predominantly female. Female representation on all of the institutions, however, remains a problem.

Lessons learnt

Participation by women in all newly formed water management institutions in all WMAs is low. There is a need to explore ways to allow catchment management meetings to take place at times suitable for women to participate. The success of the future CMAs will depend on women's local knowledge in water management being included in the decision-making processes.

Mechanisms To Promote Cooperative Governance

Intergovernmental Forum (IGF)

The IGF was established to promote dialogue between National and Provincial governments as well as cooperation on issues of common concern. It has been proposed that this body should, on an annual basis, set the priorities in terms of parliamentary decisions and monitor progress. This body could therefore serve as an instrument to ensure cooperative governance in IWRM.

Enabling Legislation

Various components of legislation provide for sectoral departments to cooperate in terms of water resources management. These are described further in **Appendix 1**. What is therefore required is the institutional capacity and planning to make it happen.

Checklist: Institutional Development Functional Areas [7]

- ✓ *Creation of statutory and non-statutory consultative participative bodies.*
- ✓ *Identifying water resources management and related stakeholder links.*
- ✓ *Coordination of the activities and relationships for WMIs in the WMA.*
- ✓ *Fostering cooperative governance and creating partnerships.*
- ✓ *Building capacity in the WMIs and forums.*
- ✓ *Resolution of water conflicts between organisations.*
- ✓ *Support and advice on water resource management activities*
- ✓ *Supportive or emergency organisational interventions.*
- ✓ *Ensuring appropriate stakeholder participation in these bodies.*

7.2 DEVELOPMENT OF STRATEGY AND POLICY

7.2.1 Background

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. This over-arching strategy requires that plans are also developed to provide for international neighbours in shared water resources, as well as prevent any region in South Africa from suffering significant water shortfalls or poor water quality. The NWRS also provides guidance on the ecological water requirements of the rivers.

The development of the NWRS between the period 2000 and 2002 at which time the final draft was produced, involved extensive stakeholder consultation that enabled input into the various drafts. The NWRS provides for the following water management aspects: -

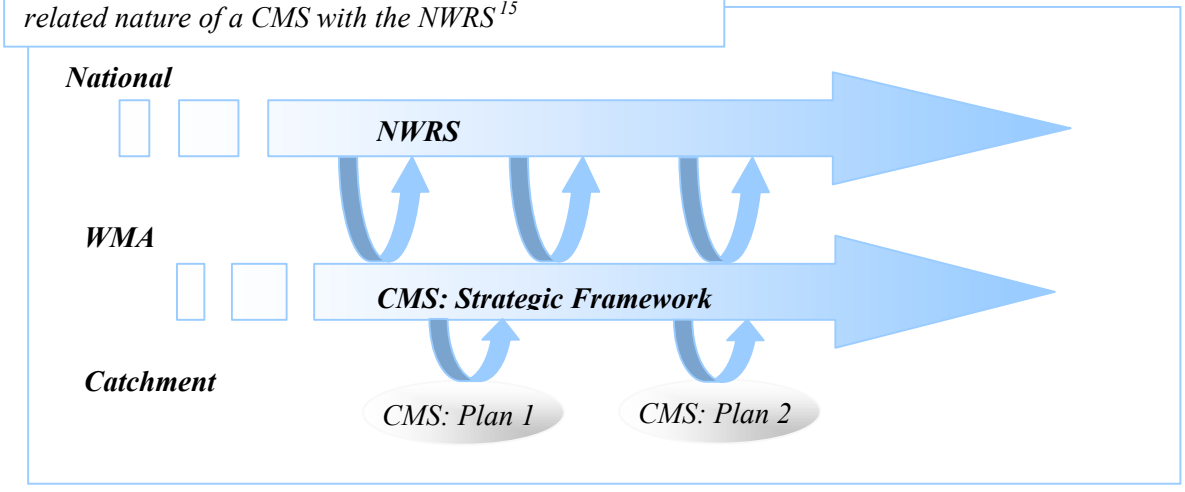
- ✧ Identification of the policy and legal framework guiding the NWRS.
- ✧ South Africa's water situation and strategies to balance supply and demand.
- ✧ Strategies for Water Resources Management.
- ✧ Complementary strategies by other government departments.
- ✧ National Planning, coordination and International cooperation in Water Management.

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. The main objective of a CMS is to facilitate local management of the water resource, and human behaviour in ways that achieve equitable, efficient and sustainable use of water.

A simple illustration of the dynamic and inter-related nature of a CMS with the NWRS is shown in Figure 7.2.1 (Adapted from DWAF [15]).

Figure 7.2.1. *Illustration of the dynamic and inter-related nature of a CMS with the NWRS* [15]



7.2.2 Developing a Catchment Management Strategy

Need for a water resource management strategy

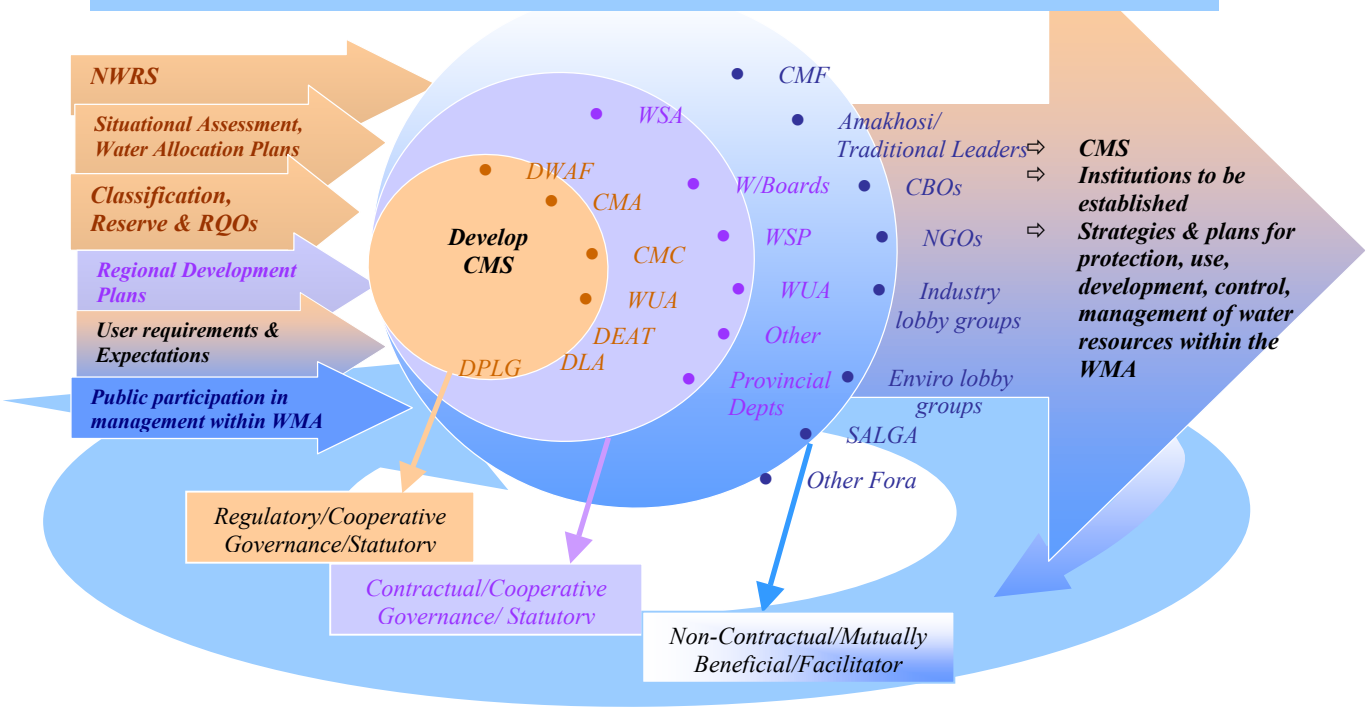
The world's freshwater resources are under increasing pressure to meet the growing demands of a rapidly increasing population and their various resource consumption needs. South Africa is no exception and if the current rate of water usage is maintained, serious water shortages are anticipated in the country by 2030 or sooner. The Water Act of 1956 did not reflect fairness, equity or attempt to recognise and respond appropriately to the country's limited water resources, further compounding the problem facing South Africa [16]. As a consequence of this and other factors, the South African water policy has undergone total revision, a core component of which promotes development of the Catchment Management Strategy in the context of the following main issues:

- ✧ *Achieving a sustainable balance between utilisation and protection of water resources.*
- ✧ *Consideration of the inter-linkages between water, land-use, the environment and human activities*
- ✧ *Recognising that partnerships/institutions for participative management between stakeholders, communities and organs of state are essential.*

Responsibility for developing the CMS

The development of a CMS is one of the initial functions of a Catchment Management Agency (CMA), although the relevant Regional Office of the Department of Water Affairs will carry out this function if a CMA is not yet established. Consultation between the CMA and the other stakeholders in the catchment is vital in development of the CMS. A schematic with the inputs, outputs and stakeholder groups that need to be considered when developing a CMS is depicted in Figure 7.2.2.

Figure 7.2.2: Development and Implementation of a CMS



DWAF has developed policy, guidelines and facilitated development of the NWRS. The CMAs are yet to be established and will drive development and implementation of a Catchment Management Strategy for each Water Management Area. Effective water use strategies and plans by water user institutions will require e.g. integration between Water Services Development Plans, Water Board and Irrigation Board Business Plans/Strategies and the CMS. The Integrated Development Plans and Land Use Management Strategies that are developed at District and Local Municipal levels are core inputs in the development of the CMS. Active participation by all other users is critical to provide the context for sustainable development in the catchment.

CMS Fundamentals

The CMS comprises three main components:

- *A situational assessment, which characterises the various features and aspects of a Water Management Area, thereby providing adequate and relevant information for formulating strategies and plans.*
- *Foundation strategies that provide background criteria for managing water resources in the WMA. These strategies create the framework for human and financial resources and the institutional development necessary to involve and deal with stakeholders, as well as to implement the supporting strategies.*
- *Supporting strategies to protect, use, develop, conserve, control, manage and monitor water resources in the WMA.*

Link Between the CMS and Existing Policies

In accordance with the NWA, a CMS should facilitate the management of the water resources within a WMA by:

- *Taking account of local conditions and public concerns;*
- *Taking account of needs and expectations of water users;*
- *Taking account of the reserve, classification, etc; and*
- *Taking account of other legislated requirements and plans for the area.*

The development of a CMS is subject to various conditions set out in regulations, policies and declarations from various sectors, including:

The National Water Act

- *Declaration of Water Management Areas*
- *CMS gazetting procedures*
- *The National Water Resources Strategy*
- *Basic principles of water allocation*
- *Licensing issues*
- *Raw Water Pricing Policy*

Water Services Act & Municipal Structures & Systems Acts

- *Water Services Development Plans*
- *Integrated Development Plans*
- *Local Development Plans*
- *Demarcation process*

National Environmental Management Act

- *Regional Environmental Implementation and Management plans.*

The situational assessment for the CMS may also be found in various sectoral studies such as Basin Studies that are commissioned by the regional DWAF offices.

DWAF Water Conservation Directorate also provides Water Conservation and Demand Management Strategies for each main sector in South Africa such as:

- *Water Services*
- *Industry*
- *Mining*
- *Power Generation*
- *Agriculture*
- *Forestry*

DWAF Water Quality Management provides detailed Guidelines for Catchment Management Strategies for water quality management

Institutions have a key role to play in the development and implementation of the CMS. In addition to performing specific assignments that form part of the CMS, involvement of stakeholders through a participative and consultative approach needs to be promoted.

Planning Tools Available

Pricing Strategy and Resource Directed Measures

Pricing Strategy

Section 56 of the National Water Act (1998) lays down the policy framework for establishing a Pricing Strategy for Raw Water charges. The Raw Water Pricing Strategy was subsequently established in November 1999 by notice in the Government Gazette.

This pricing strategy has three objectives

- *Objective (1) is to ensure that all users of a water resource pay for the ecological management of that resource.*

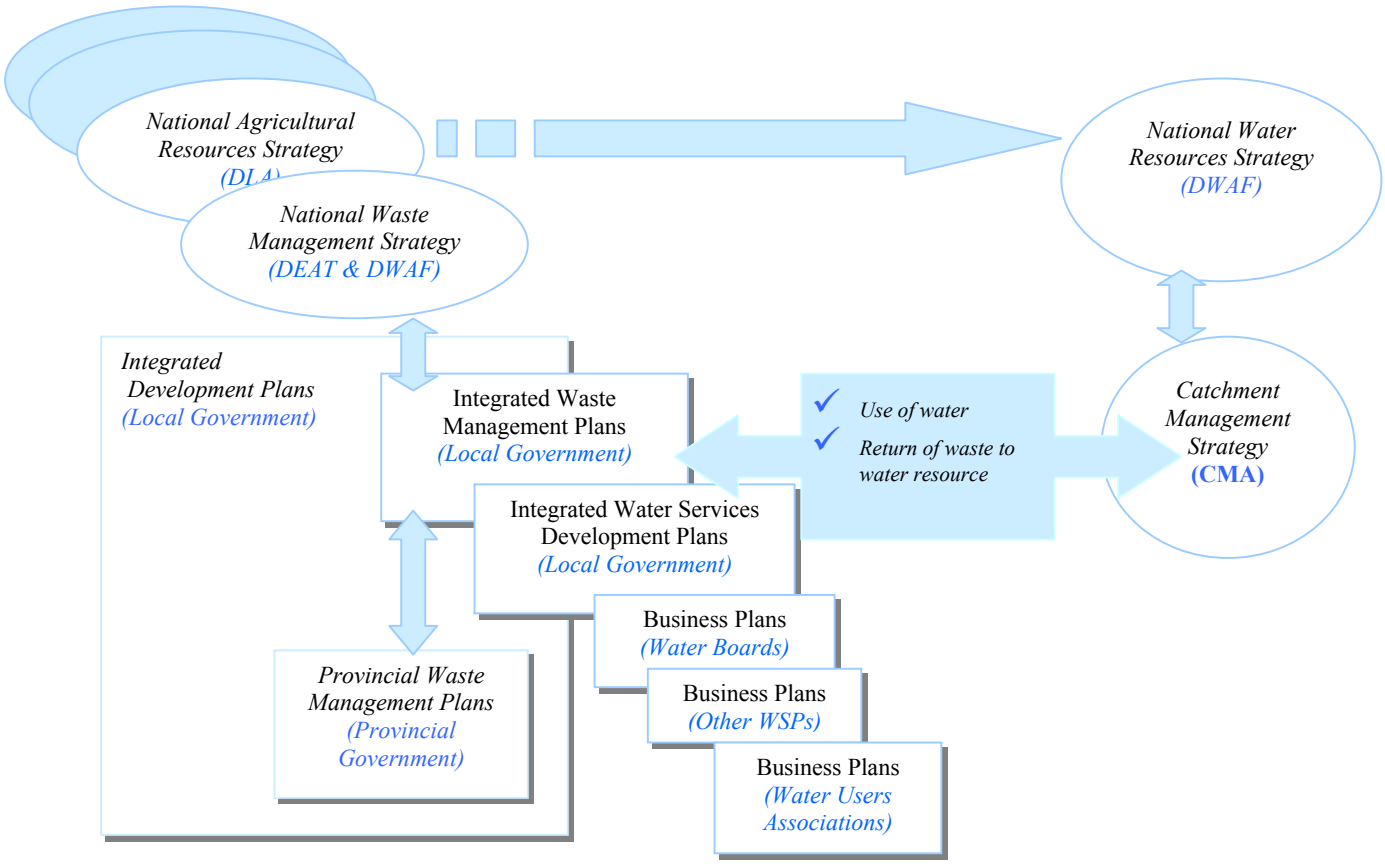
  The Catchment Management Agency (and until established DWAF) incurs costs to (i) Evaluate and issue licences; (ii) Monitor water resource quality, (iii) Detect and prosecute unlawful use, (iv) Promote water conservation and demand management, (v) Control alien vegetation, (vi) As well as any other activities deemed necessary to protect, develop, manage and control the use of raw water- surface and ground water.

These costs are recovered by the CMA from users in the form of a ***Water Resource Management Charge.***

- *Objective (2) is to ensure that the full financial cost of supplying water is recovered from the water user, including the cost of capital.*

  The Catchment Management Agencies and Water Management Institutions incur costs to (i) Develop the infrastructure necessary to store, transport and supply raw water from the source, (ii) Raise finance and service the loans used to finance the construction, (iii) Manage and Operate dams and other works, and (iv) Maintain, refurbish and replace deteriorated infrastructure.

***Figure 7.2.3**: Schematic of possible relationships between National, WMA and Local Strategies & Plans.*



The charges are recovered by DWAF from the consumer in the form of a ***Water Resource Development & Use of Water Works Charge***.

The Water Resource Management Charge plus the Water Resource Development & Use of Water Works Charge is known as the Raw Water Tariff, which is the amount paid by the bulk Water Services Provider, e.g. water boards. The bulk water services provider incurs costs associated with:

- ✧ *Purchasing the raw water*
- ✧ *The development, operation and maintenance of reservoirs, pump stations, pipelines and water treatment facilities to treat the raw water to potable standards*
- ✧ *Discharging its waste.*

The water is sold at the Bulk Potable Water tariff to the Water Services Authority (district and is some instances local municipalities), which in turn has to incur costs to operate and manage reticulation infrastructure. Consumers then pay the Municipal Water tariff.

- ✧ *Objective (3) is to achieve an equitable and efficient allocation of water and redress past imbalances.*

Resource Directed Measures (RDM)

The National Water Act states that the Minister must determine the RDM for all or part of every significant water resource. The RDM determination is initiated by DWAF as part of the licensing process. The current RDM for protection of water resources presents the procedures to be followed in undertaking determination of the:

- ✧ *Ecological Reserve*
- ✧ *Reserve and resource quality objectives for water resources*

The Department of Water Affairs and Forestry initiated the development of procedures to develop the RDM in 1997. However, refinement of the process is still under way. Until a process is published in the government gazette all RDM determinations will be considered as preliminary determinations.

7.2.3 Experiences From the Pilot WMAs

Refer to the individual stand-alone WMA reports for more detail.

Strategy and Policy Experiences from 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, who undertook a review of the proposal in 2003.*
- ⇨ *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 would 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 completed development of their Integrated Development Plans (IDPs) and Water Services Development Plans. The provision of basic water is identified as one of the urgent priorities of municipalities. These plans as well as the WSDP will inform the CMS.*
- ⇨ *The Provincial Government has drawn up the Integrated Sustainable Rural Development Strategy (ISRDS) in which the question of basic water provision is addressed. The ISRDS will form an integral part of the CMS.*
- ⇨ *The Water Board submits to DWAF an Annual Business Plan aligned with the development needs of the region. These will form an integral input to the CMS.*
- ⇨ *In developing the CMS cognisance also needs to be taken of*
  - o *The National Water Conservation and Demand Management Strategy*
  - o *The Pricing Strategies for water use*
  - o *Capacity Building, Education and Awareness Creation Strategies.*

Strategy and Policy Experiences from WMA 3: Crocodile-West & Marico

- ⇨ *Different forums were established based on water quality and quantity issues. Through capacity building and support by the Coordination and Liaison Committee, Strategy Theme Teams were established in each forum and the CLC itself. 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. These plans will form an integral part of the CMS.*
- ⇨ *All of the municipalities have prepared their WSDPs through guidance by the Water Services Directorate. Summaries of key areas in these plans have been included in the IDPs in most cases. For example, Johannesburg Water's main focus is to reduce the unaccounted for water losses, whereas Greater East Rand Metro's focus is to extend service provision to communities living in informal settlements. These plans will be taken into consideration when the CMS is drawn up.*
- ⇨ *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.*

Strategy and Policy Experiences from WMA 17: Olifants Doorn

- ⇨ *Catchment management and the development of catchment management institutions are well established in this WMA. 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. In terms of roles and responsibilities, DWAF has the responsibility to see to the protection and storage of raw water on a national level (National Water Act), while the responsibilities of the B and/or C municipalities include the purification, treatment and reticulation of water, and sewerage and storm water management (Water Services Act). This emphasised the importance of compiling a comprehensive Water Services Development Plan through the IDP process. In the longer term, the IDP will also strongly influence government funding for water management.*
- ⇨ *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.*

7.2.4 Discussion and Analysis

Mvoti to Mzimkhulu

There are currently sixteen CMFs that have been established and are at different levels of development and activity in the WMA. They also have different visions based on environmental problems in their respective catchments, including faecal contamination, bacterial contamination, soil erosion, etc. None of these have in recent times formally documented or proposed local a CMS or even business plan that will facilitate their contribution toward the WMA CMS. If this situation is not addressed, it is likely that such forums may lose focus and valuable institutional memory. Members of some of these forums, however, have participated in activities leading to the development of the CMA proposal development.

With respect to statutory institutions, Umgeni Water's business plans include: water resources plans, infrastructure plans and water quality and environmental management plans, which are catchment and system based. The organisation has also been involved in a partnership with DWAF in putting together the *Mgeni River Catchment Management Framework Plan*.

The Umlaas Irrigation Board has submitted a proposal for transformation into a WUA, and this contains catchment plans and issues relating to stakeholder consultation. To date, no response has been received as to the status of the proposal.

The natural environment has been adequately catered for, as extensive work on river health was conducted in this catchment through amongst other initiatives the River Health Programme[17]. Many of the large stakeholders had input into these studies and plans.

Crocodile West & Marico

Nine forums are active in this WMA. Most of these were established around water quality issues notably high pollution loads from the Johannesburg-Pretoria industrial areas. The

strategy and Planning business units in these CMFs were instrumental in putting information together for a regional CMS, although this is still in draft form. These fed into the CLC strategy and planning business unit, which essentially collates information reflecting broader stakeholder interests. Some of this information was used in preparation of the situational assessment report. The same information will contribute to development of a CMS as part of the initial functions delegated to the CMA. Apart from IDPs, Johannesburg Metro is in a process of developing a city catchment management strategy through a United Nations sponsored project. An information system for catchment management will also be developed as part of the project. Other bigger municipalities have pollution control strategies that cover aspects of water resources management.

Olifants Doorn

Spatially, the development of forums and water-user associations is representative of this WMA. There is a need to keep the forums motivated and their "eyes-and-ears" function will be well placed to contribute toward the development of the Catchment Management Strategy and assist in the management and implementation of that strategy in a monitoring capacity. Members of the forums have however expressed concern that their role seems to simply be to provide information and disseminate information. They would also like to play a more significant role in terms of decision-making for the catchment.

The Proposal calls for granting a further interim mandate to the Reference Group: that of acting as an interim Catchment Management Committee. One task proposed is that this committee would coordinate the forums to develop "State of the Catchment Reports". These reports would then provide a building block for the development of the CMS. It will also further develop the "usefulness" of the Forums.

The Water Services Development Plans have been completed for all Municipalities.

Business plans have been developed for proposed and existing Water User Associations, the main water users in the catchment. These initiatives will provide a further resource for the development of the CMS.

The Working For Water Program has developed a strategy for the clearing of Alien vegetation in the Riparian Zones. They have adopted a program to work through the entire Olifants River catchment. Such strategies will need to be incorporated into and built on in the CMS rather than new approaches being devised.

Perceived gaps to be addressed

- *Many forums in the Mvoti to Mzimkhulu WMA lacked capacity and coordination. The DWAF RO did not put programmes in place to address these gaps. Many expect the CMA to take full responsibility for development of the CMS. This is likely to build another bureaucratic system that will exclude the interests of people and other local and regional plans.*

- *The Crocodile West & Marico CMA process and forum activities have not received much support from local government and other government departments at provincial and national level. Of note is the fact that international obligations based on the Limpopo River basin were not given the necessary attention. This has largely been seen as a responsibility of the DWAF National office.*

- *A concern in WMA 17 arises from a lack of water resources monitoring, both on the quality and quantity aspects. The baseline information that is required for the development of the situational assessment of the strategy will be limited to basin and project feasibility studies that have had to rely on limited sampling. The development of a water quality monitoring program with appropriate pollution response mechanisms has been identified by the stakeholders as a priority for WMA 17.*

- *There is a concern that the strategy in terms of water use from Water User Associations may not reflect the broader interest, and some transformation is required in these bodies to enable them to be fully representative.*

Lessons from the three WMAs

- ✧ *Stakeholder input into local plans is essential for development of a CMS. The local wisdom, sector plans, situational assessment, trans-boundary issues and national policy and guidelines form an integral part of the CMS*
- ✧ *A comprehensive local CMS can only be drawn up if CMFs have a sound knowledge of the catchment , and capacity and support from the Regional Office of DWAF and other stakeholders are provided.*
- ✧ *There must be coordination between all CMFs in order to harmonise their visions as a building block towards development of the CMS.*
- ✧ *Institutions such as water boards, WUAs, conservancies, environmental groups, all have valuable information that needs to be harnessed to inform the CMS.*
- ✧ *Forming business units within a coordination body ensures efficient utilisation of human resources. The challenges of running such units are to ensure a balance, such that business interests do not compromise social and resource sustainability principles.*

7.3 WATER USE REGULATION

7.3.1 Background

DWAF has a key role to play in ensuring that water resources management and water services contribute to social and economic development including eradication of poverty. This is reflected by the principles of social equity, environmental sustainability and economic efficiency, which relate to allocation and use of water as enshrined in the National Water Act.

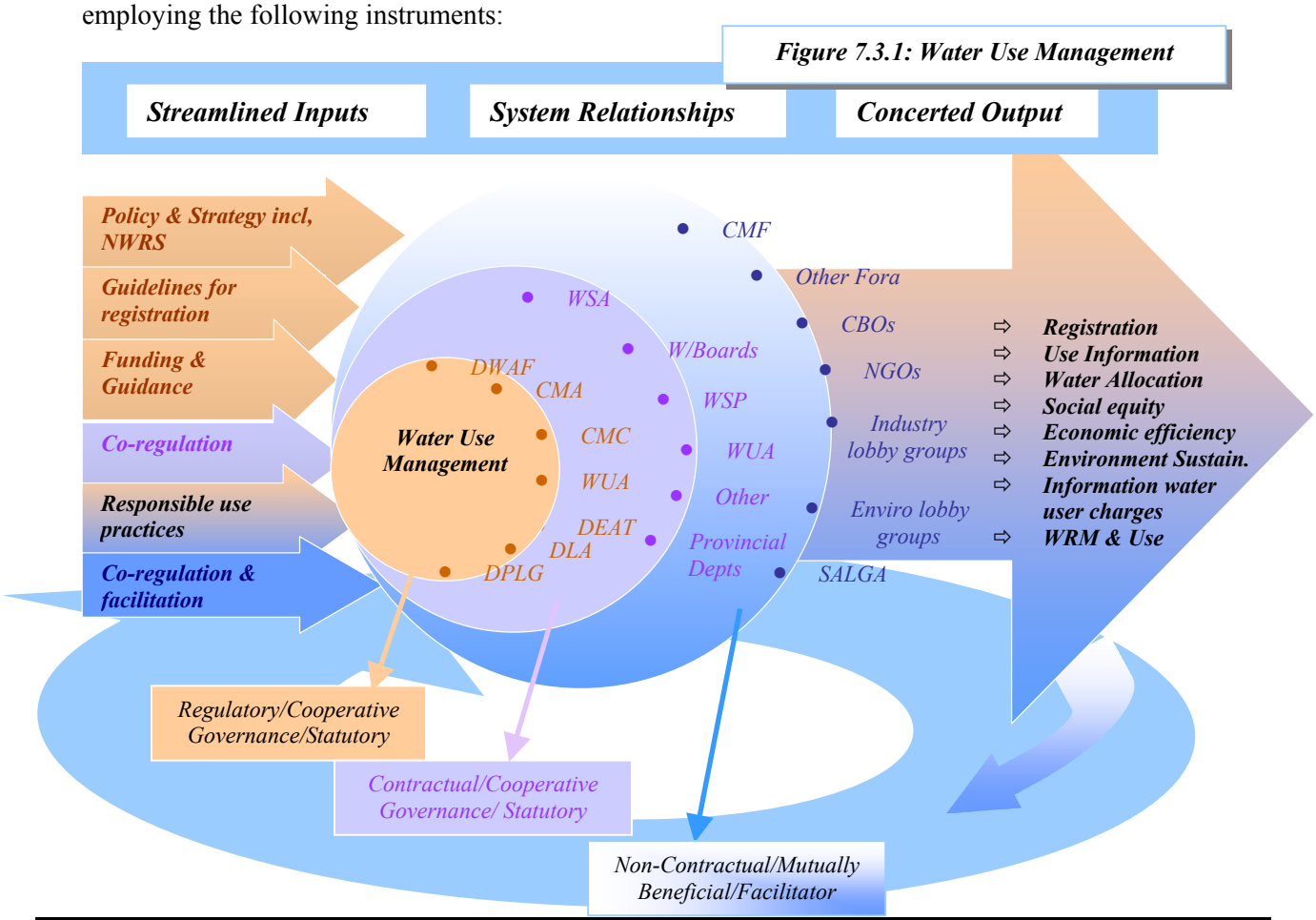
Water use in this case is broadly defined as taking and storing water, activities which reduce streamflow, waste discharges, removing groundwater for certain purposes, and recreation. The National Water Act itself defines eleven different types of water use.

Aligned with global water management principles that water is both a social good and has an economic value, DWAF has adopted the user pays principle to address economic value aspects. This is being achieved by employing the following instruments:

- ✧ *User registration - to manage permissible use;*
- ✧ *Authorisation of water use - to ensure control and equitable allocation;*
- ✧ *Water user charges, billing and collection - to fund direct and indirect costs of water resources development and management; and*
- ✧ *Auditing and regulation of water use - to ensure water conservation, demand management and equitable and effective use is practised.*

Through appropriate institutional arrangement, regulation of water use could be effected in a sustainable and efficient manner. Cooperative agreements, for example, may afford DWAF optimal use of resources (financial and personnel) with the benefit extended to users. A schematic of the inputs and outputs relating to water use management is shown in Figure 7.3.1.

Figure 7.3.1: Water Use Management



DWAF has the overall responsibility for management of water resources, while the functions relating to water allocation and licensing will be delegated to the CMA. DWAF will effectively be playing an oversight role in this relationship. Input to the system will be water use authorisations and licensing mechanisms. The Water Tribunal will hear appeals against certain decisions over water allocation and financials.

Allocation to Water Services Authorities, Water User Associations and Water Boards will be via formal contracts or licence agreements. Licensed water users will ensure efficiency in usage and thereby benefit from lower infrastructure costs and long term sustainability. Requests for allocations from institutions will require use to be identified in WSDPs, Integrated Development Plans and Business Plans.

Non-contracted users and in effect all users will benefit from equitable and efficient allocation and environmental protection to ensure their sustainable livelihoods. Active participation of all stakeholders will ensure awareness of water as a very valuable resource to be used in a balanced manner for social and economic growth for all.

7.3.2 Experiences from the WMAs

Refer to the individual WMA reports for more detail.

Water Use Experiences from WMA 11: Mvoti to Mzimkulu

- ⇨ *This WMA is well endowed with water resources infrastructure, which includes eight dams, 12 major potable water works and 18 major wastewater works. Provincial government has identified the water resources as a competitive advantage. This is because they have significant potential to stimulate growth and development in e.g. agriculture, wet industry and tourism and therefore livelihoods.*
- ⇨ *There is, however, reported studies indicating that the Water Management Area is beginning to experience water stress. This has led to the development of the Phase 1 Mooi-Mgeni Inter-basin Transfer Scheme and the completion of a feasibility study for development of a further dam on the Mooi River and associated pumping capacity - Phase 2 Mooi-Mgeni River Transfer.*
- ⇨ *There is an opportunity and potential for future more efficient use of groundwater, which is currently under-utilised and which use could delay the development of surface water related infrastructure.*
- ⇨ *The water user registration process in this WMA is still in the early stages with the focus thus far on water boards, industrial use, irrigators and forestry.*
- ⇨ *The National Water Situation Assessment Model (previously called the National Water Balance Model) shows that the major water use in this WMA is Urban, followed by Agriculture and Forestry.*
- ⇨ *There are a number of well-established and resourced institutions within the WMA such as Umgeni Water and eThekwini Municipality. Over and above that, the number of potentially viable Water Use Associations (Irrigation Boards) and catchment management forums is encouraging.*

Water Use Experiences from WMA 3: Crocodile West & Marico

- ⇨ *WMA 3 is essentially a water stressed catchment and, as such, requires 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. This also takes into consideration flood management, dam safety and to a lesser extent environmental reserve and water quality issues.*
- ⇨ *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 programme is guided by national water quality and water pricing strategies. Of note is co-regulation by users such as local government and mines, who have instituted water quality monitoring programmes in their areas and are reporting on compliance.*
- ⇨ *Water imported from the Upper Vaal catchment through wastewater discharges into the Crocodile River system supplements the resource quantity. This, however, has an impact in terms of quality and ecological status of the receiving system, which needs to be managed. It is also important to note that water conservation measures put in place by Rand Water and the Johannesburg Metro will have a bearing on WMA 3. Rand Water attends WMA 3 CLC meetings as an observer. Johannesburg Metro participates on the Juskei River forum, and has recognised the need to cooperate with regard to their effluent discharges.*

Water Use Experiences from WMA 17: Olifants Doorn

- ⇨ *WMA 17 is a water stressed catchment and, as such, requires strict regulatory measures for water use*
- ⇨ *Water conflict due to scarcity is a recurring problem in this catchment. The main complaint is that upstream users use too much water resulting in downstream shortages. WUA and Forum meetings provide a vehicle for discussion and resolution of water conflicts. The problem, however, is ongoing and at times results in serious conflict between neighbouring farmers.*
- ⇨ *Ninety percent of the water is used by the agricultural sector. Some issues that were identified at the CMF include: -*
  - ✧ *Confusion as to which WMA to register in: Some farmers are living in the Olifants-Doorn WMA, but obtained their water from the Breede WMA*
  - ✧ *While the National DWAF has jurisdiction on when to apply water restrictions, WUA are already making these decisions daily*
  - ✧ *Concern about reallocation of irrigation water, which has been suggested as an option to improve water supply to towns/villages.*
- ⇨ *The water registration process is being used for redress through empowering emerging farmers. This WMA has formed an "Irrigation Action Committee" where the DWAF provides a water allocation subsidy. In addition, the Dept. of Land Affairs is identifying access to productive land and the Dept. Agriculture develops capacity in farming practices, soils management and crop management. The emerging farmer is supported by WUAs, which provide a forum for discussion, learning & growth and cross-pollination of ideas.*
- ⇨ *While land is being provided to emerging farmers there is a complaint that the reticulation / irrigation systems do not necessarily have sufficient pressure to provide adequate water supply for crops. Several initiatives to address this concern have been considered, including:*
  - ✧ *Raising the Clanwilliam Dam - the feasibility study has just been awarded*
  - ✧ *Opening new areas for emerging farmers with new reticulation systems*
  - ✧ *Innovative technology for low-pressure irrigation systems.*
  - ✧ *Converting the canal system to a closed pipeline to minimise evaporation loss. This option was considered too expensive.*

7.3.3 Discussion and analysis

South Africa's scarce water resources are under increasing pressure and will have to be used efficiently, effectively and equitably to assure sustainable development and a future for all. This is one of the most important aspects of catchment management, requiring that considerable attention be paid to the institutions that manage this function.

Quantity of water available for use

The National Water Act defines eleven water uses including:

- *Abstracting water from a river, stream or underground source and using or storing it.*
- *Carrying out an activity within the catchment such as farming or forestry that results in a reduction in the water reaching the watercourse (stream flow reduction activity).*
- *Disposing of waste, which may detrimentally impact on a water resource.*
- *Disposing in any manner water that contains waste or has been heated in an industrial activity or power generation process.*
- *Altering the bed, banks, course or characteristics of a watercourse.*
- *Use of a water resource for recreational purposes.*

All of these are regulated as a water use.

WMA11: Mvoti to Mzimkhulu

Provincial government has identified the water resources in WMA 11 as a competitive advantage. This is because the resources have significant potential to stimulate growth and development in e.g. agriculture, wet industry and tourism.

However, reports indicate that water related stress is being experienced. In order to meet the expected increase in demand in the Water Management Area, a number of water resource schemes are being modelled. A careful balance between water demand management and upgrade of infrastructure would need to be struck to ensure optimal resource utilisation and future use sustainability.

There is an opportunity and potential for more efficient use of groundwater in the future as this resource is currently under-utilised.

WMA3: Crocodile West Marico

The total surface water available in WMA 3 is approximately 804 million m^3/a. Exploitable groundwater amounts to 400 million m^3/a with an average abstraction of 134 million m^3/a. Approximately 515 million m^3/a is imported from the Upper Vaal and Olifants WMAs.

Water resources in this WMA have been extensively developed to meet the high demands including wastewater discharges. Currently there is no coordination among various users for equitable and optimal use of this limited resource. Resource management agreements across WMAs (Upper Vaal & Olifants) are not in place. It is therefore likely that pollutants may be imported from the two neighbouring catchments.

WMA17: Olifants Doorn

The National Water Resource Strategy estimates that the Olifants-Doorn WMA requires approximately 373 million m^3/annum at a 98 % assurance of supply, while the allocable yield available is 335 million m^3/annum. DWAF reports that the required amount of water could be met by means of further water resource development, especially in the Doring River catchment. One limitation, however, is that the Instream Flow Requirements (IFR) to maintain healthy river environments have not yet been fully determined and therefore judgement of available capacity are estimates at this point.

The registered water use in WMA 17 (NWRS 2002) is 21,1 million m^3 for municipal and 316 million m^3 for agricultural use per year. No streamflow reduction activities, such as afforestation, have been registered [18].

Water availability is a key issue in WMA 17 and requires innovative action on the part of all water management institutions: -

- *Groundwater abstractions are exceeding permitted allowances in some areas*
- *Surplus "winter" water needs to be stored*

for summer use, which requires the planning, and development of storage infrastructure.

- ✧ *Domestic Water supply is inadequate in some areas with some communities using as little as 4 litres per person per day.*
- ✧ *There is very little unallocated volume left and a concern that allocation will benefit the agricultural sector at the expense of the tourism sector. The tourism sector is restricted in development as the assurance of water supply is unacceptable. The stakeholders of the WMA therefore need to review and have a combined vision for development in their catchment.*
- ✧ *Water Conservation and Demand Management initiatives are being linked to RDP water supply projects at the District municipal level, however, there is a further need for education and training in this regard in all sectors. These programs could be introduced to forums and water user associations at this point.*
- ✧ *Water availability is also limited by resource pollution. A monitoring and pollution response program is urgently required. This should be the first initiative of the CMA.*

Further interventions that may be undertaken by the CMA which may have a bearing on water availability and water use, include:

- ✧ *Determination of the ecological reserve, which will enable proper evaluation of development options in comparison to conservation priorities.*
- ✧ *Quantification of water lost in the distribution systems, and the implementation of demand management for all major water users.*
- ✧ *Further investigation into the groundwater potential of available aquifers.*
- ✧ *Investigation into the development of new water resources infrastructure and the appropriate timing therefore.*
- ✧ *An evaluation of the socio-economic development needs in the context of the resource availability.*
- ✧ *Reallocation of e.g. irrigation water to improve water supply to other sectors e.g. towns/communities.*

Steps to improve availability will assist in preventing water conflicts. However, it is recommended that the CMA develop a protocol for institutional response where misuse of water is identified. It is also recommended that information transfer be improved to ensure systems at a local level are adequately managed.

Responsibility for regulating water use

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 overrules any water use rights that an institution has under the Water Services Act, as the need may arise. Whilst the Water Services Act requires that District and Local municipalities manage the provision of water services, the National Water Act makes provision for the way that water resources (surface and ground) are to be protected, used, developed, conserved, managed and controlled.

The NWA, and it's implementing agent, the Catchment Management Agency therefore governs how municipalities may obtain the use of water that they require to provide water to their consumers and also how they may return effluent and other wastewater back to the resource. These regulatory functions can only be effective when structures and instruments for implementation are in place.

Steps are underway to formalise cooperation between Catchment Management Agencies and Local Government. A recent study by the DWAF [19] recommends that a memorandum of understanding (MOU) be developed to formalise cooperation between the CMA and Local Government. The study identifies 11 functional areas of interaction between the two entities as follows:

- ✧ *CMA governing board representation*
- ✧ *Development of CMA policy and strategy.*
- ✧ *Developmental planning*
- ✧ *Water allocation and licensing*
- ✧ *Coordination of water management activities.*
- ✧ *Land use impacts and pollution control*

- *Managing and licensing of landfill sites*
- *Water user charges, including wastewater discharges.*
- *Temporary controls during water shortage*
- *Management of information.*

While the MOU has been found to be the most appropriate mechanism to foster cooperation, it is suggested that this be further supported through other structures and interventions, including the participation by Local Government in structures such as the CMF and WUA.

Permissible Water Use

A person may only use water w*ithout* a licence*:*

- *If that water use is permissible under Schedule1;*
- *If that water use is permissible as a continuation of an existing lawful use; or*
- *If that water use is permissible in terms of a general authorisation issued under section 39 of NWA;*
- *Or if the responsible authority has dispensed with a licence requirement under subsection 22(3) of the NWA.*

All other uses *require* a licence.

The licensing process and information systems need to be streamlined to ensure that these systems do have an impact on sustainable water use. It is recommended that, for example, WUAs be regularly updated on license applications and available use in their area of jurisdiction. This will permit more effective monitoring of legal/illegal use and timely reporting to the CMA or Regional Office.

Measures in Place to Enforce Compliance

The NWA calls for the minister to draw up a classification system for the nation's water resources. Once the class of water resources and Resource Quality Objectives have been determined, they provide the core framework and are binding on all the authorities and institutions when exercising any power or performing any duty under the act. Reserve determination is an important instrument to ensure compliance. Water resources development will have to take the reserve into consideration.

Regulations in terms of sections 9(1) and 73(1)j of the Water Services Act relate to compulsory national standards and measures to conserve water. Topics of relevance include: control of objectionable substances, disposal of grey water, and water and effluent balance analysis and determination of water losses.

WMA11: Mvoti to Mzimkhulu

Although WMA 11 has relatively high rainfall, availability and use of the water resources is not evenly distributed. The uMngeni River system, for example, is stressed owing to high agricultural development and high urban usage in the Durban-Pietermaritzburg complex. Apart from inter-basin transfers put in place to supplement demand, other measures are enforcement through the registration process. The Department of Environmental Affairs and the CSIR have a GIS database with satellite image coverages, which can be used to identify existing dams in the catchment for registration purpose. DWAF or the CMA could also access information and participation from the water board, other water service providers, WUAs and catchment management forums. Roles and responsibilities, however, must be clearly defined.

WMA3: Crocodile West & Marico

The three DWAF Regional Offices perform pollution prevention functions. The more developed municipalities such as Johannesburg and Tshwane have pollution control departments that also monitor wastewater discharges. Some irrigation boards have been instrumental in terms of pollution abatement from mines and industries. The Gauteng Department of Environment, Agriculture and Conservation has been instrumental in terms of enforcing compliance on land based activities that can impact on the water resources. The department also monitors effluent discharges at strategic points.

WMA17: Olifants Doorn

The management class at the catchment outlet has been defined for the 1995 Water Balance Model for the Olifants (Class D) and Doring

(Class C) Rivers. This classification leaves much room for quantity/quality non-compliance, which is a concern as both rivers are recognised for their ecological significance and relative pristine states.

Of particular concern in WMA 17 is the lack of a comprehensive monitoring and pollution response program. Various institutions do some monitoring including farmers, district and local municipalities, DWAF and the Department of Health. However, in the event of a pollution incidence there is no agreed protocol for response that is broadly disseminated. Comparing water quality information between organisations may also be problematic in that it is largely based on 'grab sampling" with no consistency in terms of calibration of instruments etc.

Perceived gaps to be addressed

- *In all WMAs the DWAF Regional Offices do not play an active role in terms of utilising the capacity of existing institutions in order to make local impact. Establishing collaborative agreements with other role-players could be an effective strategy to enable DWAF to succeed with implementation.*
- *In the absence of a memorandum of understanding between stakeholders, implementation is likely to fail as roles may not be clearly defined or prioritisation of issues may be driven by cost resulting in key work not being done.*

The Situation In Rural Areas

The National Water Act allows water to be taken for small gardening (not for commercial purposes) and the watering of animals (excluding feedlots) by the land owner or occupier, from any water resource which is situated on or forms a boundary with that piece of land, if the use is not excessive in relation to the capacity of the water resource and needs of other users. This means that most people in rural towns accessing e.g. groundwater need not register their use.

If, however, the water is used for commercial gain and is managed by an irrigation board or Water User Association, a Water Board or a Government Water Scheme, the relevant authority will handle registration.

Water Use Registration

All water users who do not get their water from a services provider such as the local or district municipality, a water board, an irrigation board or water user association, a Government Water Scheme or other bulk water supplier and are using water for: Irrigation; Mining; Industry; and Feedlots, in terms of General Authorisation, must register their water use.

Addressing conflict over use

In water-stressed areas water quantity has posed a real source of conflict and in water rich areas the debate and concern often revolves around water quality. There are several approaches adopted by DWAF in this circumstance which may include:

- *Influencing the person to comply through public pressure. The Catchment Management Forums have been the location for many debates around water use*
- *Developing institutions to help regulate water use at a local level, such as CMA and a Water User Association.*
- *Directives from DWAF for complying with standards and practices.*
- *Instituting criminal proceedings.*

The Water Tribunal will hear appeals against certain decisions made by a responsible authority or water management institution. An appeal against a decision of the Tribunal may be taken to a High Court. The route of collaborative arrangements is the preferred one, and a platform for amicable solutions to problems should be created without the need for going through the lengthy and expensive process of engaging a Water Tribunal.

Conflict over international basins will be handled through diplomatic arrangements. However, the affected CMA must prepare

background information such as the demographic profile, infrastructure development, hydrological studies and water conservation and demand management measures to form the basis for diplomatic negotiations.

Water Use Functional Areas [7]

- ✓ *Register Water Use*
- ✓ *Authorisation of Water Use and Issue of Licences.*
- ✓ *Setting, Billing and Collecting Water User Charges.*
- ✓ *Monitoring Authorisation Requirements*
- ✓ *Ensuring Compliance (including enforcement)*
- ✓ *Negotiating Co-regulation and Cooperative Governance Agreements*

7.4 PHYSICAL IMPLEMENTATION

7.4.1 Background

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 waste water*
- ✧ *The development, operation and maintenance of water and wastewater treatment works and reticulation systems.*

The role of water sector institutions involved in the water supply, treatment and sanitation cycle is identified in Figure 7.4.

The Catchment Management Agency, and until fully established, the Department of Water Affairs and Forestry is responsible to plan for the supply of water to consumers in the catchment and to manage the resources that will fulfil that requirement. This includes: -

- ✧ *Determining the human and ecological reserve in the catchment and estuary that constitute the only "right to water" in terms of water use. The Minister is required by notice in the Government Gazette to determine the Reserve for all parts of Water Resources in South Africa. The Reserve refers to both the quantity and quality of water in the resource.*
- ✧ *Undertaking water resources planning at both strategic and feasibility level to identify future water sources to satisfy demand.*
- ✧ *Development of long term water demand projections*
- ✧ *Planning water resources infrastructure development and related operational management plans.*
- ✧ *The active promotion of water conservation.*

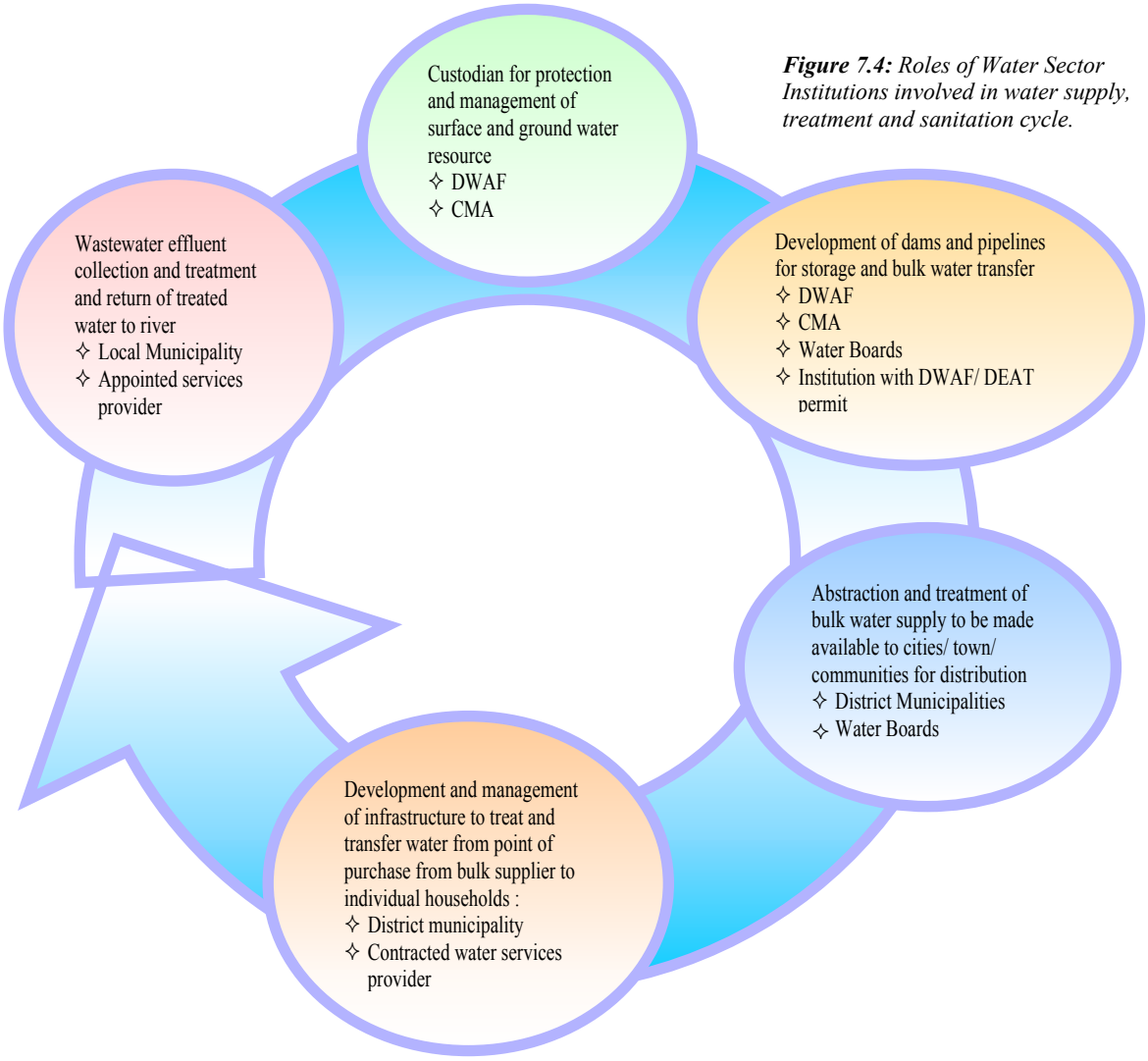


Figure 7.4: *Roles of Water Sector Institutions involved in water supply, treatment and sanitation cycle.*

Building and operating water resources infrastructure has, 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, environmental and economic 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.

Policies, standards and principles to consider in water resources development:

- ***Government***: *National Water Act, Water Services Act, Municipal Systems Act, National Environmental Management Act, Environment and Conservation Act.*
- ***Civil Society***: *Codes of practice, public information, social audit.*
- ***Private Sector***: *Codes of practice, Certification, operational policies, process guidelines.*
- ***Professional organisation***: *Standards, Sector guidelines.*
- ***International standards***: *Technical standards, ISO standards, Water health and safety standard*

Functional Areas for WRM Implementation [7]

- ✓ *Water Conservation Programmes.*
- ✓ *Water Demand Management Interventions.*
- ✓ *Temporary Controls During Periods of Water Shortage.*
- ✓ *Rehabilitation of Water Resources.*
- ✓ *Emergency Response Interventions and Disaster Mitigation*
- ✓ *Operate and Maintain Water Resources Infrastructure.*
- ✓ *Develop Water Resources Infrastructure*

7.4.2 Water Conservation and Demand Management

Whereas water engineers traditionally focused on means to develop water resources to meet water demands, water demand management focuses on the means to conserve existing supplies through a reduction in demand wherever possible. Strategies to implement a water conservation and demand management program can result in considerable ecological, social and economic benefits.

DWAF is responsible for the establishment of the National Strategy Framework and sectoral strategies for the following sectors:

- *Domestic Use Sector (District and Local Municipalities, Water Boards, Water User Associations, all households)*
- *Agriculture and Forestry Sector (Department of Agriculture, Water User Associations)*
- *Industry and Power Generation Sector (Departments of Industry, Trade and Technology, business associations.)*

Roles and functions of institutions in WC/WDM

The Water Services Act regulates Water Services Authorities to implement WC/WDM functions by requiring WSAs:

- *To meet WC/WDM requirements as specified in the guidelines of the Water Services Development Plans*
- *To comply with proposed regulations and standards*

- ✧ *To adopt bylaws and supply conditions for their consumers*

The National Water Act requires Water Services Authorities to illustrate:

- ✧ *The degree to which any proposed increase in water use application can be met by WC/WDM*
- ✧ *The degree to which the proposed water use meets efficiency benchmarks*
- ✧ *The degree to which WSAs implement best management practices.*

Water Boards are required by legislation to ensure distribution efficiency in their own systems and to influence their customers to use water efficiently, while establishing and coordinating regional water demand management objectives and activities.

The CMA has to coordinate water conservation and water resources management, which may overlap with Water Boards roles and responsibilities, and therefore needs to be managed so as to use resources efficiently.

DWAF is required to:

- ✧ *Develop benchmarks for water utilisation for water users*
- ✧ *Develop best management practices for WC/WDM measures*
- ✧ *Ensure adequate and appropriate National Research is done*
- ✧ *Facilitate the sharing of knowledge and information both locally and internationally*
- ✧ *Develop National Incentives for the Implementation of WC/WDM*
- ✧ *Ensure the implementation of WC/WDM by water services institutions*
- ✧ *Ensure the implementation of Integrated Resources Planning*
- ✧ *Enhance the capacity of Water Services Institutions*
- ✧ *Coordinate and cooperate with other Government Departments to facilitate the implementation of WC/WDM in the water services sector.*

7.4.3 Flood and Drought Management (Disaster Management)

High river level warning systems and drought planning is carried out by organisations responsible for the management of bulk infrastructure. This is either DWAF or a delegated authority. In the event of a potential disaster, response plans and programs have to ensure that they are aligned with those of the SANDF, SAPS, Health Department, DPLG, Aquatic Rescue and other emergency services being activated in the area of concern. CMAs need to take charge of the coordination function at the WMA level. This should take cognisance of the support role that CMCs can play and of stormwater management plans at municipal level. International interventions will be instituted in accordance with the SADC protocol for trans-boundary management of water resources.

7.4.4 Water Quantity

Responsibility for planning water use in the catchment

The Catchment Management Agency, and until fully established, the Department of Water Affairs and Forestry is responsible to plan for the supply of water to consumers in the catchment and to manage the resources that will fulfil that requirement. This function includes

- ✧ *Undertaking water resources planning studies at both strategic and feasibility level to identify future sources of water to satisfy demand.*
- ✧ *Determining the human and ecological reserve in the catchment and estuary that constitute the only "right to water" in terms of water use. The Minister is required by notice in the Government Gazette to determine the Reserve for all Water Resources in South Africa. The Reserve refers to both the quantity and quality of water in the resource.*
- ✧ *Development of long term water demand projections*
- ✧ *Assessment of land-use impacts on water availability.*

- ✧ *Planning water resources infrastructure development and related operational management plans.*

WMA11: Mvoti to Mzimkhulu Water Use Planning

Umgeni Water is appointed by DWAF in the role of major bulk water supplier in this WMA. While planning for the region is largely a DWAF responsibility most large water development projects in Umgeni Water's operational area has been run by Umgeni in collaboration with DWAF. Decisions to carry planned development to implementation depend strongly on water demand needs of municipalities such as the eThekwini Municipality, Msunduzi Municipality, Ugu and Ilembe Municipalities. These institutions are also involved as key stakeholders early on in the planning process.

WMA3: Crocodile West Marico Water Use Planning

The directorate, Water Resources Planning, has been involved in numerous projects at catchment, national and international level. Comprehensive reports and data are available for future access by CMAs and other water management practitioners. The Elands and Limpopo River studies, for example, have come up with important management information for WMA 3. The CMA should be wary not to carry out similar studies thereby wasting resources, as extensive information is available. Demand projections and related infrastructure plans from existing water boards and municipalities made valuable contributions to resource planning at WMA level. The role that the DWAF Regional Office will play will be regulatory.

WMA17: Olifants Doorn Water Use Planning

The development of the resource in this WMA is receiving much attention. DWAF and the Department of Agriculture are conducting feasibility studies (through consultants) on how best to develop the resource. The DEAT regulations ensure a healthy input by affected and interested public and stakeholders.

Water User Associations such as The Lower Olifants River Water User Association - LORWUA, Citrusdal and Clanwilliam WUA also carry out water resources planning functions for their areas of jurisdiction.

The delineation of responsibilities in terms of water services and water resources management has several interfaces. The process is currently very dynamic and it will take some time and resources for all District and Local municipalities to come to grips with their areas of jurisdiction and their responsibilities. Of concern is 'unfunded mandates' and conflict where responsibilities move from one authority to another.

Groundwater Management

The use of groundwater is widespread throughout South Africa. Uses include domestic supply and agricultural use. For many rural communities and farmers, groundwater is the only water source available. Most users accept that the management and protection of the resource is vital to ensure continued supply. Roles and responsibilities for the tasks necessary for effective groundwater management is summarised in Table 7.4.1, adapted from DWAF, 2002[20].

***Table 7.4.1**: Groundwater Roles & Responsibilities*

FUNCTION	*RESPONSIBLE AGENCY*
Water Use Planning	⇨ *CMA* ⇨ *DWAF while CMA is being established*
Water Use Regulation	⇨ *CMAs as directed by the National Water Resources Strategy* ⇨ *District and Local municipalities manage the provision of water services.*
Drilling New Supply Boreholes	⇨ *Individual Users* ⇨ *Borehole construction does not require registration or licensing.* ⇨ *Additional water use must be registered or licensed depending on the volume used and its purpose.*
Implementation of WC/DM strategies	⇨ *Water Services Authorities* ⇨ *Water Boards are responsible for the establishment and coordination of regional WDM objectives and activities.*
Monitoring	⇨ *CMA* ⇨ *DWAF while CMA is being established* ⇨ *Local Authorities* ⇨ *Individual users with a vested interest in protection of the resource.*

Responsibility for flood management

The National Water Act requires that District and Local municipalities identify the 1:100 year flood-line on the Town Lay-out plan. Section 144 of the Act requires that all persons who may be affected by flooding have access to information regarding potential flood hazards. It also states that no person may establish a township unless the layout plan shows, in a form acceptable to the local authority concerned, lines indicating the maximum level likely to be reached by floodwaters, on average, once in every 100 years.

The Act also requires that Water Management Institutions make information available to the public for the purposes of putting in place an appropriate disaster management strategy with respect to the following parameters

- *A flood which has occurred or which is likely to occur*
- *A drought which has occurred or which is likely to occur;*
- *A waterworks which might fail or has failed, if the failure might endanger life or property;*
- *Any risk posed by any dam;*
- *Levels likely to be reached by floodwaters from time to time;*
- *Any risk posed by the quality of any water to life, health or property; and*
- *Any matter connected with water or water resources, which the public needs to know.*

Bulk Water Management Institutions, such as Water Boards need to work closely with District and Local Municipal Authorities, the DEAT (specifically the Weather Bureau), Disaster Management Centres and Emergency Response structures (Aquatic Rescue, Hospitals, the South African National Defence Force and the South African Police etc.) to put in place emergency procedures for floods.

The Minister may, where reasonably practicable, establish an early warning system in relation to the events contemplated in subsection 144(1).

Responsibility for dam safety

Chapter 12 of the National Water Act contains measures aimed at improving the safety of new and existing dams in South Africa. This requires that owners of dams that have safety risks register and submit a report to the Minister of DWAF. The owner can appoint an approved professional person to carry out the development of the report on its behalf.

All dams that can contain, store or impound more that 50 000 cubic metres of water and have a wall of vertical height more than 5 metres, as per required specifications, are regulated as dams with a safety risk.

Streamflow reduction activities

The Minister after public consultation may regulate land-based activities that reduce streamflow by declaring such an activity as a streamflow reduction activity. The only activity that is currently declared as a streamflow reduction activity is the use of land for commercial afforestation.

The afforestation licensing process is in a state of flux in some regions in South Africa, mainly because there appears to be a duplication of effort between DWAF and the Provincial Environment Authority, who are regulators of this activity. At present both institutions need to consider the environmental impacts of afforestation development:

- *DWAF (National office) in terms of the impact on water allocation with respect to other land and environmental uses*
- *DEAT (or Provincial Environmental Authority) with respect to the impact on the environment as a whole.*

The influence and authority of the Catchment Management Agency at WMA level and the role it will play in the approval cycle is currently not clear.

7.4.5 Water Quality

There is global recognition that freshwater is a finite and vulnerable resource that needs to be protected. Water quality remains an important aspect that can affect the use and development of water resources. Many water rich countries have been faced with serious water crises due to poor quality and lack of rehabilitation measures and South Africa is no exception. Common problems in most catchments are poor microbiological status, eutrophication with related algal problems and aquatic weeds threats, high salinity, and high sediment loads.

Protecting the aquatic environment through water use management

The protection of water resources is fundamentally related to its use. The National Water Act lays down a series of measures, which are intended to ensure the comprehensive protection of all water resources. The first tool defined by the Act is the development of a *Classification System* of the water resources in South Africa. Secondly, the Minister is required to use the Classification System to determine Classes and *Resource Quality Objectives* for all the water resources that are considered to be significant.

Another tool provided for in the National Water Act is determination of the *Reserve*, which comprises, the ecological reserve and the reserve for basic human need. The exact procedure for determining the reserve is still being refined and when completed will be published in the Government Gazette. The process broadly defines how to evaluate the quantity, quality and flow of water at any time during the year as required to sustain the aquatic ecosystem, which in turn sustains use and development.

Involvement of Stakeholders

Resource Quality Objectives (RQOs) reflect stakeholders' needs with respect to use of the water resources of the catchment. They include the objectives outlined in the NWRS and by Resource Directed Measures (RDM), but express stakeholders' needs over and above those outlined by these processes. These objectives outline stakeholders' needs with respect to water quality, as well as waste disposal.

The process of determining these objectives is a consultative, consensus-seeking process, which may be incorporated into the process of developing RQOs. The RQOs outline the changes in pollution loads required to meet the immediate (5-year) water quality objectives [9].

Other Initiatives in Place

The DWAF Water Quality Directorate has produced a number of useful documents on water quality management, including reports such as; A Guide to the Water Quality Management Component of a Catchment Management Strategy. Detailed information on water quality management can be found in these documents [15].

Catchment Based Water Quality Management Activities

The classification system and the RQOs present a baseline for implementation of water quality management at catchment level. Table 7.4.2 gives examples of water quality management activities and institutions involved.

Table 7.4.2 *Water Quality Management Activities*

Activity	***Tools/methods***	***Institutions***
Assessment of water quality Status	*NWRS, RDM, DWAF classification & Information Systems, GIS, Modelling tools*	*Directorate Water Quality, Resource Quality, Water Boards and consultants.*
Assessment of impact of reductions and increases	*Water quality monitoring programme, CMS and local development plans*	*CMA, in collaboration with Water Board and CMCs.*
Assessment of loads from different sectors	*Water quality monitoring and flow measurement*	*CMA, CMC & municipalities.*
Assessment of impacts of source directed controls on pollution loads	*Source-directed measures*	*CMA, CMC*

Adapted from DWAF, Water Quality Management Sub-series No. MS 8.2 [9]

Emergency Response and Pollution Prevention

Bulk road transportation has gained popularity in recent years owing to the advantages of

flexibility and speedy deliveries. Most of the goods transported on a daily basis fall under a hazardous or toxic material classification. Over the years, many incidents have taken place in sensitive catchments with hazardous materials finding their way into streams and dams. These have a potential to cause long-term ecological damage to the system. The NWA calls for the institution/person responsible for the incident to remedy the situation. The CMA, or DWAF in the absence of the CMA, has the responsibility for coordination of the situation in the interest of protection of water resources. As most substances may be hazardous, local fire departments that are equipped with hazardous material emergency response equipment must be enlisted for containment and safety aspects. The CMA should establish a communication system for notifying stakeholders (e.g. downstream communities, water boards and farmers) about the potential risks and alternative measures for use of the resource. The national or municipal traffic departments and the police (preferably the endangered species unit) should be called in as well, as they have jurisdictional responsibilities. Bigger incidents may require services of waste handling specialists. The CMA can issue a directive to the polluter to remedy the situation as it deems fit.

7.4.6 Experiences from the WMAs

Physical Implementation: experiences from WMA 11: Mvoti to Umzimkulu

- ⇨ *The 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 major water resources infrastructure augmentation projects in the WMA, which are designed to increase the capacity of the Mgeni system, and systems to the North and South of the Mgeni.*
- ⇨ *Water conservation for urban use (the largest single user of potable water) has been particularly successful in curtailing growth in water demand over the past number of years - notably in the eThekweni Municipality, and this trend is expected to continue over the next few years. 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 (which include both drought and flood scenarios) was executed during the floods and was successful. The CMA should take this Plan into consideration 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, has been diversified to include an aquatic weed control component and is providing resources towards control of problems, including use of biocontrol agents, not readily available previously. WfW is also providing a central coordinating role in bringing together all role players and planning and managing a response through establishment of aquatic weed advisory committees. Resources available to WfW remain limited at present, and the most effective use of those available will need to be identified by the CMA.*
- ⇨ *A relationship has been in existence between the Local Municipality (Msundusi) and the Water Board, whereby the Water Board monitors the microbiological levels in rivers in the city and advises the Municipality of the quality and problems areas. These data is used by the City to detect and repair sewer blockages and leaks, which in turn, has a beneficial impact on the water quality in the downstream dam, used for treatment for potable supply to the eThekwini Municipality. Such collaborations need to be sustained by the future CMA. for it to achieve its own objectives.*
- ⇨ *Trade effluent monitoring for the Msundusi Municipality City is also undertaken by the Water Board as part of the function of operating the Local Wastewater Works. While this enables problems with industrial pollution to be identified and the city advised of sewer problems, discharges and impacts on water resources are simultaneously monitored and addressed and will serve as important input into CMA activities.*

Physical Implementation: experiences from WMA 3: Crocodile West & Marico

- ⇨ *The Crocodile West Marico is essentially a semi-arid basin with highly developed infrastructure. There are three power stations in the WMA and all get potable water from Rand Water. These stations get their cooling water in the form of effluent from the nearby wastewater works.*
- ⇨ *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 North West Water Authority primarily provide bulk water services and reticulate through management contracts in certain rural villages. There are other water treatment plants 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. A conservation and demand management study was carried out through the DWAF and DANIDA team. JHB Water has received DANIDA funding for control of water loses (currently at 43%)*

Physical Implementation: experiences from WMA 17: Olifants Doorn

- ⇨ *WMA 17 falls within a winter rainfall area with summers that are very hot and dry. To support the extensive agricultural industry, and improve the assurance of potable water supply to communities the development of water storage facilities is a necessity.*
- ⇨ *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, storing run of river winter diversions from mountain streams. Several other options for dam development have been investigated. 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 moving forward with infrastructure development. Members of Catchment Management Forums have been capacitated in water management and development options. Forum members have expressed a need for being involved in decision making with regards to water resources development and the placement of dams. The CMA should therefore play an important role in developing a vision for the catchment upon which such sensitive decisions can be based.
- ⇨ *Groundwater pumping forms a significant component of the water supply to this WMA. A priority includes further investigations of the TMG and Sandveld aquifer.*
- ⇨ *While there are no really large water treatment works and waste waterworks in the WMA, as most communities are relatively small and isolated, this function is mainly the responsibility of the district and local municipalities.*

7.5 INFORMATION AND KNOWLEDGE MANAGEMENT

7.5.1 Background

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).

In addition to implementation of the NWRS, the system has to link up with other initiatives in neighbouring countries in order to provide information to make sound decisions for trans-boundary cooperation and sharing. The system can be used as a tool for management of resources across basins for e.g. political agreements such as water trading (virtual water) and poverty alleviation plans for the SADC region. At local level, the system will provide the baseline for water classification and receiving water quality objectives. This will inform catchment based strategies and plans for water conservation and demand management, water resources protection, water allocation and implementation of the pricing strategy.

The system requires input from different sources and needs to be maintained and managed on an ongoing basis. Most water boards, local municipalities and other government departments have extensive water quality and quantity data that can feed into the national system. DWAF Water Resources Planning, Resource Quality and Geohydrology Directorates have data and information that can provide the basic infrastructure for the intended system. All these independent systems need integration in order to avoid duplication of resources, while the developed system, needs also to facilitate vertical integration and information access to ensure the availability at local level and across tiers. Figure 7.5.1 depicts the inputs and outputs that comprise a knowledge management system.

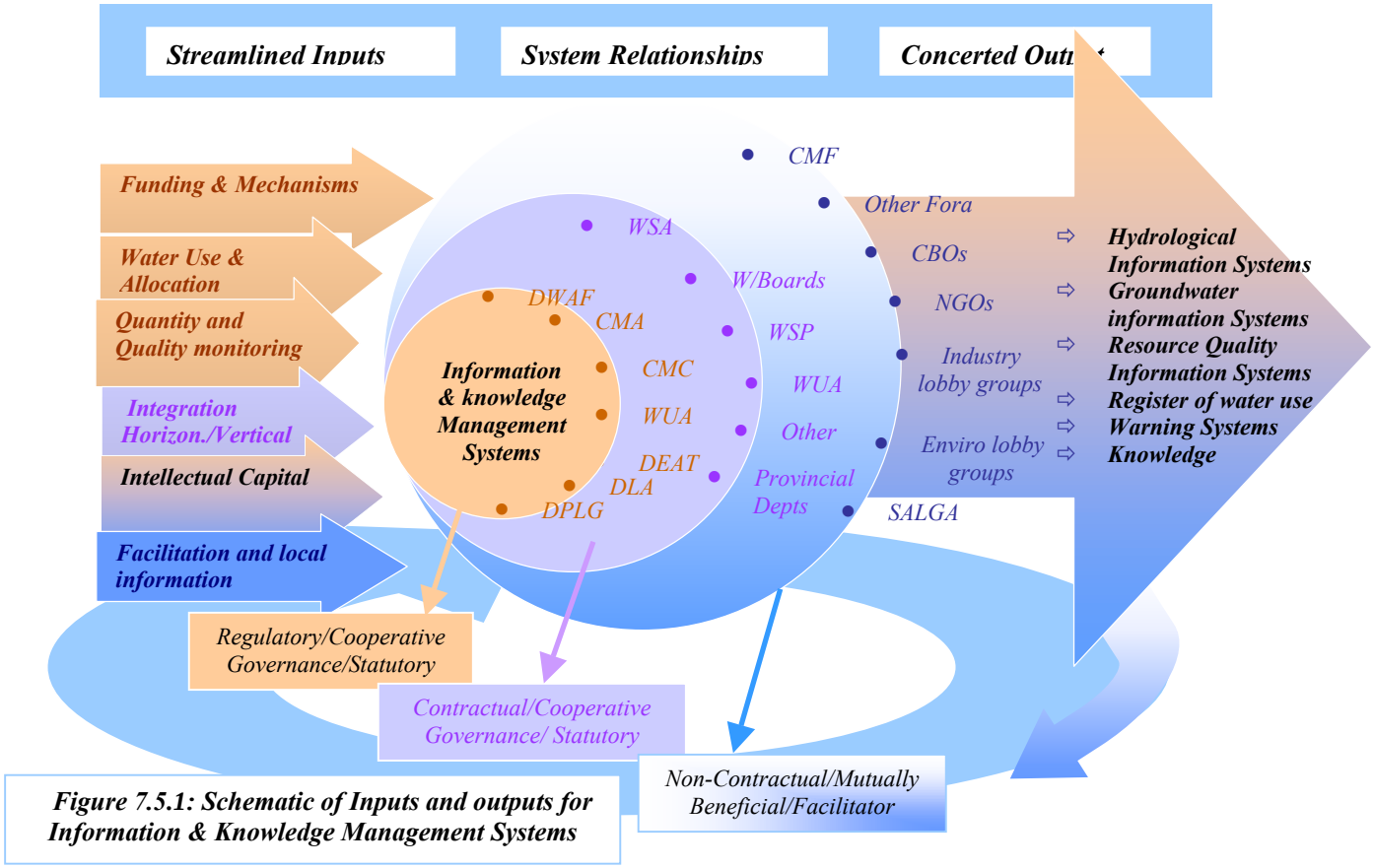


Figure 7.5.1: Schematic of Inputs and outputs for Information & Knowledge Management Systems

Monitoring, recording, assessing and disseminating water resources information is critical to assess progress toward achieving the objectives of IWRM. The NWA requires that the Minister develop procedures and mechanisms to coordinate and collect information from organs of state, water management institutions and existing and potential users of water in South Africa and establish national information systems related to these.

Water Resources Management Monitoring Systems

Monitoring systems must provide for the collection of appropriate data on

- ✧ *The quantity of water in the various water resources;*
- ✧ *The quality of water resources;*
- ✧ *The use of water resources;*
- ✧ *The rehabilitation of water resources;*
- ✧ *Compliance with resource quality objectives;*
- ✧ *The health of aquatic ecosystems; and*
- ✧ *Atmospheric conditions that may influence water resources.*

Information systems for water resource management functions such as:

- ✧ *A National register of water-use authorisations*
- ✧ *An information system on the quantity and class of water resources*
- ✧ *An information system on the quality and health of water resources.*
- ✧ *A Ground water information system*
- ✧ *A Hydrological information system*

Information provided by Water Management Institutions:

With respect to flood-lines, floods and droughts, information that needs to be provided to the public by water management institutions includes:

- ✧ *Floods and droughts information;*
- ✧ *Information on waterworks failure;*
- ✧ *Related health, life, property risks;*

Functional Areas for Information Management [7]

- ✓ *Monitoring Water Resources (collect, source and capture data)*
- ✓ *Develop and maintain databases (including quality control).*
- ✓ *Develop and maintain information management/evaluations systems.*
- ✓ *Perform needs assessment of water resource problem identification.*
- ✓ *Communicate with stakeholders and collect anecdotal information*

7.5.2 Experiences from pilot WMAs

Information management experiences from WMA 11: Mvoti-Mzimkulu

- ⇨ *Information is a vital tool for sound IWRM decision-making, and innovative/ cost-effective ways need to be considered for gathering, managing and disseminating the information to where it best may be used.*
- ⇨ *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:*
  - ⇨ *The more detailed evaluation of the extent of alien infestation in the WMA;*
  - ⇨ *Detailed environmental reserve determinations for important rivers;*
  - ⇨ *More extensive water quality data for the rivers south of the Mkhomazi River;*
  - ⇨ *More detailed evaluation of the extent and impact of erosion problems;*
  - ⇨ *More hydrological information for the rivers south of the Mkhomazi River; and*
  - ⇨ *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 institutions 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.*

Information management experiences from WMA 3: Crokodile-Marico

- ⇨ *By the virtue of being situated in Pretoria, many national government departments tend to do more work in the Guateng and nearby provinces than in remote provinces. 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 SA. Some of the input data comes from the health department, which monitors city rivers and wastewater discharges.*

Information management experiences from WMA 17: Olifants Doorn

- ⇨ *The development of future catchment management strategies will require good baseline data with which to work and plan. Unfortunately in WMA 17 information management is poorly developed with no single source where all water related databases are developed and managed.*
- ⇨ *More extensive and rigorous data gathering has been driven by projects such as the Olifants Doorn Basin study. Gaps, however, occur in that the project's area of jurisdiction is limited.*
- ⇨ *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. The comparison of data is therefore also limited.*
- ⇨ *This issue was highlighted by many of the newly established catchment management forums, as none knew where to turn to report large pollution incidences or obtain information about water quality in their river, as there is a concern that water quality is the cause of poor community health, as well as resulting in poor crop development in some cases.*
- ⇨ *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.*

8 ENGAGING MARGINALIZED GROUPS

The Dublin Principles [5] provides guidance through four basic principles for water management (see section 2 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. Translating this Dublin principle into action, however, is a challenge. Prior to 1994 water management in South Africa was dominated by central decision-making in a white male dominated environment. Since 1994 there have been some changes to this scenario, but significant gaps remain. This section briefly describes some of the recent communication and information initiatives undertaken to engage marginalized groups in IWRM. (For more information, refer to detailed reports on communication and public participation prepared as part of this same DANIDA-DWAF project).

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 information 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 of and continuity for the process through *appointing a dedicated IWRM Coordinator* and *providing resources for a WMA Forums Secretary*, for collation of meeting 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 catchment forums were selected for the DANIDA-DWAF *Champions Programs*. The primary purpose of having *Champions* was to popularise DWAF's vision on IWRM and to build capacity among other members of the forums and the greater community. An added benefit was the 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 the 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 (e.g. solving water issues or raising awareness). The case studies below describe some of these interventions.

Case Study 1 (WMA 17): Middle Olifants – Water Awareness Project

This case study described the training of previously disadvantaged individuals in Water Resources Management. This furthered the objectives of IWRM in the Water Management Area, as well as enabled the development of new livelihoods, including economic development.

Description of the initiative: With assistance from the IWRM coordinator, three Champions from the Middle Olifants Water Forum formed a partnership called the ***Middle Olifants Champions Partnership***. The partnership was formalised with a legal agreement, and included opening a cheque account at a local bank. A project proposal submission to the Demand Management initiative of the DANIDA project was made and focused on creating awareness around water conservation in different sectors as identified in a survey. These sectors included: the local authority (management and staff), a high density housing area, a low density housing area, public institutions (police station, magistrates court, old aged home and hospital), the business chamber and schools. The proposal, which included time and budget, was successful.

Outcomes/Measurable results

- ✧ The Champions trained and employed a team of four women to identify and repair domestic leaks.
- ✧ 198 homes in the high-density settlement were visited, awareness created and physical repairs carried out, including: repairs to 50 taps with replacement of 44 washers, installation of 39 jumpers and use of 65 rolls of threading tape for repair work.
- ✧ 20 homes in the low-density settlement were visited, with 6 leaking taps and two faulty meters repaired.
- ✧ Public institutions (municipality, police, magistrate, hospital and old aged home) were visited and talks held with management and staff to create water awareness. Leaks were identified and repaired.
- ✧ The business sector was similarly addressed.
- ✧ Two schools were targeted for water awareness training, which included, participating in a water audit and awareness through song, poetry and dance competitions.
- ✧ The study effectively built IWRM and resource conservation awareness in the target groups.
- ✧ The study facilitated, amongst others, the building of institutional relationships with the Local Municipality and those driving catchment management initiatives.

Case Study 2 (WMA 17): Koue Bokkeveld – Community Water Saving Awareness

In the heart of Koue Bokkkeveld, the small community of Op-die-Berg learnt how to use their water more efficiently through the implementation of a water conservation project by a local water champion (Johnny Cupido), who had been trained as part of the capacity building initiative of the DANIDA project. The project was provided with micro-project funding. The project champion in turn, trained two young, unemployed community people - for a period of 20 days - to identify and repair leaks.

Each home in Op-die-Berg was visited and of the 250 houses, a startling 198 were found to have leaks. All dripping taps, leaking toilets and pipes were repaired. This saved both water and money for the community. A pensioner (grandpa Kallie), who lived in a small RDP house, had an average monthly water consumption of more than 350 Kl, which cost him, on average, R 800 per month. After a leak was repaired his water use dropped to 43 Kl per month, and appreciation of the value of water saving was thus very significant.

Case Study 3 (WMA 17): Upper Olifants – Learner Water Awareness and River Cleanup

This micro-project is an example of the Department of Education interfacing with IWRM and the new CMA structure around water and environmental education.

The project was facilitated by the Chairperson of the Upper Olifants Water Forum (Raymond Pretorius) and the Citrusdal Inter Church Youth. The programme was implemented over a 4-day period during National Water Week and targeted local school learners.

Learners participated in essay, poetry, colouring-in and art competitions. Talks were given on the effects of alien invasive plants on catchment water yield and on how to undertake a river clean-up. This was followed by a stretch of the Olifants River being cleaned.

(i)

(ii)

(ii)

(i) *Learning how to create poetry*

(ii) *Talk on the benefits of controlling alien invasives*

(iii) *Olifants River clean up.*

Case Study 4 (WMA 11): The Role of Catchment Champions in the Establishment of the Msunduzi Municipality Disaster Management Advisory Forum

The Mvoti-Mzimkhulu Water Management Area is vulnerable to flooding during the summer rainfall season. Of the five worst floods in South Africa in the past twenty-three years, three were in the KwaZulu-Natal province. The Msundusi River itself (a major tributary in WMA 11) was the site of one of the worst flood disasters in South Africa when 170 people from the adjacent Edendale area lost their lives during a flood on Christmas Day 1995.

The Catchment Champions reasoned that setting up a Disaster Management Advisory forum would assist in mitigating the impacts of future floods. Training of the forum members would be part of the process. The stakeholders comprised Catchment mentors called Communal Foundation, Green (a network of local NGOs), the Msunduzi Municipality (disaster management centre) and a locally based group - Artwork Illustrations Design.

The Disaster Management Act in South Africa requires that a local municipality must plan for and implement measures to prevent or reduce the risk of disasters. Catchment mentors therefore engaged the disaster management centre of the Msunduzi Municipality on two occasions in August 2003 and October 2003. As a result of the interaction the following were achieved:

- ✧ A memorandum requesting the establishment of a disaster management advisory forum, in terms of the Disaster Management Act 57 of 2002, was sent to the Msunduzi Muncipality (Municipal Manager and the Mayor). A response to this is awaited.
- ✧ An editorial committee for the development of flood education material was formulated in October 2003. Preparation of the flood awareness material is progressing well and on schedule (deadline for completion is February 2004). The Green Network would undertake flood awareness in vulnerable areas once the awareness material had been prepared

The study shows linkages between communities directly affected by a disaster to gear decision makers in the Municipality and Emergency Response Teams into action.

Communication was identified as a key aspect for success. It was reasoned that improved communication would both keep the municipality informed of issues close to communities, but also enable affected communities to gain better understanding of measures to reduce flood risks.

Case Study 5 (WMA 11): Formation of the Msunduzi Environmental & Social Association (Mesa)

One shortfall in the Proposal Development process in WMA 11 discussed in the report is the lack of public participation, despite extensive advertising. Several reasons have been provided for this, one of which is the lack of information at most levels about IWRM and the proposed CMA. This case study demonstrates how a new organisation within the Msundusi sub-catchment is trying to address this problem.

Catchment mentors in the Pietermartizburg area conceptualised the formation of the Msunduzi Environmental and Social Association (MESA) with the view to expanding stakeholder participation for IWRM activities. This association would comprise historically disadvantaged communities in the Msunduzi Catchment Area, as represented by the various NGOs, CBOs and Faith-Based Organisations (FBOs). It was envisaged that this association would adopt a community-based approach in dealing with

environmental and social issues within the context of IWRM. A Stakeholder Participatory Workshop was held at the Msunduzi Municipality in July 2003 where the formation of the association was unanimously agreed to.

In September 2003 a Civil Society Initiative Workshop was hosted by the Municipal Manager, where the Municipal Manager agreed in principle to support MESA in achieving its objectives: -

- ✧ To enhance broader and more effective stakeholder participation for IWRM activities.
- ✧ To create working linkages between key stakeholders such as MESA, CBOs, NGOs, FBOs, Organised Business, Academic Institutions, the Msunduzi Municipality, other Government Institutions and Parastals.
- ✧ To facilitate networking and improve communication among the NGOs, CBOs and FBOs.
- ✧ To improve skills transfer and capacity building amongst NGOs, CBOs and FBOs.
- ✧ To act as a vehicle for service delivery for IWRM activities.
- ✧ To promote the role of NGOs, CBOs and FBOs in the Msunduzi Area.

A Strategic Planning workshop was conducted by DWAF in October 2003 to empower the MESA task team members with IWRM planning tools. A constitution for MESA was prepared in December 2003 and is currently awaiting adoption. MESA is scheduled to be launched in the first quarter of 2004.

This initiative shows one vehicle that is being established to increase participation of previously disadvantaged individuals in IWRM issues in the Msunduzi Sub-catchment (WMA 11)

Case Study 6 (incorporating WMA 3): Formation of an Interdepartmental Environmental Forum

The case study shows institutions that have been brought together to resolve water quality and environmental issues.

The forum brings together officials from the following provincial departments within the Frees State, North West, Gauteng and the Northern Cape Province: DME, DWAF, DAEA, and the National Department of Agriculture. The objectives of this forum are to harmonise the interdepartmental administrative processes and streamline implementation to achieve the objectives of NEMA, Minerals and Petroleum Resources Development Act, NWA and other acts relating to regulation of natural resources.

The key focus has been around mining, as this sector is dominant within the four provinces and mining poses a major pollution threat. The complex nature of regulation of this sector through EMPRs, EIAs and water licensing processes led to DME calling for closer collaboration between the abovementioned departments. The move was to do away with the culture of passing outputs from one department 'over the wall' without knowing what happens further downstream, including, a myriad of communication lines between consultants and individual department officials, leading to confusion.

The forum has thus far arranged presentations to discuss each department's legislation, processes and linkages. They have also embarked on joint inspections of mines as part of the EMPR process. In its presentation, DWAF used the forum to present the linkages between the EIA and licensing processes as an administrative process to be followed

Source: Minutes of the Interdepartmental Environmental Forum

Case Study 7 (WMA 3): Hartebeespoort Dam Remediation

Hartebeespoort Dam (HBPD) is located in the Crocodile River catchment, downstream of the confluence of the Crocodile and the Jukskei & Hennops Rivers that drains the eastern area of the catchment. Excessive nutrient loading, originating largely as point source discharges (from wastewater works) into the Jukskei River, have resulted in the dam being hypertrophic (i.e. excessively nutrient enriched) for several decades. A combination of nutrient availability and biophysical factors support the sustained dominance and very dense accumulations of blue-green algae. This has produced the characteristic suite of user-related problems that have plagued HBPD since the early 1970s.

The HBPD remediation project, which brings together various role-players, has been commissioned by DWAF. The project team comprises experts from private consulting firms with local support of the project activities being coordinated by the HBPD Water Action Group (HWAG). The project steering committee comprises DAEA, DWAF officials and members of the HWAG. The project scope includes:

- ✧ Reduction of external nutrient (phosphorus) loading to the reservoir.
- ✧ Management of in-lake nutrient availability (both from the water column and from phosphorus-rich sediments).
- ✧ Relaxation of impaired food web structures that no longer support or provide natural resilience to the eutrophication process

The study presents a good example of institutional arrangements for finding sustainable solutions to water resources problems that also have a bearing on water services (drinking water treatment and quality), recreational use, and integrity of the aquatic resource. The success, however, will depend on commitment from stakeholders, sharing of information, involvement of relevant government departments, commitment and professionalism by service providers, and availability of resources (financial and human).

Source: Southern Waters Ecological Research and Consulting

9 CONCLUDING REMARK

This report provides lessons for IWRM in South Africa based on current thinking and the institutional development experiences gained and lessons learnt from three pilot Water Management Areas in South Africa.

The project commenced with a review of current legislation and relevant DWAF guideline documents, followed by visits to various stakeholders in the three pilot Water Management Areas to assess progress towards IWRM. Conceptual thinking, both global and national, 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 synthesised.

This document examined IWRM principles in the context of the existing 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 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 Water Management Area 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.

APPENDIX 1: ENABLING LEGISLATION

A1.1 ENABLING LEGISLATION FOR WATER RESOURCES MANAGEMENT

The section contains a synopsis of the key enabling legislation that enables stakeholders to play their respective roles in the development and management of water resources and facilitates stakeholder participation. Refer to the specific acts for more detailed descriptions. Legislation transformation is currently ongoing with different national and provincial competencies, requiring that the list and requirements be regularly revised to take into consideration legislative reforms.

The Constitution of the Republic of South Africa

The Constitution of the Republic of South Africa, (Act 108 of 1996), identifies the following rights that have further been given effect in the National Water Act and Water Services Act:

- *Equity: Everyone is equal before the law and has the right to equal protection and benefit of the law.*
- *Environment: Everyone has the right:*
  - ✧ *To an environment that is not harmful to their health or well-being*
  - ✧ *To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:.*
  - ✧ *prevent pollution and ecological degradation; promote conservation and secure ecologically sustainable development and use of natural resources whilst promoting justifiable economic and social development.*
- *Water Security: Everyone has the right to have access to, among others, sufficient water. The State must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of the right.*

With respect to cooperative governance, the constitution obliges all three spheres of government and organs of state within each sphere:

- *To cooperate and consult with each other;*
- *Respect the responsibilities of the others; and*
- *Exercise powers and perform functions in such a way as not to encroach on the integrity of another sphere.*

With respect to water resources management and in accordance with the National Water Act, the development of catchment management strategies by the catchment management agency will assist with achieving the principles of cooperative governance.

With respect to the provision of water services and in accordance with the Water Services Act, the development of water services development plans by local government will assist with achieving the principles of cooperative governance.

The National Water Act

The purpose of the National Water Act (Act 36 of 1998) [1] is to ensure that South Africa's water resources are protected, used, developed, conserved, managed and controlled by taking the following into account [21]:

- *Meeting basic human needs;*
- *Promoting equitable access to water;*
- *Redressing the results of past racial and gender discrimination;*
- *Facilitating social and economic development;*

- *Providing for growing demand for water use;*
- *Protecting aquatic and associated ecosystems;*
- *Reducing and preventing pollution and degradation of water resources;*
- *Meeting international obligations;*
- *Promoting dam safety;*
- *Managing floods and droughts;*
- *Establishing suitable institutions and ensuring they have appropriate community, racial and gender representation.*

The National Water Act provides for the establishment of institutions to ensure the implementation of integrated water resources management and to facilitate the involvement of stakeholders within Water Management Areas. This Act defines a water management institution as:

- *A catchment management agency (CMA);*
- *A water user association (WUA);*
- *A body responsible for international water management;*
- *Or any person who fulfils the functions of a water management institution in terms of the Act;*

CMAs are statutory bodies established by a notice in the government gazette, with jurisdiction in a defined Water Management Area (WMA).

In terms of this act water services institutions obtain use of the water that it requires for distribution to its consumers. The act also governs how water services institutions may return effluent and other wastewater back to the water resource.

The National Environmental Management Act

The National Environmental Management Act (Act 107 of 1998), NEMA, governs the overall conservation and utilisation of natural resources. Water and land usage may not be in contradiction with NEMA. The specific purpose of NEMA is to:

- *Give effect to the section 24 environmental right of the Constitution, which states that everyone has the right to an environment that is not harmful to their health and well being; and to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that:*
  - ✧ *Prevent pollution and ecological degradation;*
  - ✧ *Promote conservation; and*
  - ✧ *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*
- *Create an enabling framework for cooperative governance in the environmental sector.*
- *Give effect to the environmental principles in the White Paper on Environmental Management.*

The Environment Conservation Act.

The Environment Conservation Act (Act 73 of 1989) governs the control of activities that may have a detrimental effect on the environment. Section 21 makes provision for the identification of such activities. Four of these activities that are water related include

- *Land use and transformation*
- *Water use and disposal*
- *Waste and sewerage disposal*
- *Recreation*

Schedule 1 of regulation 5999 further defines activities that may have a detrimental effect on the environment

- *The construction or upgrading of canals and channels, including diversions of the normal flow of water in a riverbed and water transfer schemes between water catchments and impoundments*
- *The construction or upgrading of dams, levees or weirs affecting the flow of a river*
- *The construction or upgrading of reservoirs for public water supply*

- *The construction or upgrading of schemes for the abstraction or utilisation of ground or surface water for bulk supply purposes.*

The Act also requires that should activities identified in section 21(2a-2k) and schedule 1 of the ECA wish to be undertaken, written authorisation is required from the Minister of Environment Affairs and Tourism (DEAT) or a local authority or officer designated by the Minister.

The authorisation referred to shall only be issued after consideration of reports concerning the impact of the proposed activity.

A1.2 ENABLING LEGISLATION FOR WATER SERVICES

The Water Services Act

The main objectives of the Water Services Act (Act 108 of 1997) [2] are to provide for [22]:

- *Right of Access to basic water supply and basic sanitation;*
- *Setting of national standards and norms and standards for tariffs;*
- *Preparation of water services development plans;*
- *Regulatory framework for water services institutions;*
- *Establishment of water boards and water services committees;*
- *Monitoring of water services;*
- *Intervention by the Minister or the relevant Province;*
- *Financial assistance to water services institutions;*
- *A national information system;*
- *Accountability of water services providers;*
- *Promotion of effective water resources management and conservation.*

The Water Services Act defines a water services institution as:

- *A water services authority,*
- *A water services provider,*
- *A water board,*
- *A water services committee*
- *A water services intermediary.*

Water services development plans must contain, among other things:

- *Details of existing and proposed water sources and the quantity of water to be obtained from and discharged into each source;*
- *Details of existing and proposed water conservation, recycling and environmental protection measures.*
- *Details of existing and proposed water services. (Water for People; Water for Food; Water for the Environment; Water for Industry and others).*

The Municipal Structures & Municipal Structures Amendment Act

The Municipal Structures Act (Act 117 of 1998) & Municipal Structures Amendment Act (Act 33 of 2000) deal with the following [1]:

- *It sets up the basis for the establishment of new municipalities in the 'A' (Metropolitan Municipalities), 'B' (Local Municipalities) and 'C' (District Municipalities) categories;*
- *It defines the manner in which municipalities are to be established;*
- *It establishes the manner in which councils are to function, including committees and mayoral options;*
- *It determines the division of powers and functions between municipalities*

The act and amendment act assigns the following water services powers and functions:

- *District Municipalities (Category C Municipalities) are allocated the water service authority function (potable water systems and domestic sewage and wastewater according to the Water Services Act).*
- *If authorised by the Minister of Provincial and Local Government, Local Municipalities (Category B Municipalities) must continue to perform the water service authority function.*

The Municipal Systems Act

The Municipal Systems Act (Act 32 of 2000) focuses on the internal systems and administration of a municipality, including:

- *Public accountability and public involvement in policy formulation and decision making;*
- *Guidelines for making bylaws;*
- *Establishing integrated development plans;*
- *Establishing a performance management system.*

The act is consistent with the Water Services Act in that it differentiates between a water services authority and a water services provider. Chapter 5, Section 24 requires that the planning undertaken by a municipality must be aligned with and compliment the development plans and strategies of other affected municipalities and other national and provincial organs of state, so as to give effect to the principles of cooperative governance.

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, 1997.** *Republic of South Africa, Water Services Act, Act 108 of 1997.*

[3] Municipal Structures Act 188 of 1998

[4] Municipal Systems Act 32 of 2000

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

[6] **Department of Water Affairs and Forestry, 2001.** *Synthesis of Phase1 of the DWAF WRM Strategic Restructuring and Transformation Project: "Getting the Ducks in a Row", Report to the minister.*

[7] **Department of Water Affairs and Forestry, 2001.** *Roles, functions and inter-relationships of institutions involved in the management of water resources. Final Report Phase 1, compiled for DWAF by AFROSEARCH.*

[8] **Department of Water Affairs and Forestry, 2000**. *Establishing a Catchment Management Agency, Guide 1 in the CMA/WUA Guide Series.*

[9] **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.

[10] **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.

[11] **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.

[12] **Department of Water Affairs and Forestry**, October 2001 (draft). *Financial Feasibility Related to the Establishment of a Catchment Management Agency for the Mvoti-Umzimkulu WMA. Prepared by Graham Muller Associates.*

[13] **Department of Water Affairs and Forestry, 2001**. Synthesis of Phase 1 of the DWAF WRM Strategic Restructuring and Transformation Project.

[14] **International Water Management Institute, 2003**; Study by Nicholas Fayese and Willem de Langa on the Transformation of Water User Associations.

[15] **Department of Water Affairs and Forestry, 2001**. Water Quality Management Series, Sub-Series No. MS 8.1, Edition 1: *A Conceptual Introduction to the Nature and Content of the Water Quality Management and Assessment Components of Catchment Management Strategies*. Pretoria.

[16] **Department of Water Affairs and Forestry, 1999.** *National Water Act (Act 36 of 1998), Establishment Of A Pricing Strategy For Water Use Charges In Terms Of Section 56(1) Of The National Water Act, 1998.* Government Gazette 20615, Section 1353.

[17] **State of the Rivers Report, 2002**. Umngeni River and Neighbouring Rivers and Streams; Product of the River Health Programme.

[18] **Department of Water Affairs and Forestry, 2003**. Proposal toward the Development of the Olifants Doorn CMA.

[19] **Department of Water Affairs and Forestry, 2003**. Development of a Memorandum of Understanding to formalise Co-opertaion between Catchment Management Agencies and Local Government (in draft for discussion).

[20] **Department of Water Affairs and Forestry, 2001.** Institutional Arrangements in Groundwater Management; Working Draft of Chapter 1 for DWAF-DANCED IWRM Project.

Department of Traditional and Local Government Affairs, 2001. *Information Package on Integrated Development Planning.*

Department of Water Affairs and Forestry, May 1999 (draft). *Water Conservation and Demand Management, National Strategy Framework*

Department of Water Affairs and Forestry, 2003. *Development of a Memorandum of Understanding to Formalise Cooperation between Catchment Management Agencies and Local Governemnt* (draft).

Gauteng Provincial Government Department of Agriculture, Conservation, Environment and Land Affairs, 2001. *Guidelines for the Development of Integrated Waste Management Plans for Local Government*: Draft 1.

[21] **Department of Water Affairs and Forestry, 2001**. *Water and Sanitation Business: The Roles and Responsibilities of Local Government and Related Institutions.*

[22] **Department of Water Affairs and Forestry, 2000**. *Establishing a Catchment Management Agency. Guide 1 in the CMA/WUA Guide Series.*