



## water & sanitation

Department: Water and Sanitation **REPUBLIC OF SOUTH AFRICA**  Water is Life Sanitation is Dignity





## Integrated Water Quality Management (IWQM) Policy March 2025

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#### FOREWORDS

#### **Minister's Foreword**

Despite efforts made by my Department of Water and Sanitation (DWS) over years in combating the water pollution problem, the water quality for both surface and ground resources continue to deteriorate across the country. The water quality problem is still predominantly a result of several challenges the country is facing in managing the ever-expanding sources of pollution.

These sources may be point or non-point (diffuse) in nature and are due to rapid urbanisation, expansion of the mining industry, increasing use of chemicals in industries, uncontrolled discharges of untreated sewage, inappropriate practices for surface soil tillage and fertiliser application, and the destruction of our ecological infrastructure, including wetlands and riparian buffer zones.

Inadequate land-use planning, unsustainable development practices, and a lack of operation and maintenance of waste infrastructure (which is predominantly an urban challenge) have compounded this problem. It cannot be business as usual as quality that is suitable for downstream water users continue to be negatively impacted.

Managing water quality is complex due to diverse pollution and varying environmental factors. These complexities result in a multifaceted and intricate array of governance problems. Historically, the responsibility to manage issues of water quality used to fall squarely on the shoulders of the Department of Water and Sanitation, (together with its various institutions), as the custodian of the country's water resources.

The fact that the status of water resources is often dependent upon how land is utilised or managed, means that DWS has no (or limited), mandate to influence decisions that impact upon water resources.



Engagements for cooperative governance must ensure that sustainable water use is the focus and will give effect to adaptive management and continuous improvement.

An inclusive approach involving all spheres of government and non-government organisations is essential to address these challenges. There is a need for institutional reforms and realignment of the IWQM function, which must include clarification of roles and responsibilities of government and other role players. Currently effective IWQM is being hampered by poor co-ordination, silo planning and conflicting approaches within the spheres of government, which have, indeed hindered the effective management of water quality.

This Integrated Water Quality Management Policy is bringing inter-departmental harmonisation of policies, legislation, regulation, integrated planning compliance, monitoring and enforcement as well as other functions related to the management of water quality in line with the Constitution.



Miss Pemmy Majodina (MP) Minister Department: Water & Sanitation



#### **Deputy Minister's Foreword**

South Africa is a water scarce country, with a below average annual rainfall of 464 mm per annum (against the world average of 860 mm per annum). As a developing economy with a growing population, this puts pressure on our water resources. The deterioration in water quality further compounds the challenge of managing the gap between the demand and supply of water. Water is a catalyst for economic growth. As a country our livelihood relies largely on agriculture, tourism and mining. These sectors relatively impact upon our water resources in terms of quality, supply and demand. Added to this is the demand for energy production and for basic human consumption, with the latter deemed as a human rights issue enshrined in our constitution.

It therefore brings to our attention that: as the country builds up its capacity in terms of water storage and distribution, water conservation and water quality management are key elements in meeting our constitutional mandate and the country's obligations to its neighboring states with whom we share some of our major rivers.

Water pollution is one of the major problems faced by the country. Efforts to address this challenge must be put in place with urgency. Water pollution does not only harm the economic growth of this country but also affects human and aquatic lives. Water borne diseases such as cholera, have led to death of many people in this country, mostly the poor and the vulnerable who at times rely on water drawn directly from the rivers for daily consumption. The problem is exacerbated by various cases reported from municipal supply systems.

The recently released Blue & Green Drop 2023 Reports are testament to the water quality decline experienced in the country. Both reports indicate that pollution issues are because of eutrophication, salinization, acid mine drainage, urban runoff etc. all of which emanate from various sources such as wastewater treatment works, mining activities, industries, urban runoff.

The Department of Water and Sanitation (as the custodian of South Africa's water resources, with a primary responsibility of managing and protecting water resources by developing and implementing policies governing the water sector) has introduced several regulations, policies and procedures, with varying levels of success or lack thereof.



The National Water Act (Act 36 of 1998) provides a framework for protection, management, control, conservation and development of water resources. Chapter 2 of the NWA makes provision for the development of strategies for proper management of water resources.

The Department has made various attempts to combat the deteriorating water quality with its first issue of the policy on water quality developed in 1991. However, it is realised that there is disintegration and lack of accountability from various water users and stakeholders. Therefore, this policy calls for a more integrated and inclusive approach towards management, financing and regulation of water quality issues. This approach will allow various stakeholders to understand their roles and responsibilities towards improving water quality issues in South Africa.

An integrated approach is therefore necessary to turn the situation around, as Government is unable to combat this problem alone. Government must play its role as a regulator however, self-regulation must be promoted if we are to protect this precious resource.



Mr Mbangiseni David Mahlobo (MP) Deputy Minister Department: Water & Sanitation



#### **Deputy Minister's Foreword**

Water pollution comes from the release of substances into subsurface groundwater or into wetland, lakes, rivers, estuaries, and oceans to the point that, such substances interfere with the beneficial use the water or with the natural functioning of ecosystems. The effects of water pollution are significant since water serves as a source for drinking water and is used for different production by industries for growing the economy.

There are several sources of pollution, which range from chemical contaminants, including poorly designed and poorly maintained subsurface sewage disposal systems; industrial wastes disposed of improperly lined or unlined landfills; mining and petroleum production, and leaking underground storage tanks below gasoline service stations; littering with hazardous debris and agriculture use of pesticides.

Water quality management increasingly requires catchment rehabilitation through a range of rural and urban measures, implying an integrated approach that requires cooperation with other sector regulators.

While DWS is primarily responsible for protection and management of water resources, there are a number of other spheres of government that have important roles in this regard in particularnational, local and provincial departments of: Cooperative Governance and Traditional Affairs; Mineral Resources; Agriculture; Environmental Affairs; Science and Technology; Health; Trade and Industry; Education (Basic and Higher); , Rural Development and Land Reform; Human settlements; National Treasury, as well as Catchment Management Agencies (CMAs) and Municipalities.



Therefore, the IWQM Policy provides an initial Policy framework that (a) aims to connect with wider national policies, (b) provides the opportunity to align approaches towards managing water quality, and (c) ensures that water quality management becomes a national imperative (, and not just the responsibility of the Department of Water and Sanitation).

hillhalo

Mr Isaac Sello Seithlolo (MP) Deputy Minister Department: Water & Sanitation



## Message from the Director-General Department: Water & Sanitation

The Department of Water and Sanitation is the custodian of South Africa's water resources. It is well documented that South Africa is a water scarce country and while that is the case, there is a constant threat on our water resources as the water quality continues to decrease. It is incumbent upon the Department and the entire water sector to ensure that this precious resource is utilised in an efficient and sustainable manner in the interest of all water users, both domestically and of those countries with whom we share this resource.

Pollution from agriculture, industry and municipal wastewater systems poses a great threat to the country's aquatic systems and ecological infrastructure because the phenomenon reduces the assimilative capacity of our water resources while increasing the costs associated with the treatment of water. Domestic waste also plays a negative role in polluting our rivers and the environment in general. Urgent measures and interventions need to be put in place to address water quality challenges as these pose a significant threat to water security of the country.

This policy aims to address all these water quality challenges by taking an inclusive and integrated approach that allows all stakeholders to understand their roles and thus assume the responsibility to protect the resource and improve the quality of our water resources.

The Integrated Water Quality Management (IWQM) Policy consolidates the existing water quality management practices and integrate dimensions that will support the realisation of IWQM.

The policy provides a coherent and inclusive approach to management of water quality by building on the current strengths, addressing gaps/weaknesses and seizing opportunities identified in relation to IWQM.



The policy will also guide further development of legislative and regulatory instruments as well as establish appropriate measures for managing water quality. The IWQM Policy is aligned with the National Water Resource Strategy, Third Edition (NWRS-3) as a high-level strategic document that operationalises the National Water Act (Act 36 of 1998). It is therefore important that water quality is managed at all levels - from source, to-tap, and back to source. The implementation of this policy is critical for the socio-economic development since water is a catalyst in economic development, job creation and improvement of the quality of life.

I would like to thank all those who have contributed to the development of this IWQM Policy.

Dr Sean Phillips Director-General Department: Water & Sanitation







2025 IWQM POLICY

## **TABLE OF CONTENTS**

1.	BACKGROUND & INTRODUCTION	1
1.1	Rationale for the development of IWQM Policy	1
1.1.1	Water Quality Challenges	1
1.1.2	Water Quality & Water Quantity	4
1.1.3	Fragmented Approaches to Water Quality Management	4
1.2	Water Quality and the Developmental Agenda	5
1.3	Considerations for Unlocking IWQM	6
1.3.1	Political Will	6
1.3.2	Realistic Timeframes Supported by Sustained Financing	7
1.3.3	IWQM in Complex Social Ecological Systems	7
1.3.4	Promoting Responsible Behaviour	8
1.3.5	Improved Regulatory Landscape	9
1.3.6	Innovative Thinking	9
1.4	Target Audience	10
2.	PURPOSE & OBJECTIVE	11
2.1	Aim of the IWQM Policy	11
2.2	Vision and Goal for IWQM	11
2.3	Values Underpinning IWQM	11
3.	POLICY & LEGISLATIVE FRAMEWORK	13
3.1	Overview of Policies and Legislation	13
3.1.1	Constitution	13
3.1.2	White Paper on National Water Policy of 1997	13
3.1.3	National Water Act	14
3.1.4	Water Services Act	14
3.1.5	Strategic Framework for Water Services of 2003	14
3.1.6	National Water Resource Strategy of 2023	14
3.1.7	National Sanitation Policy of 2016	15
3.1.8	Mine Water Management Policy May 2022	15
3.1.9	The National Development Plan (NDP) of 2030	16
3.1.10	Global Sustainable Development Goals (SDGs) 2030	16
3.2	Other supporting Legislation	17
3.3	Challenges in the Legislative Frameworks	18



## TABLE OF CONTENTS

4.	KEY POLICY CONSIDERATION	20
4.1	Policy Pillars	20
4.1.1	PILLAR A: Taking an Inclusive Approach to Water Quality Management	20
4.1.2	PILLAR B: Applying Integrated, Adaptive Water Quality Regulation and Management	20
4.1.3	PILLAR C: Financing Integrated Water Quality Management	20
4.1.4	PILLAR D: Building an Appropriate Knowledge and Information Management Base	20
4.2	Policy principles	21
5.	PROBLEM STATEMENT & RESPONSES FOR EACH POLICY PILLAR	23
5.1	Pillar A: Inclusive Approach to Water Quality Management	23
5.1.1	Inter Government Approach to IWQM	24
5.1.2	Non-Government Approach for IWQM	25
5.2	Pillar B: Integrated, Adaptive and System Based Water Quality Regulation and Management	26
5.2.1	Integrated & Adaptive Water Quality Management	27
5.2.2	Regulatory approaches	29
5.3	Pillar C: Financing Integrated Water Quality Management	33
5.3.1	Economic, Social & Ecological Costs of Poor Water Quality	34
5.3.2	Government Funding & Financing Mechanisms	35
5.3.3	Partnerships	39
5.4	Pillar D: Knowledge and Information Management	40
5.4.1	Monitoring & Data Management	41
5.4.2	Research & Innovation	43
5.4.3	Capacity Building & Training	44
6.	CONCLUSION	46
7.	IMPLEMENTATION FRAMEWORK	48



## LIST OF ACRONYMS

Abbreviation	Meaning
AMD	Acid Mine Drainage
DALRRD	Department of Agriculture, Land Reform and Rural Development
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CMA	Catchment Management Agency
CMF	Compliance Monitoring and Enforcement
CMF	Catchment Management Forum
CMS	Catchment Management Strategy
COGTA	Department of Cooperative Governance and Traditional Affairs
CSO	Civil Society Organisation
DFFE	Department of Forestry, Fisheries and Environment
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
IWQM	Integrated Water Quality Management
IWRM	Integrated Water Resource Management
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NWRS	National Water Resource Strategy
R&D	Research and Development
SADC	Southern African Development Community
SAQA	South African Qualification Authority
SDG	Sustainable Development Goals
SALGA	South African Local Government Association
SWPN	Strategic Water Partners Network
SWSA	Strategic Water Source Areas
WDCS	Waste Discharge Charge System
WMA	Water Management Area
WRC	Water Research Commission
WSA	Water Services Act (Act 108 0f 1997)
WWTW	Wastewater Treatment Works



#### 1.1 Rationale for the development of Integrated Water Quality Management (IWQM) Policy

South Africa faces multi-faceted water challenges which if not addressed effectively, have the potential to drastically limit the growth potential of the country. Deteriorating water quality is one of these challenges, which is exacerbated by the fact that South Africa is a water scarce country, where water scarcity is compounded by frequent droughts and increasing water demands. As such, various concerns have been raised regarding pollution and resource quality, and its impact on water security for both social and economic development as well as services quality. These concerns must be addressed as they have major social, economic environment, legal and political impact on the lives of South Africans, businesses and ecosystems.

Despite the considerable attention given to water quality management over the years by the Department of Water and Sanitation (DWS), the current state of South Africa's water resources are in dire need of interventions as they present several enormous challenges confronting the water sector, resulting from various contributing factors. Hence the need for an integrated approach to the management of the resource. The initial Water Quality Management Policy was developed in 1991 and was reviewed in 2017. However, the policy could not be finalised due to COVID 19 Pandemic. The objective of this IWQM Policy is to bring about integrated management of water resource and an integrated approach to managing water quality and quantity, recognising the inter-linkages between pollution concentrations and the amount of water in the system.

In addition, throughout the evolution of IWQM, the burden of managing water quality has fallen largely on the shoulders of the DWS. It is clear, however, that finding a solution to the problem requires an integrated approach across key government departments and other sectors, utilising global best practice tools and mechanisms. This approach also informs the new Policy approach.

## **1.1.1 Water Quality Challenges**

Despite efforts made by DWS over many years, surface and groundwater quality across the country is deteriorating. Water quality challenges are still predominantly a result of several challenges the country is facing in managing the ever-expanding sources of pollution. These sources may be point or non-point (diffuse) in nature and are due to rapid urbanisation, expansion of the mining industry, increasing use of chemicals industries, uncontrolled discharges in of inappropriate untreated sewage, practices for surface soil tillage and fertiliser application, and the destruction of our ecological infrastructure, including and riparian buffer wetlands zones. Additionally, inadequate land-use planning, unsustainable development practices, and inadequate operation and maintenance of waste infrastructure (a predominantly urban challenge) have compounded these challenges.





Figure 1: Map of the different types of water quality problems within different Catchment in South Africa insert at bottom

As a result, the quality of the country's water resources has been deteriorating and, in many cases, the quality that is suitable for downstream water users has been negatively impacted.

Water Pollution challenges in South Africa have different scales and severity of impact, and some are more geographically specific than others.

Usually, salinisation, sedimentation, nutrient enrichment, and microbial pollution, occur at a national scale, while acid mine drainage and agrochemical pollution occur at regional or site-specific scales. The prevalence and/ or severity of impact of water quality issues varies markedly from river system to river system and between Water Management Areas (WMA)

Based on an analysis of the scale and severity of impact, five water quality issues stand out as priority issues of national importance. These are:

- Eutrophication.
- Salinisation.
- Acid mine drainage and acidification.
- Erosion and sedimentation of water resources; and
- Urban runoff pollution.

There are other pollution issues that must be addressed at regional or site-specific scales. These includes industrial and agrochemicals. metals and nanoparticles, (reflected on the right-hand side of Figure 2) about which there is insufficient information to understand the severity of impacts, which may be significant, and about which more research and investigation is needed to inform the actions to be taken. Good research and accessing knowledge from the international water sector must inform the approach to managing potential new pollutants.

Critically however, precaution must be taken in relation to less known pollutants, to avoid the introduction of potentially harmful new pollutants into our water resources.





Figure 2: Water quality issues mapped against impacts and knowledge/understanding

In addition, there are several other factors which are already of concern in South Africa such as:

- climate change, which is predicted to change rainfall patterns, increased water demand due to higher temperatures, and change the rate of biogeochemical and ecological processes that determine water quality.
- Sewer treatment failure, which can lead to severe pollution of water bodies due to untreated or inadequately treated wastewater, affecting water quality and posing serious risks to public health and aquatic ecosystems
- unconventional oil and gas extraction using hydraulic fracturing.
- nanoparticles and pharmaceutical product disposal.
- increased coastal pollution.
- the growth of inadequately serviced densely populated settlements.
- population growth; and
- increasing industrialisation.

These factors may result in new or accelerated water quality impacts and need to be integrated into the management approaches.

Internationally, the failure to recognise the importance of (ecological) infrastructure as a critical aspect of water resource and water quality management in both urban and rural settings is also a growing concern and must similarly be integrated into all management approaches.Healthy water-related ecological infrastructure, such as wetlands, rivers, riparian areas and Strategic Water Source Areas (SWSA), can directly support water security by increasing run-off and water storage in soil, preventing or delaying the build-up of sediment in dams, improving water quality and reducing flood damage. Investing in ecological infrastructure also creates valuable employment and supports and enhances built infrastructure. Water-related ecological infrastructure in the vicinity of water resources is critical for the longevity of water resources infrastructure due to its role in water quality and flow regulation. For that reason, the role of water-related ecological infrastructure should be considered in decisionmaking when planning for the design and maintenance of water resource infrastructure. This will expand the lifespan of infrastructure critically for the supply of water of sufficient quality and quantity. It will also strengthen the application of the mitigation hierarchy in landuse planning.



2025 IWQM POLICY

#### 1.1.2 Water Quality & Water Quantity

Water quality management is a complex and confounding challenge because of incomplete, contradictory, and changing requirements that are often difficult to recognise. Often, there are a multitude of interacting factors, including incomplete information, political interference, institutional instability, and changes outside the control of managers. Unfortunately, it is an operational reality, that the water quality management approach used to date in South Africa has not managed to adequately address the challenge. The water quality challenges reflected above occur within already complex socio-economic and bio-physical systems and understanding the multiple potential impacts and changes in these systems provides a major challenge.

Within these complex systems, water and water quantity issues quality are inextricably linked. Water resources have a certain assimilative capacity which can manage pollution impacts to acceptable levels. Increased abstraction of water from water resources decreases the amount of water available in the resource, resulting in reduced assimilative capacity and increased concentrations of pollutants. While a portion of the abstracted water is usually returned to the water resource at the tail end of the use process, it is inevitably in a worse quality than when abstracted. In certain instances, the abstracted water is never returned to the water resource as it is reused and recycled within operations. In periods of drought, the assimilative capacity of water resources is significantly decreased, while floods have the potential to mobilise pollutants that have been trapped in sediment. Thus, the management of water quality cannot be done in isolation from the management of abstraction, storage and use, including water conservation and demand management.

### 1.1.3 Fragmented approaches to Water Quality Management

Currently water quality management arrangements or governance is hampered by disintegrated institutional structures, poor coordination and conflicting approaches between spheres of government. There is a myriad of supporting operational policies, strategies and management instruments fragmented across all Government, which has created a challenge for water quality management.

Water quality management increasingly requires catchment rehabilitation through a range of rural and urban measures, implying an integrated approach that requires cooperation with other sector regulators.

While the DWS is primarily responsible for protecting and management of water resources, there are a number of other spheres of government that have important roles in this regard, in particular, national, local and provincial departments of Cooperative Governance and Traditional Affairs, Mineral Agriculture, Environmental Resources, Affairs, Science and Technology, Health, Trade and Industry, Education (Basic and Higher), Rural Development and Land Reform, settlements, Human National Treasury, Catchment Management Agencies (CMAs) and Municipalities.

Therefore, this Integrated Water Quality Management (IWQM) Policy provides an initial Policy framework that aims to connect with wider national policies, provides the opportunity to align approaches towards managing water quality and ensures that water quality management becomes a national imperative, and not just the mandate of the Department of Water and Sanitation.



### 1.2 Water Quality & the Developmental Agenda

Effective management of water quality in South Africa is a developmental issue, not simply an environmental issue, and must be addressed appropriately by government and its partners in civil society and the private sector as such. Without a radical improvement in WQM, worsening water quality will continue to decrease socioeconomic benefits that ought to accrue to the country and at the same time will continue to increase the costs associated with use of the country's water resources and integrity of the ecosystems and their functions.

The improved management of water quality and reduction of water pollution are critical elements of the sustainable socio-economic development path of South Africa as outlined in the National Framework for Sustainable Development (2008): "South Africa aspires to be a sustainable, economically prosperous and self-reliant nation state that safeguards its democracy by meeting the fundamental human needs of its people, by managing its limited ecological resources responsibly for current and future generations, and by advancing efficient and effective integrated planning and governance through national, regional and global collaboration".

The National Development Plan (2012), in turn, states that from an environmental perspective, South Africa faces several related challenges and conflicting demands between resource utilisation and sustained socio-economic growth, that need to be managed carefully. The country needs to "protect the natural environment in all respects, leaving subsequent generations with an endowment of at least equal value". Sustainable development is critically dependent on assurances of good quality of the country's limited resources. The country's development must be balanced by an increased supply of water of an appropriate quality to satisfy the human needs. Demand for good water quality will continue to grow as the country's population increases as well as social and economic conditions improve in South Africa, hence placing increasing pressure on the country's already scarce water resources and concurrently, increasing potential threats to water quality. Poor water quality has significant and adverse impacts on South Africa and:

- reduces the amount of water available for use (more water must be retained in our river systems to dilute the pollution to acceptable standards).
- increases the costs of doing business (the cost of municipal water treatment increases, and many enterprises are forced to treat water before being able to use it in their industrial processes,);
- impacts on human health and reduces productivity (an increased number of workdays are lost due to water-related illnesses);
- hreatens several economic sectors (poor water quality impacts on crop yields and makes crops vulnerable to import restrictions from countries with strict quality standards), and
- threatens ecological goods and services provided by our water resources.
- Consequently, deteriorating water quality is a socio-economic and development challenge and the management of the country's water resources must be undertaken in consideration of the increasing water resource pressures whilst aiming to sustainably support socio-economic development and specific water use requirements.





Figure 3: Water quality related SDG targets for Goal 6

In addition, this Policy will contribute to the country's ability to meet the global Sustainable Development Goals (SDGs), adopted in 2015. The SDGs are aimed at ending poverty, protecting the planet, and ensuring prosperity for all as part of a new sustainable development agenda. South Africa, as a signatory to the SDGs, must strive to meet the targets under each of the SDGs. Water quality has a direct bearing on the ability of the county to meet the goals of ending poverty, ending hunger and achieving food security, ensuring healthy lives and promoting sustainable economic growth. In relation to Goal 6: Ensure availability and sustainable management of water and sanitation for all, water quality is particularly relevant. Under Goal 6, there are three targets that are particularly relevant to water quality as illustrated in Figure 3.

### 1.3 Considerations for Unlocking IWQM

#### 1.3.1 Political Will

Addressing water quality challenges requires political will at all levels. Government needs to play a lead role in driving, coordinating and often financing the remediation of critical water quality problems in the public interest. Political will and supporting basin institutions have been illustrated as key to the successful maintenance and restoration of catchments such as in Western Australia and the Mersey Basin in the United Kingdom (Salman, 2007). As in India, political will has increased the willingness of international funding entities to be involved in funding the initiatives, and to also build the required institutional and regulatory mechanisms required to rehabilitate the basin (Sharma, 2015).



#### 1.3.2 Realistic Timeframes Supported by Sustained Financing

Integrated Water Quality Management is a long-term process that requires political will and attention to build the required institutional capacity and financial sustainability to enact change. The change must also be supported by sustained financing over the required period for improvement. Improving the resource water quality in a catchment can have short term economic impacts, however, the long-term socio-economic and environmental benefits of improved water quality often outweigh these.

There are various economic (and financial) approaches that can be implemented to fund the cost of water management and innovative financing mechanisms for incentivising good IWQM practice. The selection of the approach should be dependent on the individual context. This can range from pollution charges for direct discharge of wastewater as applied in Germany, or financial compensation for environmental services as is the norm in France.

The Ganga Basin initiative in India illustrates that government needs to drive efforts to remediate water resources, and also source funding (Ramachandran, 2014).

#### 1.3.3 IWQM in Complex Social Ecological Systems

Integrated Water Quality Management adopts the overall philosophy that:

i. All-natural water quality, polluting impacts on water quality, and remediation of water quality happen in the context of a catchment.

ii. All catchments comprise the landscape and the people who live there. The landscape is bio-physical environment and people exist as society.

Simply stated, people living in landscapes comprise of complex social ecological systems.

This implies that it is important to understand both the elements of the system and the interactions between these elements. The relevant elements include, among many others, water resource users and managers, water quality variables, water flow and quantity, and waste discharge. The relevant interactions and feedback include, among many others, licensing, waste discharge charges, the green drop programme, resource directed measures and source directed controls. Consequently, integration and adaptive management are critical to the IWQM.





Figure 4: Schematic of sources of water pollution

#### 1.3.4 **Promoting Responsible Behaviour**

Water is a basic human right, without which, life on earth would perish. Whilst economic development is important, without water, this development would cease. Recognition of this very simple concept should change the way we, as a society, behave, however, the state of the country's water resources proves that it does not effectively inform our behaviour. It is therefore critical to rethink the way in which water is being managed.

Government alone cannot ensure good water quality. As inhabitants of this country, everyone has the obligation to behave in a responsible and ethical manner and support Government in the management of the country's most precious resource, either through their own behaviour or by reporting unlawful behaviour. Section 19 of the National Water Act emphasizes this shared responsibility, requiring landowners, a person in control of land or a person who occupies or uses the land to take reasonable measures to prevent pollution and protect water resources.



The newly introduced "Carbon Tax" and the continued development of the Waste Discharge Charge System (WDCS) are initiativestochangebehaviourtoeitherreduce carbon emissions or reduce pollution load to the resource respectively, however, these rely on financial incentives. Water quality management requires a shift in behaviour to realise longer term improvements. These shifts in behaviour need to go beyond a response to economic incentives, towards a recognition that societies are part of the complex social ecological system.

Promoting joint custodian of the water resources through education from grass roots level, to ensuring that the public are informed and capacitated to care for the scarce water resources, and to actively participate in its protection and management, are steps in ensuring the much-needed behavioural change. The "Adopt a River" Health programme, and programmes of this nature promote this shift in philosophy.

#### 1.3.5 Improved Regulatory Landscape

While South Africa has a strong institutional and regulatory landscape, the alignment and consistency is an emerging challenge that requires cooperative governance and regulatory and strategic approaches that aim for alignment.

Lessons from international practice show that regulatory and strategic approaches are increasingly focusing on minimising pollution by being stringent on major polluting sectors and enterprises. For example, The People's Republic of China has demonstrated that shifting regulatory approaches to improving monitoring and compliance (CEF, 2014), and enforcing the 'polluter pays' principle, forces polluters to minimise pollution and also provides finances to the regulating entity (through taxes or fines) for rehabilitation and restoration interventions (Falk, et al., 2014; Matthews, 2015).

India is also showing intent to implement this strategy, although institutional challenges are delaying implementation. Innovative land-use planning approaches in Porto Alegre (Brazil) illustrate that all sectors have a role to play in minimising pollution (Tucci, 2002; Gersonius et al., 2008).

#### **1.3.6 Innovative Thinking**

Clean technology supported by green economy initiatives and financing mechanisms provide targeted ways of reducing pollution at source. The private sector has a crucial role to play in minimising its impacts on water resources. Collaborative efforts by the private sector and international funding organisations (such as the World Bank), CEO Mandate and/or NGOs (such as the World Wildlife Fund - WWF) illustrate that by sharing water risks, benefits can also be shared. There is therefore a recognition that business risk associated with physical, reputational and/or regulatory impacts has contributed to collective action initiatives associated with new emerging partnerships. This. however, requires an enabling environment for research and development and the promotion of the clean technology industry.



## 1.4 Target Audience

This IWQM Policy is a national document, based on a set of Policy principles and values to guide decisions and improve the management of water quality in South Africa. Whilst the DWS is the custodian of the country's water resources and the lead government, this Policy is directed at all spheres of government, it also speaks to South Africa as a whole, including the country's many sectoral institutions, as well as non-governmental entities including the private sector, the research community, and civil society.

Most importantly, the IWQM Policy is meant for anyone in South Africa who is involved in socio-economic initiatives, from planning to implementation. The IWQM Policy is not solely an "environmental sector" Policy. Instead, it is a document for every individual or institution or organization that plays a role in South Africa's socio-economic growth and development, that impacts or that is affected by the impact on the water quality.



## 2. PURPOSE & OBJECTIVES

### 2.1 Aim of the IWQM Policy

The Policy aims to update the 1991 policy and to consolidate the existing water quality management practices as well as to strengthen the approach by introducing new integrative dimensions that will support the realisation of IWQM. Core dimensions include:

- Providing a coherent, consolidated and inclusive (i.e. government in partnership with the private sector, organ of states and civil society) approach to the way water quality is managed by building on the current strengths, addressing gaps/ weaknesses and seizing opportunities identified in relation to IWQM.
- Aligning with legislation and relevant overarching policies and provide resolution on matters not adequately addressed in the existing Policy.
- Guiding further development of legislative and regulatory instruments and appropriate measures to manage water quality.
- Define the water resource management roles and responsibilities as well as the required framework for the development of related policies and sub-strategies related to IWQM.
- Addressing key operational aspects such as adopting an integrated approach, broadening finance mechanisms and improving knowledge and information in the execution of the IWQM function, and
- Providing guidance on sustainable water use, especially in as far as it relates to IWQM.

### 2.2 Vision & Goal for IWQM

Noting that South Africa has progressively developed its approach to IWQM over the last century, the status of water resources is declining, and these resources will be placed under increasing levels of pressure as development progresses. In this context, The Constitution of South Africa indicates that we need to ensure a "Sustainable, equitable and secure water for a better life and environment for all."

Towards this end, the country's vision for IWQM is therefore:

#### "Government, in partnership with private sector and civil society, secures water that is suitable for its beneficial use, for all South Africans"

Consequently, the goal for IWQM for the country is to adopt an integrated approach, in collaboration with the spheres of government, private sector, civil society, and community at large to improve resource water quality in South Africa, prevent pollution and ecological degradation, support ecologically sustainable economic and social development as well as informed use of the nation's water resources.

### 2.3 Values underpinning IWQM

This IWQM Policy is underpinned by a set of core values which are essential for enabling the successful implementation of the Policy. These values support the vision, guide the principles that are used to shape the Policy responses, and reflect the ethos for managing water quality in South Africa. These values are presented in Figure 5 on the following page.



Value system - justice, ethics,equity,integrity, fairness	Coherent action without a value system is at risk of floundering in the face of demands from competing sectors & the challenge of corruption. The Bill of Rights & the Constitution provide clear value-based principles for action in implementing the IWQM Policy.
Courage	The courage to act decisively, to make mistakes & to learn, within a cycleof monitoring & review that is governed by a strategic adaptive management approach.
Communication & Team work	Recognition of an interconnected water system of which water quality is a part, supports the needs for transparent communication & the ability to work as a team across all sectors of government & with the privvate sector & civil society.
Competence	With many aspects to IWQM, inc technical & the need to manage complex systems, that require high levels of technical competence. The appointment of competent staff must be supported by capacity building programmes.
Empowerment	Officials are empowered to act (thatis, to use their courage & competence) where there is effective leadership.
Informed Civilians	Are a key element of the effective delivery of integrated water quality management. The emergence of an informed civilian population requires investment in effective public information processes.
Responsibility & Accountability	Responsible action emerges when there is competence, trust & an active, shared, value system. Accountability arises from the willingness & transparency to take ownership of those actions.
Listening & Learning	Responsive implementation of the policy will require water quality managers to listen to water resource users & protectors, both individually & institutionally, and to be open to new learning & to be able to change approaches in the spirit of adaptive management.

Figure 5: Values underpinning the IWQM Policy





### **3. POLICY & LEGISLATIVE FRAMEWORK**

## 3.1 **Overview of Policies & Legislation**

The legal and Policy framework for water quality management begins with relevant provisions in the Constitution of South Africa,1996 (Act No. 108 of 1996), and cascades down through National Policy to legislation supported by secondary legislation or regulations. This section reflects on the relevant Constitutional provisions, and a high-level framing of the Policy and legislative framework and the support required from Government for IWQM.

#### 3.1.1 Constitution

Section 24 (Bill of Rights) of the Constitution of South Africa, guarantees everyone the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of the present and future generations, through reasonable legislative and other measures that—

- 1. prevent pollution and degradation.
- 2. promote conservation; and
- 3. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Section 27, guarantees everyone the right to have access to sufficient food and water; and

Section 32, guarantee everyone the right of access to any information held by the state; and any information that is held by another person and that is required for the exercise or protection of any rights.

#### 3.1.2 White Paper on a National Water Policy of 1997

The white paper please emphasises on the value of water in many ways in which it serves the needs of the people as indicated in the guiding principle, specifically, Principle 7 states that:

"The objective of managing the quantity, quality and reliability of the nation's water resources is to achieve optimum, long-term, environmentally sustainable social and economic benefit for society from their use".

The National Water Policy also indicate that, the water and water-related services which people use are not dependent only on the physical and chemical characteristics of the water itself, but on the healthy functioning of whole ecosystems, such as rivers, lakes, dams, wetlands, estuaries or the coastal marine environment. It is the healthy functioning of the whole ecosystem which gives a water resource its ability to recover from droughts, floods and the impacts of human use. Therefore, the most effective approach is to use receiving water quality objectives as the basis for water environmental quality management."

The concept of integration recognising the inter-linkages between pollution concentrations and the amount of water in a system was also introduced under principle 15 states that "water quality and quantity are interdependent and shall be managed in an integrated manner" which is consistent with broader environmental management approaches.



#### 3.1.3 The National Water Act (NWA) (Act No. 36 of 1998)

The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in a responsible manner, take into account: -

- meeting the basic human needs of present and future generation
- protecting aquatic and associated ecosystems and their biological diversity
- reducing and preventing pollution and degradation of water resources
- meeting international obligations

The mandate of the department with regards to water quality is found in Chapter 3 of the NWA which speaks to the protection of water resources. The protection of water resources is fundamentally related to their use, development, conservation, management and control. The NWA also introduces the measures to prevent the pollution of water resources and measures to remedy the effects of pollution of water resources.

At the same time, a decentralized approach to water resources management was introduced, with the NWA enabling the establishment of CMAs, responsible for managing water resources at the catchment level.

**3.1.4 The Water Services Act,1997 (Act No.108 of 1997)** provides a legislative framework for the effective provision of water services, including for basic human needs. It highlighted the spirit of co-operative governance with the emphasis on building capacity at all levels of government.

**3.1.5 The Strategic Framework for Water Services of 2003** addressed water supply and sanitation issues, serving as an umbrella framework for the entire water services sector, setting overall water supply and sanitation goals and outlining an institutional framework and operational frameworks (financial, planning and implementation) that need to be set or be in place to achieve these goals.

#### 3.1.6 National Water Resources Strategy (NWRS)

NWA requires the establishment of the of a National Water Resources Strategy (NWRS) by the Minister of Water and Sanitation. The National Water Resource Strategy (NWRS) is the policy framework for implementing and operationalizing the National Water Act (NWA) and it is binding on all authorities and institutions implementing the NWA. The NWRS sets out the strategies, objectives, plans, guidelines and procedures of the Minister, and the institutional arrangements relating to the protection, use, development, conservation, management, and control of water resources. This NWRS is now in its third edition (NWRS-3) and its purpose is to ensure the protection and management of water resources to enable equitable and sustainable access to water and sanitation services in support of socio-economic growth and development for the well-being of current and future generations in South Africa. The NWRS-3 is a strategy for all sectors and stakeholders who use and impact upon South Africa's water resources and it responds to the NWA by outlining strategic objectives and actions which are then carried forward for resourcing and implementation in the National Water and Sanitation Master Plan (NW&SMP).



The Strategy (NWRS-3) outlines some of the outstanding challenges in managing the water resources in the country, namely:

- To reduce water demand and increase efficiency of water supply and effectively implement WCWDM measures.
- To increasingly redistribute water for transformation.
- To manage water and sanitation services more effectively.
- To improve the management of water and sanitation under a changing climate.
- To improve raw water quality and increasingly protect and restore ecological infrastructure.
- To enhance the effectiveness of water sector institutions and improve financial sustainability.
- To innovate and implement new technologies in the sector.
- To address the long-term declining water quality situation.

#### Provision is already made for this Policy to be implemented as part of the NWRS-3 and monitored through the National Water and Sanitation Master Plan (NWSMP).

**3.1.7 The National Sanitation Policy of 2016,** is the first comprehensive Policy for sanitation provision in South Africa. The Policy includes positions on equity, institutions and sustainability, and commits the Minister to developing norms and standards for sanitation in informal settlements. 3.1.8 Mine Water Management Policy May 2022, provides for the common approach to the mine water management and introduces protection measures to water resources management. The policy also enhances the legislative and regulatory role of the spheres of government through clearly defined policy positions. The purpose of the policy is to provide integrated and coherent approaches across government, the private sector and civil society for sustainable management of mine water by building existing frameworks, addressing gaps or weaknesses and capitalizing on opportunities identified in relation to mine water management, including Acid Mine Drainage.

The objective of the policy is to:

- Provide relevant and integrated legislative remedies to entrench a proactive mine water management approach within the whole mining life cycle.
- Provide measures for protection of water resources from prospective, operational and abandoned mines.
- Promote mine closure that endangers sustainable societal and environmental benefits, with an emphasis on mine water management
- Supports the mandates of government for management of mine closure, in particular the mandates of the DALRRD, DFFE, DMR and DWS.



In addition to the primary Policy and Legislation discussed above, water quality is managed by DWS through several operational policies and strategies. Thus, IWQM in South Africa has evolved over time from end-of-pipe pollution control focused on the enforcement of uniform effluent standards to the current approach of resource planning and management, complemented with appropriate source management controls and remedial efforts, within the context of Integrated Water Resource Management (IWRM).

**3.1.9 The National Development Plan (NDP) of 2030** aims to eliminate poverty and reduce inequality by 2030. To do this, South Africa needs to draw on the energies of its people, grow an inclusive economy, build capabilities, enhance the capacity of the state, and promote leadership and partnerships throughout society.

The NDP specific goals for water resources management are as follows:

#### • Effective administration

This includes involving users so that they understand and can respond to emerging constraints, systematic monitoring to ensure effective water-supply planning, development and operation, and regulating water's various uses (including disposal of wastewater) to ensure sustainability. Effective administration requires clear legislation and policies based on research and development capacity and the right technical tools.

#### • Water resource management

Given growing uncertainty about the availability of water to meet expanding demand, the management approach must be regularly reviewed. A statutory public process for this already exists, requiring that a national water resource strategy is produced every five years.

#### • Prioritization

There is an urgent need for a solid plan to ensure the protection of water resources and the environment in the Mpumalanga Highveld coalfields, upstream of the Vaal and Loskop dams, as well as in the Lephalale-Waterberg area. Given environmental pressures and development demands, current water allocations in the upper Vaal and Olifants River water management areas urgently need to be revised. Local planning should also ensure that groundwater resources are optimally used. If properly planned and managed, groundwater can often meet local needs more effectively than large regional infrastructure projects.

**3.1.10 Global Sustainable Development Goals (SDGs) 2030**, 17 Global Sustainable Development Goals (SDGs) to be achieved by 2030. These goals aimed at ending poverty, protecting the planet, and ensuring prosperity for all as part of a new sustainable development agenda. There is a dedicated water goal i.e. Goal 6: Ensure availability and sustainable management of water and sanitation for all, Goal 6 has 6 sub-goals/ targets namely:

- Achieve universal access to safe and affordable drinking water.
- Achieve access to safe and adequate sanitation (specific focus on needs of woman and girls).
- Improved water quality through reduced pollution.
- Improved water-use efficiency/water security.
- Implement integrated water management.
- Protect and restore Ecosystems.

Water quality has a direct bearing on the ability of the county to meet the goals of ending poverty, ending hunger and achieving food security, ensuring healthy lives and promoting sustainable economic growth.



### 3.2 Other Supporting Legislation

Whilst the technical elements of water quality management have been sound for many years, it is realised that the shift in approach now must be one of managing water quality with a sector integrated approach. There are a range of policies and pieces of legislation administered by other government departments that are also relevant to the management of water quality in South Africa. In effect, these show the important connectivity of landbased activities to water quality. These are described below.



Figure 6: Relationship between sector activities & the environment

3.2.1 The White Paper on Environmental Management in South Africa of 1997 and the National Environmental Management Act,1998 (Act No. 107 of 1998) (NEMA) set out the overarching Policy and legislative framework for environmental management in South Africa. The White Paper outlines government's environmental vision, strategic goals and supporting objectives as well as the powers and responsibilities of different spheres of government and civil society.

The primary instrument to ensure that natural resources are managed sustainably as far as new projects are concerned is Environmental Impact Assessment (EIA) (Brownlie, Coetzee, Morris, 2013).

3.2.2 The White Paper South on African Land Policy (1997) stipulates that "environmental issues" should inform the Policy and stipulates that one challenge of land reform is to relieve land pressure without extending environmental degradation. The Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013), administered by the Department of Agriculture, Land Reform and Rural Development (DALRRD), provides a framework for spatial planning and land use management and specifies the relationship between spatial planning, the land use management system and other kinds of planning. It provides for development principles and norms and standards; for the sustainable and efficient use of land; and provides for cooperative government and inter-departmental relations between national, provincial and local spheres of government.

3.2.3 The Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) applies to the whole of South Africa (urban and rural areas) and governs informal and traditional land use development processes. However, there has been insufficient consideration of water quality impacts from land use and this aspect is not sufficiently considered in spatial planning and land use management initiatives.



3.2.4 The White Paper on Agriculture of 1995 and the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA) principally aim to build the agricultural sector in South Africa to reduce unemployment and poverty. One of the Policy objectives is "to preserve agricultural natural resources and to develop supporting policies and institutions". The Department of Department of Agriculture, Land Reform and Rural Development, has developed a number of legislative and other tools which provide and contribute to the prevention of water pollution by agricultural activities. They include: -

- An Irrigation Strategy of South Africa, 2015.
- National Policy on organic production.
- National Aquaculture Policy Framework.
- Pesticide Management Policy for South Africa, 2010; and
- Research studies in relation to water quality developed in collaboration with the Water Research Commission (WRC) and the Agricultural Research Council (ARC).

In addition, there was the development of a discussion document on a *Policy on Agriculture in Sustainable Development* by the Department of Agriculture, Land Reform and Rural Development, which deals extensively with water issues, including impacts on water quality arising from agricultural practices. However, the Agricultural Policy Action Plan (2015 – 2019) itself does not make any reference to issues relating to the water quality impacts of agriculture, or of the impacts of agriculture on declining water quality.

This reality reiterates a recognition of the fragmented nature of IWQM and underscores the observation that the issue of water quality is not being appropriately addressed.

# 3.3 Challenges in the Legislative Frameworks

From a mine water management perspective, there are additional challenges posed by current Policy and Legislation from which the mining industry continues to benefit. For example, the authorisation of mining developments by DMR is not aligned with an assessment of sensitive, vulnerable, and important water resource areas as legislated under, NWA, NEMBA and NEMA, placing some of South Africa's strategic water source areas at risk.

This results in a conflict of interest in the DMRE's mandate, between the promotion of mining and the regulation of its environmental impacts; this fundamentally compromises effective regulation of the detrimental impacts of mining.

Despite the requirement of a one-stop authorisation process involves that Department of Forestry, Fisheries and (DFFE), Environmental Affairs DWS and DMRE, too often mines are given authorisations to operate without due consideration of the long-term and often extremely significant water quality implications resulting from mining.

The agreement between the Ministers of Water and Sanitation, Environmental Affairs and Mineral Resources concluded in 2014 set the basis for improved integration and alignment between the three Departments.



This agreement, titled **One Environmental** System, entails that all environment related aspects will be regulated through NEMA and that all environmental provisions will be repealed from the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) ; that the Minister responsible for environmental affairs sets the regulatory framework and norms and standards, and that the Minister responsible for mineral resources will implement the provisions of NEMA and the subordinate legislation as far as it relates to prospecting, exploration, mining or operations; that the Minister responsible for mineral resources will issue environmental authorisations in terms of NEMA for prospecting, exploration, mining or operations, and that the Minister responsible for environmental affairs will be the appeal authority for these authorisations; and that the three Ministers agreed to align the time frames and processes for authorisation processes.

Water pollution from agricultural runoff, industrial discharge, and particularly acid mine drainage (AMD) is a persistent issue. The existing regulatory frameworks is not sufficiently addressing the extent of water pollution, specifically AMD from abandoned mine. There is a need to align legislation and enforce compliance.

The Mining Charter provides that mines are expected to design and plan all operations so that adequate resources are available to meet the closure requirements of all operations. Section 28(2) (c) of the MPRDA requires mines to report on their compliance to the Mining Charter on an annual basis. However, in instances where a mine is declared insolvent and subsequently closes, the responsibility is inherited by the State who then must ensure the continuous rehabilitation of derelict and ownerless mines.



The rehabilitation fund provided prior by the mine is often not sufficient for continuous management and rehabilitation and the financial burden falls on the state. The challenge of providing sufficient funding for the on-going management of water pollution from closed mines has not yet been satisfactorily addressed.

What becomes clear in looking at the relevant policies across government is that there is a lack of Policy and implementation alignment between the relevant government Departments, and a lack of a common Policy imperative which balances the need for economic development with the protection of natural resources, including water. The DWS has developed a Mine Water Management Policy which has been approved by Cabinet in May 2022, which seeks to address the issues outlined above, particularly when it comes to issues around liability, funding and attribution.



## 4. KEY POLICY CONSIDERATION

The management of water resources is structured around a number of key themes, namely, governance and institutional aspects, technical and managerial approaches, financial instruments, information and data management that underpins decision making and the human resources and skill sets required to undertake water quality management activities.

The National Water Resources Strategy (NWRS) and the Integrated Water Quality Management Strategy 2017 typically would cover these dimensions, as would a Catchment Management Strategy (CMS). These dimensions have then been refined for the purpose of the IWQM Policy into four key pillars around which the Policy is structured. These pillars are underpinned by the 18 Policy principles, noting the interconnectivity and inter-dependencies between these pillars. However, when collectively implemented, the result will be the attainment of the vison and goals of the Policy. The naming of these pillars has been based upon the core issue that is required to shift the water quality management paradigm to one of integration and the realisation of impact.

#### 4.1 Policy Pillars for Intergrated Water Quality Management (IWQM)

#### 4.1.1 PILLAR A:

## Taking an inclusive approach to water quality management

This pillar refers to:

- the need for a government integrated adaptive and systems-based response to IWQM challenges throughout country.
- key Policy aspects that must be addressed in achieving such an approach.

- the need to build partnerships between government, civil society, and the private sector to successfully address the challenges; and
- the need to gather input through public participation.

#### 4.1.2 PILLAR B:

#### Applying Integrated, Adaptive Water Quality Regulation and Management

The second pillar spells out:

- The integrated approach to adaptive, systems-based IWQM
- The Hierarchy of decision-making; and
- Key regulatory instruments for implementing the integrated, adaptive and system-based approach.

#### 4.1.3 PILLAR C: Financing Water Quality Management

The third pillar examines the financial basis for integrated IWQM, looking at tools for financing the required actions, and the key role of the private sector.

#### 4.1.4 PILLAR D: Building an appropriate knowledge & information management base

The fourth and final pillar describes the Policy elements that focus on the knowledge and human resource capacity base that is required to implement the Policy approaches described in the above three sections. This also includes embracing a bottom-up approach in IWQM through educating and creating awareness within communities and water users in a quest to improve water quality.



#### 4.2 Principles underpinning Integrated Water Quality Management (IWQM)

The development of Policy needs to be constructed around a suite of principles that provides a core suite of objectives and as such a framework for the Policy. Noting that there is an increasing recognition of the need to introduce elements of change that will influence the ability to affect Policy, the principles for the IWQM Policy need to i) elaborate on the existing Policy principles present in various primary Policy documents of government, and ii) respond to the gaps in IWQM by proposing new principles.

Eighteen Principles underpin the IWQM Policy and ensures that the approach to IWQM is structured, transparent and predictable. Internally, the Principles guide the development of IWQM Policy positions and statements. Externally, these Principles substantiate the basis of Government's views to the public.

## Principle 1: Government- wide integrated water quality management:

It is the constitutional duty of all spheres of government and the state as a whole to protect the quality of South Africa's water resources.

#### **Principle 2: People-centric:**

Public participation is a crucial element of IWQM that must be promoted to ensure active and engaged citizenry. Participation of stakeholders at all levels must be carefully balanced and integrated so as to ensure impoverished rural subsistence farmers, local NGOs, civil society groups and marginalised and disempowered communities are also included.

#### **Principle 3: Subsidiary & accountability:**

Water quality must be effectively and efficiently managed and the institutions responsible for polluting water quality must be held accountable (i.e. blue drop, green drop monitoring, etc).

#### Principle 4: Transboundary IWQM:

Water pollution has spatial dimensions that traverse an array of administrative and natural boundaries. International, national, provincial and local boundaries do not typically align with natural boundaries creating an array of planning, management and operational challenges that need consideration.

#### **Principle 5: Partnerships:**

To manage water quality effectively, partnerships must be developed between the government, private sector and civil societies.

## Principle 6: Administrative fairness & implementability:

Regulation must be administratively fair and must also be effectively implementable within technical and financial resource constraints.

## **Principle 7: Administrative & Criminal penalties:**

A system of effective administrative and criminal penalties for water pollution offences must be adopted and the waste discharge charge system must be implemented promptly.

## **Principle 8: An integrated & adaptive approach:**

An integrated and adaptive, systemsbased resource, remediation and source directed approach which manages the water resource system as a unit at catchment or sub-catchment scale will be adopted, e.g. to include integration between "quality" and "quantity", integrated planning and integrated regulation.



## Principle 9: Hierarchies of pollution management:

Pollution management will follow a hierarchy of decision-making permeated by:

- Prevent, where possible.
- Minimise, where possible or be subjected to specific licence conditions or minimum standards.
- If the above options have been exhausted, then apply a precautionary approach using agreed minimum standards.
- Reuse and recycle, where possible, in order to support the green economy.
- For catchment specific responses, a differentiated approach is applied. This allows for continuous improvement and adaptive management approaches. Rehabilitation and reclassification will be applied catchment specific contexts as needed.

#### Principle 10: Promotion of green/ ecological infrastructure restoration and rehabilitation:

Rehabilitation and restoration of catchments will be pursued, including the use of green/ ecological infrastructure, and provision measures put in place via the pricing strategy to ensure funding for green infrastructure.

#### Principle 11: Risk-based approach:

A risk-based approach to regulation will be adopted, based on the likely magnitude of potential impacts.

## **Principle 12: Water quality is a developmental issue:**

In addressing the management of water quality, the developmental, economic, social and environmental impacts of deteriorating water quality must be taken into account.

## Principle 13: Broadened funding mechanisms:

The mechanisms for funding integrated water quality management must be broadened, given that water quality has impacts on, and is impacted by, many different sectors, and recognising the negative developmental impact of declining water quality.

#### Principle 14: Polluter pays:

The cost of treating water discharge and pollution must be recovered from users who discharge and impact or threaten Resource Quality Objectives.

#### Principle 15: Informed public:

Efforts to ensure that broader societal awareness of the importance of resource water quality will prove increasingly important in catalysing more responsible behaviours.

#### Principle 16: Data is a strategic asset:

Use of technology and real time data on water quality must be improved, standardised, reliable and scientifically defensible and must be collected, managed and protected as a strategic asset for monitoring, management, legal actions and research purposes, while also being used to support co-learning and adaptive management (e.g. estuarine monitoring with DFFE coastal). Furthermore, data must be transformed into meaningful information to support decision making on water quality aspects.

## Principle 17: Publicly available information:

Information and data on water quality, waste discharges and audit and compliance reports must be made available in the public domain and should be used to enhance public awareness and education, and to support adaptive management approaches.

# Principle 18: Protect strategic water sources areas:

Using various mechanisms & regulatory tools.



## 5. PROBLEM STATEMENT & RESPONSES OF EACH POLICY PILLAR

### 5.1 - PILLAR A:

Taking an Inclusive Approach to Water Quality Management



2025 IWQM POLICY

## 5.1.1 Inter Government Approach to IWQM

#### **PROBLEM STATEMENT**

Deteriorating water quality in South Africa present а significant socio-economic and developmental challenge and it's a world-wide problem, affecting sectors such as agriculture, tourism, industry, and municipalities leading to substantial financial cost for water treatment to meet the specific needs of the water use. Poor water quality affects the functioning of ecosystem and poses serious health risks, especially in underserved communities.

Managing water quality is complex due to diverse pollution and varying environmental factors. These complexities result in a multifaceted and intricate array of governance problems. Historically, the management of water quality has fallen solely to the Department of Water and Sanitation, and its various institutions, as custodian of the country's water resources.

The fact that the status of water resources is often dependent upon how land is utilised and managed, means that the DWS has no, or limited, mandate to influence decisions that have significant impact upon water resources. Engagements for cooperative governance must ensure that sustainable water use is the focus and will give effect to adaptive management and continuous improvement in cooperative governance. An inclusive approach involving relevant spheres of government and non-government organisations is essential to address these challenges. There is a need for institutional reforms and realignment of the IWQM function, which must include clarification of roles and responsibilities of government and other role players. Currently effective IWQM is being hampered by poor co-ordination, silo planning and conflicting approaches within the spheres of government and have hindered the effective management of water quality.

Despite these challenges, some progress has been made in improving co-ordination, such as the amendments to National Environmental Management Act (NEMA) strengthening the ability of the DFFE to deal with non-compliant mines and progress in the revision of Environmental Impact assessment (EIA) Regulations which is strengthening the requirements of EIAs. Progress has been made in developing a coordinated one environmental authorisation system between DWS, DMR and DFFE and formulation of joint approaches to compliance monitoring and enforcement. However, some issues remain a challenge in relation to mines on the integrated approach set in 2014 by various Ministries.

Non-compliant municipalities are a major source of pollution through illegal discharges of wastewater. There have been significant efforts to incentivise and support municipalities in improving the operations and maintenance of WWTW, through Programmes such as the Green Drop programme, and this has proven to be successful, however, more collaboration is required as the water containing waste comes from different sources.



#### **POLICY RESPONSES**

In line with the Constitution, all relevant government role players are required to develop and implement appropriate legislative (and other) measures, and to operate in concert through formalised cooperative governance structures, to protect water resources from pollution. This requires inter-departmental harmonisation of policies, legislation, regulation, integrated planning compliance, monitoring and enforcement as well as other functions related to the management of water quality. Roles and responsibilities of different Departments when dealing with polluting land-based activities need to be clarified, e.g. the overlapping roles of DWS and DMRE when dealing with tailings facilities.

Establishment of inter-departmental and intergovernmental structures to ensure government wide coordination of water quality management processes, these will include the needs for financing the declining water quality.

## 5.1.2 Non-Government Approach for IWQM

#### **PROBLEM STATEMENT**

The private sector is a significant player in generating pollution in South Africa, whether from large or small enterprises. While some enterprises have made considerable progress in improving on their processes and meeting water quality standards, there are still some enterprises that continue to contravene legislation and pollute water resources. This not only has significant impacts on other water users and aquatic ecosystems but also places an additional burden on state resources.

Government, on its own, will not be able to successfully manage the water quality challenges. There is a need for collaboration, stewardships and partnerships between all stakeholders including spheres of government, the private sector, government entities and civil society. Education is an important step for partnerships to ensure common understanding of the water quality issues and challenges.

Civil society and community at large is required to assist in the identification of pollution incidents and issues of water pollution, in partnership with the state as eyes and ears (watch dogs).

#### **POLICY RESPONSES**

The private sector and civil society have a crucial role to play in minimising its impacts on water resources. The National Water Resource Third Edition (NWRS-3) places emphasis on partnerships with private sector, and civil society to deal with water challenges. There are already established platforms to facilitate cooperation (e.g. Strategic Water Partnership Network and DBSA) and dialogue (National Business forums, Initiative the Water Sector Leadership Group and Provincial Catchment Management Forums) to address water challenges, align plans and strengthen collaboration and promote stewardship.

There is a greater need for governments to use public-private partnerships to collaborate with private-sector companies to finance water quality improvements projects.



## **5.2 - PILLAR B:**

## Applying Integrated, Adaptive Water Quality Regulation & Management





#### 5.2.1 Integrated & Adaptive Water Quality Management

#### **PROBLEM STATEMENT**

Water pollution arises from several sources in a catchment, whether direct discharge or diffuse pollution arising from run-off from land-based activities. Water pollution affects both surface and groundwater resources. It is exacerbated by factors such as rainfall, temperature, and the volume of water abstraction, which influence the nature, concentration, and mobility of pollutants increasing the complexity of water quality management. In addition, most of South Africa's large watercourses are shared with neighbouring states. Therefore, water quality is a transboundary issue that requires coordinated action amongst the riparian states.

South Africa's water resources also experience pressure from climate change effects, including water scarcity and extreme hydrological events. Adding to the complexity of managing water quality is the fact that catchments are complex socialecological systems subject to continual non-linear changes arising from external influences and internal system changes.

A further complexity is that social values are not coherent across all groups in the catchment and may change over time, changing the desired management outcomes within the catchment. These complexities can create uncertainties about what management strategies best meet societal goals and call for ongoing learning and adaptive strategies and systems-based management approaches is required. Water quality management must be maintained to preserve its use through authorisation of water use and setting of RQOs. This also requires processes of planning, development, implementation and administration of water quality Policy, management. regulations, the authorisation of water uses that may have, or may potentially have, an impact on water quality, as well as monitoring compliance to the aforementioned. In cases where there is non-compliance, decisive enforcement action must be taken.

#### POLICY RESPONSES

Responding to this complex challenge requires the adoption of an integrated, adaptive and systems-based approach at the catchment scale, and the adoption of practical tools and mechanisms that result in the greatest benefit with the use of limited state resources.

Enabling of water management institutions (CMA's) to co-ordinate with the institutions responsible for land use, economic development and water use planning at the catchment scale. DWS will expedite the establishment of CMAs as well as the delegation of appropriate functions to CMAs, to support the uptake of integrated water resource management.

Transboundary basin planning is by its nature complex and requires sovereign states to consider their water quality impacts beyond international borders. DWS will strengthen integrated water resources planning through the water basin commissions and sharing of experiences. The establishment of CMAs is an important tool in addressing integrated water quality management at the WMA and catchment scale.



In managing the complex interaction of elements affecting water quality, an resource-based, integrated, systems approach will be adopted at the catchment scale (Catchment to Catchment). This will require integrated planning within catchments that considers water quality and quantity elements, and well as landuse plans, changing user and stakeholder requirements and expectations, and other elements, as necessary. DWS/CMAs will work with relevant departments and organs of state to align water, environmental, economic development and land use planning processes at the catchment scale.

Improved real time-based water quality monitoring to address, identify and manage the pollutants especially emerging pollutants such as EDCs and microplastics.

A targeted risk-based approach will be adopted. Under this approach, the potential significance of the impact of water pollution will inform the level of response or intervention from the state. Thus, areas of sensitivity will receive heightened attention, as will activities from which the pollution potential is of a particularly hazardous nature and areas where pollution is already extremely high.

In support of the hierarchy of decisionmaking, which informs the level of regulatory response, three over-arching principles will be applied in managing water quality. Precautionary principle: This has four central components namely:

- take only risk-averse actions in the face of uncertainty.
- shift the burden of proof to the proponent of an activity in the face of uncertainty.
- explore a wide range of alternatives to possibly harmful actions; and
- significantly increase public participation in decision making.

Continuous improvement: As a sector there will be a drive to minimise and, ultimately, to prevent pollution, within the context of justifiable socio-economic development imperatives, while being cognisant of inevitable constraints on the availability of water supply and assimilative capacity of water resources.

Adaptive management: The management of water resources will utilise an evidencebased flexibility in decision-making in a situation of increasingly holistic scientific socio-economic understanding and of cause-and-effect dynamics in catchments. Historical mannerisms in managing wastewater components need to adapt for the improved management of water quality and will assist in managing water quality impacts that may have originated as linked to existing lawful water use.



### 5.2.2 Regulatory approaches

#### **PROBLEM STATEMENT**

The water resource quality within South Africa is declining. The ability to control pollution sources and manage water quality is crucial, especially as population growth, urbanization, the introduction of new contaminants, and climate change place increasing pressure on water resources. Achieving the desired resource quality objectives (RQOs) requires strengthening and effectively applying a range of regulatory and management instruments, such as command and control measures, economic incentives, informational regulations, and self regulation.

Mining operations, agricultural practices, urbanization/ Wastewater Treatment Works (WWTWs) and industrial activities are of the critical role players when it comes to land use impacts on the water resources. Water resources may be polluted from these activities either through point-source releases or non-point/diffuse sources. To effectively manage water quality, there is a need to improve and strengthen the range of regulatory approaches that are utilised as well as to ensure that these approaches are then effectively and consistently applied.

#### **POLICY RESPONSES**

The exact nature of regulatory controls that will be applied to a catchment will depend on the management objectives that are set for local water resources. A hierarchy of sequential steps of both water pollution management decision-making and water use management decision-making will be applied as in Figure 7 below.

In addition, and differentially, due consideration will be given to the need to rehabilitate specific resources or in some instances reclassification of resources.

Rehabilitation: In considering specific responses to catchments, there will be need to rehabilitate or remediate heavily polluted water resources to improve water quality. In this regard, a catchment-wide approach will be adopted to ensure that the most cost-effective solutions for addressing the rehabilitation at the catchment scale are identified and implemented.



Figure 7: Hierarchy of decision-making



Reclassification: As a last resort, if the receiving water body does not have enough allocable water quality to absorb the waste without exceeding the RQOs, and if there are major socio-economic drivers behind a proposed new waste discharge, there may be a case to be made for reclassification of a resource. In such a case, the full procedures required under the legislation for the determination of Resource Classes, RQOs and the Reserve, including stakeholder consultation, will be applied.

Command and control instruments to be strengthened through the IWQM system: Water Use Authorisations are instruments that are used to support social and economic development which Government will continue to use as the primary mechanism for management of discharge of water containing waste. Other command and control mechanisms include the regulation of land use activities and the control of development activities through regulations, EIAs, prohibitions of certain activities (in line with the National Freshwater Ecosystem Priority Areas), setting of product or technical production standards, and setting of performance standards. The relevant regulatory instruments will be implemented within the IWQM system created. The continued use of the waste discharge standards remains an important part of the WQM toolbox and must be revised to give effect to the RQOs. Water quality management in existing lawful use will be given attention for water quality management improvements.

A key area of focus is unconventional gas activities, which were declared as a Section 21(e) controlled activity under Section 38(1) (d) of the NWA in Government Notice 999 (Gazette no: 39299) of 16 October 2015. Supporting regulations aimed at regulation of unconventional gas activities in relation to water resource protection are to be developed as a response. Municipal potable water supply is not to be used as a source of water for unconventional gas development. This is further expanded to known water supplies where the discovery and use of new water sources from the unconventional gas development phases shall be regulated at the discretion of the Department in terms of the hierarchy of use. As well saline aquifers form part of the water balance and are therefore considered as part of the water resource.

All waste streams emanating from unconventional gas development must be treated on site by the industry at their expense for reuse in continued operations. Disposal is required to be at purpose-built site.

Continual improvement in the processes to authorise water use will be sought to support development, ensure sustainability and to fast-track adaptive management responses. The water use authorisation conditions will be reviewed from time to time for adaptive management. Further, the process will be differentiated according to the complexity of the application and will have compulsory public participation processes.

Noting the importance of the Strategic Water Source Areas (SWSA), DWS will develop appropriate instruments to ensure that these areas are protected. Currently, the NWA only allows for the prohibition of activities in a water source area. A legislative amendment is being contemplated that would allow the Minister of DWS to protect the strategic water source areas.

A significant challenge in the management of water quality is weakness in enforcement of legislation and authorisation conditions, whether under the NWA or the MPRDA, resulting in the externalisation of costs to communities and society. Cooperative governance where water management must take centre stage is key in sustainable development and not just as an afterthought.



Government will enhance its capacity for controlling the discharges of water containing waste and will take more stringent action against non-compliance. In addition, greater regulatory attention will be paid to waste dischargers with a history of non-compliance. Mines will be subject to stricter regulatory requirements than in the past, with requirements for the application of Best Practicable Environmental Options to deal with mine water drainage. Mines will be categorised in relation to their potential water quality impact and regulated accordingly.

The reuse, reduce and recycle aspects of water management play a part in conservative water management. Conservation in water demand management can be directly linked to reducing wastewater loads and therefore the management thereof. This aspect is interlinked with adaptive management, continuous improvement and partnerships and can be linked to industries cost savings in terms of water and energy. Habitat restoration and maintenance will promote resilience water ecosystems for efficient water management. The maintenance of satisfactory habitat is a key component in sustainable water management and should not be delinked from the taking of water or the discharge of wastewater. Land use changes need to take cognisance of this factor for preserving watercourses and are the receivers of point and non-point source contaminants. Efforts to keep this matter relevant from water security perspective to industry and the public will help to maintain the adherence to goals.

Currently South Africa relies on criminal prosecution for addressing water quality violations, but such processes are slow and difficult, particularly in an overburdened criminal justice system. Criminal prosecution is dependent on evidence that proves the case beyond reasonable doubt, and the support of the South African Police Service and National Prosecuting Authority. Many of the players in the criminal justice system do not fully understand water legislation or the seriousness of environmental crimes, with the result that such violations do not draw serious penalties.

DWS will work in coordination with DFFE to create the relevant legislative framework regulatory authority to impose and administrative penalties that reflect the cost of water quality violations to society. This intervention will enable the state to achieve greater compliance with water quality regulations amongst waste dischargers. This will require an amendment of the NWA and NEMA. In line with the inter-departmental approach to IWQM, this regulatory authority could serve both DWS and DFFE in relation to administrative penalties for water and environmental non-compliance. Certain activities that result in water pollution, however, will still follow the criminal prosecution route, such as acts of vandalism. Economic instruments will be strengthened to complement other approaches such as information and communications measures. Economic instruments include water pricing, charges, penalties and to serve as an incentive to reduce the discharge of water containing waste. These are further explored under Pillar C.

2025 IWQM POLICY

The publication of information is a useful tool towards incentivising responsible behaviour. In the South African context, the Green Drop certification system for municipalities has proved the regulatory value of the reporting and disclosure of information, and it will continue to be used as a tool in IWQM in relation to municipalities. DWS will introduce a water pollution register (the register will comply with POPIA) to extend this reporting beyond municipalities to incentivize polluters to reduce their pollution. In this register, enterprises that are meeting best practice standards will be recognised, as will non-compliance by enterprises.

The support and facilitation of voluntary regulation is an important addition to the suite of regulatory instruments that will be utilised across the sector. The water stewardship approach adopted by DWS supports the voluntary regulation approach.

The types of voluntary regulation that will be introduced includes:

- environmental agreements negotiated between regulators and industry.
- public programs (administered by regulators or third parties) that individual firms are invited to join; public disclosure initiatives that collect and disseminate information on participants' environmental performance.
- unilateral commitments made by firms, and
- Citizen-based regulation where citizens, communities or residents play a critical, if non-statutory role, in monitoring and reporting on environmental compliance.





## **5.3 - PILLAR C:**

## **Financing Integrated Water Quality Management**



# **5.3.1 Economic, Social & Ecological Costs of Poor Water Quality**

#### PROBLEM STATEMENT

The financial resources currently available for managing water quality are insufficient and do not recognise the level of investment that is required to counteract the economic harm done by declining water quality. In some catchments, water quality challenges are exacerbated by limited investment in the maintenance and restoration of both ecological infrastructure and water quality infrastructure (wastewater treatment works). As water quality challenges increase because of increasing population and economic development, the associated costs and funding requirements will also increase. Understanding these costs is critical. Table below sets out a non-exhaustive list of economic costs associated with poor water quality (constructed from UNEP, 2010).

Table	1: Indicative Economic Consequences from Water Pollution
Type of Cost	Indicative Economic Impacts
Economic Impacts/ Costs related to Industries, Livelihoods & Government	<ul> <li>Impacts on economic sectors including industry, agriculture, tourism &amp; fisheries</li> <li>Loss of income due to impacts on livelihood activities (agriculture, industry, mining)</li> <li>Time &amp; productivity costs of people, often women, having to walk further to access clean water</li> <li>Increased costs of water treatment by industry &amp; water services providers</li> <li>Loss of reservoir storage capacity from sedimentation leading to reduced water availability or the need to construct further water storage infrastructure</li> <li>Costs of weed control</li> <li>Maintenance of monitoring &amp; radiological protection activities</li> <li>Costs of preventative measures (costs of preventing further pollution)</li> <li>Costs of litigation (associated with pollution)</li> <li>Loss of property values (property market reaction to pollution close to water bodies)</li> <li>Emerging pollutants that require new testing &amp; treatment capabilities increase costs &amp; are contributing to the load</li> </ul>
Economic Impacts/Costs Related to Human Health	<ul> <li>Loss of productive working time &amp; increased medical costs as a result of increases in water-related diseases</li> <li>Increased morbidity &amp; mortality</li> </ul>
Economic Impacts/Costs Related to Ecosystems	<ul> <li>Loss of ecosystem goods &amp; services, including fish, recreational opportunities, tourism.</li> <li>Costs of remediation of degraded ecosystems &amp; loss of heritage.</li> </ul>



The qualitative economic analysis for the impacts from declining water quality is well understood. However, there is limited quantitative data for this economic analysis, especially for South African. To effectively and efficiently manage water quality, these water quality-related costs must be quantified. The number of resources required to adequately invest in the maintenance and restoration of ecological infrastructure for water quality, at the catchment level, needs to be quantified and budgeted as part of the operating budget of the CMAs.

There is a need for investment in the maintenance and restoration of ecological infrastructure and water and sanitation infrastructure to be seen as complementary and not separate from each other.

This approach of investing jointly in ecological infrastructure and built infrastructure would enhance the effectiveness of the allocation of public infrastructure funds. Strategic investment in ecological infrastructure lengthens the life of existing built infrastructure and can reduce the need for additional built infrastructure - often with significant cost savings. As the nature-based equivalent of built or hard infrastructure, ecological infrastructure enhances built infrastructure and is just as important for providing water services and underpinning socio-economic development.

#### POLICY RESPONSE

DWS and WRC, will conduct an analysis of the financing required for effective IWQM, and develop a Water Quality Management Investment Framework. The analysis must include financial impact on socio-economic and environmental development from poor water quality. The Framework must be used as a prioritisation and decision-making tool for funding IWQM interventions into the future.

### 5.3.2 Government Funding & Financing Mechanisms

#### **PROBLEM STATEMENT**

Water quality challenges have historically been viewed as "technical", with the result that the funding required for IWQM has often been insufficient. The funding mechanisms for addressing water quality challenges need to be revised to recognise the significant economic and developmental impact of declining water quality resulting institutional, sustainability from and operational challenges. Financing of water quality management initiatives should thus not be limited to the Department of Water and Sanitation but should include other mechanisms, where appropriate. These could include funding through other government department streams such as funding for municipal infrastructure; special charges like the waste discharge charges proposed in the WDCS; and funding streams from outside of government through partnerships with private sector initiatives. The funding implications of mainstreaming water quality issues into the business of government needs to be considered and provided for, for example, conditions attached to national treasury funding for infrastructure.

Funding is required not only for regulatory activities such as water use authorisation, compliance monitoring and enforcement, but also for rehabilitation and in some cases, the construction and management of water and wastewater treatment facilities. Funding is required to:

- Ensure sufficient and competent staff in DWS, CMAs and other relevant Departments for IWQM.
- Effective water uses authorization and tools for compliance monitoring and enforcement.
- Monitoring water quality (monitoring stations, data and information systems).
- Research on emerging pollutants and the impacts of declining water quality with timeframes for implementation.
- Maintenance and restoration of ecological infrastructure to secure goods and services including:
- Removal of solid waste in and around the river.
- Clearing invasive alien plants on the riverbanks and within the river.
- Clearing invasive alien plants in and around wetlands.
- Clearing invasive alien plants in Strategic Water Source Areas and other water source areas.
- Maintaining and restoring buffers of natural vegetation along riparian areas.
- Rehabilitation of eroded riverbanks.
- Rehabilitation of wetlands.
- Reinstating buffers of natural vegetation between agricultural crops and rivers and wetlands.
- Improving rangeland management practices in priority catchments (e.g. grazing regimes and fire management).
- Spatial planning and prioritisation to identify priority water-related ecological infrastructure features for maintenance and restoration.

- Support awareness, information dissemination, and capacity building of the sector.
- The building, operation and maintenance of WWTW (including ecological WWTWs); and
- The rehabilitation of degraded ecosystems and areas.
- The execution of monitoring activities and development of digital tools.

The funding-related challenges are:

- Inadequate funding raised through the administrative and regulatory mechanisms available to DWS due, for instance, to delayed implementation of the WDCS and the inadequate cost of a Water Use Licence Administration fee.
- Continued culture of non-payment.
- Lack of political will to hold major polluters accountable.
- The lack of sustainable financial models for local government, leading to inadequate funds to maintain WWTW's, such as ring-fencing of funds to appropriate solution
- Inadequate implementation of environmental provisions related to mine rehabilitation.
- Poor co-ordination and planning across the sector, and
- Economic Policy uncertainties and anomalies as well as the generally uncertain political climate, which have resulted in inadequate investment by private sector companies, including in IWQM.



Three additional financial issues are of specific concern regarding the management of water quality.

Firstly, the current funding models for municipalities create perverse incentives for а build-degrade-rehabilitate/rebuild model of infrastructure. Substantial grants are available to municipalities for the construction of new infrastructure and the rehabilitation of dysfunctional infrastructure. Operation and maintenance costs, however, are expected to come from the equitable share and the municipal budget. In many municipalities, expenditure on preventative maintenance is limited, resulting in the rapid degradation of infrastructure. This leads to the need to rehabilitate or replace the infrastructure. Grants are available from national government for infrastructure rehabilitation, making this an obvious choice for Municipalities. This is an unsustainable model, and new conditions for such grants, or new grant models are required to ensure sustainable infrastructure models at local government level. Of further concern is the fact that water services revenue is, in many cases, not ring-fenced, and tariffs are not reflective of actual costs. This results in municipal water services budgets that are too low to maintain and operate wastewater and sanitation systems effectively.

Secondly, in relation to mining activities, ensuring sufficient funding for IWQM after mine closure remains a significant challenge. Section 41 of the MPRDA obligates an applicant for a prospecting right, mining right or mining permit to make a prescribed financial provision for the rehabilitation or management of negative environmental impacts. There are significant concerns that the financial provisions made are inadequate to deal with the on-going risk of water pollution from, specifically, closed mines and the burden for rehabilitation falls to the taxpayer and the State. The financial provision must be aligned to the classification and categorisation of the mine, and the risk posed to ensure funds for sufficient rehabilitation of the impacted water resources. Access to these funds is also problematic, with access being contingent on the issuance of a mine closure certificate. To date it is unknown if any mine has been issued with a mine-closure certificate.

Thirdly, whilst the MPRDA allows for this financial provision, other industries are currently exempt, and in line with the "polluter pays" principle, are only liable after the fact. Generally, the net benefit of an activity must outweigh the net cost, considering the needs for socio-economic and environmental development. Where water pollution takes place, the enterpriserelated costs of preventing the water pollution are paid by the environment and by society, rather than by the specific enterprise causing the pollution. The polluter pays principle seeks to reverse this and to achieve accountability by ensuring that pollution costs are internalised to the enterprise and are carried by the polluter. It is an internationally accepted principle that those responsible for environmental damage should pay the costs to rehabilitate the environment and redress those impacts upon human health, as well as the costs of preventative measures to reduce or prevent further pollution and environmental damage. Downstream costs should be understood in an expanded form that covers direct costs to other water users, costs of environmental degradation over time, and indirect costs such as the costs to a community not being able to develop from a lack of available of clean water.



#### **Economic Instruments**

An economic instrument is "a Policy, tool or action which has the purpose of affecting the behaviour of economic agents by changing their financial incentives in order to improve the cost-effectiveness of environmental and natural resource management." Economic instruments often work best when they complement other approaches such as information and communications measures. Economic instruments include water pricing, charges, penalties and incentives to be used to stimulate marketing mechanism and serve as an incentive to reduce pollution of water sources.

The WDCS is the most important tool that will be implemented in this regard. It is based on the polluter-pays principle and aims to promote the sustainable development and efficient use of water resources: internalise the environmental and social costs of using water: create financial incentives for water users to reduce waste and use water resources more optimally, and recover costs associated with impacts of waste discharges. It consists of two charges: The Water Resource Management Charge for waste related activities and a Waste Mitigation Charge. The Water Resources Management Charge funds the water resource management activities related to the protection, allocation, conservation, management, and control of all the nation's water resources.

The Waste Mitigation Charge, provided for by the NWA, is related to the recovery of costs associated with mitigation and abatement measures employed in the water resource to achieve Resource Quality Objectives. The current penalties for non-compliance are not effectively implemented, but also not sufficiently priced to change behaviour and must be reviewed.

#### **POLICY RESPONSES**

Municipal discharge is a significant challenge for IWQM in South Africa and the sustained maintenance and rehabilitation of failing municipal WWTWs is a critical step in turning this around. DWS will work with National Treasury and COGTA to ensure sufficient funding through municipal grants and municipal budgets for the rehabilitation and effective operation and maintenance of WWTWs.

Determination of the costs of longterm water pollution from mines and the development of a pragmatic funding model. This process will build on the work being done by the Mine Water Coordinating Body (created through the Strategic Water Partners Network to deal with water quality challenges in the Olifants catchment) which aims to determine the requirements to access the existing mine rehabilitation fund and facilitate its disbursement.

Existing and new mining ventureswill be required to prove that the long-term costs of dealing with the residual impacts associated with mining (e.g. AMD) are sufficiently catered for in the financing arrangements. The financial provisioning for site rehabilitation should extend to all industries that are deemed "high-risk" polluters, so that provision is made whilst the industry is operational to avoid post facto actions, with the State carrying the risk.

The funding implications of mainstreaming water quality issues into the business of government must be included in all related planning and budgeting processes. The Waste Discharge Charge System will be implemented in a phased approach targeting the critical catchments as a primary mechanism for operationalizing the "polluter pays" principle.



Licence use application fees will be revised to reflect the risk level resulting from the proposed activity, and the resulting intensity of investigation required before authorisation can be granted/refused. Fees will reflect the cost of the time required to process a licence application. For simplicity of implementation, waste discharge authorisation applications will be divided into categories of complexity and level of risk, with appropriate fees allocated to each category.

## **5.3.3 Partnerships**

#### **PROBLEM STATEMENT**

Noting that there is a requirement to fully understand the cost implications of effectively managing water quality in South Africa, the need to broaden and diversify the funding base to support effective management will become prerequisite. To date, the burden of funding water quality management has broadly fallen to the state supported by revenue generated by water use charges or funds claimed for the rehabilitation of pollution incidents.

Donors have historically provided support to assist in addressing issues that are close to their own agendas and have largely been to support the development of Policy and guidance on specific issues. The challenges that exist do range from the strategic through to the specific and localised. As such, the drive to diversify funding streams may look towards focused funding streams that are aimed at supporting and addressing such distinctive issues, as have some donor funds.

#### **POLICY RESPONSES**

Government will build partnerships with the private sector to mobilise private sector capacity, financing and funding to support water quality management and maintenance and restoration activities.

Government will develop partnerships with a range of relevant institutions to support distinctive IWQM challenges. These may include more innovative, or emergent funding streams as are the current Green Funds and the various climate funding options.



## **5.4 - PILLAR D:**

# Building an Appropriate Knowledge & Information Management Base



#### 5.4.1 Monitoring & Data Management

#### **PROBLEM STATEMENT**

Water quality monitoring programmes produce data or information that support appropriate water management decisions. The social, legal, ecological and financial implications of making incorrect decisions because of unreliable or non-existent data or information can be significant.

South African water quality monitoring programmes are constrained by limited financial resources, inadequate number of suitably skilled staff, uneven availability of access to accredited laboratories for testing of samples, and the complexity of monitoring the number and variety of pollutants entering water resources, including new and emerging pollutants. The sheer mass of data that requires management can also contribute to delays in managing water resources

Structured expansion of the monitoring networks is needed to enable an integrated approach that will ensure optimal evaluation of water quality across the country. This will require a more comprehensive collation of data from a range of sources that includes various institutions (including relevant or affected state departments, provincial governments, municipalities, water services authorities and providers, Water Boards, and the various water management institutions), water users and citizen-based monitoring. This will need to reflect data and information collection from transboundary, national, catchment (WMA) and local levels to inform the much-needed adaptive management regime.

Currently, data and information sharing between stakeholders and across these spatial levels leaves room for much improvement. There is an urgent need for a well-designed, coordinated and managed programme for collecting, assessing and disseminating data and information on water quality. The sharing of water quality data and information with neighbouring countries in shared river basins is becoming increasingly important. This is clearly articulated in the General Principles of the Protocol on Shared Watercourses in the Southern African Development Community but is also an important part of the responsibility to prevent harmful impacts upon shared resources. In the South African Development Community (SADC), there are not yet common standards or systems for water quality monitoring and information management in transboundary river basins and aquifers, limiting the ability to effectively share information and jointly manage water quality challenges. However, the basin commissions, through their Secretariats, play a key role in facilitating the exchange of data and information.

At the more local level, there has been global shift towards more engagement with citizen-scientists who can support data and information collection. There has been local success through such programmes as Mini-SASS and the lessons learned need to be up-scaled to support our drive for which is already in place to monitor aquatic ecosystem health.

There are also challenges in translating the raw data into appropriate information useful for decision-making around planning, water use authorisations, water quality management practices and rehabilitation actions. Whilst there are challenges in terms of systems and the need to improve these to support information management, there are also challenges in ensuring that staff is sufficiently skilled and experienced to utilise the systems and to effect decisions based upon the available data and information.



The exchange of data and information between differing Government Departments and agencies is becoming increasingly important, especially in terms of strengthening the combined regulatory response that is required. Whilst progress is being made, it will be an ongoing process of improvement.

Changes in behaviour cannot be expected if data and information are not communicated. The results of the water quality monitoring programmes are available from DWS but are not always easy to interpret or understand. There is a shortfall in the way in which data is interpreted and transformed into information that can be communicated and utilised. Systems issues are being addressed and development regarding this will be ongoing.

#### POLICY RESPONSES

Current monitoring networks will be strengthened and expanded to include all role players, locally and international river basin commission. The roles and responsibilities of different government departments and spheres of government in the collection of raw water quality data and the provision of requisite data in a standardised form to DWS will be clarified. DWS will be responsible for the national assessment of water quality based on this data and will report annually to Parliament on the state of water quality in the country, including the performance of local government management of wastewater through the Green Drop reports. To achieve this, DWS will strengthen its role in the monitoring and evaluation of performance by local government.

DWS will lead the ongoing strengthening and improvement of information management systems that enable the uploading of data, as well the extraction of data and information to enable management decision-making and improved self-regulation. In this regard, DWS will update its data information systems such as the National Integrated Water Information System, Water Authorisation and Registration Management System and, ultimately the Electronic Water Use Licence Application and Authorisation System. This will enable the provision of up-to-date and correct information on all water use authorisations and on registered water use across the country. DWS will put in place the necessary mechanisms, through CMAs and DWS provincial offices, to ensure that the information is kept up to date.

The information provided by the monitoring and evaluation system will be used to support co-learning process amongst key stakeholders and decision-makers to inform amendments and improvements to management approaches.

DWS, with the WRC and CMAs, will investigate the options provided by recent technological developments to improve water quality monitoring as well as data storage and management across the country. Effective digital resources are recommended for real time monitoring and decision making. Key supporting actors such as SAEON, CSIR, Water Institute of South Africa (WISA), SALGA and SACN will be important partners from the perspectives of practice and implementation. South Africa's Universities and various research institutes will be invaluable platforms for further research and innovation.



DWS, with the WRC and CMAs, will lead the development of a programme to create and support citizen-based monitoring programmes to augment the government monitoring systems. This is in line with the SADC Regional Strategic Action Plan IV for water, which promotes the use of citizen science to monitor river water quality status in selected river basins/reaches.Partnerships with the private sector will be important to support these programmes.

Water quality data collected by public sector institutions will be made available to the public in line with the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights. Civil society will be capacitated through catchment management forums to ensure capacitated communities that can buffer themselves from impacts of poor water quality.



## 5.4.2 Research & Innovation

#### **PROBLEM STATEMENT**

The context in which water quality must be managed is continually changing, not least due to the introduction of new contaminants and the potential impacts of climate change. With the growing suite of emergent water quality issues, as well as the need for innovation in resolving more pervasive issues, ongoing R&D becomes essential.

The NWRS identifies key strategic issues requiring attention related to research and development:

- Lack of alignment of water research objectives, thrusts and programmes with the broader national policies and strategies relating to water resources management and water use.
- Limited participation of sector-wide stakeholders in the setting and execution of the water-related research and innovation agenda for the country.
- Availability of skills and expertise in water research; and
- Insufficient allocation of financial resources for water sector research and innovation.

The Water Research Commission (WRC), in partnership with DWS, ensures that the strategic direction of water research in South Africa is attuned to the country's needs. However, the funding needs are significant, and existing funds are becoming increasingly stretched.

The South African Bureau of Standards produces various South African National Standards. Some address water quality, but these are not sufficient, and the budget is limited for further work in this regard. Both the WRC and the South African Bureau of Standards are key partners of the water sector to ensure on-going research into relevant topics, knowledge and information sharing, uptake of new and appropriate technologies and continuous revision of national standards and benchmarks.

The role of sector organisations such as the WISA, the South African Local Government Association (SALGA) and South African Cities Network (SACN) and others, are important in terms of raising the awareness of issues that require further R&D, as well as being a conduit for channelling research and development findings through to the sector.

#### POLICY RESPONSES

To develop and encourage water quality research and innovation in South Africa and our shared river basins, the DWS and WRC will lead the sector in developing a national water quality research plan that aligns applied research priorities throughout the water value chain to ensure that water research directly contributes to the resolution of water sector challenge and addresses emergent areas like emerging pollutants and the different impacts of pollution upon women and men.

The role of South Africa's academic institutions, and independent research organisations, will be critical in the development of this plan. DWS and WRC will investigate and improve funding for water quality research. DWS and WRC, together with sector organisations such as WISA, SALGA, SACN, academic institutions and others, will promote innovation and knowledge sharing to support new and appropriate technology uptake. There will be a specific focus on supporting municipalities to use appropriate and new technology; and designing, developing and marketing new technology and approaches in partnerships with the private sector, civil society and the research community.

In this regard, the WRC, the Department of Science and Innovation will continue to develop and enhance the impact of the Water Technologies Demonstration Programme which aims to pull together the applied R&D and commercialisation stages of the water innovation continuum and to bridge the gap between water research and the market to achieve a connected water innovation system that delivers socio-economic benefits for South Africa.

## 5.4.3 Capacity Building & Training

#### PROBLEM STATEMENT

The existence of a highly trained and competent cohort of officials across the water sector, particularly in Government Departments, Government entities and institutions, is essential for the management of water quality. There is indeed existent capacity, but it is understood that this is stretched and more needs to be done to establish the necessary staffing compliments with the necessary skills to manage water quality.

Historically, DWS ran regular training programmes for water quality officials, resulting in a highly trained cadre of officials. However, over the past decade, these training programmes have fallen away leaving a shortfall in the opportunities for staff to develop their understanding of IWQM.



This has resulted in ineffective implementation of IWQM programmes and inadequate regulation of water use.

Noting the need for strengthened intergovernmental approaches, the shortfall in capacity across and between Government Departments is being realised. Therefore, the ongoing interaction between DFFE and DWS with regards to the training programmes for Environmental Management Inspectors (EMIs) is the type of initiative that will be needed for the ongoing development of capacity.

There are concerns that the competencies of staff within some key technical positions do not have the necessary training and qualifications to perform the functions required of them. This has been particularly emphasised with regards to the more technical skills required of municipal staff operating WWTW. There is currently training that is being developed under the South African Qualifications Authority banner and this will need to be implemented nationally.

The need to improve the broader awareness of the private sector and civil society so that behaviours can be influenced is important and currently lacking. There is a need to improve the capacity of civil society as they play a very significant role in terms of monitoring and reporting upon local water quality management issues. The strengthening of CMFs, that bring together Government, the private sector and civil society, will prove increasingly essential as these forums play an important role in localised monitoring of water resource management issues and provide a platform for more cooperative and adaptive management. However, these forums are not always appraised of technical issues and insufficient effort is being applied to build this capacity.

#### **POLICY RESPONSES**

The development of appropriate on-thejob and technical training programmes for officials from all relevant state institutions to improve the capacity of government to adequately manage water quality.

Cooperation between Government Departments, to strengthen the capacity across the sector with regards to regulating activities that impact upon water quality. This will include interventions to strengthen the inter-governmental capacity to ensure and enforce compliance with regulations.

DWS will continue to provide bursaries for students to study water quality-related subjects at universities to provide a pool of qualified recruits for the state.

DWS, in partnership with DFFE, will also make training available to civil society organisations active in the water sector to enable their informed participation in IWQM processes, particularly in areas where water quality is under severe threat. This will be supported by broader awareness campaigns to encourage societal action towards improved water quality.

DWS, in partnership with CMAs, will strengthen the capacity of CMFs to provide local capacity for water quality management. DWS, in collaboration with COGTA, will develop the necessary regulations to ensure the professionalization of key water services positions in Water Services Authorities to ensure that the staff responsible for the management of water and wastewater systems at municipal level have the necessary training and competencies.

## **6. CONCLUSION**

This policy is based on the recognition that integrated water quality management is crucial if we are to achieve equitable and environmentally sustainable social and economic development in South Africa. This will enable us to achieve our social and economic goals and will give strength to the right to water and the right to an environment that is not harmful to health or wellbeing, as enshrined in the Bill of Rights in the Constitution.

The Policy outlined in this document is therefore vital for the future of all of South Africa's inhabitants. It provides government, at all levels, with the necessary tools required to fulfil its role as custodian of our valuable and limited water resources.

Whilst some of the elements of the Policy are implementable within the current legislative framework, other elements will need amendments to the NWA, and possibly to the NEMA, MPRDA and the CARA. Such legislative amendments are a critical part of protecting and restoring water quality in South Africa, and include:

- Amendment to allow reclassification of the resource class.
- Amendment to allow for the declaration of protected water source areas.
- Amendment to allow for the categorisation of polluting industries, based on risk.
- Amendment to extend the financial provisioning clause to all high-risk polluting sectors.
- Amendment to allow for the publication of a pollution register.

Amendment to allow for administrative penalties. In addition to these amendments, the successful implementation of this Policy will require high-level political commitment to inter- and intra-governmental cooperation, integration and co-operative governance, the establishment of effective intra-governmental structures, systems and processes as well as possibly the development of Memoranda of Understanding between key government departments and entities.

This policy gives effect to Chapter 13 of the National Water Resource Strategy Third Edition (NWRS-3) and will be implemented through National Water and Sanitation Master Plan (NWSMP), which translates the Policy imperatives into actions.







## 7. IMPLEMENTATION FRAMEWORK

IWQM POLICY PILLAR: A		
Taking an inclusive approach to integrated water quality management		
NWRS-3 STRATEGIC OBJECTIVE	NWRS-3 Actions	
To harmonise policies & strategies to enable improved IWQM.	<ul> <li>Ensure that policy development and refinement within DWS addresses IWQM.</li> <li>Harmonise policies and strategies to support IWQM.</li> <li>Finalise and implement the non-point source pollution strategy.</li> <li>Develop, finalize and implement the National Eutrophication Strategy.</li> <li>Align the Policy and Strategy for Groundwater Quality Management with the Resource Directed Measures Framework.</li> <li>Align the Policy and Strategy for Groundwater Quality Management with the Waste Act of 2008 in terms of groundwater protection and ensure emphasis on groundwater remediation.</li> <li>Ensure that Acid Mine Drainage, Unconventional Gas Developments and others are covered during this alignment and ensure that waste and water regulations including the Mine Water Management Policy address the issue of brine produced through desalination being a hazardous waste and potential ground and surface water pollution caused by unconventional gas development</li> </ul>	
To undertake legislative reviews & amendments to effectively enable IWQM	<ul> <li>Amend the NWA and WSA to provide effective support to IWQM.</li> <li>Develop guidelines and protocols on the effective use of IWQM instruments.</li> <li>Identify and amend relevant legislation to strengthen IWQM.</li> </ul>	
To improve IWQM related governance	<ul> <li>Assess the current DWS Head Office and Regional Office IWQM functions and structures and implement restructuring changes to ensure alignment with the DWS IWQM strategy.</li> <li>Establish inter-governmental IWQM structures at trans-boundary basin, national and provincial levels to ensure coordination and joint action supported by regular reporting (linked to MoAs).</li> <li>Facilitate the development of sector IWQM plans by other government departments and ensure that these are incorporated into all CMA Strategies and that progress is reported annually</li> </ul>	
To formalise IWQM governance frameworks to support non- governmental IWQM engagements	<ul> <li>Develop an IWQM partnership framework that is fair and equitable and defines the relationships with the private sector and NGOs.</li> <li>Develop and foster strategic IWQM sector partnerships.</li> <li>Develop an IWQM engagement framework that enables more active participation of civil society at transboundary, national and catchment levels.</li> <li>Support and drive functional IWQM platforms for the engagement of civil society nationally and within catchments.</li> </ul>	



IWQM POLICY PILLAR: B		
Applying Integrated, Adaptive Water Quality Regulation & Management		
NWRS-3 STRATEGIC OBJECTIVE	NWRS-3 Actions	
To improve co-ordination of WQM planning	<ul> <li>Develop an IWQM plan for national priority catchments, ensuring consideration of trans boundary WQ concerns.</li> <li>Develop a strategic action plan for the financing, rehabilitation and upgrade of prioritized WWTWs.</li> <li>Develop a strategic action plan for the implementation of the minewater management policy.</li> <li>Develop strategic action plans to reduce non-point source pollution.</li> <li>Develop a protocol for the management of industrial discharge within the municipal environment.</li> <li>Develop an IWQM plan at catchment and regional level for each water management area as part of the CMS.</li> <li>Integrate IWQM and water resource planning with Regional Mining Plans in priority areas.</li> <li>Ensure that WSDPs, IDPs and SDFs reflect WQM priorities and management responses.</li> </ul>	
To strengthen IWQM regulation, compliance & enforcement	<ul> <li>Address the backlog of WUL applications urgently and meet stipulated timeframes for new licence applications by setting up appropriate organisational structures in the CMAs and DWS Regional Offices.</li> <li>Categorise risk-based protocols for determining water use authorization.</li> <li>Develop protocols for CMA engagement in IWUL applications and approval processes.</li> <li>Ensure that the conditions in WUL are scientifically defendable and can realistically be achieved in a developing country.</li> <li>Publish licencing regulations and ensure adherence to the regulations through co-operative management.</li> <li>Develop IWQM information management systems to support the integrated licensing approach and ensure that the roles and responsibilities of all role-players doing monitoring are defined.</li> <li>Develop a targeted approach for the enforcement of IWQM regulation.</li> <li>Assess gaps in IWQM regulatory frameworks and instruments and develop revised approaches to strengthen operational CME and the EMI network</li> </ul>	
To apply IWQM systems-based adaptive management processes	<ul> <li>Develop localised programmatic monitoring and reporting of IWQM actions and outcomes.</li> <li>Review, identify and address priority WQ challenges at regular intervals.</li> <li>Develop protocols for systems-based adaptive management for IWQM.</li> </ul>	



IWQM POLICY PILLAR: C Financing Water Quality Management		
NWRS-3 STRATEGIC OBJECTIVE	NWRS-3 Actions	
To achieve fiscal support for IWQM	<ul> <li>Support research into the socio-economic-environmental and management costs of poor WQ.</li> <li>Develop a framework to access the Financial Provision set aside by mines from DMR to deal with Mine Water Challenges such as AMD.</li> <li>Review municipal conditional grants and identify financial support required for Local Government.</li> <li>Develop and implement a protocol for extending the financial provisioning clause to all industries that are deemed "high-risk" polluters.</li> </ul>	
To develop pricing & incentives that support IWQM	<ul> <li>Develop an action plan to support the phased implementation of the WDCS across the country.</li> <li>Explore innovative financing mechanisms for incentivising good IWQM practice.</li> <li>Determine financial incentives for water-reuse (AMD, other).</li> <li>Promote Public Private Partnerships to unlock the AMD economy.</li> <li>Develop the legal and institutional mechanisms for introducing administrative penalties for environmental non¬compliance including water pollution.</li> </ul>	



IWQM POLICY PILLAR: D		
Building an appropriate knowledge & information management base		
NWRS-3 STRATEGIC OBJECTIVE	NWRS-3 Actions	
To strengthen IWQM monitoring & information management	<ul> <li>Strengthen national and catchment WQ monitoring networks through spatial expansion and identification of priority constituents for catchment-specific monitoring.</li> <li>Support the network expansion with an initiative to ensure that accessible accredited laboratories are available to ensure efficient and effective WQ analyses.</li> <li>Lead the development of a programme to create and support citizenbased WQ monitoring programmes.</li> <li>Ensure the harmonisation of data and information systems pertaining to resource WQ.</li> <li>Develop systems to enable WQ data and information access by stakeholders / public.</li> <li>Develop protocols and systems to ensure M&amp;E and that new information informs adaptive management decisions for IWQM.</li> </ul>	
To build equitable water quality & IWQM capacity through education, training & communication	<ul> <li>Develop and implement a capacity building programme for officials in DWS, CMA and other sector departments in systems-based, adaptive IWQM.</li> <li>Expand IWQM capacity-building initiatives to civil society and the private sector.</li> <li>Develop regulations to ensure the professionalization of key water and sanitation services IWQM functions.</li> <li>Provide bursaries / learnerships pertaining to WQM at tertiary institutions.</li> <li>Investigate options provided by innovative developments to improve water quality.</li> <li>Lead the sector in innovation, research and development for IWQM.</li> <li>Report annually on the state of WQ in the country.</li> <li>Develop online tools for easy access to WQ and WQM related information.</li> <li>Develop and maintain multi-sector stakeholder platforms for sharing IWQM information.</li> <li>Lead and roll-out IWQM awareness creation campaigns.</li> </ul>	

