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2030 NDP

NATIONAL WATER SECURITY FRAMEWORK FOR SOUTH AFRICA

Summary, Principles and Recommendations

July 2020 | 1st Edition

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This report represents the extended summary, principles and recommendations from the National Water Security Framework (NWSF) for South Africa which forms part of the implementation of the National Development Plan (NDP): Vision 2030 who's overall strategic objectives is to eradicate poverty, reduce inequality and address unemployment.

The Summary and Recommendations are part of the on-going work of the National Planning Commission (NPC) in its task to consult and advise on the implementation of the NDP. It is a result of extensive consultation process across the country aimed at guiding the implementation of the NDP in as far as the national water security is concerned.

This document is a living document and will be reviewed from time to time as new insights become available. Please feel free to send comments and feedback to NWSFSummary@dpme.gov.za

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Cover photos: MP Nepfumbada, Rand Water

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ACRONYMS AND ABREVIATIONS

ABREVIATION/ ACRONYM	
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
DBSA	Development Bank of Southern Africa
DBSA	Development Bank of Southern Africa
DPME	Department of Planning Monitoring and Evaluation
DWA	Department of Water Affairs (superseded DWAF)
DWAF	Department of Water Affairs and Forestry (superseded DWS)
DWS	Department of Water and Sanitation
EIFE	Expanded Inclusive Fairer Economy
GDP	Gross domestic product
GWP	Global Water Partnership
HDI	Human development index
IDP	Integrated Development Plan
IDP	Integrated Development Plan
IWRM	Integrated water resource management
M&E	Monitoring and evaluation
M&E	Monitoring and Evaluation
MDGs	Millennium Development Goals
NCPC	National Cleaner Production Centre
NDMC	National Disaster Management Centre
NDP	National Development Plan
NIWIS	National Integrated Water Information System
NIWS	National Integrated Water Strategy
NPC	National Planning Commission
NRS	Natural resource system
NSDF	National Spatial Development Framework
NSDF	National Spatial Development Framework
NWA	National Water Act
NWPDR	National Water Plan Diagnostic Report

ABREVIATION/ ACRONYM	
NWRS	National Water Resource Strategy
NWSF	National Water Security Framework
NWSMP	National Water and Sanitation Master Plan
OECD	Organisation for Economic Cooperation and Development
ORASECOM	Orange-Senqu River Basin Commission
RDP	Reconstruction and Development Programme
RWP	Regional Water Policy
SACU	Southern Africa Customs Union
SADC	Southern African Development Community
SAPP	Southern Africa Power Pool
SCOPA	Standing Committee on Public Accounts
SDG	Sustainable Development Goal
SWSA	Strategic Water Source Areas
WAR	Water Allocation Reform
WEF	World Economic Forum
W-E-F	Water-Energy-Food
WFD	Water Framework Directive
WfGD	Water for Growth and Development
WSA	Water Services Authority
WSDP	Water Services Development Plan
WUA	Water User Association
WWF	World Wide Fund for Nature
WWF4	World Water Forum Four

ACKNOWLEDGEMENT

This document represents an extended summary of the National Water Security Framework (NWSF) for South Africa, and reflects high level principles, scope and recommendations distilled from that work of the National Planning Commission (NPC), who's main task was to review and ensure the implementation of the National Development Plan (NDP) as intended.

A large part of what the authors had to do has been to consolidate and distil the critical issues as articulated and nuanced throughout the process of development of the NDP and the framework. This work has been made possible by the leadership provided by the Task Team on Water Security, The Expanded, Inclusive and Fairer Economy (EIFE) work-stream and the many commissioners who contributed at different points from other work-streams. The secretariat and researchers have done everything possible to get this work to this point in many different ways.

Without singling out any individual or group of people, we express our utmost gratitude to all those who took their time to participate in the consultation processes across all the provinces that were visited. The generous support from the Rand Water, which included the involvement of then Chief Executive in the NPC and releasing dedicated resources to the project, is also highly appreciated.

1. INTRODUCTION AND BACKGROUND

Water security has always been an issue of concern in South Africa but, in recent times, it is increasingly under very serious threat in the country. The National Water Security Framework (NWSF) responds to the question of the extent of this threat and the actions required in the short, medium and long term to mitigate or offset the threat. It frames a national pathway to a water secure country up to 2050 to enable inclusive economic growth, poverty eradication and reducing inequality, in line with the National Development Plan (NDP) imperatives.

Water security for South Africa not only circumscribes the entire water sector, but has far-reaching consequences for the entire economy of the country. It is potentially a significant hurdle for the ongoing and sustainable growth and development of all sectors of our economy. The NWSF acknowledges the importance of water security for our country and addresses issues at national, regional and local levels. Water security touches on many facets, including

- identifying future water sources for our growing population, economic development and the attendant future water resources development and waste-water management (which includes sanitation) options;
- the development, operation and maintenance of water and sanitation infrastructure;
- the management of our water quality and water supply services, as well as the resilience of our country to climate change and its associated impacts; and
- water conservation and water demand management as a consistent national paradigm.

The NWSF is the initiative of the National Planning Commission (NPC). Our current circumstances and policy directives such as the NDP impel the NWSF. It is underpinned by international agreements and commitments to which South Africa is a signatory, such as the United Nations Sustainable Development Goals (SDGs), the African Union's Agenda 2063 for the socio-economic transformation of the continent and the Southern African Development Community (SADC) Regional Strategic Action Plan. The NWSF guides, complements and dovetails with existing national policies and strategies. It enhances the water security component of the National Water Resources Strategy II (NWRS2), South Africa's blueprint for the management of its water resources, as well as the National Water and Sanitation Master Plan (NWSMP) of the Department of Water and Sanitation (DWS), which is the positioned as an implementation plan for the NWRS2 and NWSF.

South Africa has a long history of engaging on issues of water security, albeit from the perspective of managing scarcity and availability. Intervention examples include the previous 1956 Water Act (Act 54 of 1956), the 1966 drought and industrial expansion of the country that resulted in the Commission of Enquiry into Water Matters that presented its findings and recommendations in 1970. Key recommendations from the enquiry included the creation of the Water Research Commission (WRC) and related internal DHSWS structures, some of which are currently in operation. Like South Africa's other socio-economic sectors at the time, the context was in accordance with Apartheid institutional and political arrangements and earlier colonial constructs that excluded the majority of the population in the country.

This also included the Irrigation and Conservation of Waters Act, No. 8 of 1912, the Natives Land Act of 1913 and related policy and legislation, all prior to the 1994 democratic dispensation, which formed the basis of the water sector inequality in the country. However, these measures ensured the security of water supplies to the minority beneficiary population at the time and were the key drivers of the economy - then mainly agriculture, mining and industrial development with the primary focus on water supplies through the development of water resources infrastructure (dams, canals and irrigation schemes).

Post 1994, the water sector in South Africa made clear progress to substantially advance water supply extension in rural areas and previously under serviced areas of the country. In its 2017 general household survey, Statistics South Africa (Stats SA) reported that an estimated 46.7% of households had access to piped water in their dwellings. A further 27.5% accessed water on site while 12.2% relied on communal taps and 2.1% relied on neighbours' taps. The report confirmed that the number and percentage of households with access to piped water had increased since 2006, showing that 13.5 million households had access to piped water in 2017 compared to 9.3 million in 2006.[1]

Among world firsts have been the country's recognition and legislation of water resources management within the entire hydrological cycle, the provision of ecological (environmental) water needs and its (social) free basic water policy. South Africa is a pioneer in environmental flow determinations, with highly regarded methodologies developed for this purpose and its work on the quantification and implementation of environmental flow requirements[2] in some of the country's river basins. There is a strong social component in the methodology that describes the implications of management interventions, not only on ecosystems, but also on common-property subsistence users. In the Limpopo River Basin (shared by Botswana, Zimbabwe, South Africa and Mozambique), interest in environmental flows has been prompted by the South African water law, which requires the prioritisation of water allocation to meet the basic needs of people and of ecosystems (the concept of the 'Reserve'[3], which is the only right to water in the legislation).

Since the promulgation of the National Water Act (No.36 of 1998) (NWA), the water sector has faced several implementation challenges including, among others:

[1] Stats SA GHS 2017

[2] An environmental flow is the water regime provided within a river or wetland to maintain ecosystems and their benefits where there are competing water uses and where flows are regulated. Environmental flows provide critical contributions to river health, economic development and poverty alleviation. They ensure the continued availability of the many benefits that healthy river and groundwater systems bring to society.

It is increasingly clear that, in the mid- and long-term, failure to meet environmental flow requirements has disastrous consequences for many river users. Addressing the water needs of aquatic ecosystems will often mean reducing the water use of one or more sectors. These are tough choices, but they have to be made to ensure the long-term health of the basin and the activities it encompasses. Source: IUCN

[3] The NWA defines the 'reserve' as the quantity and quality of water required to satisfy basic human needs and to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource.

- the establishment of Catchment Management Agencies (CMAs) and Water User Associations (WUA) that are responsible for managing water resources at catchment and local levels;
- race and gender equity redress of water allocations through the Water Allocation Reform (WAR) programme; and,
- programmatic implementation of water conservation and demand management initiatives nationally. yet been completed.

Recent challenges to water supply in the Western Cape, Eastern Cape and KwaZulu-Natal raise concerns about the robustness of water planning, management and implementation strategies. The NDP reflected on the incomplete actions required to achieve the 2030 goals and included the following:

- A review of the National Water Resource Strategy (NWRS2) as the sector master-plan;
- Finalising the implementation plan for institutional establishment and rationalisation for water resource management, with full implementation. The institutional arrangements include:
  - A national water-resource infrastructure agency to develop and manage macro infrastructure systems (national and regional);
  - Catchment management agencies and water user associations to undertake resource management on a decentralised basis, with the involvement of local stakeholders;
  - A national facility for research, development, innovation and testing, with a focus on water reuse and desalination.
  - Creation of regional water and wastewater utilities, including the consolidation and expanding existing water boards mandates;
- Initiating a comprehensive financing and investment programme for water resource development, bulk water provision and waste water management; and,
- Poor progress with Water Allocation Reform to address equity in water allocations and enhance water resources management.

A key observation is that the water sector has not significantly transformed[4] as was envisaged when the policies and legislation were developed in the mid to late 1990s. Much of this could be attributed to the early emphasis on addressing the backlog of water and sanitation services provision to underserved communities during the Reconstruction and Development Programme (RDP), and subsequent weak implementation of key transformation programmes that have left the fundamental architecture of the old system largely intact. Challenges remain with the poor implementation of policy for a number of reasons including an erosion of sector capacity, competence and leadership and a lack of collaboration and effective coordination among jointly responsible and implementing entities. This is exacerbated by the depletion of competence and capacity in the line-function Department, which has had an adverse effect on its ability to provide effective sector leadership. The

[4] Transformation defined as fundamental deconstruction and reconfiguration of the entire system of water management and provision of services as envisaged in the national policy and legislation.

reactionary approach to change or amend policy it has not implemented has further compounded systemic problems.

South Africa has been at the forefront of several water sector initiatives in the region, yet has struggled to implement some of the policies it advocates. The root causes of many of its implementation problems are known; however, its repeated inability to timeously address these has resulted in an aggregation of the problems to the extent that they have progressively and cumulatively become systemic.

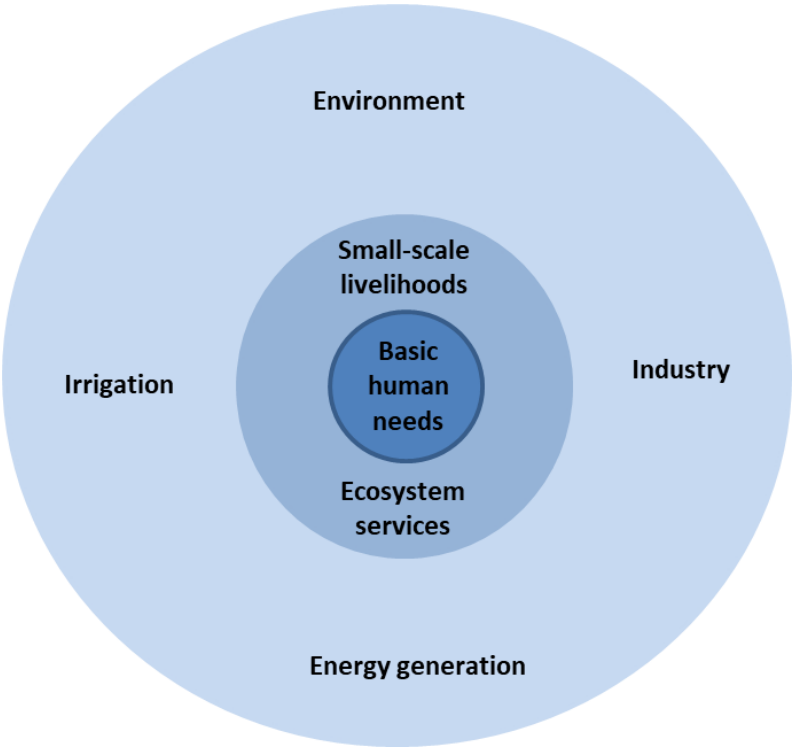

Figure 1. Important socio-economic water uses requiring water security

There now has to be a deliberate and concerted effort to address the challenges described above to provide water security for South Africa's current and future socio-economic development needs. This NWSF seeks to ensure the water security of the nation, and considers all the water uses that are important from this perspective, as shown in Figure 1. The framework must focus on national priorities underpinned by a thriving economy. It must also incorporate the SDGs and international obligations, including the Africa development agenda and SADC water and development protocols. The NWSF building blocks must emanate from local, regional, provincial, national and various economic sector development plans and strategies, the integration of which will provide high-level direction and performance and require accountability from all role-players for its implementation. The NWSF implementation sequence is simplified to allow progress tracking and identification of areas needing intervention. Accordingly, its institutional framing allows seamless planning, management and monitoring.

2. KEY DEFINITION AND CONCEPTUAL CONSTRUCTS

2.1. Defining water security

Water security, as a concept, has evolved in recent years and the various nuances of its definition often make water security analyses difficult. It is therefore critical to focus on elements that are important for South Africa's positioning in respect of the notion of water security.

UN Water defines water security[5] as

> '*the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability*'.

Several other definitions have been put forward and all are characterised by common strands that include a focus on:

- Access to a reliable source of potable water for basic human needs or domestic use that ensures resilient communities. In South Africa this is enshrined in the Bill of Rights of the Constitution and forms part of the definition the Reserve[6] in South Africa's NWA;
- Provision of adequate water supplies for productive activities and livelihoods;
- Environmental sustainability, preservation of ecosystems to deliver their services upon which nature and people rely, including the provision of freshwater. This also forms part of the Reserve and is a Constitutional human right; and
- The risks associated with the presence or absence and reliability of water supply.

Taking into account that most of the challenges associated with water and the importance of its centrality to all aspects of life, in a context appropriate for South Africa, the definition of water security *scope*"[7]:

> "*…water security is less about obtaining water, and more about fostering human capabilities as they relate to water... It is not simply a state of adequate water – however defined – to be achieved, but rather a relationship that describes how individuals, households, and communities navigate and transform hydro-social relations to access the water that they need and in ways*

[5] https://www.unwater.org/publications/water-security-infographic/

[6] National Water Act, 1998 (Act 36 of 1998) (NWA), Government of South Africa

[7] Jepson, W., Budds, J., Eichelberger, L., Harris, L., Norman, E., O'Reilly, K., Pearson, A., Shah, S., Shinn, J., Staddon, C. and Stoler, J., 2017. Advancing human capabilities for water security: A relational approach. *Water Security*, *1*.

that support the sustained development of human capabilities and wellbeing in their full breadth and scope"[8]

This resonates with the ultimate vision espoused by the NDP of rising living standards, falling poverty and inequality as well as restoring the dignity of the people of South Africa.

2.2. What is a framework for water security?

A simple definition of a *framework* is a particular set of rules, ideas or beliefs which are used to address problems or to decide what to do. It sets a scope and limits within which to execute a systematic programme or programmes or nationally agreed policies and strategies. Water security can touch on:

- identifying future water sources for a growing population and the attendant future water resources development options;
- the operation and maintenance of water and sanitation infrastructure;
- the management and restoration of ecological infrastructure;
- the proper management of water quality;
- water supply services;
- resilience of a country to climate change impacts; and,
- water conservation and water demand management.

In South Africa, since the dawn of democracy, water is governed by a legislative framework that is complex and dynamic, aimed at managing water with significant participation by the people[9]. It promotes a coordinated approach to the management of water, land and related resources in order to maximize the resulting economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. Another typical example of a framework is the European Water Framework Directive (WFD), which introduced a shift in water management, placing ecology at the centre of decision-making in Europe.

The basis of the NWSF is the constitutional imperative relating to water, which gives every person a fundamental right to an environment that is not harmful to his or her well-being, and requires the environment to be protected for the benefit of the present and future generations. The water policy, legislation and other measures provide protection of the environment while promoting justifiable economic and social development. Water management, as a discipline, has grown in complexity with the recognition of its interconnected and diversified nature to meet the challenges of climate variability, climate change, population growth and socio-economic development needs. Practitioners, managers and decision-makers across the entire water sector spectrum need to ensure that operating rules for water systems satisfy multiple objectives, such as maximising water security, flow reliability

[8] Jepson, W., Budds, J., Eichelberger, L., Harris, L., Norman, E., O'Reilly, K., Pearson, A., Shah, S., Shinn, J., Staddon, C. and Stoler, J., 2017. Advancing human capabilities for water security: A relational approach. *Water Security*, *1*.

[9] Thompson, H. 2006. Water Law – A practical Approach to Resource Management and the Provision of Services. Juta and Co. Ltd.

and meeting environmental flow requirements; and minimising operational cost, flood risk and energy use.

Framing of water security has become more comprehensive, expanding from an initial focus on quantity and availability of water for human uses to include water quality, human health and ecological concerns[10]. A broad and integrative conceptualisation of water security has emerged as a major framing template[11]; and the utility of the approach in water governance, while recognising constraints that arise in the context of implementation and management, has become critical in the planning for water management and the provision of services.

2.3. The relevance of Water for Growth and Development and the Sector Masterplan

Water security is much more than looking at basic needs "taking into account other needs". Its focus is on livelihoods (beyond basic or subsistence) and, as articulated/implied elsewhere, the key issue is socio-economic development. We need to make an argument around "water for growth and development" or simply how water can contribute to economic growth.

South Africa's awareness and elevation of water security gained prominence following the 2006 Fourth World Water Forum (WW4), which was reflected in the theme document "*Water for Growth and Development*"[12]. Ultimately, the Department of Water Affairs and Forestry (DWAF) developed a framework for growth and development (WfGD)[13] aimed at guiding actions and decisions to ensure water security in terms of quantity and of quality to support South Africa's requirements for economic growth and social development – as required by the Constitution of the Republic of South Africa of 1996. The Development Bank of Southern Africa (DBSA) commissioned a number of papers on water security covering a number of aspects as interpreted at the time[14].

The evolution of water security has seen the refinement of earlier conceptual framing as evident from the report of the Global Water Partnership (GWP) and the Organisation for Economic Co-operation and Development (OECD) Task Force on Water Security and Sustainable Growth[15]. The framing takes

[10] Cook, C and Bakker, K. (2012). Water security: Debating an emerging paradigm. Global Environmental Change 22 (2012) 94–102.

[11] Gerlak, A. K., House-Peters, L,Varady, R. G., Albrecht, T., Zúñiga-Terán, A., Routson de Grenade, R., Cook, C., Scott, C.A. (2018). Water security: A review of place-based research. *Environmental Science and Policy 82 (2018) 79–89.*

[12] "Water for Growth and Development." David Grey and Claudia W. Sadoff in Thematic Documents of the IV World Water Forum. Comision Nacional del Agua: Mexico City. 2006.

[13] DWAF, 2009. Water for growth and development version 7.

[14] Muller, M. et al. 2009. Water security in South Africa. Development Planning Division. Working Paper Series No.12, DBSA: Midrand

[15] Sadoff, C.W., Hall, J.W., Grey, D., Aerts, J.C.J.H., Ait-Kadi, M., Brown, C., Cox, A., Dadson, S., Garrick, D., Kelman, J., McCornick, P., Ringler, C., Rosegrant, M., Whittington, D. and Wiberg, D. (2015) Securing Water, Sustaining Growth: Report of the GWP/OECD Task Force on Water Security and Sustainable Growth, University of Oxford, UK, 180pp

into account key issues of risks associated with water insecurity and links to socio-economic development (growth, wealth and wellbeing). Risks would include climate and poor water governance – leading to scarcity, which in turn has an impact on national security. Scarcity or supply and demand are no longer the main drivers of water security for sustainable development, but rather a complex set of elements such as human/community security (vulnerability), national security, water resources, ecological security, social (health, spiritual and religious) usage security, food security, energy security and climate security[16].

The National Water and Sanitation Master Plan (NWSM)[17] on the other hand, is intended to guide the water sector with investment planning for the development of water resources and the delivery of water and sanitation services until 2030, and beyond. The core purpose of the NWSMP is to provide an overall perspective of the scope of the water and sanitation business to provide a comprehensive schedule of actions needed to address present challenges, to estimate the investments required to ensure effective water resources and water and sanitation services delivery, as well as to facilitate effective integrated investment planning, implementation of actions and evaluation of achievements.

The NPC's assessment confirms the analyses by the World Bank, Asian Development Bank, United Nations and the World Economic Forum (WEF) which rates water security as one of the risks and strategic challenges confronting humanity. This is primarily due to a serious and worsening supply/demand imbalance and declining reliability of water supply caused by rapid population growth and industrialisation, over-extraction of water, widespread pollution and climate change. The issue of water security provides greater consideration of human values, ethics and power and complement the concept of integrated water resources management (IWRM)[18] which in South Africa is done at catchment level. From a water security perspective, water resources should not be treated in isolation, as if independent of the food, climate or energy security of individuals, communities and the country. Currently South Africa is battling to ensure that these approaches are fully implemented.

3. PURPOSE AND RATIONALE - WHY THE FRAMEWORK?

South Africa is water insecure due to an acknowledged backlog in water infrastructure, insufficient maintenance and investment, inequities in access to water, and deteriorating water quality as well as climate change. Assessments have shown that, despite South Africa's successes and world-renowned water policy and legislation, transformation and implementation have remained a serious challenge and the framework brings a fresh and objective look at gaps and provides an opportunity for continuous evaluation and interventions.

The framework focuses on flow dynamics – in terms of finance, knowledge and other drivers of planning such as population. For example, instead of overemphasising population growth, the focus

[16] Halmatov et al. 2017. Water security for productive economies: Applying an assessment framework in southern Africa. Physics and Chemistry of the Earth 100. 258-269.

[17] DWS, 2019

[18] A.K. Gerlak, F. Mukhtarov, 'Ways of Knowing' water: integrated water resources management and water security as complementary discourses, Int. Environ. Agreements: Politics Law Economics 15 (3) (2015) 257–272.

is on population dynamics; whilst on financing, absolute figures are de-emphasised and the focus is on financial flows and impact. Similarly, environmental flow requirements are inclusive of water conservation needs. The NWSF intention is to direct an integrated holistic approach towards water security. It seeks to guide, complement and incorporate other national, strategic water sector strategies and plans such as the NWRS, the NWSMP, Integrated Development Plans (IDPs), the Water Services Development Plans (WSDPs) as well as National Spatial Development Framework (NSDF) among others. It sets out a framework for national, regional and local water security and reflects South Africa's focus on water for basic human needs, while acknowledging the importance of other water uses. It provides a set of concepts, approaches and commitments that the country can use to safeguard the water supplies of poor and marginalised communities as part of an integrated approach to improving water, sanitation and hygiene.

The framework is the first of its kind in South Africa in being key to addressing the country's water security challenges in a holistic and decisive manner. With the framework being at the highest level, it must guide the execution of roles and responsibilities and accountability expected from all mandated institutions towards achieving the goals of the NDP. It will, among others:

- Guide all water-related policies across the governance system in terms of short-, intermediate- and long-term planning and support;
- Strengthen implementation and ensure that it is managed at a level that allows for holistic oversight and fosters cross-departmental and sectoral integration;
- Ensure national accountability linked to mandates across the governance system to address the challenge of department-specific mandates that impact on water and sanitation; and,
- Provide cross-sectoral water security through full engagement of stakeholders at all levels.

It is vital that all key role players in the water and sanitation sector develop the NWSF collectively, and that it enjoys their full support, acceptance and agreement.

Water security will not be achieved by actions in the water sector alone. The NWSF outlines the sources of water and the systems on which it depends. It considers the management of the country's wastewaters, how industrial activities such as mining, the performance of local municipalities and includes emerging challenges that face the country if it is to achieve, and then sustain, its water security.

4. WATER SECURITY FRAMEWORK CONTEXT

4.1. Planning for water security

Given its limited water resources and the constraints that these have placed on its development alternatives, South Africa has a long history of innovation and investigation in water resource management, albeit skewed to the benefit of a minority of the population in its pre-democracy era. The 20th century saw the advent of mining and industrialisation along with an extensive programme of infrastructural development in South Africa, including water infrastructure.

Since 1994, there have been particular efforts to address the legacy of inequality and the additional challenges that the transition to democracy has brought. Importantly, during this period, South Africa crossed the 'hydrological transition' and moved from a focus on water resource development for expanding supply, to one of water resource management. The transition was confirmed through post-1994 policy initiatives and legislation. These fundamentally changed the focus from infrastructural development to a more balanced approach, with an equal emphasis on measures for 'soft' water resources management. The shift was accompanied by an explicit emphasis on managing water to derive optimum benefit from its use ensuring that water is used optimally in support of sustainable and pro-poor growth and development. This approach has guided government programmes since 1994.

Water resources across the globe are under increasing pressure as a result of economic and social development. Conventional management methods are unable to cope with these ever increasing demands; hence a shift towards an integrated approach to water resources management. If managed in a sustainable manner, incorporating the three pillars of sustainability (the environment, society and the economy), water availability and access to it can enhance the development of a country.

Whilst acknowledging the significant progress made in the post-apartheid era a historical context is provided to acknowledge the challenges and lessons learnt to ensure that the new approach is built on a solid foundation. In parts of the country, development choices are already being determined by water resource constraints. In many others, poor management of municipal infrastructure and other sources of pollution are causing a decline in water quality. There is also growing competition for, and the potential for conflict over limited water resources, both within the country and with its neighbours.

In order to address potential unintended consequences of the policy and legislative reform of the democratic period, the positioning of the Water Security Framework must articulate critical issues and provide a guide that will ensure that the benefits of the transformation project are realised within a reasonable period.

South Africa's water crisis can be attributed to insufficient water infrastructure maintenance and investment, recurrent droughts driven by climatic variability and change, inequities in access to water and sanitation, deteriorating water quality, deteriorating condition of water-related ecological infrastructure, including Strategic Water Source Areas (SWSA), as well as lack of skilled and competent professionals to address these water challenges. The crisis is already having significant impacts on economic growth and on the well-being of people in the country and these impacts will be exacerbated if the crisis is not addressed, hence the justification and rationale for a national water security framework.

Water is severely under-priced and cost recovery is not being achieved. To achieve water security, the current capital-funding gap, estimated at R33 billion per annum for the next 10 years, is required. However, this figure must be reviewed to align to fiscal constraints and to stimulate innovative financing and investment models, including a combination of improved revenue generation and a significant reduction of costs.

In planning for water security, the NWSF takes into account the demand for transformation and national strategic goals by reflecting on the quality and quantity of water available taking into account the demand required for transformation and national strategic goals, by reflecting on the processes and institutional mechanisms for implementation and ensuring national accountability and systematic programme implementation. It focuses on achieving water security in South Africa in the context of the two overall targets in the NDP, which are: (i) elimination of poverty; and (ii) reduction of inequality to acceptable levels

Inclusive economic growth is seen as an enabler that must form part of continuous assessment. The intention is for the NWSF to be a living document, to be revised as new information and knowledge is obtained and as the NDP is progressively implemented. In addition, a stakeholder engagement strategy will ensure synergy in communicating water security from the line-function Department(s) and at NDP level.

4.2. Challenges and Key Water security issues

Flowing from the definition of water security and framing thereof, some key gaps relating to planning for water security can be discernible, such as:

a) **Inadequate understanding of the bio-geophysical environment** largely due to lack of sufficient regular assessment, including as a result of using old or out-dated information or spatial planning models that are not necessarily responsive to new and complex demands.

b) **Water governance and leadership issues**

These refer mainly to adequacy of legal regime, institutional arrangements, infrastructure and capacity required for implementation and management -

i. Lack of follow through on policy and legislation – reflected in many decisions being aborted, slowed down or reviewed unnecessarily;

ii. Functional instability and lack of continuity resulting from change in leadership of the Department and some water entities over the years since 1994;

iii. Failure to implement the basic institutional framework espoused in the post-Apartheid water policy and legislation;

iv. Inadequate emphasis on the new water management model and consistent stretching or even extrapolating old strategies without analysis based on empirical evidence;

v. Incapacity resulting from incompetence and ineptitude – many decisions appear to have been either delayed or aborted due to this, including officials lacking confidence or being afraid to make decisions.

vi. Incomplete restructuring and re-organisation processes that is exacerbated by start-stop processes since 1999.

c) Inadequate **enforcement of data and information ownership and curatorship** resulting in moving away from the notion of the knowledge commons – large consultancy companies appear to have a hold on critical data and information required for national planning needs.

d) Consistent under-expenditure and qualified audits by the sector leader – a serious concern that requires closer examination and decisive intervention. One of the most critical factors contributing to risks to water security is corruption and misappropriation of funds and lack of accountability.

e) Inadequate financing and investment exacerbated by too much wastage in the system resulting mainly from how the function is done.

The DPME's 2015 diagnostic report identified and delineated six key thematic areas that are critical for water security as reflected in Table below.

Table 1. Key issues identified in the National Water Diagnostic Report, 2015

ISSUE/AREA	COMMENTS/OBSERVATIONS
The water demand and supply situation	• Inefficient water use • Unconstrained water use increases in many municipalities • Unauthorised water use is prevalent especially in mining & agriculture
Impact of extreme climatic events and **climate change**	• Precise magnitude and spatial extent are uncertain; • A recent flagship research programme on climate change - using a scenario-based approach to explore adaptation options • Under a 'wetter' scenario, water allocation between sectors will be less restrictive, but under a 'drier' scenario significant trade-offs are inevitable • Under all scenarios, higher frequencies of flood and drought events are anticipated
Infrastructure asset management and functionality	• history of under-investment in asset maintenance and renewal and deficient management systems and record keeping • Concern about the actual state of existing water resource schemes • Failure to adhere to the established operating rules poses a critical water security risk • Prevalence of water supply interruptions and recurring social protests • High number of water systems are in the high to critical risk category • Pockets of waste water effluent infrastructure in a critical state require urgent refurbishment
Infrastructure planning and development	• While there is an elaborate inventory of planned projects to ensure water security, based on past records there are concerns about the sufficiency of funding, robustness of institutions, and decisiveness in implementing the envisaged infrastructure • Commitments made during the conception of such infrastructure tend to be irreversible once implemented, and given that resultant assets might have limited functionality outside the original 'intent, the robustness of governance during the planning stage is critical. (socially robust information) • Many municipalities fail to comply adequately with the prescripts. • Planning maturity in most municipalities has remained poor • Challenges to coherent planning, amid increasing urbanisation and migration • Indications that factors like political interference, lengthy litigation processes, time constraints, limited skills, and inadequate alignment across the spheres of government, all contribute to deficient planning
Institutional and regulatory framework	• Collaboration appears to be elusive • Across all spheres of government, divergent interpretations of the framework seem to have fuelled territorial contests to the detriment of service delivery • Two decades into the democratic era, while access to a safe water supply is a constitutional right and critical in meeting socio-economic objectives, there is still inequitable access and allocation • Many institutions in the sector and their overlapping roles have often severely compromised effective regulation

ISSUE/AREA	COMMENTS/OBSERVATIONS
	• Prevalence of limited compliance with the prescripts of the regulatory framework
Human capital and institutional capacity.	• In each of the foregoing themes, deficient human capital and institutional capacity across the water value chain have surfaced among the key features that could inhibit water security • Skills shortage in the country has been at the centre of many discussions, and well documented • Although the skills deficit in the country is considered as critical, the problem is part of a global phenomenon affecting both developed and developing countries • Concerns about the capacity of key national government departments and municipalities - in ensuring the effective implementation of developmental water management and services

The diagnostic report recognised the significant strides made in confronting the daunting legacy of apartheid, and in particular in addressing serious backlogs in water services. It raised a wide range of issues that cut across the various themes and that are seen as exhibiting *wicked* attributes where the term 'wicked' in this context is used to suggest problems that comprise complex interdependencies – where there is often little consensus on the precise problem to be addressed or the approach to its resolution. It is stated that moving forward, the continued ability to ensure water security for the country will only be certain if a number of critical choices are prioritised and implemented to urgently confront the challenges and limitations facing the water sector. The report proposes a suite of opportunities and recommendations for sector-wide migration into water security strategies that covers the following:

- Scaling-up non-traditional water augmentation;
- Enhancing demand-side management and conservation;
- Innovatively pursuing universal service coverage;
- Proactively planning for strategic water infrastructure;
- Increasing attention to water resource protection;
- Strengthening human and institutional capacity; and
- Establishing quality assurance protocols for the front-end phase.

Consultation processes during the development of the NWSF have confirmed many of the findings from the diagnostic report and subsequent assessments. The following broad issues were among the those raised during the consultation process:

Table 2. Some challenges raised during consultation processes

ISSUE/AREA	COMMENTS/OBSERVATIONS
Integrated Planning	• Ensure alignment and build in scenario approaches and other tools • The framework should recommend de-linking long-term planning for water from political cycles. • Financing and investment should form part of long term planning • Need for foresight in water planning.

ISSUE/AREA	COMMENTS/OBSERVATIONS
	• Spatial planning to incorporate environmental protection (protection of source areas) • Include water sensitive design in planning
Water and Agriculture	• Agricultural water requirement is critical and of national strategic importance. The decision-making round what is grown where and what measures are to be put in place to ensure that water is not wasted must be examined and addressed.
Governance and Institutional	• Institutional design may have had direct impact on effective decision making and implementation • Regulation/enforcement, monitoring and evaluation, enforcement of ground water use and capacity to manage water licensing conditions needs to be strengthened. • Investigate failure of CMAs implementation. Berg and Breede River systems are heavily involved in supplying the Western Cape Water Supply System and may be merged.
Infrastructure asset management and functionality	• Maintenance and expansion analysis to accommodate growing demand • The is a need to involve the private sector, including small business and traditional authorities/leaders across the value chain.
Communication & Stakeholder engagement	• Advancing active citizenry, including awareness and education
Research, monitoring, assessment and information	• Promote alternative technologies to ensure water security, including fourth industrial revolution (IR 40.0), artificial intelligence (AI), machine learning (ML), data analytics etc) • Elevate research and development to support exploring ways of conserving water, re-use and other alternatives. • Update data and information. • Judging from declining values of research there may be a need to investigate the adequacy of the levy system or find alternative sources.
Water financing and investment	• There is a need to cover the true cost of water, including environmentally provided 'goods and services'. If not done there may be externalisation of costs to downstream users and/or environment with long-term negative consequences.
Human capital and institutional capacity.	• Re-professionalise engineering, scientific and technical fields. • Deal with revolving door • Ongoing failure to address skills shortage and asymmetry is the single biggest strategic risk facing water management in South Africa
Water use and unaccounted for water	• Reduction of unaccounted for water to be made a key priority and set ambitious target such as a net per capita water use of 100 litres per day with a plan of action to achieve both.

Water security challenges may differ from environment to environment (regions, countries, localities and so on) and contexts may have different dimensions[19]. The core argument advanced in the

[19] López-Gunn, E., Ballesteros, M., De Stefano, L., Garrido, A., Hernández-Mora, N. and Willaarts, B.A., 2016. Water security or water 'securities'? Increasing complexity in balancing of multiple goals in Spain. In *Handbook on Water Security*. Edward Elgar Publishing.

framework is that water security is essentially 'beyond abundance and scarcity' which over the years has been about the development of storage capacity, the approach which has since been challenged by an ecosystems based approach to water resource management and reflected in South Africa's post-1994 water policy and legislation. In the South African context, like many countries with similar challenges, the dimensions shown in Figure 2 below may be used to cluster these challenges generally.

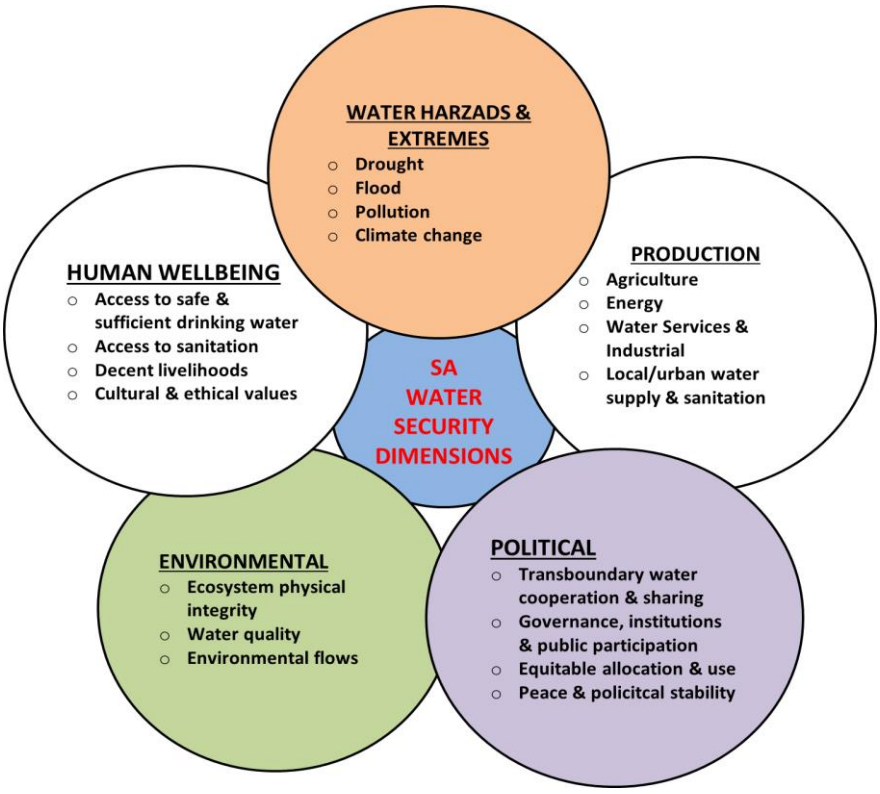

Figure 2. Water security dimensions that may be relevant for South African situation to be taken into account in Monitoring and evaluation (modified from López-Gunn et al. 2016)

5. SCOPE, PRINCIPLES AND APPROACH

5.1. Scope

At a national level, the overall vision of the NDP is that of rising living standards and falling poverty and inequality by 2030. Key aspects of the NDP vision are reduced inequality by 2030; eradication of poverty; and significantly reduced unemployment through inclusive economic growth. This vision resonates with the 2015 World Water Development Report (WWDR)'s vision on water security[20] which states that:

[20] WWAP (United Nations World Water Assessment Programme). 2015. *The United Nations. World Water Development Report 2015: Water for a Sustainable World.* Paris, UNESCO.

> ***"By 2050, humanity has achieved a water secure world**, where every person has access to adequate quantities of water of an acceptable quality and from sustainable sources, to meet their basic needs and sustain their wellbeing and development. The human population is protected from waterborne pollution and diseases and water-related disasters. Accessing water is no longer a gendered burden, and equitable access to water resources and services for both women and men has fostered greater social inclusion. Ecosystems are protected in a climate of peace and stability. Local and national economies are more robust, as the risks and uncertainties related to the availability of water resources have been taken into account in the long-term planning for poverty reduction and economic development. Norms and attitudes have changed as a result of educational interventions, institutional changes, improved scientific and technical knowledge, sharing of lessons learned and best practices, and proactive policy and legislative developments."*

The UN's 2016 WWDR[21] estimates that three out of four jobs in the global workforce are heavily or moderately dependant on water, and has highlighted three issues related to water and economy, water and inequality as well as water and poverty[22]:

- **Water, economy and jobs -** critical functional categories recognised in value chain, viz.,
  - Water resource management and ecosystems restoration and remediation;
  - Building, operating and maintaining water infrastructure; and
  - Provision of water related services including water supply, sanitation services wastewater management.
- **Water and inequality**
  - Access to safe water and sanitation services is **a human right**.
  - Balancing act – increasing access reduces inequality but increase demand
- **Water and poverty eradication**
  - Water is key to poverty eradication and health.
  - Balancing act – supply can be increased but at steeply increasing costs and interdependency

The recent report by the World Bank Group[23] in collaboration with Stats SA and the DPME assesses poverty and inequality looking at drivers, constraints and opportunities. The diagnosis shows that:

- Poverty levels are high for an upper middle-income country;
- High inequality slows down poverty reduction;
- Skills and labour market factors have grown in importance in explaining poverty and inequality and that
- There are root causes of poverty and inequality in South Africa, and potential solutions exist.

[21] World Water Assessment Programme, 2016. *Water and Jobs: The United Nations World Water Development Report 2016*. UNESCO.

[22] See also Ward, M and Mudombi, S. 2018. Protecting and unlocking jobs through water stewardship: a case study linked to the Umbogintwini industrial complex, Ethekwini.

[23] Sulla, V. and Zikhali, P., 2018. *Overcoming poverty and inequality in South Africa: An assessment of drivers, constraints and opportunities* (No. 124521, pp. 1-148). The World Bank.

The report puts water insecurity (environmental fragility) among key challenges and underscores the need to focus on a Water Security Framework to form part of the solution to achieving the NDP goals.

Within the context of the centrality of contribution of water to socio-economic growth and development to address the above priorities and from a monitoring perspective, two key aspects are considered important, namely,

- Inclusive economic growth measured by gross domestic product (GDP) growth, contributed directly or indirectly through water;
- Reducing the inequality gap measured in terms of human development index focusing on livelihoods locally through to national (bottom up) and reflective of redressing past imbalances.

The NWRS2 highlights the vision 2030 for the water sector in relation to NDP as a driver. As stated, the NDP articulates the national development goal of eradicating poverty and sharply reducing inequality by 2030. To achieve this, government has defined a New Growth Path, which is one of inclusive growth and development, with a focus on diversification and wide participation by South African citizens within a vibrant and growing economy. Given that water plays a central role in all sectors, including agriculture, energy, mining, industry, tourism, urban growth and rural development, the 'protection, use/allocation, development, conservation/protection, management and control' of water is an essential prerequisite for inclusive economic growth, poverty reduction and the significant reduction of inequality in South Africa.

The NWA and NWRS provide the framework for the protection, use, development, conservation, management and control of water resources for the country as a whole. They also provide the framework within which water is to be managed at regional or catchment level, in defined water management areas. It is binding on all authorities and institutions exercising powers or performing duties under the National Water Act, 36 of 1998, and must be formally reviewed from time to time[24].

The NWRS2 analyses the role of water in the economy and identifies the specific challenges, development opportunities and actions that inform an agreed framework for priority areas of focus for the country. It is meant to address concerns about socio-economic growth and South Africa's development potential, which may be restricted if water security, resource quality and associated water management issues are not resolved efficiently and effectively. The NWRS2 aims to ensure that water serves as an enabler for inclusive economic and social development and not a bottleneck. However, as stated above, implementation remains an enduring challenge. The NWSF is contextualized to address these gaps.

The National Water Security Framework must provoke thinking so that the country looks at the medium to long-term horizon (2030 and beyond) and ensure that current actions are always aligned with desired outcomes and impacts. It cannot simply elevate the outputs and programmes, as listed in the Departmental plans, as the trustee of water resources and overseer of water services and sanitation in the country.

[24] National Water Act, 36 of 1998, Government of South Africa

A radical paradigm shift is needed if the implementation of the NDP goals and aspirations is to be realised. It is critical that at the highest level the Water Security Framework's achievement must be tested against two key aspects of the country's development, namely, per capita growth and reduction in inequality. It must be able to connect all aspects of water's contribution to social and economic development which has proved to be difficult, if not impossible, for the line Department, especially in recent times and given that it is not necessarily mandated to control or manage the total value chain of national development.

In defining the end state for the water sector a radical view is essential to address the spatial equity and examine why there are gaps between the intent of policy and legislation on one hand and the implementation on the other. Systems and processes must be compatible with the goals. Specifically, the following, among others, need to be revisited:

- Poor quality, quantity and relevance of data. A concern that was also raised in the 2013 World Wide Fund for Nature (WWF)[25] report on South African water sources;
- Poor regulation and enforcement;
- Lack of reform and transformation of the water institutions as envisaged during policy and legislative development;
- Lack of integration and common goals;
- Lack of accountability and unclear roles and responsibilities; and
- Arguably sufficient legislation, but poor implementation and lack of decision-making or follow through.

It is necessary for the framework to be integrated and use the mass balance approach[26] when it comes to water in that it must ensure aspirational needs for every drop and movement thereof to be accounted for. The framework seeks to integrate:

- All the competing water requirements from all sectors, look into input water from neighbouring states (surface and ground water through shared basins and aquifers) and precipitation (meteorological information necessary), sea water (desalinated for potable or industrial use)
- Look at output in the form of evaporation, exit to neighbouring states, and consumptive use of water (irrigation without runoff);
- Non-consumptive use (such as religious, traditional and recreational); and
- Span beyond South Africa and do risk assessment for security of supply in neighbouring countries like Lesotho, from which bulk of our water comes from.

[25] Nel, J., Colvin, C., Le Maitre, D., Smith, J. and Haines, I., 2013. South Africa's strategic water source areas. *WWF South Africa, Cape Town*.

[26] The law of conservation of matter states that matter (e.g. water) is conserved – that is, neither created nor destroyed. A mass balance is an accounting of a material for a specific system boundary. In other words, you are keeping track of all sources of the material that enter the system, all sinks of the material that leave the system, and all storage of the material within the system. This method is called the mass balance technique. Source: http://environ.andrew.cmu.edu/m3/s4/matbalance.shtml

It is also evident that the silo paradigm and approach in the water sector has persisted into the democratic dispensation, which results in a tendency or risk of focusing on the lowest common denominator and not focusing on interdependencies. **Spatial planning** has not managed to break the former homeland boundaries, which deprives many communities of the required economies of scale when it comes to water for livelihoods and economic development. The allocations for irrigation use must be reformed and structured to be informed by the quantified livelihoods benefit per volume allocated.

Cursory discussions with water experts and practitioners suggest that per capita consumption per day may be in the region of 150 litres (based on mean annual rainfall availability per quaternary catchment generally)[27]. There are areas where higher allocations can be made to enable local economic activities. This is in contrast with the incremental, proposed RDP/MDG standards ranging from 25 litres to 60 litres, progressively to universal access. The argument was that it should be enough to allow for livelihoods locally, compared to the RDP initial plan. From a planning perspective this should be done this where possible, such as the eastern parts of the country which are source areas, yet many communities in those areas have been deprived at the expense of development zones. Huge amounts of money are spent to transport water and yet locals do not have enough allocated. In short planning must be done from the needs perspective. The reported actual use is much higher than 150 litres (averaging 188 litres countrywide and up to 270 litres for Gauteng, for example). The number of 150 litres must be seen as target, which needs to be verified through scenario planning and depending on what is possible, hence the condition of 'where possible'. These numbers are proposed as a starting point for discussion. The actual figures can be tested through a consultation process in the same way as was done for the earlier 25 litres per capita.

Irrespective of the actual figures that are agreed once the research has been done, the fact remains that radical changes, such as raising the minimum up to 150 litres (depending on local conditions) per person per day, need to be considered in areas where this is possible. This would include but not be limited to, employment created by revenue from produce, food security and achieved efficient water use efficiency index, and contribution to GDP. In this context the nexus approach should be clearly articulated and implemented.

In considering the radical changes, the mutual interconnections between land, water, energy and food (the WEF nexus) must as a matter of course be taken into account. It can no longer be seen as an isolated issue as a result of a lack of understanding and complexities of the relations between the component parts[28]. For instance, if the demand for water for energy and the associated impact on water quality is reduced significantly by 2030, the water allocated for energy will become available for other uses. The interdependencies with agricultural requirements for both water and energy need to be strategically determined in order to maximise the benefit to society.

The Water Security Framework takes cognisance of the fact that unlike other resources, **WATER CANNOT BE SUBSTITUTED** with anything. It is finite and must be conserved and protected for future generations.

[27] Msiwa MZ. 2016. (personal communication & verified during consultation process).

[28] Mpandeli *et al*. 2016

The scarcity of fresh water or water fit for use is driving the world towards innovative technologies which look into more efficient ways or treating water and also reducing pollution of our water resources. Desalination of sea water into potable or industrial grade water is common practice around the world where surface water is depleted. These technologies demand huge investment costs together with high level skills sets which South Africa should have. The fourth industrial revolution (IR4.0) brings with it opportunities to address various aspects of water management and provision of services.

In recent years, a *fatigue* resulting from start-stop regarding issues of water governance can be discernible. The advent of Local Government legislation made the governance of water services even more competitive. An understanding and alignment of legislation is a critical process that must be undertaken. It should be noted that legislation is one of the critical tools at our disposal for the governance and management of water in South Africa. Legislation should be clear on the allocation of responsibilities and mandates across the water value chain, and across the various role players. Of outmost importance is the enforcement of regulation, where accountability is demanded.

The OECD[29] in addressing the question of why water security matters, after assessing the common challenges of water security globally and in the context of OECD countries, recommended that a risk-based approach to water security is essential. Achieving water security means maintaining acceptable risk levels for four water risks, namely:

- Physical shortage (including drought): Lack of sufficient water to meet demand in short, medium and long-term for beneficial uses by all water users;
- Inadequate quality: Lack of water of suitable quality for a particular purpose or use;
- Excess: Overflow of the normal confines of water system or the destructive accumulation of water over areas that are not normally submerged; and
- Risk of undermining the resilience of freshwater systems: Exceeding the coping capacity of the surface and groundwater bodies and their interactions (the "system"); possibly crossing tipping points, and causing irreversible damage to the system's hydraulic and biological functions.

In the context of South Africa and her relatively new transformational policies the above risks are exacerbated by the lack of skills and capacity in general. Assessment of the risks needs to be done conjunctively as they impact on each other given the nature as a hydrologically interconnected resource. Effective management of the risks is central to achieving the objectives of the Water Security Framework.

Key aspects of the framework include the fact that it must:

- Remain a high-level national guide that is long-term in nature but that determines immediate decisions and actions based on empirical evidence and best available information and knowledge.
- Be sufficiently instructive to ensure that all mandated institutions and organisations draw from it with the line Department sufficiently capacitated to play its sector leadership role properly;

[29] OECD (2013), Water Security for Better Lives, OECD Studies on Water, OECD Publishing. http://dx.doi.org/10.1787/9789264202405-en

- Provide an analysis of why the sector seems to be in a stagnant state with decisions either not being made or if made they are not executed or followed through;
- Reflect urgent and immediate decisions to be made to ensure sector functionality such as institutional framing and establishment as well as high level roles and responsibilities and financing, a basket of tools such as foresight methodologies etc.;
- Recognize and take into account that many water programmes are by nature long-term and that every effort must be made to decouple water security planning cycles from the geopolitical, financial and other cycles which are largely short term in nature. Furthermore, bad planning whether due to wrong assumptions or a lack of requisite capacity can result in irreversible or devastating impacts in the long-term. For instance, on average a mega project conceptualised in 2017 can produce first results in 2032 to 2037 (three to four political/administrative/governance cycles multiplied by three spheres of government and several economic cycles which may include recessions and so on); and
- Cursory assessment of the water situation in the country reflects that the challenges faced are a result of cumulative effect over a long period which needed proper long-term, scenario-based planning and implementation on decision analysis in early in the document).

Further,

- National spatial planning needs to be responsive to the redistributive needs of the country and not the *usual* economic zoning which by default leads to maintaining the *status quo*. Water should form an integral part of the spatial planning. It is an irreplaceable commodity and a national asset in Government's trusteeship;
- Water Security needs to be seen as key driver, especially in respect of sustainability and the nexus approach (water-food-energy-health etc.);
- Sector direction as dictated and lead at the highest level with clear roles and responsibilities across the value chain is critical;
- Strengthening leadership, water governance and stewardship should be non-negotiable.
- Serious consideration is to be given to separating the technical functions through a structured process, starting immediately with those that will not need political or legislative changes;
- Tools and instruments exist to be used for co-implementation, state-owned enterprises, private institutions, and other spheres of government;
- As a country we must be looking at *end-to-end value chain* coverage that takes into account a holistic development agenda through beneficiation.

The scope of the framework is to position the need for key interventions at short, medium and long-terms with the objective of enabling an integrated approach to planning for water security, creating an enabling mechanism for implementation and clarifying roles and responsibilities. For instance, linking water issues with other aspects of the NDP such as spatial planning among others, and ensuring that the various role players at national level focus on the priorities of the NDP goals and objectives.

In doing so, it is important to note the critical constitutional framing of trusteeship of all water resources which underscores the principle of "total value chain ownership" and the need to ensure water justice in all its manifestations taking into account historical injustice.

The framework segregates the various elements of implementation in terms of areas of focus and the respective roles and responsibilities. Most importantly, it provides a platform for monitoring implementation in a focused manner at the highest level in line with short-, medium- and long-term impact. To this end, two key areas will drive the monitoring, namely:

- Economic growth measured by GDP growth, contributed through water and associated activities;
- Reducing the inequality gap measured in terms of human development index (HDI) focusing on livelihoods locally through to national (bottom up) and reflective of past imbalances.

The above must be viewed in terms of the three apex priorities of reducing inequality, eradicating poverty and improved employment in line with the NDP's vision and enabling milestones of universal access to clean running water in the homes as well as the commitments made through the SDGs.

5.2. PRINCIPLES AND APPROACH

Eight principles have been identified to enable achievement of water security, and these are outlined below.

5.2.1. Source to sea across the water value chain

In articulating the water and sanitation value chain, water supply and use is considered from source to sea in a holistic or integrated manner with an indication of needs for conveyance systems that link to infrastructure requirements, financial flows and impacts at the lowest/local scale.

The framework is based on a holistic approach that considers the entire water cycle from source to sea, and back; and should put human influence on the water and *nutrient* cycle (environmental flows) at the centre[30]. In the South African context, this must as a matter of course include putting livelihoods and improvement of the country's majority at the forefront of all socio-economic development efforts. The moment this approach is taken; the transboundary aspect of water security gets logically incorporated across the value chain, as communities and society generally are not bounded by their geographic locations alone, but connected upstream and downstream of the value chains. A case in point is the ORASECOM's approach where both land and oceanic circulation are taken into account from Angola's Cabinda Province through to the Eastern Cape (Port Elizabeth) in South Africa[31]. Further, discussion and planning on projects such as the opportunities presented by the Zambezi and Congo Rivers, as well as desalination bring about a different narrative. This line of thought resonates with the fact that any large project funding for South Africa cannot be separated from the Southern African Customs Union (SACU) countries or Southern African Development Community (SADC).

This framework reflects key elements of an "*end-to-end water value chain"* consideration that will allow full beneficiation upstream and downstream of any project. A case in point would be the drive for Operation Phakisa[32] that aims at unlocking the oceans' economy in that water resource and provision of water and sanitation services development must be looked at as an integral part of the

[30] Conradin, K., (2012). World Natural Heritage Sites–Triggers for Sustainable Development Processes?

[31] ORASECOM (2013). From Source to Sea: Interactions between the Orange-Senqu River Basin and the Benguela Current Large Marine Ecosystem.

[32] https://www.operationphakisa.gov.za/Pages/Home.aspx.

marine integrated plan. Further, local water management must be considered within the context of socio-economic development and not just from a social perspective.

5.2.2. Long-term view based on scenario planning and associated risks

Water management generally takes a long-term view due to the nature of the resource. For instance, a typical large water resource development scheme generally takes 15 to 20 years from conception to first day of benefit realisation like water coming out of the tap. Further, the impact of such project will take several decades. Viewed in the context of the South African water situation of scarcity and uneven distribution, as well as impact of high climatic events, climate variability and change; it is critical that interventions and management need to be holistic and take into account the various supply and demand scenarios.

Planning for water security must by design go beyond the 2030 horizon reflected in the NDP. The various planning horizons should be accommodated for, depending on the objectives as well as the size of planned intervention.

5.2.3. Policy and Legislation as starting point

In line with the 1996 principles of the National Water Policy and the revised positions of the 2013/14 policy and legislation need to ensure focus and creation of enabling conditions. Reviewing of policies and legislation must be informed by the need to enable planning for water security and judicious management. The basic assumption in this regard is that until changes to policy and legislation are motivated for and carried out, water security planning, management and implementation must be based on the current policy and legislative regimes. That is why water security planning and implementation should form an integral part of IWRM. Changes to legislation or policy must be run as parallel processes to avoid unnecessary delay in implementation.

The institutional framework must be finalised within the shortest possible time, so that the policy and legislative regime is properly tested through implementation and not defeated or questioned before implementation to at least a 60 to 70 per cent level.

5.2.4. Nexus approach to planning, implementation and management

In simplest terms, nexus refers to a connection or series of connections within a particular system. Within the water context, it is recognised that water is central and in many respects a limiting factor in terms of energy, food, health, economy, etc. In the context of the Water Security Framework, focus is placed on the W-E-F nexus which refers to the interconnections that exist between the water, energy and food sectors. After the SDGs agenda was established by the United Nations (UN) in 2015, the W-E-F nexus activities were factored as part of the SDGs, especially goals 2, 6 and 7). Based on the decisions taken by the UN on the SDGs, various countries including South Africa are at various stages of driving the W-E-F nexus both at technical and policy levels.

The nexus approach to dealing with the SDGs provides a platform for a holistic and systems view that goes beyond access to water and sanitation services. In this way we are able to deal with the limits imposed by reality on the ground in terms of natural carrying capacity, human capability and financial constraints to ensure a balanced and sustainable availability of the resources. It is clear that the financial requirements, estimated at approximately one trillion rand over 10 years, to address the

challenges of water in South Africa cannot be seen in isolation and in all probability will come to nothing if all other issues are not addressed in a systematic and integrated manner.

5.2.5. Decision support from credible information and research results

Policy, planning and implementation decisions must be based on credible information and appropriate knowledge currently available. Every effort must be done to ensure data and information reliability.

Intellectual capital associated with full value chain in recognition of the importance of knowledge economy is essential. South Africa's capability to leverage this aspect in line with its positioning, especially in respect of infrastructure and socio-economic development is critical.

5.2.6. Mass balance approach to assessment and implementation

A mass balance approach to assessment and implementation is necessary to ensure that the spatial and temporal distribution of water effectively address the imbalances of the past on one hand and the social and economic needs in the long-term. Mass balance will ensure accounting for what happens through the water value chain. Continuous improvement through identification of risks and bottlenecks and provision of appropriate interventions and guidance needs to be taken into account.

Such assessment brings to the fore the notion of accounting for water which looks into water inflow, change in storage, depletion or process as well as outflow taking into account the quantitative and qualitative values. Water productivity has been studied over the years, especially in respect of agriculture normally represented in kg/m^3 or even monetarily in $\$/m^3$ and so on.

5.2.7. Accountability and clear roles and responsibility

A key concern highlighted by sector role players across the board has been the issue of accountability and clarity of roles and responsibilities. It has been observed that a greater part of the challenges in the water sector space generally is lack of accountability and consequence management. Generally, accountability refers to being able to accept responsibility for one's actions, whether it be good, bad or indifferent. Furthermore, accountability is critically linked to ethical behaviour and leadership and translates into the ability of individuals and institutions' ability to provide services as expected from various jurisdictional mandates. This is much more so for a highly technical and professional area of water management and service provision.

Appropriate checks and balance need to be developed in addition to the normal sectoral oversight, monitoring and evaluation. This is important given that mistakes and errors in development may have devastating impact on the country and society.

5.2.8. Total value chain ownership concept in context of the trusteeship doctrine

In South Africa the right of access to water is enshrined in the Constitution. The National Water Act empowers the National Government to be the trustee[33] of all the nation's water resources through the Minister. The Minister has a duty to regulate all water use for the benefit of all South Africans in a way that takes into account the public nature of water resources and the need to make sure that there is fair access to these resources, including redressing the past imbalances as they relate to beneficial use in the public interest. The framing of water security must take the above into account and the key recommendations embedded in the focus areas.

6. FRAMEWORK FOCUS AREAS

In order to address the various dimensions presented, focus areas were identified to guide the framing and implementation. Ten focus areas covering various dimensions of water security have been identified for the NWSF for South Africa based on the latest understanding of the national state of play and global trends, and aligned to the NDP vision and overall objectives. The focus areas are prefaced by a contextual overview covering five key aspects of water security, namely,

- The natural resource system – the hydrologic environment representing the physical resource endowment and the spatial and temporal dimentions as well as interconnectedness at local, national and international level;
- The socio-economic environment – taking into account aspects of water as an economic and a social good;
- The future environment – Risks and opportunities, including the implications for global climate change and associated transitions as they relate to water;
- Provision of water and sanitation services forming a greater part of conveyance systems and implications for national commitments;
- Administrative and institutional system which forms a greater part of enabling national water security.

The structural arrangement of the key focus areas is listed below.

6.1. Narrowing the inequality gap – water as an enabler

The first focus area addresses the issue of measurable improved livelihoods, human well-being and socio-economic impact of the total value chain from conception to impact in the short, medium and long-term.

[33] The NWA, Act 36, of 1998 s3 states that:

(1) as the public trustee of the nation's water resources the National Government, acting through the Minister, must ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all persons and in accordance with its constitutional mandate.

(2) Without limiting subsection (1), the Minister is ultimately responsible to ensure that water is allocated equitably and used beneficially in the public interest, while promoting environmental values.

(3) The National Government, acting through the Minister, has the power to regulate the use, flow and control of all water in the Republic.

A paradigm shift in thinking and approach is required so that future planning takes place within the new Water Security Framework that emphasises scenario-based planning with continuous measurement of impact both real and potential.

The World Bank[34] reports that the inequality gap in South Africa is high, persistent and has increased since 1994 and states that South Africa is one of the most unequal countries in the world. The GWP/OECD indicates that the goal of improving the material wealth of societies must be negotiated within the boundaries imposed by the availability of the water resource and balanced with the cultural and spiritual values of water. Sustainable economic growth, wealth and human well-being are at the heart of water security. Drags on growth are associated with compromised water security in that where water is reliable, economic opportunities are enhanced, whilst where it is unreliable or inadequate quality or where water related hazards are present there will be drags on growth.

It is necessary to urgently conduct an assessment of in-country economic water security as already recommended before taking into account the fact that although national and global assessments show South Africa being among the top in terms of policies and intervention programmes, it is among the highest in terms of inequality.

6.2. Infrastructure and Finance- Ensuring financial sustainability

Financial sustainability is highly dependent on financial flows and sustainability is linked to investment in infrastructure and the associated interdependency with socio-economic development in the water sector. Infrastructure and associated conveyance systems comprise the largest proportion of financial resources and can make or break the country's water security beyond absence or abundance.

Water management and provision of services is a costly business irrespective of the mode of mobilisation of funding resources. Water projects tend to be indivisible and capital-intensive, and South Africa like many countries has major backlogs in developing water infrastructure. There is a need for innovative and smart national and international financing approaches as well as appropriate incentives to achieve development goals. Financial resources need also be allocated to public sector financing e.g. for the management of the resource, not only the water services. Therefore, full value chain of infrastructure requirements, financing, including its impact on institutional alignment, financial flows etc. need to be clearly articulated as part of planning for water security.

Ensuring that projects are funded effectively from conception to execution through to outcome and impact needs to be clearly articulated to ensure effective implementation. Most importantly, the financial flows and sustainability are critical as the projects on water tend to be interconnected with almost every other sector, especially in context of South Africa where water availability challenge is a reality due to the centrality of water.

[34] Sulla, V. and Zikhali, P., 2018. *Overcoming poverty and inequality in South Africa: An assessment of drivers, constraints and opportunities* (No. 124521, pp. 1-148). The World Bank.

Innovative ways of funding need to be found such as those similar to the Southern Africa Power Pool (SAPP)[35], which is recently being considered for repurposing as a model for water. Financial flows and decisions must be monitored and regulated appropriately with an emphasis on accountability (See Principle 7).

6.3. Diversifying water sources /alternative water sources/'new water'

In general, surface water from impoundments or dams as well as direct abstraction from the river systems account for most water available for use, 74 per cent of all water available in South African context, taking into account that a proportion of this is transboundary or from shared rivers in nature. 'Non-conventional water sources', which although currently seen as comprising a smaller proportion (up to 25 per cent), are critically important for socio-economic development and indications are that there is substantive opportunity for growth and contributing to water security.

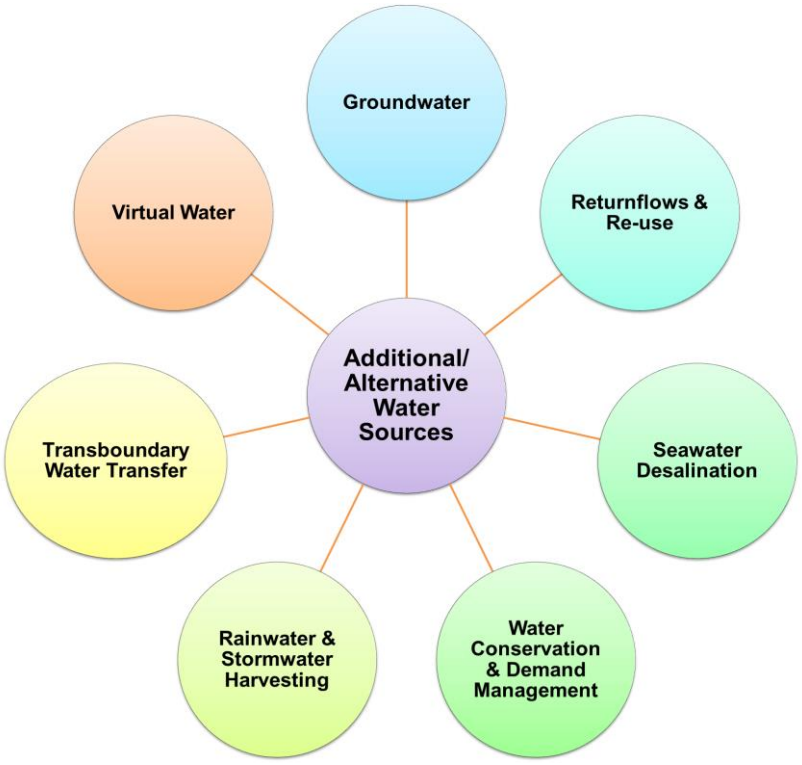

Figure 3. Additional alternative water sources

The NWSF focuses on the full water cycle, namely a so-called source-to-sea approach, as well as the notion of the circular economy which relates to the just transition and other considerations of climate change.

The primary purpose of the focus area is to look into integrating current national strategies on alternative water sources to supplement current and traditional water supply sources (Figure 3) from a point of view of strategic socio-economic development in the context of water and to ensure a balanced approach that looks at progressive realisation of national water security from local scale

[35] Wright, JG., John van Coller, J. 2018. Journal of Energy in Southern Africa 29(4): 37–50. DOI: http://dx.doi.org/10.17159/2413-3051/2018/v29i4a5581.

through to regional and global scale. It is also critical to look at "virtual" water as an additional category as this plays a critical role in respect of water security.

6.4. Water research, monitoring and information

This focus area is on water related information and research needed to ensure national water security by consolidating existing capacity from a functional, institutional and financing perspective. For water security to be guaranteed in the South African context and within reasonable scope, a specialised water intelligence centre, in the form of a shared service, should be considered. Cursory assessment has indicated that this will not require additional funding or new legislation.

The water policy developed since the dawn of democracy and subsequent legislation envisaged the need for information and made provision for this. For instance, water management as a system with tools such as NWRS and the associated Catchment Management Strategies (CMSs), Water Services Development Plans (WSDPs) as well as Integrated Development Plans (IDPs) is premised on the ability to assess the water resource base and the needs or demands every five years based on the information that is collected and assessed regularly. However, the ability to do this has significantly declined over time and most of the assessment is no longer systematic but ad hoc, disparate and largely under the control of consultants. To this end, an urgent need to create a sector-wide "water intelligence" capability through reorganisation of current configuration is critical. Such a facility must devote its time and resources to analysing the information and support the national planning and decision making across the board.

Research and development must be aimed at technological and systems improvement to help with improved water security and management in general.

Positioning water and sanitation monitoring, information and research to enable water security planning in South Africa includes the role of knowledge generating organisations in producing national research that addresses mega-nexus challenges in the medium- to long-term. The focus is on water monitoring, research, information and knowledge management.

6.5. Key nexus aspects of water

Water security is pivotal in other "security" areas like climate, energy, food, economy, human well-being etc.

In this theme, special focus is gives to agriculture, health, energy, climate change and mining in relation to access, cost or investment, economic and environmental foot-print among others.

In response to the global trend in adopting the W-E-F nexus approach, the NWSF considers the W-E-F nexus as part of the SDGs. Tackling these challenges requires coordinated efforts among different economic sectors, mostly water, energy and agriculture. The W-E-F nexus emphasises the inextricable linkages between the three sectors and that actions in one area often have impacts in one or both of the others.

The Water Security Framework therefore has a responsibility to raise awareness about the WEF nexus interlinkages and to create a platform for discussion of practical solution. The W-E-F nexus presents an opportunity to promote integrated planning in a sustainable manner. The translation of this knowledge into an actionable plan that can be adopted by policy makers remains the next frontier.

6.6. Ecological infrastructure and environmental flows

Ecological infrastructure is the network of natural lands, working landscapes and other open spaces that are the substructure or underlying foundation on which the continuance or growth of essential life-supporting and life-enhancing ecosystem goods and services depends. Environmental flows refer to the quantity, timing and quality of water flows required to sustain freshwater ecosystems and the human livelihoods and well-being that depends on these ecosystems. This is embedded in the South African water law.

The National Spatial Development Framework (NSDF)) makes reference to environmental infrastructure and flow in relation to environmental goods and services, socio-economic benefits and impact.

Quality of life is inescapably linked to environmental conditions and how they are affected by human activities. A key concept is that of ecosystem services – defined as the benefits people derive from natural processes, such as the delivery of clean water and air, the habitat for biodiversity and the provisioning of food and fibre. As the land surface and water bodies are progressively transformed due to climate change, land use change, resource extraction and pollution, the plotting of a sustainable path requires a deep and predictive knowledge of the underlying processes and their limits.

Human rights and the environment are inextricably linked through the right of every citizen to a clean, healthy and productive environment. Sustainable development implies universally meeting basic needs and extending everyone the opportunity to fulfil their aspirations to live in dignity. In this context integrated catchment management, which is a holistic approach focusing on both water and land management, is necessary to ensure the integrity of ecosystems. Whilst substantive work has been done such as determination of the reserve at national level, and the implementation of programmes run by individual organisations, integrated catchment management has largely been hampered by the lack of a coordinated effort resulting from catchment management agencies not being established at the envisaged rate and CMSs not being properly developed.

In order to ensure water security, valuing (measuring) ecosystems services as an economic part of water infrastructure has become essential and must be incorporated in the assessment of the extent to which the water security is achieved. Ecological infrastructure is the stock of assets that deliver these services. As the land surface and water bodies are progressively modified due to land use change, resource extraction and pollution, and other pressures and threats such as invasive alien species and climate change, the ability of ecosystems to provide services and benefits to people can become compromised.

SWSAs are core element of water-related ecological infrastructure. They are the 10% of South Africa's land area that delivers 50% of our water, which in turn supports half the population and two-thirds of the economy. SWSAs for surface water and for groundwater have been identified and mapped based on best available science. Ensuring their ecological integrity can make a major contribution to water security.

Like built infrastructure, ecological infrastructure needs active maintenance and management, and in some cases rehabilitation or restoration which also contributes to job creation. However, because ecological infrastructure is seen as 'free', its true value is often under-appreciated and not taken sufficiently into account in planning and decision-making.

6.7. Water and spatial planning

This focus area considers the key elements of spatial planning and how this is intricately linked to water security both historically and into the future. This is also related to the movement of people, goods and services and in turn socio-economic development. In considering this focus area questions need to be asked regarding the extent to which we are able to seriously look into developmental planning.

The focus area proposes a paradigm shift from past planning practices.

Going forward, bold decisions need to be made in respect of spatial planning and find a way to highlight issues as they relate to water especially given the many examples within the water sector in respect of flaws brought by apartheid spatial planning. To this end is important that the NWSF is anchored on the NSDF. Critical to note is that the success of the NWSF is dependent on the success of the implementation of the NSDF

6.8. Enabling the water security planning and implementation

This area has been identified to focus on, among others, issues of governance, policy and legislation, investment in human capital as well as institutional setting in terms of country readiness to ensure water security, especially within the nexus context. For the NWSF implementation to be successful, institutions must be created without delay. In order to enable planning for and implementing programmes to ensure water security, mechanisms need to be in place to address institutional, regulatory and policy requirements and implications.

Institutionally speaking the water sector management is generally based on multilevel governance and relations between water resources on one hand and provision of water and sanitation services on the other. The interdependencies of various levels make water management a seemingly straightforward set up yet it is highly complex despite globally accepted general practices. Institutional configuration can often make or break the implementation of the water programmes as evident from recent developments in South Africa were policy and legislation are regarded as among the very best and at cutting edge, yet implementation remains elusive.

Parliamentary proceedings through the Portfolio Committee on Water and Sanitation as well as Standing Committee on Public Accounts (SCOPA) are a case in point where issues of poor governance became apparent when corruption, incompetence and lack of accountability were identified as key problems currently.

It is for this reason that the NWSF must seek to clarify the institutional framing and ensure that the roles and responsibilities are articulated upfront at different levels of scale and across the full water value chain. That will ensure a focussed intervention that takes into account the respective roles in the value chain.

The approach must include enabling water security through:

- effective institutional arrangements;
- effective water management and governance; and
- capacity building and requisite skills development.
- Fighting corruption and ensuring fiscal management.

The skills requirements and strategy need to be re-evaluated in context of the NDP's commitment to building capable state. From the water sector perspective there has not been a careful assessment of skills needs other than commitments made in the NWRS2.

6.9. Managing water risks – promoting preparedness, building resilience and effectively respond and recover from water shocks

Water-related risks arise from too much water, too little water, or polluted water. These extreme that manifest in the form of occurrence of floods and droughts are expected to increase with a changing climate, and as the Intergovernmental Panel on Climate Change (IPCC) predicting these water-related disasters to increase in both frequency and severity, as the entire global water cycle is affected by global warming.

Droughts and floods are prevalent hazards in South Africa. Recent climate variability scenarios suggest that there will be an increase in the frequency of extreme weather events. Drought has been gripping the country since 2015. Many parts of South Africa experienced the worst drought since 1921. Whilst rainfall brought much relief, it did not dissipate the drought completely and indeed some areas in the county still experience significant dry conditions and water scarcity. There is a need to recognise that water is not an unlimited resource. The prolonged drought situation is already having significant impacts on economic growth and on the well-being of everyone in the country. These impacts will be exacerbated if the water crisis is not addressed. When floods occur after droughts, the impact may become even more pronounced.

We are compelled to build resilience to ensure that South Africa is better positioned to absorb future impacts caused by water shocks and to manage water risks more effectively and efficiently.

The 2019 Global Assessment Report lists global warming, growing populations, income inequality, environmental degradation and agricultural limitations as contextual risks that through stressors such as droughts, heat waves, international trade complexity etc. result (suddenly or gradually) in systemic failures in a society which increases their vulnerability, especially to disasters. There is a need for adaptive and integrative plans to reduce disaster risks with bottom up processes supported by top to bottom measures.

Water management and development strategies have a pivotal role in reducing the exposure and vulnerability of people and assets to water-related extremes.

The National Disaster Management Centre (NDMC) promotes an integrated and co-ordinated system of disaster management with special emphasis on Disaster Risk Reduction, particularly through various institutional and programme interventions across all sectors. The NDMC is established as a presidentially assigned function to a Cabinet Member.

Water is key in managing disaster and addressing climate change impacts, because water is the medium through which most climate impacts and many disasters such as droughts and floods are manifest. To recognise this reality and to respond accordingly is essential. It also presents several development opportunities. Various adaptation measures that respond to climate variability, and build upon existing land and water management practices, have the potential to strengthen the

resilience of vulnerable communities to climate change and to ensure water security, and thus directly contribute to sustainable development and the SDG's. Innovative technological practices and implementation of strategies at the appropriate levels are necessary measures to address the needs of adapting to climate change and variability, while at the same time managing water risks through enhancing preparedness and building resilience. Where adaptation responses are insufficient there is also a need to address loss and damage related to impacts such as water-related disasters.

Some of the key actions/ outcomes that are required to manage water risks include the following:

- At-risk communities need to implement hazard-specific early warning systems and evaluate effectiveness of their systems with respect to lead time and accuracy of forecasts and efficiency of dissemination.
- Understand trends in water related disaster impacts and ability to make informed decisions as to investments in disaster risk reduction, preparedness and building resilience is essential.
- Leaders must be aware of the impact of disasters to vulnerable groups and must tailor policies to address the specific root causes of vulnerability (including water insecurity).
- SA needs to reduce economic losses and improve livelihoods for vulnerable communities.

Disaster risk reduction and water security are essentially not water sector issues *sensu stricto*, but societal issues. Encouraging all sectors to consider water risks in their policies and planning is the only way to ensure water-related disaster risk reduction. We need a "all of society" approach to prevent the creation of new risks; reduce existing risk; and increase resilience to withstand residual risk.

There is a need to strengthen the capacity of disaster management across the spheres of government to ensure that South Africa promotes and strengthens water disaster risk governance, invest in water disaster risk reduction to build resilience, enhance water disaster emergency preparedness for effective response and building back better in recovery (rehabilitation and reconstruction) to recover from water shocks. A capable, resourced and well-equipped NDMC is fundamental for the country to effectively implement disaster management services.

From a water security perspective, the OECD risk assessment methodology has been identified as among the tools to be used for risk assessment.

6.10. Communication and stakeholder engagement

Before aiming to engage and influence stakeholders, it is crucial to seek to understand the people you will be working with and relying on throughout the phases of the implementation process. Sharing information with stakeholders is important, but it is equally important to gather information about the stakeholders and conduct a proper stakeholder analysis.

Communication and stakeholder engagement is about two-way communication and an open dialogue – the process must ensure that the NWSF speaks to, listens to and collaborates with stakeholders to motivate, educate and reach the best possible outcomes for the NWSF in a way that promotes co-development of solutions and actions that are required for implementation with responsibility, ownership and accountability across the board. The communication and stakeholder engagement should link to other areas in the NDP implementation process.

This focus area is required to be aligned with needs of other streams and to ensure that the necessary paradigm shift on planning for water security is internalised throughout the value chain and across various role players.

The communication and stakeholder engagement strategy must enable key stakeholders to actively engage with each other, with the wider public and with organisations that have the responsibility for carrying out activities related to water security at different institutional levels. In the context of the Water Security Framework, this must be seen to be more than exchanging and sharing information, knowledge experience and views; but also involve debate, negotiation and joint learning that have the potential to build trust and social capital away from anecdotal to evidence-based decisions. Key to this is that ensuring water security will require serious and difficult trade-offs that will ensure proper pathways to a water secure South Africa.

Communication and stakeholder engagement, whilst a separate process at NDP as a whole, efforts must be made for messages not to be crossed with the line Departments within government generally or other social partners as they play a critical role in the implementation and holding each other accountable.

The following principles will be applied during the stakeholder engagement process:

- Invest in careful planning before engaging stakeholders;
- Identify and build stakeholder relationships to increase confidence across the relevant sectors, minimise uncertainty, and speed up problem-solving and decision-making. Where there is trust, people work together more easily and effectively;
- Consult early and often;
- On-going and regular communication;
- Maintain a productive relationship throughout the process;
- Use foresight to anticipate misunderstandings, and take simple and timely actions with stakeholders to significantly improve delivery;
- Stakeholders are important influential resources and should be treated as potential sources of risk and opportunity within the project;
- Manage stakeholders' expectations and priorities; and finally
- Manage roles and responsibilities by providing clarity about what is expected of people involved in the process.

In respect of communications planning, developing, sharing and maintaining a stakeholder engagement strategy and communications plan is important throughout the process. It is important to update plans, seek stakeholder feedback about the value of communications and adapt plans to reflect stakeholder changes, feedback and progress.

7. OVERSIGHT, MONITORING AND EVALUATION

Focus area on water research, monitoring and information has highlighted the challenges related to data and information on the status of the country’s water resources in support of the various aspect of water security from the hydrologic environment, socio-economic environment, risks and opportunities, through to administrative and institutional dimension. Appropriate analysis at national

level is required that is primarily focussed on the oversight and performance evaluation from a water security perspective to ensure long term focus and continued adaptation to the best possible solutions.

Water security has spatial and temporal dimensions. Spatially it can range from individual family unit to a community or village, town, district, province, country level or continental. It can vary from spatial unit to another or seasonally to a year, a decade or century. The framework for monitoring and evaluation must therefore take these dimensions into account.

From a water security perspective, immediate interventions needed include the development of a monitoring and evaluation (M&E) system that will include development of indicators at outcome and impact level in order to monitor and evaluate programmes beyond processes. The M&E system is aimed at focusing on whether policy and legislation are producing the correct enabling environment; whether the national objectives articulated through the NDP and the Water Security Framework are being achieved; whether delegation of powers within the sector is effective and responsibilities that the president delegates to the minister, who in turn delegates to the institutions that report to him/her are performed. It is further expected to take a view that monitors the contribution of other social partners like the private sector; labour, practitioners etc. are playing their respective roles which include accountability and ownership of failures and successes.

Three criteria will drive the monitoring of water-related planning and implementation at NDP level, namely: economic growth (measured by GDP) growth contributed by or through water); eliminating or reducing the inequality gap (measured in terms of human development index); and poverty reduction, addressing inequality and unemployment.

A framework for water security assessment for South Africa is proposed and the initial metrics developed further as part of regular review of the NWSF development and implementation.

8. SUMARRY RECOMMENDATIONS AND NEXT STEPS

South Africa's water legislation gives correct and clear guidance on water management, but implementation has been weak. Therefore, a clear understanding of roles and responsibilities and difficulties in implementation is urgently required. In framing and planning the water security journey, cognisance is given to difficulty that comes with disrupting the status quo and the associated need to invest in paradigm shifts, as well as building the necessary momentum for change. Accordingly, the framework is expressed in a manner that allows for a possible phased approach that takes into account the urgency to deal with the low hanging fruits such as urgently implementing the legislation and commitments made through the various strategies. This includes making immediate decisions that do not require any addition resource capacity except delegated authority or other forms of convening capital associated with jurisdictional mandates from government through to private sector and other social partners.

A number of recommendations are summarised below and potential steps required to take the country on the path to water security in the immediate term:

- Assessing and taking stock of current difficulty in implementing policies and programmes. If relevant, mitigation measures should be identified for potential difficulties in implementations;

- Roll-out of the national framework to guide national processes and provide a long-term view of ensuring water security, including immediate process to develop the second edition of the Framework as a living document;
- Positioning of the effective implementation of the framework by creating a centre of water intelligence, taking into account the importance of water in all aspects of human life, especially for the South African conditions. This will further involve development and refinement of national indicators on water security and redirecting the various institutions mandated to carry out the water business, including stakeholders, public and private sectors as well as citizens;
- Creating a planning and monitoring framework that is robust to ensure that water-related risks are avoided or mitigated;
- Setting up a consultation process, during development and execution, taking all role players and stakeholders along through a participatory process without losing focus on the apex priorities espoused in the NDP;
- An assessment framework is proposed with indicators aimed at addressing the full spectrum of water security considerations that are in line with the identified key apex priorities. Water is seen as cross-cutting in all aspects of human life and the NWSF is set to address this.
- Aligning local government legislation and national legislation;
- Unpacking roles and responsibilities of all role players from the line department, institutions, private sector and other social partners;
- Given the lessons over the past 20 years since the National Water Policy and subsequent individual work done by the Department and researchers from across the country as well as internationally, further detailed assessments need to be done within 12 to 24 months. The key for this would be to consolidate what has been learnt and ensure that the amendments address the shortcomings.
- It is evident that one of the key risks in the sector is the enabling environment for water security. It is therefore important to immediately implement the institutional framework by establishing the institutions for water management without delay, especially those that have been debated and even gazetted.
- Continuous and managed consultation process both during the development of framework and execution taking all role players.

This framework is the first of its kind in South Africa and meant to bring a fresh, internationally-legitimised, and inclusive approach to assessing and addressing South Africa's challenges and opportunities for managing its water resources and provision of services to harness benefits and mitigate risks.

It is clear that SA is world class with legislation, policy, strategy and planning, but is poor with implementation of these. In fact, it is well accepted that the situation of water management and provision of water and sanitation services have deteriorated instead of improved. It is due to this lack of implementation and emerging challenges like climate change, infrastructure deterioration and massive urbanisation amongst others, that water security is now under threat, and that it requires a

systematic and carefully considered intervention not only to stop-gap immediate challenges in the short term, but also to ensure water security in the long term. The framework provides an opportunity to ensure that water takes its rightful place as an enabler to uplift communities, reduce the economic inequality gap, stimulate economic growth and create wealth. It has huge potential to positively influence other sectors of the economy including health, education, crime prevention, mining, industry, tourism, finance, environment, security, etc. in different ways.