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Sustainable Water Resources Management (2024) 10:69
https://doi.org/10.1007/s40899-024-01040-3

ORIGINAL ARTICLE

Overcoming systemic and institutional challenges in policy implementation in South Africa's water sector

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Received: 3 June 2023 / Accepted: 10 January 2024
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Abstract

The water sector in South Africa is faced with numerous challenges, among which include; increased flooding and prolonged droughts caused by increased climate variability, rapid population growth, unsustainable water demands and withdrawals by various water users, deficiencies in institutional management and infrastructural maintenance, lack of political will with accompanying high levels of corruption and steady deteriorations in all sub-sectors of the economy. Other significant challenges include provision of water in rural communities, water pollution especially from poorly operated wastewater treatments works, acid mine drainage, nutrients from agriculture, siltation of dams. A combination of these factors has led to high levels of water scarcity and an immense burden on the water supply. However, it must be noted that in 1994, South Africa (SA) embarked on developing numerous policies and strategies to address water challenges. While some levels of success have been achieved in terms of policy formulation, there is, however, a lack of comprehensive coordination and synergy that cut across the broad objectives of these policies in meeting environmental, social and economic targets and aspirations. Additionally, the implementation of the policies and programmes is stalled by structural, systemic and institutional factors, coupled with new challenges arising from climatic variabilities. Using a combination of qualitative and quantitative methods together with rapid appraisal of existing literature, we explore systemic and institutional factors impeding the implementation of policies and strategies designed to drive South Africa's water sector as envisaged within the National Development Plan of 2012. We argue that the water sector is faced with multifarious and interweaving challenges such as inadequate human capital, changes in climatic conditions, limited financial resources, infrastructural deficiencies largely linked to poor urban planning and rapid growth of informal settlements, rampant corruption and mismanagement, lack of stakeholders' involvement and compartmentalisation of institutions. This paper, therefore, recommends a community-based approach that enforces transparency and the participation of civil society, cross-sectoral cooperation and a broad range of stakeholders and decentralisation of policy implementation strategies.

Keywords Policies · Water management · Livelihoods · Sustainability · National Development

Introduction

Globally, there have been significant and extensive advancements in the development of policies, legislative systems, and structures such as Water Management Information Systems (WMIS), water recycling and reuse, water efficiency standard, desalination, water rights and governance, policy reforms and integrated water management to enhance the administration of water resources (Makanda et al. 2022). These developments have been necessitated by the myriad of challenges that engulf water resource management, including climatic variabilities and influence and institutional and policy deficiencies. While the water management concept long predates modern discussions, understanding water

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Published online: 05 March 2024

management and governance as a public policy remains a comparatively modern phenomenon (Dirwai et al. 2021). In many countries across the globe notably in Sub-Saharan Africa, Latin America and parts of Southeast Asia and Middle East, the policies and legislations for managing water resources are at the policy debate stage rather than the implementation phase. The fundamental occurrence in these countries is either a lack of progress in developing the right policies to manage water resources or the constraints in implementing existing policies and legislation to meet the growing demand for water resources (Cosgrove and Loucks 2015). Although there has been progress in some developed countries in implementing policies that meet present and future water demand, the majority of developing countries including South Africa are constrained by systemic and structural barriers in executing strategies to meet the provision of water resources or operationalise infrastructure systems that are already stressed. In developed countries, the involvement of private operators in the extraction of water from different sources, purifying and treating wastewater and seawater has advanced, and awareness of the consequences of policy gaps has provided the drive for creativity and solution-driven programmes, including public and private partnerships (Voulvoulis and Giakoumis 2018). Notwithstanding some successes in terms of access to potable water post the adoption of Sustainable Development Goals, the overall access, quality and sustainable supply of water remain a major concern (Weststrate et al. 2018). Numerous related barriers present constraints to the execution of policies and strategies in water management across the world, especially in Africa. These constraints entail the absence of political will and shareholder support, inadequate capacity and resources in water administration, weaknesses of institutions tasked with monitoring and evaluating policy requirements, and conflicting interests among global players and corporations (Tebele 2016).

South Africa is not immune to these alarming constraints after it became a democratic society in 1994; the government introduced and implemented several water policies and strategies intended at establishing dependable and sustainable water provision, enhancing the quantity and quality of water access to the country's inhabitants, especially to the previously deprived black population. Whereas these strategies guaranteed increased access to clean and safe water to households, which soared substantially from 61.7% from 2002 to 88.7% in 2021. Nonetheless, data from the Department of Water and Sanitation (DWS), as well as Statistics South Africa (StatsSA 2022), exposed that over 3.4 million households in the country have no access to consistent water provision, with 14.1 million of the population still using sanitation services below the Reconstruction Development Programmes (RDP) benchmark (Jamieson et al. 2017; Pengelly 2017; Wilkinson 2018). Additionally, Montmasson-Clair et al. (2022) and StatsSA (2022) specified that despite these notable improvements, access to water actually declined in six provinces between 2002 and 2021 with largest declined observed in Limpopo (– 4.4 percentage points), Mpumalanga (– 4.3 percentage points), North West (– 2.2 percentage points) and Free State (– 2.0 percentage). Furthermore, it was argued by Smith et al. (2022) that nearly 56% of the 1150 municipal wastewater treatment works (WWTWs) and more than 44% of 962 Water Treatment Work (WTWs) in South Africa are in dire or critical states and require urgent attention and expert hands, while more than 11% of this infrastructure is totally beyond repairs. The fundamental causes of these challenges are the lack of guidelines and the capacity to implement water management strategies with exception of Usuthu-Inkomati and Breede Overberg (WMAs) (Molobela and Sinha 2011; Knuppe 2011). Seppala (2002) alluded that while the policy statements are well-defined, the action plans to implement the policy are often unworkable and impractical. Seppala (2002) further highlighted that appropriate and systemic policies may not be effective at operational levels due to several impediments at implementation levels. Abrams (2000) identified some of these constraints as inadequate of inadequate and financial resources. In addition, South Africa's water policy implementation is hindered by excessive government involvement and administrative control, outdated institutional arrangement, fragmentation and poorly coordinated water administration, over-reliance on consultants as well as inadequate capacity, funding, information and accountability Molobela and Sinha (2011); OECD (2015); and Anderson and Guppy (2017) highlighted that South Africa's water policy implementation is hindered by excessive government involvement and administrative control, outdated institutional arrangement, fragmentation and poorly coordinated water administration, over-reliance on consultants as well as inadequate capacity, funding, information and accountability.

As a result of this predicament, several commentators working on these complex issues advocate the development of a systematic and integrated approach to facilitate the implementation of holistic policies and strategies that promote sustainable management of water resources. For instance, Weaver (2017) recommended developing and enforcing a useful concept, such as Strategic Adaptive Management Plans. Mackay et al. (2003) proposed a basic road map for the adaptive process. Their theory proposes a cycle of learning, gathering experiences, and implementing phases. Makaya et al. (2020) and Folifac (2010), on the other hand, advocated for broad participation that encompasses all stakeholders in water management, while Mwendera (2003) suggested that policy implementers should place emphasis on water demand management and foster a cross-cutting approach to water governance. Despite these burgeoning theories and works of literature in the past 2 decades, less

literature exists on pragmatic factors hindering policy implementation in South Africa after 1994. In light of these gaps, this paper explores the systemic, structural and institutional obstacles to policy implementation under the following objectives: (i) institutional and governance constraints to policy implementation, (ii) resource and capacity barriers, (iii) alternative strategies to enhance policy execution in the Department of Water and Sanitation. The rest of the paper unfolds as follows: Sect. "Literature Reviews on Policies and Programmes in South Africa" contains literature on policies and programmes regulating water management in South Africa and impediments to policy implementation, Sect. "Methodology" elaborates on the approaches of carrying out research, Sect. "Empirical Evidence and Analysis" deals with the empirical findings and discussions, and finally, Sect. "Analysis and Discussion" component elucidates the conclusion and recommendations of the paper.

Literature reviews on policies and programmes in South Africa

An overview of water policies and regulations in South Africa post-apartheid

Post 1994, the government made significant changes to the country's water resources regulations (Mackay et al. 2003). A major transformation in the sector includes; the nationalisation of water in the country thus, replacing the riparian rights with licences for water use, the allocation of water for specific use by the environment that ensure sustainability and Ecological Reserve, and the fundamental right which guaranteed 25L per person or 200L per household per day for eating, drinking and basic hygiene is the Basic Human Needs Reserve (Molobela and Sinha 2011). Freedman (2014) opined that the country's new constitution creates multilevel water governance, local, provincial, and national and converse sets of responsibilities in each government sphere in water management. The national government has legislative and executive authority over all freshwater resources, while the local government is meant to structure and manage all aspects of providing water services, including administration, budgeting, and planning (Toxopeus et al. 2019).

Many scholars and literature, including Maphela and Cloete (2020), Mogomotsi (2018) and Adom and Simatele (2021), postulate that two main umbrella Acts that govern South Africa's water sector: the National Water Act (36 of 1998) with stresses on the water as a resource and converses the responsibilities and rights on the Department of Water and Sanitation (DWS) and the minister with powers and authority of custodian and the Water Services Act (103 of 1997) controls access to and delivery of water as a service. At its core, the Water Services Act seeks to provide the constitutional mandate of providing access to water necessary to meet basic human needs and sanitation. This responsibility falls to the local government (with some oversight from the Department of Cooperative Governance and Traditional Affairs [CoGTA]). The two Acts, WSA and NWA govern municipal structures and systems, which are important because they confer certain responsibilities to municipalities. The National Water Resource Strategy (NWRS, 2004, 2013 and 2020) provides the framework for protecting, using, developing, conserving, managing, and controlling water resources for the whole country (Nkondo et al. 2012). This strategy further seeks to provide guidelines for managing water at provincial, regional or catchment levels in the defined water management areas (Meissner 2016). Table 1 summarises the policies and legislation of the water sector in South Africa post-1994.

While the legislation, policies, and regulations sound good and contain innovative strategies for meeting sustainable water resources management, water scarcity, social equity and economic development significant challenges are associated with implementing the programmes. Many commentators and literature, including Maphela and Cloete (2020) and Mackay et al. (2003), believed that the implications of failing to implement these policies have contributed to wider social and economic setbacks for the country.

An Overview of Integrated Water Resource Management (IWRM) in South Africa's Context

Integrated Water Resource Management (IWRM) is a comprehensive strategy that inculcate the principles outlined in the Dublin Statement on Water and Sustainable Development (Dirwai et al. 2021). The Dublin principles stress that water is a finite and vulnerable resources that must be managed sustainably to meet the needs of the current generation without compromising future needs and requirements (Qureshi 2021). Falconi et al. (2017) opined that the principles emphasis on participatory approach on water governance and management where all stakeholders particularly women are involved in decision-making processes. Similarly, Katko (2023) disclosed that IWRM recognises the critical role women play in the provision, management and safeguarding water resources as well as capacity building of women, while at the same time promoting feminist sensitive policies in water administration globally. Additionally, the IWRM stresses that water be regarded as an economic good rather than a common commodity that must be exploited (Zisopoulou and Panagoulia 2021). Similarly, Berbel and Exposito (2020) postulates that IWRM promotes water pricing water, value and scarcity of the commodity, cost recovery strategies, infrastructure maintenance as well as market-based approaches that include water trading and

Table 1 Water legislation, policies, NWRM 2020, and bills passed post-1994

Year Promulgated	Name of Act/Legislation	Framework	Relation to water security
1996 (Dec)	Constitution of the Republic of South Africa (Act 108 of 1996)	Legislation	The supreme law of SA embraces human rights principles and sets forth the right of access to water as part of a list of social and economic rights. These include the right to a healthy environment, housing, health care, food, security, education, and culture
1997 (Dec)	Water Services Act 108 of 1997	Legislation	To provide for the right to access water for basic human needs and sanitation
1998 (Aug)	National Water Act 36 of 1998	Legislation	The Act recognises that water in SA is scarce and unevenly distributed and belongs to all; and that the government is responsible for water resources and their allocation. This should be managed in a sustainable way by means of, inter alia, an integrated water catchment management of all water resources and, where appropriate, the delegation of management functions to a regional or catchment level to enable everyone to participate. It also legislates how the water resource is protected and how a municipality may return effluent and other wastewater back to the water resource
2004 (Sept.)	National Water Resource Strategy 2004	Strategy	To provide a comprehensive framework for guiding water management and development in South Africa. It also seeks to lay the foundation for subsequent water policies and strategies in the country, focusing on the responsible and sustainable use of water resources and to ensure water security for all citizens
2013 (June)	National Water Resources Strategy 2013	Strategy	To address the water challenges and accommodate management interventions in a structured manner, the various identified interventions have been clustered into logical and meaningful overarching strategies Provides a framework for the protection, use, development, conservation, management, and control of water resources for the whole country (DWA 2013:35)
2021 (September)	National Water and Sanitation Master Plan	Policy	Legal framework for the sustainable management of water resources and the provision of water and sanitation services in the country and to provide all South Africans with access to safe and reliable water supply and sanitation services, including vulnerable and underserved communities

Sources: Constitution (1996), van Koppen and Schreiner (2015), Tempelhoff (2016)

water markets. Meran et al. (2020) opined that in promoting commodification and value of the resources nonetheless subsidies must be granted to vulnerable and disadvantaged group whose water access and sanitation must be maintained promoted, however, efficiency and conservation must be enforced. Similar arguments were also advanced by Katusiime and Schutt (2020); Meran et al. (2020) that IWRM promotes inclusive planning, water quality, efficient use of water for food production and industries, pollution control, ecosystem protection, equitable allocation of the resources, conflict resolution, adaptive management, collaborative policies and regulations, capacity building, public education and awareness as well as effective management of water catchment areas.

While IWRM sound good theoretically with well-defined objectives of enhancing water governance and improve water security globally, the implementation of this strategy is severely constrained by institutional, structural and capacity challenges (Fulazzaky 2014). Agarwal (2000), Kirschke et al. (2017) identified some of these challenges as; national sovereignty, political conflicts, inadequate resources, data gaps, climate change impacts, socio-economic inequalities, legal frameworks, cultural factors, global governance deficiencies, conflicting stakeholder interests, and the lengthy implementation timeline.

Integrated Water Resources Management principles, vision and purpose in South Africa is not different from the global perspective. IWRM is a fundamental approach that lies at the heart of sustainable water management in South Africa due to the complex and diverse water challenges in the country (Dirwai et al. 2021). Post-apartheid the country adopted the principles of IWRM as guideline of safeguarding this precious resource for current and future generations (Meran et al. 2020). Similarly, Russo et al. (2014) opined that IWRM is an important and integral component of sustainable development and stands comparable to the sustainability theory. This concept demands meeting water requirements for every water consumer without negatively

impacting on the scarce water reserves (Cole et al. 2018). Stated more precisely, Cardwell et al. (2006: 14) defined IWRM as "a process that promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and ways for stakeholders to meet their water needs". Similarly, Haigh et al. (2010: 13) described the "IWRM means a move away from traditional sub-sector-based approaches (e.g. WATSAN, irrigation, industry) to a more holistic or integrated approach to water management that is based on a set of agreed key principles". It is a concept grounded on the principle that water resource is a critical and important constituent to human sustenance, ecological sustainability, economic and social good (Loucks et al. 2009). Moreover, IWRM includes allocating the resources equitably among different and contending goals and consumers (Russo et al. 2014). Furthermore, IWRM promotes coordination between basic human needs while stressing on economic, social and environmental sectors in an equitable manner, without compromising the sustainability of ecosystems and the use by future generations (Gonzales and Ajami 2017). Moreover, Martinez-Santos et al. (2014) opined that IWRM is a concept that multi-dimensional, integrating physical, chemical, biological, economic and cultural elements that seek to promote effective management of as wetlands, streams, rivers, lakes, coastal oceans and other water assets. IWRM contends that the mainstream, cross-sectoral amalgamation, macroeconomic effects, coordinated decision-making, policy on economic development, stakeholders' engagement, and water conservation are indispensable ingredients that must be considered cooperatively in sustainable water management (Cardwell et al. 2006).

Over the past 2 decades, in line with the new democratic governance, South Africa introduced reforms of water legislations guided by the ideologies of "equity, efficiency, sustainability and representativeness" driven by IWRM in South Africa (Mehta et al. 2016). Blackmore (2015: 9) pressed that "IWRM is an explicit policy document related to the biological and physical structures that are supported by a robust legal framework, among them include the1996 Constitution, the National Environmental Management Act (NEMA Act 107) of 1998, the National Water Act 36 of 1998 the Biodiversity Act 10 of 2004, the National Environmental Management: Protected Area Act 57 of 2003 (NEMPAA) and the Water Services Act 108 of 1997 (WSA)". These Acts and legislation call for a stringent, coordinated strategy to stimulate the execution of appropriate environmental managerial instruments to ensure the integration of initiatives and measures in managing the environment and water resources (Leendertse et al., 2008). IWRM is considered as the core legal instrument associated with management of water resources in the country (Butterworth 2010). The fundamental aim of IWRM is to guarantee the efficient use of water in the interest of the public, with the basic principles of efficiency and equity, sustainable use of water, and equal representation of interest (Butterworth 2010). The concept stipulates a legal context to which water and sanitation services must be provided to the population with emphasis on affordability and accessibility. Similarly, the programme articulates how local administration, through the municipalities, must carry out their responsibility to provide water and sanitation services to their residents (SAHRC 2014).

Notwithstanding the significant and the integration of the IWRM concept into legislative and policy documents of South Africa as the guiding principle of administering water resources in the country including protecting, using, expanding, conserving, and managing the country's water resources, IWRM has not achieved the desired outcomes of improving water governance in the country mainly because of inadequate capacity and desire to enforce the policy (Katusiime and Schutt 2020). The World Bank (WB), a strong advocator and devotee of IWRM, concedes that the objective of the programme is inconsistent with realities and, for many scholars and commentators, the foremost barriers to the effective implementation of IWRM are the inadequate resources and scarcity of intellectual capabilities to drive the concept globally including South Africa. Grigg (2019) states that the idea is vague and characterised with theories that have no practical meaning and concrete direction. To support this argument, Molle (2008) describes IWRM as a "nirvana idea" or a theory model that pursues to harmonise and address many wishes, yet its ladened with contradictory objectives at the same time. Supporting these assertions, Acheampong et al. (2016) alluded that the philosophy of the IWRM are just processes of ambiguous and theories. In their views, IWRM is conflict-loaded and political slogans in water governance and water security to the population. Ashton (2013) disclosed that the IWRM in South Africa has failed to acknowledge one single establishment with a mandate to management land within the institutional setup. Conspicuously, the Department of Mineral Resources and Energy, and the various Environmental Institutions empowered in the administrative issues, have been either alienated or side-lined from the IWRM. Even though, these institutions are directly impacted by land and minerals issues (Monney et al. 2017). The limited roles of traditional leaders and grassroots organisations in land and water management are not justifiable considering the fact that the leadership of communities have significant control and dominance in land and water administration in the country. About 80 per cent of the country's land and water resources in the countryside are controlled by traditional leaders; they control, distribute and administer land (Mwendera 2003; Donnenfeld et al. 2018). Muller (2009: 69) questioned, "how then can any water policy or strategy be executed successfully in the

absence of these institutions in South Africa, a country with a high level of water scarcity?" The unavoidable mismatched nature of water distribution between competing uses and consumers has resulted in the contemporary inequalities of privileges and control among participants. These scuffles and illegitimate use of power by state officials fused into water distribution serve as significant obstacles to any execution of IWRM in South Africa (Munnik 2020; Roger et al. 2020). Furthermore, public participation and engagement, which are the foundation on which IWRM is built, have been reduced to public consultation and political activities (Malaza et al. 2019). Public participation in water management is based on a participatory approach, with decisions taken at the lowest level and that special attention given to the role of women (Van Koppen et al. 2020). South Africa is yet to execute an all-inclusive and a workable strategy to public participation in the context of water governance (Masiangoako et al. 2022). Haigh et al. (2010) opined that this problem is due to the fact that the actual need of communities is not prioritised. Van Koppen et al. (2020) disclosed that the lack of interest in community needs has led to poorly conceptualised, misdirected and often perceived as confusing by stakeholders of public participation programmes. Supporting these arguments, Dirwai et al. (2021) concurred that the lack of coordination between government and communities and poor decentralisation of water resources management has seriously jeopardised the principles of IWRM. In addition, implementing IWRM in the country is hindered by both capacity and funding challenges. The capacity challenges come in the form of human resources, expertise, and infrastructure remains a significant constraint. Designing and implementing IWRM to reach SDG targets requires resources and knowledge (Mollinga et al. 2008). Currently, South Africa does not have the adequate capacity to effectively provide technical and financial services to operationalise the IWRM principles (Claassen 2013).

Factors hindering the implementation of South Africa's water policies

The government of South Africa, post-1994, adopted an integrated and comprehensive strategy for sustainable development at the national government level (Haigh et al. 2010). This strategy was in pursuance of Sect. 24 of the South African Constitution and the NWA 36 of 1998, which advocate for ensuring a reliable and sufficient supply of water to meet the needs of the population, agriculture and industries (du Plessis 2018: 1848). The strategy embraced the right to environmental sustainability and the judicious use of natural resources while advocating reasonable economic and social advancement of societies (Makanda et al. 2022). This policy incorporated environmentally friendly, sustainable economic growth and social advancement (Haigh et al. 2010). Moreover, the policy led to the creation of the Department of Water and Sanitation (DWS) in 2014 previously the Department of Water Affairs and Forestry (DWAF), with an explicit mandate of implementing and enforcing the IWRM principles encapsulated within NWA in the country. Water is regarded as natural asset custodianship by the state. The NWA advocated for the creation of Catchment Management Agencies (CMAs). The creation of these organisations is to assign water resource administration to the local or catchment ranges and to involve communities in water management (Munnik 2020). Regrettably, the application of these policies and strategies is impeded by institutional and capacity constraints. Haigh et al. (2010) enumerated the impediments as inter alia inadequate human capacity to implement and enforce these strategies, especially at the local levels. Donnenfeld et al. (2018) alluded that the water sector in South Africa does not have enough qualified personnel, such as water engineers and water scientists, to monitor and evaluate water infrastructure development effectively. Secondly, policies are severely hindered by inadequate financial resources (Viljoen and Walt 2018). Similarly, Howes et al. (2017) indicated that insufficient or inadequate funding is a significant constraint to the water sector in South Africa. Viljoen and Walt (2018) believe South Africa needs R126 billion or R33 billion each year for the next 10 years to build and sustain new networks, replace and modernise the current water infrastructures and guarantee water security for the entire population. The shift from management to governance has resulted in more financial and managerial predicaments at the community level. Furthermore, the decentralisation policy was not complemented by political and financial empowerment in the local sphere of government (Haigh et al. 2010).

Institutional and governance challenges further stall the execution of water-related policies in the country. According to OECD (2015), water policies and programmes are fragmented across diverse institutions and levels of administration in the country, which often raises the question of vertical and horizontal harmonisation for the effective implementation of the policies. In addition, implementation strategies are carried out in "silos", which has jeopardised the execution of these policies (Donnenfeld et al. 2018). Other impediments entail political interferences, lack of accountability, lack of proper and clearly defined objectives, and weak structure of information circulation. Table 2 summarises the institutional and capacity constraints to policy implementation in the water department in South Africa.

Methodology

This paper employed an extensive review of literature complemented by the concurrent mixed method of quantitative and qualitative approaches to explore the systemic, structural and institutional barriers to the execution of policies and

Table 2 Policy implementation challenges in the water department

Impediment/Challenge	Explanation
Institutional impediment	Hesitancy to act, adequate harmonisation, inadequate institutional accountability and fragmentation of institutions
Political constraints	Policy or action interferes with national or individual interests, lack of stakeholders' engagements and interested parties, and absence of political responsibility and incentive
Strategic constraints	Lack of straightforward strategies and objectives, weak coordination of policies and activities among role-players and stakeholders
Planning insufficiencies	Lack of integrated planning, the nonexistence of both short and long-term opinions in planning, unattainable objectives and goals
Financial impediments	Lack of funding opportunities and fitting financial structures, unwillingness to pay for water services and high administration and infrastructural expenses
Human resource impediments	Inadequate of qualified and professional sector staff, but at the same time overstaffed, dearth of decision-making process, weak comprehension of complex and all-inclusive nature of decisions of strategies and lack of morale in the water sector
Information and communication impediments	Lack of precise, consistent, and adequate data and information, contradictory messages, poor coordination, dissemination of information and strategies and very few stakeholders at ground level know water resource management structures and what their rights are

Adapted from Seppala (2002: 206)

programmes in South Africa post-apartheid. The literature review and detailed assessment covering over 20 sources of academic publications, journals, media articles, book chapters, grey literature and government gazettes were solicited to obtain information involving various government policies, strategies, and regulations implemented in the democratic governance to address water challenges; the literature review also assisted in comparing implementation constraints in South Africa's water policies with other regional countries.

Extensive field trips were undertaken to households in Makanda (formerly Grahamstown), Bloemfontein, Cape Town and Pretoria to obtain first-hand data on water accessibility challenges to complement the information derived from the literature review. The choice of these sites were informed by water scarcity concerns, infrastructure and water management systems, health, socio-economic conditions associated to water resources as well as climate and environmental factors. A mixed-method survey grounded on quantitative and qualitative philosophies were employed concurrently in all these field surveys. This approach was well suited for the study due to its ability to harness robustness of the qualitative and quantitative methods, at the same time, complementary for the limitations of each method. In line with the pragmatic nature of the study, keenness to unearth institutional and structural challenges hindering policy implementation and to offer pragmatic strategies for improving the execution of policies and programmes, we earmarked specific institutions within four provinces in South Africa (Eastern Cape, Free State, Gauteng, and Western Cape) that are involved directly in the design and operationalisation of the policies and programmes daily. Specifically, these institutions include; the DWS, municipalities, academic institutions and Non-Governmental Organisations (NGOs). More importantly, we selected the four provinces due to their strategic locations in terms of their economic influence on the country, the massive backlogs in infrastructure development, frequent occurrences of water accessibility constraints due to climatic conditions and existing studies and data. Furthermore, we factor in the fast pace of population growth in the provinces. Based on latest statistical data from Statistics South Africa, these four provinces recorded the fastest growth rate of 1.52%, more than the national average of 1.28% (StatsSA 2017). Consequently, these population increases have contributed to dire water shortages in these provinces.

The participants from these institutions were purposively picked due to their deep knowledge, understanding and expertise in policy formulation and execution. We also considered the positions of respondents and their responsibilities in the field of water administration. Similarly, we conducted in-depth and semi-structured interviews in the form of face-to-face and telephonic interviews with three managers of (NGOs), namely: The International Water Management Institute (IWMI), Water Institute of Southern Africa (WISA) and Federation for Sustainable Environment (FSE). Additional interviews were also conducted with a lecturer and two postgraduate students at Rhodes University's Institute of Water Research to gain first-hand information on the factors hindering policy implementation and to assess the nature of political influence on policy executions, the role of stakeholders in policy implementation and identify strategies to overcome implementation challenges.

The quantitative data were obtained using a random sampling technique. A random sampling is a widely used technique in data collection for a research (Campbell, 2020). It involves selecting a subset of individuals from a larger

population in completely random and unbiased manner (Creswell, 2003). The choice of this technique is to ensure that every member of the population has equal chance of being included in the sample and to ensure representativeness of the population distribution, statistical confidence, time sentiments, and practicality and feasibility. A total of 110 households were issued with questionnaires from the 4 selected communities namely: Makanda in the Eastern Cape, Bloemfontein in Free State, Pretoria in Gauteng and Cape Town in the Western Cape. The choice of this figure was to ensure precision and accuracy as this study seeks to minimise errors and to exhibit a reasonable level of confidence in the result. The distribution was based on probability proportional to size (PPS) sampling formula of **P ¼ (C/T) * S** to calculate the sampling population in each community. In this formula**: P is the proportion of the community in the sampled population, C is the population of the community, T is the total population and S is the sample size).** Using this equation, we distributed 15 questionnaires to households in Makanda, 20 in Bloemfontein, 35 in Pretoria and 40 in Cape Town. Although not all the responses were received, a total of 65 answered responses were returned representing 59%. According to Ebert et al. (2020), a survey response rate of 50% or higher is considered excellent in most circumstances. The quantitative questions focused on the institutional and capacity barriers and evaluated their levels of impact on policy implementation, the nature of resource and capacity challenges and their bearing on policy execution.

The data attained from the surveys through questionnaires, interviews, and literature were scrutinised simultaneously. A descriptive statistical technique using Microsoft Excel, was employed to examine the quantitative data. This technique enabled the data to be presented in tables and graphs for quick interpretation and easy understanding. The data derived from the interviews and literature were reviewed with the help of the thematic technique. This method involves scrutinising qualitative data that involves reading through the interviewees' answers to derive their meaning (Kiger et al., 2020). Thematic review assisted in classifying the data obtained into different themes including institution and governance challenges, resource and capacity constraints to policy implementation and strategies to enhance execution of policies and strategies in South Africa for analysis and discussion.

Empirical evidence and analysis

Data collection and analysis were structured and sequenced to bring to the fore the perspectives of leading water experts in both public and private institutions and households with varying goals and expectations. The analysis was structured to conform with the key objectives of the paper.

Institutional and governance constraints to policy implementation

One of the fundamental objectives of this study is to assess the levels of institutional constraints to water governance in South Africa. Participants were asked to choose from these variables "No impact, likelihood effect, serious constraints and Very critical obstacles" to specified constraints variables listed. Table 3 depicts the responses of participants.

A breakdown of the responses depicts that out of 25 variables assessed from "No impact to Very critical", a significant majority of variables, 21 representing 84%, were rated under either severe or very severe obstacles to policy implementation by the respondents. Only four variables translating to 16%, were rated as either 'No impact' or likelihood' hindrances. As shown in Table 3, the majority of the respondents mentioned institutional crowdedness, policy implementation challenges, lack of an institution to oversee and coordinate policies, lack of correlation among multiple players and fragmented approaches to execute the policies and programmes as severe and very critical constraints. This statistical information was validated by an interview conducted. For instance, the Strategic Executive Director at the provincial DWS, who was engaged in an interview, disclosed that:

> *"Generally, the South African water sector has some excellent forward-looking water policies and programmes that have secured water security for the majority of the population. For example, the policies and programmes introduced by the government post-1994 has enabled the majority of households and communities, especially the previously disadvantaged population, access to clean, safe and reliable water supply" Per.com 7th April 2021 1A*

However, not all of the respondents agreed that the country had achieved much in meeting the growing demands for water from the population. An interview with a Director of WISA revealed that:

> "*There is generally a lack of understanding and coordination across the three spheres of governments from national to local municipalities as well as the private sector.*
> *In the view of this interviewee, "Policy development and implementation are supposed to be executed by the three spheres of government together with NGOs as well as grassroots organisations. Nevertheless, this is not on the ground; coordination remains a significant challenge as roles and responsibilities are undefined, information flow is poor, and functional implementation structures are absent at different governance levels. There is no coordination between the govern-*

Table 3 Institutional and governance constraints to policy implementation

{∑ fx/n)}		No impact	Likelihood	Serious	Very critical
Lack of appropriate water policies and programmes	Respondents (65)	5	19	25	16
		8%	31.7%	41.7%	26.7%
Fragmented approaches to policies and programmes	Respondents (65)	7	8	20	30
		10%	12.%	31%	46%
Institutional crowdedness and institutional voids	Respondents (65)	4	6	30	25
		6%	9%	46%	38%
Lack of coordination among multiple players and resources	Respondents (65)	8	6	20	31
		12%	9%	31%	47%
Poor working relationships among partners and key stakeholders	Respondents (65)	3	7	35	20
	Respondents (65)	5%	11%	54%	31%
Fragmentation of water-related tasks	Respondents (65)	3	4	28	30
		5%	6%	43%	46%
Poor programme planning and design intervention programme	Respondents (65)	12	6	25	22
		18%	9%	28%	34%
Poor information management system	Respondents (65)	12	8	25	20
		18%	12%	28%	31%
Substantive, strategic and institutional uncertainty	Respondents (65)	6	4	24	26
		9%	6%	37%	40%
Weak management of the crescendos of water demand and supply management.	Respondents (65)	4	8	20	33
		6%	12%	31%	51.3%
Lack of strategic vision across the water-related sector	Respondents (65)	30	15	10	10
		46%	23%	15%	15%
	Respondents (65)	5	10	20	30
Nonexistence of a workable structure to involve societies in the administration processes		8%	15%	31%	46%
Weak institutional coordination for IWRM programmes	Respondents (65)	7	8	30	20
		11%	12%	46%	30%
Poor governance and leadership structure that works in water resource management	Respondents (65)	25	10	15	15
		38%	15%	23%	23%
Lack of an institution to oversee and coordinate all the implementation policies	Respondents (65)	3	7	20	35
		5%	11%	31%	54%
Inadequate equipment and proper infrastructure network	Respondents (65)	10	6	20	29
		15%	9%	21%	45%
Inadequate technical know-how and expertise to administer water governance	Respondents (65)	5	10	20	30
		8%	15%	21%	45%
Inadequate Research and Technology	Respondents (65)	30	20	10	5
		46%	25%	15%	10%
Lack of correlation between water supply and demand	Respondents (65)	3	5	25	32
		5%	8%	38%	49%
Improper land use planning and soil management in catchment areas	Respondents (65)	8	17	24	16
		12%	26%	40%	25%
Lack of clear-cut strategies for pollution prevention, control, and regulations	Respondents (65)	4	6	25	30
		6%	9%	38%	46%
Socially and culturally unacceptable policies by communities	Respondents (65)	5	7	22	31
		8%	11%	34%	48%
Lack of programmes to promote economic, social, and ecological values link to water resources.	Respondents (65)s	2	14	25	24
		3%	22%	38%	37%

Source: Field survey (2022)

ment, the private sector and communities. Each sector operates in a complete silo; hence, majority of water sector is bedevilled with chaos and confusion" (Pers. com 9th April 2021 1B)

This view was reinforced by a lecturer in the Institute of Water Research at Rhodes University who was engaged in an in-depth interview. He disclosed that:

"the institutional challenges to policy implementation occur at the planning and execution stages. These impediments restrict the capability of the department and organisations to collaborate "vertically and horizontally," to incorporate actions within their structures and to step up innovative systems that mobilise resources for infrastructure development and cost retrieval. This lack of amalgamating in the reliance on prevailing organisational "silos" and spreads disinterest in the water sector". (Pers.com 13th April 2021 1C)

A common perspective across the survey suggests that there is poor coherency and stand-alone policies and policy-making processes. In most circumstances, the national government and municipalities take the central stage in developing and implementing policies and by-laws, while non-state actors and local communities are not sufficiently involved.

Resource and capacity constraints to policy implementation

Capacity limitations in terms of human resources, expertise, infrastructure development and funding remain significant constraints to implementing policies and programmes. Given these assumptions, this paper explored the resource and capacity constraints hindering the execution of policies in the water sector. Participants were asked to choose from the variables 'Not an obstacle', Likelihood challenges, 'General constraints' and 'Serious obstacles' to a set of listed barriers to the execution of policies. Table 4 reflects the responses of the respondents.

As shown in Table 4, out of 13 variables assessed, ranging from "Not an obstacle" to " Serious obstacle", 8 of them, representing 67%, were rated as significant obstacles, and 4 of the variables were ranked under important obstacles. Lack of capital, relevant technologies to implement policies, corruption, and undue political interference in operational management were the major obstacles for 72% and 65% of the respondents, respectively. The other obstacles significantly mentioned by respondents as either major or important constraints include lack of infrastructure and other logistics, inadequate research on the execution of policies, and lack of capital and investment in the water sector. This statistical breakdown is reverberated by an expert in the water sector in the Western Cape. She mentioned that:

"The entire water sector has a challenge of attracting skills, expertise and human capital as a result of budget constraints. The National Treasury continued to cut down the budget for the department over the past years as a cost-cutting measure embarked upon by the government. Due to emigration, unsatisfactory working conditions, and low salaries and wages, this budget constraint has resulted in our inability to employ competent and highly skilled employees or even retain some of our best and qualified staff such as engineers, technicians and technologists." (Per.com 15th April 2021 1D).

Given the above sentiments, it can be concluded that severe challenges are facing the water sector regarding capacity constraints. These challenges result from budgetary issues and poor coordination of training and capacity development for the department. Among these challenges is the poor coordination of capacity and training programmes for the water service sector, limited use of public tertiary institutions in skills development for the water services sector, and capacity constraints within the relevant Sector Education & Training Authorities (SETAs).

Overcoming obstacles to policy implementation in the water sector

In light of the governance and capacity obstacles highlighted above, this study investigated strategies that can improve the implementation of policies in the water sector. Respondents were asked to rate the listed variables from; "Not to high priority" of strategies required to enhance the implementation of policies. Table 4 shows the responses of the participants.

Out of the 15 implementing strategies presented to respondents, 13 of them, representing 87%, were seen as either "Priority" or "High Priority" necessity strategies to improve policy execution. For instance, 97% of the respondents concurred that effective integration of indigenous knowledge into policy formulation and execution is the surest to improve the implementation of water policies at the local levels. This was followed by 85% of the respondents, who believed that encouraging capacity building and skilling relevant employees and senior managers would enhance implementation policies and strategies in the sector. Nevertheless, 13% of the respondents, mainly from the DWS, believed there is no urgency or high priority in changing the water management strategies in the country due to successes associated with the policies. Most of these respondents think South Africa exceeded water provision expectations after 1994. This statistical breakdown is reflected in interviews conducted. For example, an interview with a community leader stated that:

Table 4 Resources and capacity challenges to policy implementation

		Not an obstacle	Likelihood Challenge	General Constraints	Serious Obstacles
Lack of skills and managerial qualities	Respondents (65)	5	7	25	28
		8%	11%	38%	43%
Lack of funding and investments for policy execution	Respondents (65)	10	12	20	33
		15%	18	31%	51%
Lack of researchers and technical inadequacy	Respondents (65)	12	10	25	18
		18%	15	38%	28%
Lack of knowledge of water (technical, finance etc.)	Respondents (65)	3	6	22	34
		5%	9%	34%	52%
The challenges of infrastructure not adapting to climate change and natural disasters	Respondents (65)	10	10	25	20
		15%	15%	38	31%
Poor planning and infrastructure decay, and inadequacy	Respondents (65)	8	12	25	20
		12%	18%	38%	31%
Corruption and undue political interference in operational management	Respondents (65)	3	5	15	42
		5%	8%	23%	65%
Strong political interference in strategic and professional matters	Respondents (65)	5	7	25	28
		8%	11%	38%	43%
Lack of accountability and transparency	Respondents (65)	10	12	18	25
		15%	18%	27%	38%
Lack of information on policies and programmes	Respondents (65)	10	9	30	16
		15%	14%	46	25
Lack of monitoring and evaluation of policies	Respondents (65)	10	14	25	17
		15%	22%	38%	26%
Lack of capital and other technologies to implement policies	Respondents (65)	2	8	28	47
		3%	12%	43%	72%

Source: Field-based surveys (2019)

"Water holds significant cultural and spiritual importance for many indigenous communities, therefore, incorporating their knowledge and perspectives into water policies give recognition of their rights and cultural heritage, and connect to the land, which often enhances the sense of ownerships and responsibility towards water resources. Additionally, indigenous communities have their own customary laws and governance systems related to water. Recognising and integrating these systems into broader water policies will bridge the gap between traditional knowledge and formal governance structure" (Per.com 18th April 2021 5A)

Another engagement with a Director for Planning and Strategic Development based in the national office of DWS in Pretoria that:

"Nationally, the policies and programmes have enabled more than 80% of households to have quality water-related services. Furthermore, the policies and the programmes advocate for a more coordinated approach to water resource management in planning, implementation, monitoring and evaluation. With these achievements, there is not much that must change the only thing that is required is the implementation of which there are a lot of effort been done to execute the policies" (Per.com 20th April 2021 6A)

Nevertheless, a lecturer at the Water Institute at the University of Western Cape stated in an interview:

"establish institutional clarity in the water sector with appropriate channels of accountability. Support capacity development and resource mobilisation consistent with decentralisation. Strengthen financial frameworks. Expand and strengthen strategies that take into consideration public-private partnerships." (Per.com 22nd April 2021 7A)

Another manager in the Federation for Sustainable Environment, an NGO based in Johannesburg promoting effective management of the environment in South Africa, disclosed in an interview that:

"Effective monitoring and evaluation mechanisms have to be put in place to review the progress and, ulti-

mately, the final results of the capacity development policy and strategy. Similarly, organisational capacity development (action) plans will need proper monitoring and evaluation mechanisms, forming part of the national capacity development system." (Per.com 22nd April 2021 8A)

These comments underscore the belief that formulating policies and strategies is comparatively straightforward; however, building institutions and organisational structures to enforce such policies is more cumbersome. An efficient administrative system is required to translate the policies and programmes into concrete actions at the field level.

Analysis and discussion

This paper provides an overviews of the policy implementation challenges in South Africa's water sector. Our discussion is structured to explore the three key objectives set out for the paper: institutional and governance constraints to policy implementation, resource and capacity constrictions and strategies for improving policy execution in the water sector.

Institutional and capacity constraints to policy implementation

The outcomes and interpretation of Table 3 confirms the views of numerous authors, such as Turton (2015), Jacobs-Mata et al. (2021), Dugard (2021) and Funke et al. (2018) that the water challenges facing South Africans today far outweigh the successes projected by the government and the DWS. Nevertheless, part of our findings concurred with the DWS that much has been achieved with the current policies and legislation to expand water access to a significant number of households since 1994. Overall, we found that public institutions and the DWS have overhyped the successes of water provisions to households of previously disadvantaged groups and undermined or overlooked the weaknesses of policies and challenges confronting the sector. These findings are also shared by Turton (2015), Jacobs-Mata et al. (2021) and Howes et al. (2017) that although a significant number of the population have access to safe and reliable water currently, the statistics provided by the DWS and the government overstated the actual number of households with access to the consistent water supply. Based on the information obtained from Table 3 and views from relevant stakeholders such as Federation for Sustainable Environment and Water Institute of Southern African revealed more than 20% of the country's population, particularly those in rural communities, do not have regular access to safe and reliable water supply but, depend on contaminated and unsafe water sources, while more than 37% of the country's water is lost through leaking pipes and other infrastructure failures. Supporting these findings, Viljoen and Walt (2018) disclosed that the policies and strategies have failed to address the problem of the poor record of water conservation and inadequate water treatment infrastructure and to prevent deteriorating water quality.

The findings of Table 3 classified the constraints hindering policy implementation in South Africa into two broad areas: weak or dysfunctional institutions and governance gaps. These findings are also picked up by some literature and practitioners, including Ampaire et al. (2017), Kohler (2016) and Pengelly (2017). Based on the findings of Table 3, the majority of state institutions that manage and regulate water in South Africa are ineffective with inadequate capabilities to accomplish the vision of providing safe, clean and affordable water for all. Furthermore, these institutions lack independence from political interference, poorly defined or overlapped mandates as well as poor collaboration among stakeholders. Our findings established that horizontal coordination in the water sector is very weak, with more than eight policies covering water governance and management. This is a similar view shared by Makaya et al. (2020) that complex management structure, communication barriers, coordination inconsistencies and undefined, unclear actor roles, responsibilities and top-down approaches are some of the institutional constraints to policy implementation. These phenomena have resulted in conducive situations for the proliferation of actors and massive influx of funds opening up multiple opportunities for corruption and the looting of resources. Nearly 70% of the respondents felt that the sector is susceptible to manipulation by many vested interests at the formulation and implementation phases. It was uncovered in Table 3 and engagements from some interviewees that the poor participation of key stakeholders across all three levels of governance (national, provincial and local) hinders any policy reforms and implementation of any meaningful policy. These are similar perspectives shared by Olagunju et al. (2019) that the decentralisation policy envisaged to drive the implementation of policies had been abandoned, with the national and provincial Departments of Water and Sanitation taking centre stage in the formulation and implementation of policies, in most situations neglecting the non-state actors and the local authorities, contrary to Article 108 of 1996 Constitution of South Africa, which declared local government as autonomous in terms of formulation and implementation policy at the local levels. These findings are further supported by Claassen (2013) and Hudson et al. (2018); these authors disclosed that the vulnerability of collective decision-making and the inability to create a common platform to solve problems through effective administrative procedures remain justifications for successive implementation obstacles at community and local levels. Outcomes from

Table 3 and our engagements with some interviewees uncovered that there are disconnects of institutional arrangements, incentives, resource mobilisation and misalignment between communities and government priorities regarding policy execution. This is fundamentally due to misunderstanding and perception of government towards the community's needs and lack of active community forums and grassroots participation in the implementation of policies. These views confirm the observations of Mollinga et al. (2008), which highlight a serious misalignment between government-induced water policies and informal water institutions, for instance, customary water rights and traditional authority in water management. It is difficult to understand that water management is deeply embedded in informal institutions but not adequately included in the policy implementation. These have threatened the feasibility and implementation of policies. Additionally, it has created situations where formal and informal institutions contradict one another in the water sector, especially at the community level.

Closely linked to the above hindrances are politicisation and unduly interference by politicians in administrative issues. Sebola (2018) disclosed that the Constitution of South Africa gave authority to political institutions to make laws that govern and regulate water management and to provide oversight functions in the entire water sector while the professional bodies and administrators execute the policies. Nevertheless, findings from Table 3 and views from key stakeholders revealed that this is not often the case. Politicians have overstepped their roles and responsibilities in operational and professional activities of policy implementation in the form of tenders and awarding of contracts. Our findings revealed that political manoeuvres had created situations where resources are distributed unevenly or hijacked to serve individuals' or organisations' interests at the expense of common interests. Similar findings have been presented by Ampaire et al. (2017) and Molobela and Sinha (2011) that political interference and personal achievements by government representatives and community leaders constrains policy implementation and fuels conflicts and mistrust between local communities, technocrats and government institutions.

Resource and capacity constraints to policy implementation

Regarding resource and capacity constraints to policy implementation, the findings unearthed numerous impediments hindering the implementation of policies in South Africa's water sector this is shown in Table 4. Capacity constraints in human resource expertise, financial, and aged infrastructure facilities were picked as major constraints. Many scholars, including Imonikhe and Moodley (2018) and Donnenfeld et al. (2018), shared similar views that formulating and operationalising water policies to achieve IWRM goals requires huge capital and human skills. Our findings in Table 4 revealed that human capital in the water sector in South Africa is limited both in numbers and capacity to implement complex policies and strategies in the sector effectively. These findings are reinforced by the South Africa Academy of Engineering (SAAE 2020). These authors concurred that the main constraints to policy implementation in South Africa are porous administration, deficiency of knowledge and experience as well as lack of experts and technical workforce, political meddling in daily operations, and weak supervision resulting from the limited separation of powers between political decision-makers and the executive administrators in the water sector.

Furthermore, our findings established that a lack of investment and funding significantly hinders policy implementation. This is also shared by Viljoen and Walt (2018) that the water sector requires more than R33 billion annually for 10 years to meet water requirements in the country. Currently, an estimated amount of R10.8 billion is allocated to the provision of water in the country, a budget which is woefully inadequate to meet the population's water needs (Edokpayi et al. (2020). From Table 4, the findings revealed that the inadequate investment due to inadequate funding had been a huge contributor to poor operations and performance maintenance. Similar views were also expressed by our engagements from interviews that lack of investment hampers water supply facilities as money is not available to buy spare parts, properly train staff and provide competitive salaries to attract highly qualified personnel. The interpretation from Table 4, further revealed that most of the local and even some metropolitan municipalities, such as Buffalo City Metropolitan and Mangaung in the Eastern Cape and Free State provinces, respectively, are badly managed and frequently cash-strapped and have to depend on the national government to a large extent rather than self-sourced funding. These are the same reports shared by DWS that 144 of the 278 municipalities, representing 52%, depend on grants to fund over 90% of their physical infrastructure and other expenses; 58% collect below 70% of the projected proceeds, and 42% have no reliable source revenue. These revelations are further buttressed by the Helen Suzman Foundation (HSF 2020) and the Council for Scientific and Industrial Research that the DWS is severely constrained financially that it is restricted and unable to meet its obligations to build new or maintain its existing infrastructure to provide water to the population.

Alternative strategies for enhancing policies implementation in the water sector in South Africa

Enhancing policy implementation in the South Africa's water sector was analysed as it constitutes one of the key objectives of this paper. As shown in Table 4, numerous

strategies were enumerated by the respondents. However, we summarised the strategies into three main broad themes; (i) social equity and inclusivity, (ii) circular water economy, and (iii) digital water management, capacity building and financial incentives. Findings from Table 4 established that policy implementation strategies and intervention mechanisms have not been holistic but ad hoc and fashionable to solve short-term challenges. However, findings from Table 5 suggest that the constraint can be solved by ensuring that water governance considers the needs and perspectives of the marginalised and vulnerable communities, empowering them to actively participate in decision-making processes. Similar views were also obtained during our engagements with some respondents suggesting that there must be a good working relationship among all the layers of government, from local government (communities) to provincial administration to the national government in the manner in which information, ideas or feelings are share between communities, departments or institutions involved in water management or governance. This view has been shared by OECD (2020), which disclosed that improving policy implementation in the water sector requires that no one is left behind. This suggests that the implementers of policies must promote public, private and non-profit actors who have expertise, knowledge, and experience and have a stake in the outcome or are likely to be affected by the policies. This suggests that strategies must be built on involving all parties, which include governments, organisations, and communities to embrace the implementation of the policies effectively.

Improving policy implementation requires coherence and alignment of the policies and strategies. Based on the findings from Table 4, we discovered that the implementation of policies had been hampered due to a lack of coherent policies and difficulties in collaboration vertically and horizontally among government institutions and other stakeholders. The results and the findings of Table 4 further proved that the incompatibilities of the policies stem from outdated legislation, compartmentalisation of institutions developed on legislative framework, conflict of interest, weak coordination in planning, fragmented inducements and poor implementation mechanisms such as multi-sectoral appraisals, monitoring and evaluation of impact assessment, inter-ministerial platforms or cohesive regulation. Similar findings were shared by Seppala (2002), Adom and Simatlele (2020) and Funke et al. (2018), who disclosed that several departments and institutions implement their policies and strategies based on their own requirements and mandate without consultation with other agencies regarding planning and implementation. The ineffectiveness and malfunctioning in the water sector suggests that some the current and water management practices have been inadequate or inefficient in addressing contemporary challenges like water scarcity, pollution, and unsustainable water use. Findings from Table 4, revealed that the top-down decision-making without considering local conditions or the involvement of stakeholders have contributed to mismanagement and underutilisation of water resources. Similarly, as shown in Table 4, there is the need to address sources of conflict among different institutions involved in water governance, along with providing motivations and guidelines to reduce tensions between sectoral agencies. Moreover, the findings emphasise the importance of incorporating these policies into water governance and finding solutions that are acceptable to local governments and communities. These proposals fit in well with the recommendations of the OECD (2018), which disclosed that identifying, assessing and addressing the obstacles to policy coherence from practices, policies and regulations within and beyond the water sector, using monitoring, reporting and reviews.

Finally, capacity building and resource mobilisation in the form of knowledge, competency and adequate financial support are important pillars in implementing policy in the water sector. Our interpretation of respondents' feedback is that without adequate investment in capacity building, knowledge and infrastructure, there will be no effective implementation of policies. These findings underscored the views of Tantoh et al. (2020), which indicate that weak capacity hinders the appropriate targets and fusion of development funds and the balanced operation and management of realistic investments. To improve capacity building and increase funding, gaps in capacity need to be identified to execute proactive and cohesive management of water resources, specifically in planning, decision making, project management, funding, budgeting, information gathering, monitoring and risk assessment. These findings confirmed the views of Hudson et al. (2018), who opined that enhancing policy implementation in the water sector requires transparency in making financial dealings and accountability that provide up-to-date information on water events and any accompanying conditional responsibilities, comprising infrastructure investment and supporting annual strategic plans and medium-term priorities of governments.

Conclusion

The challenges of policy implementation in South Africa are multifaceted and require urgent attention to achieve the desired outcome of water security. Fragmented policies, overlapping responsibilities, capacity constraints, insufficient funding, ageing and broken infrastructure, bureaucratic complexities, corruption and insufficient public engagements are some of the key obstacles that must be addressed to implement policies and programmes to achieve water security for all the population. To overcome these hindrances, it is essential for the government

Table 5 Policies implementation strategies

$\{\sum fx/n)\}$		Not a Priority	Average Priority	Important Priority	Very High Priority
	Respondents (65)	3	10	25	27
Community-based and multilevel implementation approach		5%	15%	35%	38%
Cross-sectoral cooperation in the implementation processes	Respondents (65)	5	12	20	28
		8%	18%	30%	43%
Strengthen water-sector governance, finance and institutions.	Respondents (65)	2	6	15	42
		3%	9%	23%	64%
Improve adaptation planning among the population, and encourage research in policy implementation.	Respondents (65)	10	10	25	20
		15%	15%	38%	30%
Encourage regionalism and denationalise of implementation of water policies.	Respondents (65)	25	20	10	10
		38%	30%	23%	23%
Promote the concept of the water-energy-food nexus approach in policies implementation	Respondents (65)	2	8	35	20
		3%	14%	53%	30%
Encourage capacity building and skilling of relevant employees, including senior managers of the sector	Respondents (65)	1	4	12	48
		2%	6%	18%	75%
Develop a more integrated and coherence approach in the implementation	Respondents (65)	4	12	30	19
		6%	18%	46%	29%
Promote stakeholders' participation in all phases of the policies implementation	Respondents (65)	1	3	21	40
	%	2%	5%	23%	62%
Encourage information dissemination, awareness and education of local communities through policies.	Respondents (65)	8	10	35	12
	%	12%	15%	53%	18%
Encourage regular appraisal of policies using toolbox metrics of assessment.	Respondents (65)	5	7	25	28
	%	8%	11%	38%	43%
Review the applicability of various policies often and gauge their adaptation in the contexts of environments	Respondents (65)	25	18	12	10
		38%	28%	18%	15%
Develop systematic ways to communicate the relevance of policies and programmes to stakeholders.	Respondents(65)	5	7	30	23
		8%	11%	46%	35%
Integrate indigenous knowledge into policy strategies as a baseline and starting point for adaptation planning and implementation.	Respondents (65)	0	2	6	57
		0.0%	3%	9%	88%
Formulate the appropriate methods to scrutinise, administer and communicate relevant policies and programmes to key stakeholders.	Respondents (65)	23	20	10	12
		35%	31%	15%	18%

Source: Field-based surveys (2021)

to adapt innovative strategies such as investing in capacity building training, implement robust monitoring and evaluation systems, promoting-data-driven decision-making, encourage public participation and fostering partnerships between public and private sectors. This paper concurred by tackling these challenges head-on and embracing a cultural of transparency, accountability and adaptability the country can unlock the full benefits these policies and achieve water security for all as envisaged by the 1996 Constitution of South Africa.

Acknowledgements We, the authors of this paper, owe a debt of gratitude to the NRF's Global Change Grand Challenges, under the funding instrument, 'Global Change Social Sciences Research Programme, Grant No. 129481, for granting us the necessary resources to write this paper. We also are indebted to respondents from the Department of Water and Sanitation in the four these provinces: Eastern Cape, Free

State, Gauteng and Western Cape. We are also grateful to the respondents from these NGOs Federation of Sustainable Environment (FSE), International Water Management Institute (IWMI) and Water Institute of Southern Africa (WISA)

Funding Open access funding provided by University of the Witwatersrand.

Data availability The data supporting the finding of this study are available on request from the corresponding author. The data are not publicly available due to privacy and ethical restriction.

Declarations

Conflict of interest The authors of this paper declared that there is no conflict of interest in writing this manuscript.

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