Exploring the Perceived Challenges and Opportunities for Compliance Monitoring and Enforcement in the South African Water Sector

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Abstract

Water use authorisations (WUAs) in South Africa aim to regulate the sustainable use and distribution of water in the water sector. These WUAs are supported by compliance monitoring and enforcement (CME) processes to ensure compliance and performance in line with prescribed conditions of the authorisation. However, anecdotal evidence suggests that numerous challenges exist in the South African water sector regarding CME processes, including compliance inspections and investigations. To this end, the article aims to explore these perceived challenges and opportunities for CME by focusing on the Chief Directorate: Water Use Compliance Monitoring and Enforcement at the Department of Water and Sanitation (DWS). Semi-structured interviews were conducted with 20 participants in the unit who identified a total of 13 challenges and eight opportunities for CME related to WUAs. Key challenges included insufficient skills and knowledge, interpretation inconsistencies of the water-related legislation, political interference, and undefined roles and responsibilities. Key opportunities included stakeholder engagements and increased regulatory awareness among water users. In the pursuit to improve the overall effectiveness of CME in the South African water sector, it is recommended that the DWS ensure avoidance of political interference in the sector, continuous awareness and competency training to upskill employees for ongoing capacity building and skills development. Improvements in communication and the clear delineation of roles and responsibilities will also support preplanning and collaboration among government departments. There is also a call to strengthen the base of designated environmental management inspectorates that play a crucial role in enforcing compliance in the sector.

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Introduction

Compliance monitoring and enforcement (CME) refers to the mechanisms used to manage and regulate anthropogenic activities in the natural environment in an attempt to mitigate negative impacts (Kotzé 2006; Snijman and Petterson 2021). According to Craigie et al. (2009) and the INECE (2009), CME comprises a framework of five essential components required to achieve a predetermined level of compliance and promote sustainable development: (1) identification and strategy development; (2) promulgation of legislation; (3) promotion of compliance; (4) education and awareness; and (5) CME. However, international literature suggests that several challenges associated with these CME components exist, which lead to unsustainable practices (Ambituuni et al. 2014; Belal et al. 2015; Prasetyaningsih et al. 2022). For example, Bodwitch et al. (2021) found that farmers in the United States of America perceived that government incentives were too weak to motivate compliance with permit conditions and that the government did not provide clear, accurate information about the regulations, which contributed to a lack of compliance. Espin and Perz (2021) also reported that budget constraints and insufficient resources, such as vehicles and equipment, made it impossible to implement post-decision CME actions to ensure environmental compliance in the artisanal gold mining sector in Peru. It seems that these challenges are exacerbated by the duplication or overlapping of functions between government departments, shortcomings in government capacity and skills, bureaucratic administrative systems, and the absence of political will to make informed decisions (Ambituuni et al. 2014; Greiner et al. 2015; Wilson et al. 2011).

In the South African context, similar post-decision CME challenges have been observed in the broader environmental management sector and can be traced to insufficient capacity and training, the shortcomings in the quality of authorisations, and ineffective regulations (Alberts et al. 2022; Wessels et al. 2014; Wessels and Douglas 2024). Anecdotal evidence also suggests that CME challenges have been persistent in the water sector, particularly regarding compliance with conditions in water use authorisations (WUAs) (CER 2012; Schreiner 2013). Some examples of such challenges can be seen in recent court cases (see South African Government 2023, 2024), where, even after several post-decision investigations and directives, continual non-compliance against WUAs has led to ongoing pollution of water resources.

Water use authorisations are mandated by section 22, Permissible water use, of the National Water Act (NWA) (South Africa 1998) and issued by a responsible authority, that is, the Department of Water and Sanitation (DWS), to ensure that water resources are managed and used in a sustainable manner (Pegasys Institute 2018). These WUAs are supported by CME processes provided for in section 125, Powers and duties of authorised persons, of the said Act. These processes include the monitoring and inspection of performance in line with prescribed authorisation conditions, norms and

standards, and the undertaking of enforcement actions (ie penalties and fines, see section 151, Offences, of the said Act) to ultimately restrain unlawful practices (DWS 2025). For this reason, the DWS relies on CME, which forms an integral part of the South African environmental management framework by means of strengthening the regulatory functions and improving overall compliance and enforcement (DWS 2025). However, limited empirical research has been conducted on the challenges and opportunities for CME in the South African water sector. To this end, the article aims to identify the perceived challenges and opportunities for CME related to WUAs. This will be achieved by following a case study approach and focusing on arguably the most important role player in South Africa when it comes to CME related to WUAs, namely, the Chief Directorate: Water Use Compliance Monitoring and Enforcement.

The following section explains the research approach and methodology implemented to achieve the aim of the article which is followed by the findings and discussion. The article concludes with recommendations for addressing the identified CME challenges as they related to WUAs.

Research Approach and Methodology

The article follows the approach and methodology often implemented for investigating the perceptions of individuals in the South African water sector (see Awuah et al. 2024). A case study approach was implemented to ensure that an in-depth understanding of the perceived challenges and opportunities for CME in a real-life context can be determined (Crowe et al. 2011). Qualitative data were collected by conducting interviews with purposively selected stakeholders involved in CME in the Chief Directorate: Water Use Compliance Monitoring and Enforcement at the national office of the DWS in Pretoria.

Case Study: Chief Directorate: Water Use Compliance Monitoring and Enforcement

The Chief Directorate: Water Use Compliance Monitoring and Enforcement at the DWS is considered a suitable case study to determine the perceived challenges and opportunities for CME as they relate to WUAs in the South African context. The selection is based on the important responsibilities the directorate fulfils at a national level in CME. These responsibilities include, among other things, capacity development, training, compliance promotion, together with planning and reporting on compliance inspections, and enforcement of compliance with relevant legislation and prosecution through investigation (DWS 2025). The responsibilities in the directorate align with three of the five CME components as described by Craigie et al. (2009) and INECE (2009), namely, compliance promotion, education and awareness; compliance monitoring; and enforcement.

Data Capturing and Analysis

A total of $n = 20$ semi-structured face-to-face interviews (Awuah et al. 2024) were conducted with participants from the directorate during February 2024. The selection of participants was based on a purposive sampling technique (see Crowe et al. 2011). This allowed the authors to select participants based on their responsibilities, knowledge and experience in CME. The selected participants' functions focused on developing policies, strategies, protocols and tools, training material, and training on CME responsibilities; undertaking compliance inspections; prosecuting transgressors through investigations; participating in joint inspections with other governmental departments; and performance reporting.

An interview design sheet was developed for capturing the responses of the two open-ended questions posed to the participants, namely, (1) What are the challenges related to CME in the water sector? and (2) What are the opportunities related to CME in the water sector? The interviews lasted approximately 45 minutes. The selection of the participants was based on their functions, experience and knowledge related to CME and WUAs.

The interview responses were thematically analysed (Cavanagh 1997) through deductive reasoning (Braun and Clarke 2006). The process entailed that the authors familiarise themselves with the data by reading through the interview responses, generating initial codes of interest, and aggregating relevant data for each code. This was followed by identifying themes and collating codes into potential themes and reviewing whether the themes relate to the codes. Themes were then refined for ongoing analysis, culminating in a final set that addressed the research aim. The identified themes were coded (C1 to C13 and O1 to O8) and are presented in frequency tables (tables 1 and 2). The frequency tables summarise the responses, including the assigned codes and the frequency with which the theme was based on the participants' responses (Roos et al. 2022).

Findings

Perceived Challenges for Compliance Monitoring and Enforcement

The perceived challenges for CME mentioned by the participants are outlined in table 1.

Perceived Opportunities for Compliance Monitoring and Enforcement

The perceived opportunities for CME mentioned by the participants are outlined in table 2.

Table 1: The number (out of a total of 20 participants) of responses per code as it relates to the perceived challenges of CME in the South African water sector

Themes and codes	Responses	Frequency as a relative fraction of *n*
Theme A: Budget and capacity		
(C1) Budget	"budget constraints on travelling and accommodation impacts on conducting investigations", "we buy our own PPE when we have to and incorrect PPE hinders performing the CME functions"	9/20
(C2) Human capacity	"limited officials to do inspections at head office and regional office", "capacity issues at the regional office producing poor reports for lack of officials to do inspections and write the reports"	7/20
Theme B: Operational matters		
(C3) Knowledge/awareness/ skills and interpretation of legislation	"lack of skills, knowledge and experience to conduct inspections", "lack of interpreting the WUL conditions", "officials are leaving the dept and not transferring their skills", "water users do not understand the NWA and enforcement actions", "the public have a lack of awareness to compliance inspections", "CME officials do not know legislation well enough to engage the different stakeholders", "not enough specialists within water sectors", "lack of understanding of the water legislation by the courts and the South African Police Service hinders the enforcement actions", "local government disregard the laws yet they receive a lot of direction"	17/20
(C4) Communication	"lack of communication between the CME units hinders feedback", "poor communication between head office and regional office shows incompetence to the water users", "lack of communication from line managers to officials", "poor communication regarding mandates of the relevant depts confuses the water users", "lack of communication between CME and WUA units regarding enforcement actions and the issuance of the water use licence to the same transgressor contributes to the loss of cases, "officials from different units/depts work in silos"	12/20
(C5) Functions and delegation of powers	"separation of CME functions is needed in the regional office as one official cannot inspect all the water sectors due to limited understanding of the sectors", "regional office do not have to report to head office therefore inspection reports are not verified by head office ", "lack of proper administrative process in the regional office is delaying the work", "regional office	11/20

Themes and codes	Responses	Frequency as a relative fraction of *n*
	do not have separation of functions which causes a conflict of interest", "no clear definition of roles and responsibilities of head office ", "regional office and head office do not align when it comes to inspections", "fragmented administrative procedures are hindering reporting to water users", "new delegation of powers is an administrative burden and will delay enforcement actions", "the delegation of powers are always changing becoming challenging"	
(C6) Preplanning/collaboration/ follow-ups	"Regional office is not following up on time with the water users on administrative actions", "doing follow-ups on inspections will ensure the non-compliant conditions are reviewed", "follow-up inspections ensure continuous compliance", "poor administrative processes is due to poor planning for inspections", "lack of collaboration between units for information", "lack of collaboration between other government depts and DWS for the issuing of WULs, ie sand mining is a challenge for potential enforcement actions", "large teams at joint inspections overwhelms the water user", "unavailability of WUAs hinders the preplanning/inspection process", "regional office should consider human capacity when planning their annual targets"	8/20
(C7) Standardisation and quality of reporting	"Lack of confidence and understanding to conduct inspections leads to poorly drafted reports from the regional office", "quality of information captured in the reports are not good", "regional office does not necessary apply the CME SOPs", "unstandardised procedures in providing feedback to water users", "fragmented administrative processes in reporting to water users"	7/20
(C8) Training and compliance promotion	"Even though water users are trained they still don't comply", "there is a lack of training at regional office", "CMAs need training to know what to look for during inspections", "regional office must be trained on CME SOPs", "CME SOPs is not being implemented at regional office level"	3/20
Theme C: Attitude, willingness, behaviour		
(C9) Buy-in and willingness to comply	"Communities and traditional leaders are not accepting of the legislation, especially for illegal sand mining", "resistance from water users to change from ELU they need to be regulated", "historically disadvantaged communities do not understand legislation and are unable to comply to the requirements",	8/20

Themes and codes	Responses	Frequency as a relative fraction of *n*
	water users must understand the value of water they misunderstand the availability of water"	
(C10) Existing behaviour and attitudes	"lack of interest among officials, we need capacity building", "build stronger relations within the dept to strengthen the water sector", "get rid of hearsay and powerplay at head office", "promote incentive-based approach for officials' performances to retain skills"	3/20
Theme D: Administrative processes and procedures		
(C11) Political interferences and will power	"political interferences and corruption are effecting service delivery", "political interferences are influencing decision-making", "political interferences change the decision, cooperative governance is not working", "lack of political will cause the scope of work not to succeed", "municipalities have successes due to political interferences"	8/20
(C12) Legislation and processes	"the Intergovernmental Relations Framework Act must be amended as taking action against municipalities is difficult", "DWS is funding the municipalities but it's not refurbishing the plant", "municipal funding must be monitored", "wording of the NWA must be amended to stand up in court", "NWA must be amended to include on-the-spot charges to transgressors", "gaps in the NWA do not allow the water user to pay for transgression before issued a WUA", "compulsory licensing should be more effective", "WULs are being issued to water users while investigations are being conducted"	6/20
(C13) Research and technology	"water users have new technologies that officials are unaware off", "new research can lead to effective compliance in the water sector", "improve technology to do effective monitoring", "improve technology to fourth industrial revolution"	4/20

ELU: existing lawful water use; PPE: personal protective equipment; SOP: standard operating procedures; WUL: water use licence

Table 2: The number (out of a total of 20 participants) of responses per code as it relates to the perceived opportunities of CME in the South African water sector

Themes and codes	Responses	Frequency as a relative fraction of *n*
Theme A: Capacity		
(O1) Human capacity	"improve on human capacity for enforcement actions at head office to lessen the workload"	1/20

Themes and codes	Responses	Frequency as a relative fraction of *n*
Theme B: Stakeholder engagement		
(O2) Meetings and forums	"conduct engagements with private sector on how to manage water use and understand the NWA", "engagement with officials helps gets the work done faster", "conducting meetings with external stakeholders provides new interventions", "Catchment Management Forum helps to discuss water issues and increases compliance promotion", "water users engagement with DWS helps them understand the CME process"	8/20
Theme C: Operational opportunities		
(O3) Inspections/ investigations	"compliance inspections/investigations create awareness", "conducting inspections with the regional office helps build relationships", "inspections show water users what's going on with their activity and improve compliance", "issuance of pre-directives/directives are working", "joint inspections make the process more effective	8/20
(O4) EMI designation	EMIs can tighten the criminal investigation and carry a docket under enforcement", "designated EMIs carrying a docket to the National Prosecuting Authority [NPA] removes reliance on the South African Police Services [SAPS]", "EMIs can do their investigation with collaboration of SAPS and other stakeholders", "EMIs are designated as peace officers"	8/20
(O5) Training awareness	"sector-specific training helps the regional officials to conduct inspections", "training to communities assist them to understand legislation", "create enforcement awareness campaigns to local communities on water legislation", "training on the systems helps new and old officials", "the EMI training is equipping us to do effective enforcement", "training the NPA and SAPS is helping to educate them on water legislation"	7/20
(O6) CME systems	"the National Compliance Information Management System [NCIMS] provides standardisation when conducting inspections", "NCIMS and enforcement case management system [ECMS] keep track of transgressors", "these systems help us to get information of the water user faster", "it helps capture information at a central place", "NCIMS/ECMS has standardised reporting", "metering regulation tool and Integrated Regulatory Information System are good tools to track the water users"	6/20
(O7) CME procedures	"CME SOP manual provides structure to the CME processes and procedures"	3/20

Themes and codes	Responses	Frequency as a relative fraction of *n*
Theme D: Attitude, support, behaviour		
(O8) Working relationships	"we need to support each other to have successes", "willingness of the officials is what is needed", "we need to maintain relationships between head office and regional office to make CME more effective", "strengthen relationships with schools, communities and the private sector", "we need to create relationships with other depts to share skills"	3/20

EMI: environmental management inspectorate

Discussion

Compliance Monitoring and Enforcement Challenges

Figure 1 ranks the perceived challenges for each code from highest to lowest. The challenges are discussed below in accordance with the four identified themes (A–D) in table 1.

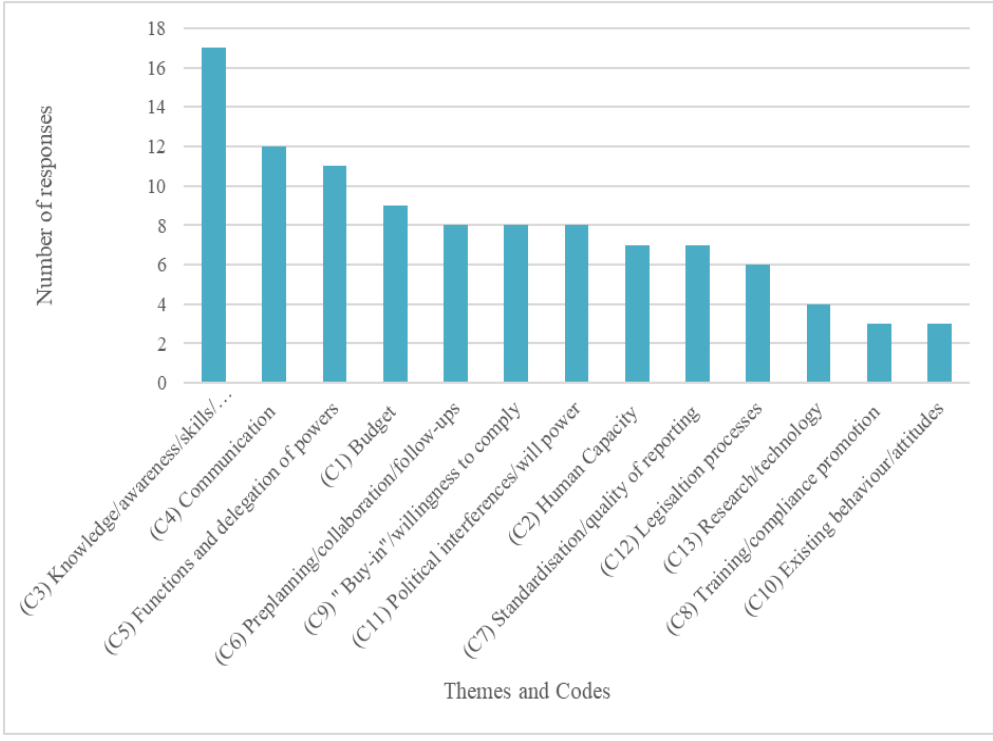

Figure 1: Perceived challenges for CME in the South African water sector, ranked from highest to lowest

Theme A: Budget and Capacity

The fourth highest ranked challenge (see figure 1) was budget constraints (C1). A total of 9/20 participants perceived that the shortfall in budget is a constraint in obtaining PPE (ie uniforms, cameras, bulletproof jackets) and hindered them in searching for and retrieving information and evidence during inspections and investigations.

This was evident from the responses: "budget constraints on travelling and accommodation makes it difficult to conduct investigations" and "we buy our own PPE when we have to, and incorrect PPE hinders performing the CME functions". Limitations in these resources contributed to their feeling frustrated in performing their duties effectively and threatened their safety and security (Edo et al. 2022; Espin and Perz 2021).

Tied as the sixth highest ranked challenge (see figure 1) was insufficient human capacity (C2). This was mentioned by 7/20 participants who believed this as having a negative impact on the number of inspections and investigations being done on the approximately 134 524 registered water users (DWS 2025). The participants had the perception that the limited number of officials on the ground contributed to the submission of poor-quality inspection reports and increased delays in reporting to line management as well as providing feedback to the water users.

One of the participants stated: "Limited officials to do inspections at head office and regional office".

Similar challenges had been observed in countries such as Peru, Bangladesh and Nigeria in having financial and human capacity constraints which are hindering officials from conducting their CME duties effectively (Belal et al. 2015; Edo et al. 2022; Espin and Perz 2021).

Theme B: Operational Matters

The highest ranked challenge (see figure 1) mentioned by 17/20 participants was related to limited skills, knowledge, awareness, and the inability to interpret legislation (C3) and are seen as major challenges in the department and among stakeholders including the judiciary, the SAPS, local communities and traditional leaders. The participants believed that these challenges contributed to poor performance in inspections and investigations, failure to win cases against the transgressors, misinterpretation of mandates of other governmental departments and insufficient information and understanding of legislation and WUAs.

This was evident from responses such as: "lack of skills, knowledge and experience to conduct inspections", "officials are leaving the department and not transferring their skills" and "lack of understanding of the water legislation by the courts and SAPS hinders the enforcement actions".

The participants perceived that the lack of understanding and awareness of CME functions created a feeling of intimidation among the water users, especially in the smaller or historically disadvantaged communities. It was also noted that officials at the regional level were leaving the department without transferring their skills, which added pressure to new officials to perform their duties competently.

Literature acknowledges that these challenges are experienced in both developing and developed countries. Insufficient capacity for development and training awareness has led to the misinterpretation of legislation, which led to ambiguity of legislation and made it difficult to be applied by officials and stakeholders (Abdalla et al. 2013). Furthermore, gaps in scientific and technical knowledge have contributed to delays in updating new water management interventions in the sector (Naidoo et al. 2016).

More than half of the participants (12/20) perceived communication (C4) as a challenge and is the second highest ranked challenge (see figure 1). A breakdown in communication between the CME units affects the process of receiving feedback on inspections/investigations and hampers CME processes. Since new officials were being appointed and officials leaving for promotions or changing job descriptions, the participants were unhappy as the lack of being informed about these changes had a negative impact on their responsibilities and duties. They also observed that the regional office did not always communicate the outcome of the inspection to the water users, which reflected as incompetent towards the department.

Some participants stated that “a lack of communication between the CME units hinders timely feedback” and “officials from different units work in silos”.

The breakdown in communication between the CME and WUA units had a negative effect on conducting enforcement actions against the transgressor. Water use authorisations were being issued to a transgressor concurrent to the prosecution of the transgressor, making the department appear incompetent and which attributed to units working in silos and breakdown in communication. It was also observed that poor communication between government departments hampered inspections and investigations by duplicating processes leading to frustration from the water user.

It is well acknowledged that insufficient communication leads to poor management of water resources, lack of transparency and trust among stakeholders (Bodwitch et al. 2021; Naidoo et al. 2016). Poor communication has the potential to duplicate work and create silos and promotes the lack of cooperation and coordination required among stakeholders resulting in compromised decision-making (Chepyegon and Kamiya 2018; Kotzé 2006).

The third highest ranked challenge (see figure 1) was related to the separation of functions and delegations (C5). In total, 11/20 participants expressed that CME functions should be separated according to water sectors (ie mining, industry,

agriculture, irrigation and streamflow reduction and afforestation) at regional level rather than officials performing CME functions for all the water sectors simultaneously. This would allow officials to specialise in specific water sectors enabling a more effective process and clear understanding of each sector's requirements in accordance with the WUA.

This was apparent from responses such as "separation of CME functions is needed in the regional office as one official cannot inspect all the water sectors due to limited understanding of the sectors".

According to the participants, regional officials were not obligated to report to head office on their inspections owing to its delegation of powers in the DWS. This posed significant challenges to the inspection reports not being verified or quality checked by officials at head office.

Other concerns were related to the participants' believing that there were no clear definitions of roles and responsibilities of CME at head office and regional office which contributed to the lack of alignment of these functions. The fragmented administrative procedures and duplication of duties were hindering CME functions within and across departments and units contributing to poor communication (see C4), and further increase the inconsistencies and delays in the CME functions. These findings align with those by Tuokuu et al. (2018) who concluded that legislative, institutional and intersectoral fragmentation led to confusion of roles and responsibilities and duplication of functions.

The fifth highest ranked theme (see figure 1) mentioned by 8/20 participants was insufficient preplanning/collaboration/follow-ups (C6) between the head office and regional office CME units and government departments during inspections and investigations. This contributed to administrative delays and large groups of officials at joint inspections overwhelming the water user and delaying the work production of the facility. The participants indicated that planning of human capacity should be more efficient when conducting inspections and investigations.

This was apparent from responses such as "a lack of proper administrative process in the regional office is delaying the work".

The participants believed that insufficient collaboration between CME units at head office and regional office hampered the gathering of information from water users as the same information was requested repeatedly, which created frustration with the water users. Deficiencies in collaboration also had an impact on the administrative and enforcement actions, especially with the illegal sand mining as departments were not aware of one another's CME actions.

The participants highlighted the importance of conducting follow-up inspections to ensure that water users were rectifying non-compliances. With the current delegation of powers, the regional office is responsible to conduct follow-up inspections therefore the participants mentioned that clear roles and responsibilities should be defined to be able to assist in these inspections.

The sixth highest ranked challenge (see figure 1) is related to the standardisation and quality of report writing (C7) in regional offices. This was mentioned by 7/20 participants who perceived that the lack of confidence and understanding in drafting inspection reports contributed to the challenge. Currently, inspection reports reflect poor quality information and technical writing skills, which are attributed to limited human capacity and high volumes of inspections. This also delays the required sign-off by line managers and consequent feedback to the water user.

The participants' responses included "the quality of information captured in the reports are not good" and "lack of confidence and understanding to conduct inspections leads to poorly drafted reports from the regional office".

It is evident from the literature that producing good quality inspection reports and delays in the submission of reports is associated with insufficient human capacity, skills and knowledge (Naidoo et al. 2016) and has been noted as contributing challenges (see C2).

Ranked as the ninth highest challenge (see figure 1) was training and compliance promotion (C8) and mentioned by 3/20 of the participants. The participants believed that the regional offices required training and compliance promotion on the CME SOPs in conducting inspections and investigations.

This was evident from the following responses: "there is a lack of training at regional office", "catchment management agencies need training to know what to look for during inspections" and "CME standard operating procedures are not being implemented at regional office level".

The literature highlights that weak compliance promotion and training increase inconsistencies in conducting compliance inspections (Greiner et al. 2015). Furthermore, training on SOPs can ensure that a gradual and consistent way is followed for implementing CME processes.

Theme C: Attitude, Willingness, Behaviour

Buy-in and willingness to comply (C9) was tied as the fifth highest ranked challenge (see figure 1) and mentioned by 8/20 participants. This challenge relates to the buy-in or willingness from historically disadvantaged communities and traditional leaders to comply with water-related legislation, especially in the context of mining and agricultural activities.

One of the participants stated: “Communities and traditional leaders are not accepting of the legislation, especially for illegal sand mining.”

However, one should understand that many historically disadvantaged communities have limited knowledge of legislation or the required financial resources to comply with WUA processes (Denby et al. 2016). The literature indicates that the cost of compliance is high and, in many cases, unaffordable (Bodwitch et al. 2021). These communities will therefore struggle to comply with legal requirements even if they are willing to do so.

Tied as the ninth highest challenge (see figure 1) mentioned by 3/20 of the participants was related to existing behaviour and attitudes which contributed to the lack of interest and team building (C10). It was observed that officials from head office displayed an attitude of “powerplay” and “hearsay” in compelling officials to work together. The participants believed that relationships among officials needed to be strengthened to improve the water sector.

This was evident from the responses such as “a lack of interest among officials exists, we need capacity building”.

This may be addressed through relevant workshops, forums and meetings between officials to share their experiences and difficulties in the sector, which may increase their confidence in carrying out their duties (Pons et al. 2019).

Theme D: Administrative Processes and Procedures

Mentioned by 8/20 participants, political interferences and willpower (C11) ranked as tied fifth highest challenge (see figure 1). It was believed that the lack of political will to follow through on enforcement actions, especially in local government, contributed to the scope of work to be unsuccessful, which has undesired impacts on service delivery and decision-making.

Some participants stated that “political interferences and corruption is effecting service delivery” and “political interferences change the decision, cooperative governance is not working”.

These experiences of political interference and lack of political will have been observed in countries such as Bangladesh and Nigeria and have contributed to inefficiencies in the implementation of legislation and decision-making (Belal et al. 2015; Edo et al. 2022). It seems, however, that political interference is on the increase in the South African water sector (Reddy 2016). For example, recent reports of patronage networks, party politics and electoral concern have negatively influenced the allocation of water resources and decision-making processes in KwaZulu-Natal (Tutu and Dlamini 2024).

The seventh highest ranked challenge (see figure 1) mentioned by 6/20 participants was that water users, especially municipalities, do not comply with legislation and legal processes (C12). The participants were adamant the Intergovernmental Relations Framework Act (South Africa 2005) should be amended as executing compliance and enforcement actions were futile against municipalities, which resulted in poor operations of wastewater treatment works (WWTWs). According to the latest national Green Drop Report, a total of 334 WWTWs are in a critical state and pose a risk to both the environment and public health (WISA 2022). Furthermore, the funding of the DWS to the municipalities was a concern, and the participants felt municipalities should be strictly monitored to ensure compliance with the WUAs.

Some participants stated that "the Intergovernmental Relations Framework Act must be amended as taking action against the municipalities is difficult resulting in poor wastewater treatment works" and that "DWS is funding the municipalities but it's not refurbishing the plant".

This lack of compliance by municipalities may be attributed to ignorance, limited capacity of skilled and experienced staff and increased corruption in service delivery, which results in job losses and pollution of water resources (Thornhill 2014).

The eighth highest ranked challenge (see figure 1) mentioned by 4/20 of the participants was related to the improvement of research and technology in the DWS (C13). This is to ensure alignment with what the water users were implementing regarding new innovations to improve sustainable water conservation. The participants were convinced that ongoing research and new technology would improve water management and create awareness in the sector. It was perceived that the improvement of technology to the Fourth Industrial Revolution would contribute to the monitoring of the water uses.

This was evident from the responses: "new research can lead to effective compliance in the water sector" and "improve technology to do effective monitoring".

However, deficiencies such as budget availability (see C1), communication barriers (see C4) among the public and private sectors and the over-bureaucracy of administrative procedures need to be addressed before implementing new technologies in CME (Pegram et al. 2006).

Compliance Monitoring and Enforcement Opportunities

Figure 2 ranks the perceived opportunities for each code from highest to lowest. The opportunities are discussed below in accordance with the four identified themes (A–D) in table 2.

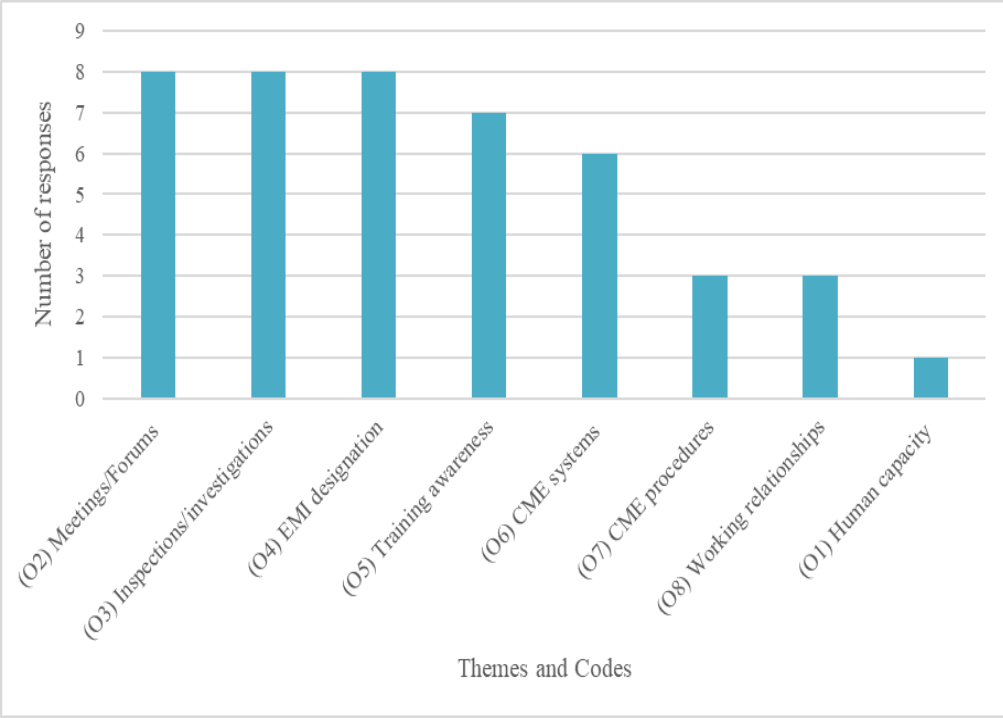

Figure 2: Perceived opportunities for CME in the South African water sector, ranked from highest to lowest

Theme A: Capacity

The lowest ranked opportunity (see figure 2) and mentioned by 1/20 participants was related to human capacity (O1). The participant perceived that an increase in human capacity will strengthen the workforce on the ground, relieve overworked officials, and improve CME processes. Creating dedicated units for enforcement actions will also speed up workflow and ensure that tasks are completed on time while being more visible in the sector through inspections and investigations.

Theme B: Stakeholder Engagement

Tied as the highest ranked opportunity (8/20) (see figure 2) was the engagement with water users through meetings and forums on understanding legislation and WUAs to improve water management (O2). This collaboration with external stakeholders can also provide for new ideas and interventions in the sector.

This was evident from the responses: “catchment management forums help to discuss water issues and increases compliance promotion” and “water users request engagement with DWS and helps them understand the CME process”.

Engaging water users at workshops and forums also provide the opportunities to discuss CME functions, processes and procedures with the water users. Similar views in the literature support stakeholder engagement to promote information sharing and the potential to increase compliance levels in the sector (Lyu and Yang 2024; Ravindra et al. 2016).

Theme C: Operational Opportunities

The highest ranked theme (see figure 2) mentioned by the participants (8/20) was related to inspections and investigations (O3). The participants perceived that inspections and investigations created awareness among water users on how to comply with the WUA conditions.

One participant responded: "inspections show water users over time what's going on with their activity and improve compliance."

Similarly, joint inspections allowed the involvement of different units which made the CME process more effective and efficient, while contributing to building relationships with the regional office and other governmental departments.

These responses are supported by Gray and Shimshack (2011), who concluded that inspections and investigations provide deterrence to non-compliance with regulations, thereby increasing overall compliance. Hauck and Kroese (2006) also highlight the importance of joint inspections in the effort to strengthen networks and the sharing of information resources.

The other highest ranked opportunity (see figure 2) mentioned by 8/20 of the participants is the designated EMIs (O4). The EMIs play a significant role in monitoring environmental legislation, with the aim of bringing everyone to task who are failing to comply (Baloyi and Masinga 2011). They are also designated to carry a docket while performing enforcement functions and do not rely on the administrative processes of the SAPS. Currently, there are 3 404 designated EMIs at national, provincial and local government level, of which only 124 function in the DWS. However, during 2023/2024 these inspectorates inspected more than 400 facilities and issued 250 administrative enforcement notices, which was the highest among all institutions in South Africa (DFFE 2024).

The importance of the EMIs could be concluded from responses such as "EMIs are able to tighten the criminal investigation and carry their docket under enforcement".

The second highest ranked opportunity (see figure 2) related to conducting training and awareness (O5) and was mentioned by 7/20 participants. The participants perceived that this opportunity would improve understanding of legislation and WUAs, and relationships in the water sector.

Some of the participants responded: “sector-specific training helps the regional officials to conduct inspections” and “training to communities assist them to understand legislation”.

This seems to be low-hanging fruit to pick, seeing that awareness and training promote confidence among employees and other stakeholders to effectively implement regulatory actions, create relationships between public and private sectors and increase their responsibilities as they relate to CME (Lyu and Yang 2024; Ravindra et al. 2016).

The third highest opportunity (see figure 2), as mentioned by 6/20 participants, was related to CME information systems (O6), namely, the NCIMS and the ECMS. Both these systems allow for the standardisation of inspection reports, tracking of transgressors and provide easy access to information. The introduction and implementation of such types of technology can improve monitoring and availability of data for the effective enforcement of regulations and assist governmental departments hampered by the lack of capacity (Lyu and Yang 2024).

One participant mentioned that “these systems help us to get information of the water user faster”.

The fourth highest ranked opportunity (see figure 2) was related to the CME procedures (O7) at the DWS, with 3/20 participants mentioning this opportunity. The intent of the procedures is to provide a standard approach for implementing CME processes such as inspections and investigations through clear instructions and information (DWS 2025).

This opportunity was evident from statements such as “the CME SOP manual provides structure to the CME processes and procedures”.

Theme D: Attitude, Support, Behaviour

Also tied as the fourth highest ranked opportunity (see figure 2) was working relationships (O8) as mentioned by 3/20 of the participants. The participants believed that supporting each other and the willingness to work together would strengthen relationships and improve skills between head office and regional office, contributing to effective CME. They expressed that fostering relationships with schools, communities, the private sector and other government departments would also promote the sharing of skills and create better understanding of the water sector.

Some participants stated: “we need to support each other to have successes” and “we need to create relationships with other departments to share skills”.

The literature supports these findings and indicates that working together can create successful working relationships for more efficient regulatory regimes (Ravindra et al. 2016).

Conclusion

This article aimed to explore the perceived challenges and opportunities for CME in the South African water sector with a specific focus on WUAs. By implementing a semi-structured interview approach, the 20 participants from the Chief Directorate: Water Use Compliance Monitoring and Enforcement at the DWS identified numerous challenges and opportunities. According to the literature, these challenges and opportunities are not unique, as they have been recorded in both developed and developing countries. In the South African context, the highest ranked and most frequently mentioned challenge was the need to improve knowledge, awareness, skills and understanding of legislation.

The lack of skills and overall competency in the water sector has been a persistent problem for decades. Concerns about limited skills and the exodus of experienced personnel in the water sector have been well documented (Karar et al. 2011; MacKay et al. 2003), and it seems that this is a continual trend with no concrete solution in sight. The other high-ranking challenge is ineffective communication in the CME units. This "soft skill" in the form of communication in the DWS has been an issue of concern over the recent years (Moolman et al. 2023). Ineffective communication between head office and regional offices creates administrative burdens and delays in CME units and contributes to the confusion when it comes to the delegation of functions and powers. Although many participants did not perceive it as a challenge, the trend of political interference in the water sector is alarming. Politicians are seemingly using "water" as an instrument to pursue political ideologies and have transformed the water sector into a political playing field (Bourblanc 2012; Bourblanc and Blanchon 2014). All to the detriment of the South African people.

The most frequently perceived opportunity is the promotion of compliance through meetings and forums within the department, among water users and other stakeholders in the water sector. Allowing for such a participatory approach to CME has mutual benefits including realising the objectives of integrated water resource management (Du Toit and Pollard 2008), fostering of relationships and the responsible implementation of legislation (King and Reddell 2015). The importance of the EMIs in CME processes should be highlighted. The inspectors are designated peace officers and may carry a docket which removes reliance on the SAPS and provides additional support to the NPA.

The following key recommendations are proposed to improve the overall effectiveness of CME in the South African water sector:

- Must do: the DWS must ensure that CME processes are not influenced by political interests or motivations and must prioritise transparency and accountability throughout its CME structures (Tutu and Dlamini 2024).
- Should do: the DWS should ensure the continuous upskilling of employees. A potential solution is the development of mentorship programmes in the DWS for

ongoing capacity building and skills development (Moolman et al. 2023). This should be supported by improved communication processes and established clear roles and responsibilities for more effective implementation of CME actions.

- May do: the DWS may consider strengthening the base of designated EMIs. It seems as if the efforts of the current corpus of EMIs are contributing to the overall CME objectives (DFFE 2024), and therefore additional boots on the ground may reinforce these efforts.

In conclusion, the findings provide a strong empirical validation of the components required for an effective CME framework (Craigie et al. 2009; INECE 2009). However, they also reveal the five components where systemic breakdowns are present. First, identification and strategy development are weakened by limited skills, fragmented roles and poor planning, which indicate that enforcement strategies are not consistently informed by adequate institutional capacity or sector-specific expertise. Second, although promulgation of legislation is well established through the NWA, the findings demonstrate that unclear legislative interpretation and limited understanding among officials undermine its practical authority. Third, promotion of compliance is underutilised, but highly promising; stakeholder engagement, inspections and forums are examples of proactive compliance mechanisms. Fourth, deficiencies in education and awareness – internally among officials and externally among water users – may explain the difficulties experienced in compliance levels and reinforce the fact that informed stakeholders are more likely to comply voluntarily. Finally, CME processes are constrained by political interference, capacity shortages and inconsistent implementation of procedures despite the presence of designated EMIs. The findings indicate that CME effectiveness depends on the integrated and systematic functioning of all five components, and that the failure of any single component may have a ripple effect across the framework.

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