WATER RESEARCH COMMISSION

WORKING PAPER

Reconfiguring the institutional landscape in the South African water sector

by

John Dini, Luxon Nhamo, Virginia Molose, Sylvester Mpandeli, Samkelisiwe Hlophe-Ginindza and Dhesigen Naidoo

Summary

The 1998 National Water Act was visionary. It summarised an aspirational institutional framework to simultaneously achieve a post-Apartheid transformation and redress, ensure immediate and future water security, ensure the basic human right to water in a sustainable development paradigm, while setting out the building blocks for water as an important instrument for the democratisation of state and society as envisioned in the Reconstruction and Development Programme.

However, the institutional landscape within the water sector has been in a state of flux since the National Water Act came into effect in 1998. There are many important reasons for this, not least being the limited harmonization of the development trajectories of different sectors, and the necessary muddiness of a negotiated settlement that included often incoherent compromises. This has impacted on the extent to which the sector has been able to achieve its own policy objectives as well as contribute to broader national development and transformation imperatives.

This WRC working paper compares the current institutional landscape with the desired future configuration expressed in policy pronouncements. It also examines the barriers to achieving this desired future institutional landscape and potential solutions for overcoming them. The analysis of the desired future configuration suggests that it should be successful in giving effect to the principle of separation of functions, especially those relating to policymaking, regulation and operations. There is an urgent need to boldly address remaining policy gaps and implement policy decisions in order to complete the long-standing institutional reform process. This is critical in both achieving policy certainty on institutional arrangements where gaps remain, and in decisively confronting the inevitable set of divergent interests and consequent resistance that the institutional reform process has invoked. The water-energy-food (WEF) nexus is put forward as a potential model of interaction between water sector institutions and other sectors, where there is a need to find a common ground to achieve multi policy decisions that lead to sustainable development and achieve national goals.

Acknowledgements

This working paper builds on, and attempts to summarise coherently, a large body of existing work. Numerous participatory processes, informed by a wide array of stakeholders, have continued to shape the evolution of the institutional landscape. Most of this work has been done under the leadership of the Department of Water and Sanitation, in its capacity as policymaker and sector leader. Recent landmarks include the National Water Policy Review published in 2014 and the National Water and Sanitation Master Plan published in 2018. This working paper aims to contribute to the further conversations that are necessary to enable an optimal set of institutions for the water sector. The diverse, vibrant voices that have shaped the conversation, and continue to shape it, are gratefully acknowledged.

1. Introduction

The governance of water requires interaction and mediation between complex systems. Viable and effective institutions are essential for enabling a structured, coherent approach to engaging with complexity, uncertainty and ongoing change. Weaknesses in the institutional fabric can have significant economic, social and environmental consequences, as we have already seen.

Water institutions, particularly those in the public sector, provide vehicles through which government can pursue its development and transformation objectives. In the South African water sector, two foundational pieces of legislation mandate the establishment of a set of public institutions. The Water Services Act (1997) provides for institutions concerned with delivery of water services. The National Water Act (1998) lays out an institutional landscape for the management of water resources. Both these statutes also prescribe the powers, functions and duties of the Minister of Human Settlements, Water and Sanitation, expressed through the Department of Water and Sanitation (DWS).

It could be argued that the institutional landscape within the water sector has been in a state of flux since the National Water Act ushered in ground-breaking reforms in 1998. An Institutional Reform and Realignment process initiated by the then Department of Water Affairs in 2010 confirmed that far-reaching institutional reforms in the water sector would still be necessary to ensure that government's key development and transformational objectives are met (DWA, 2011). The outcomes of this process, and subsequent policy developments with regard to institutional reform remain a work in progress to this day.

This paper sets out to compare our current institutional landscape with the desired future configuration expressed in policy pronouncements. It starts by examining the current configuration of public institutions in the water sector. By analysing a range of policy

documents, it then assembles a single coherent picture of the intended future institutional landscape articulated by our policymakers. It also examines the barriers to achieving this desired future institutional landscape and potential solutions for overcoming them. The paper concludes with an examination of the water-energy-food (WEF) nexus as a model for interaction between water institutions with other interconnected sectors to enable coherent, integrated policy making and implementation that drives towards equity and sustainability.

There is value in turning the spotlight on to the institutional landscape as a means for understanding some of the dimensions of what is currently working and not working in the water sector. It is argued here that resolving the institutional landscape will go a long way to addressing many of the seemingly intractable problems in the water sector. Tremendous value will be added by laying down a bedrock of institutions that have the necessary powers, duties and functions; clarity of roles and responsibilities; and sustainable resourcing to carry out their mandates.

The second edition of the National Water Resource Strategy (NWRS2) recognises the urgency and importance of this institutional bedrock and put forward the following five strategic areas requiring urgent attention with respect to institutional reform (DWA, 2013, p. 59):

- Developing, financing and managing national water infrastructure
- Managing water resources at the local and catchment level
- Managing regional water infrastructure and supporting local government in the delivery of water services
- Managing local water resources infrastructure, supporting resource-poor farmers and transformation of the irrigated agriculture component of the water sector
- Regulation of the sector

2. Separation of functions

In sketching the picture of the current institutional landscape, a frame of analysis is used that applies the principle of separation of functions. The expression of this concept in the water sector has roots in the White Paper on a National Water Policy for South Africa (DWAF, 1997) but was more explicitly articulated in the Strategic Framework for Water Services (DWAF, 2003). The Institutional Reform and Realignment process further highlighted the importance of the separation of functions, specifically policy making, regulation and operational roles (DWA, 2011). This theme continues in the second edition of the National Water Resource Strategy (NWRS2) through the inclusion of a clear principle on the separation of regulatory and operational responsibilities (DWA, 2013, p. 61).

In terms of international practice, the importance of ensuring separation of functions is clearly embedded in the Principles on Water Governance recently completed by the Water Governance Initiative of the Organisation for Economic Cooperation and Development (OECD, 2018). Principle 1 states, “Clearly allocate and distinguish roles and responsibilities for water policy-making, policy implementation, operational management and regulation, and foster co-ordination across these responsible authorities”.

The sections that follow take each of the functional silos (policy making, implementation and regulation) in turn and examine each of the institutions that they contain. The current configuration is discussed as well as the intended future configuration of each institution. For the purpose of keeping the paper short and focused, institutional arrangements for management of watercourses shared with neighbouring countries will not be discussed.

3. Current institutional landscape

Figure 1 outlines the current institutional landscape. Each of the institutions in the figure are shown in relation to which of the functions listed above (policy making, implementation and regulation) they are most closely associated with. This superimposition provides a clearer picture of how the principle of separation of functions, as expressed in several DWS policy documents, will be enabled through the intended future institutional configuration. Implementation/operations in this context refers primarily to functions related to the development of water infrastructure at all scales (national, regional and local) and the provision of water and sanitation services to consumers. Policy-making, sector leadership and institutional oversight includes promotion of good practice, development and revision of national policies, oversight of all legislation impacting on the water sector (including the setting of national norms and standards), co-ordination with other national departments on policy, legislation and other sector issues, national communications, and the development of national strategies to achieve water sector goals. Regulation refers to a set of functions encompassing water use authorisation, compulsory national standards for water services, infrastructure regulation, oversight of public entities reporting to the Minister, regulation of competition, and economic regulation.

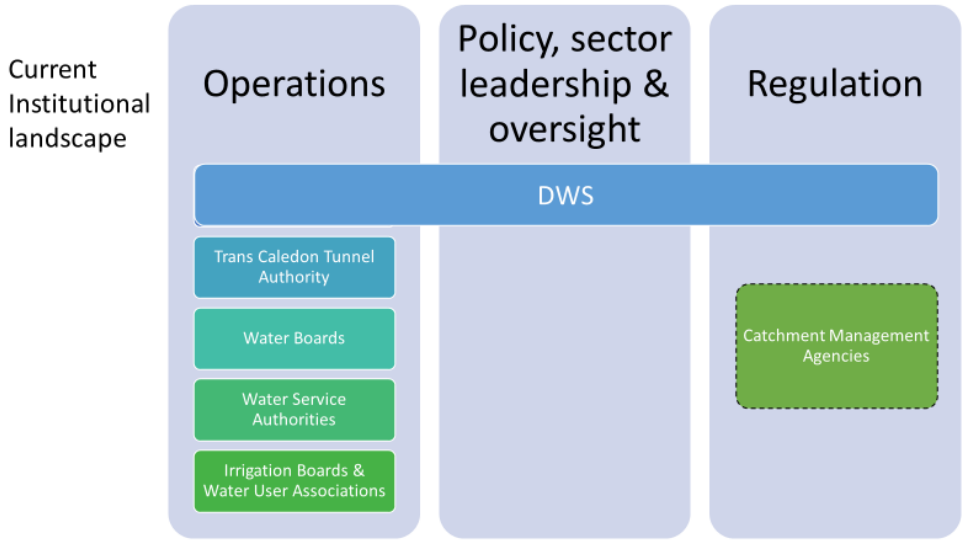

Figure 1. Current institutional configuration in relation to the functions of operations, policymaking and regulation. The dotted border for Catchment Management Agencies indicates that only two of the proposed nine are operational and the powers to act as the responsible authority in relation to water use licencing and water allocation have not yet been delegated or assigned..

3.1 Operations

Operations/implementation in this context refers to a set of functions related primarily to the development of water infrastructure at all scales (national, regional and local) and the provision of water and sanitation services to consumers.

3.1.1 DWS

At present, DWS manages most of the national water resources infrastructure through its Water Trading Entity and National Water Resources Infrastructure Branch.

3.1.2 Trans-Caledon Tunnel Authority

The Trans-Caledon Tunnel Authority (TCTA) finances and project manages the implementation of economically viable water projects, as directed by the Minister. TCTA projects are financed off-budget and the investment costs are repaid through user charges.

3.1.3 Water Boards

Water boards are state-owned regional water services providers that provide both bulk services to Water Services Authorities (WSAs) and retail services on behalf of WSAs. Water Boards are public entities established through the Water Services Act. The Minister of Water

and Sanitation comprises the shareholder and executive authority. There are currently 12 water boards within South Africa.

3.1.4 Water Services Authorities

The Constitution assigns responsibility for "potable water supply systems and domestic waste-water and sewage disposal systems" to the local sphere of government. Responsibility for these functions lies with the 144 metropolitan, district and local municipalities designated as WSAs, which provides them with the executive authority to provide water services within their areas of jurisdiction.

3.1.5 Irrigation Boards and Water User Associations

The National Water Act envisages Water User Associations (WUAs) as "associations of individual water users who wish to undertake water related activities for their mutual benefit with voluntary membership intended to support the management of local water resources in the common interest". The Act provides for the establishment and disestablishment of WUAs, which may only carry out duties and functions assigned or delegated to them by the Minister.

Irrigation Boards existing when the Act came into effect were to be restructured into WUAs and thereby regulated under the Act. However, there are still 220 Irrigation Boards in existence. There are currently 90 WUAs, comprising both new WUAs and transformed Irrigation Boards.

3.2 Policymaking, sector leadership and institutional oversight

This set of functions refers to promotion of good practice, development and revision of national policies, oversight of all legislation impacting on the water sector (including the setting of national norms and standards), co-ordination with other national departments on policy, legislation and other sector issues, national communications, and the development of national strategies to achieve water sector goals.

3.2.1 DWS

The DWS leads, coordinates and regulates the water and sanitation sectors in South Africa, develops policy and strategy, and provides support to the sector. It also has the responsibility to develop policy with regard to international water issues.

3.3 Regulation

Regulation refers to a set of functions encompassing water use authorisation, compulsory national standards for water services, infrastructure regulation, oversight of public entities reporting to the Minister, regulation of competition, and economic regulation.

3.3.1 DWS

There is currently no coherent economic regulation of the entire water value chain (DWS, 2014). DWS, primarily through its Chief Directorate: Economic and Social Regulation, currently fulfils the role of the national regulator of the water sector. This involves setting raw water tariffs and playing an oversight role in the setting of bulk water tariffs by Water Boards and retail tariffs by Water Service Authorities. A further role entails monitoring sector performance, including conformity to national norms and standards.

3.3.2 Catchment Management Agencies

Expressing the principle of subsidiarity, the National Water Act mandates the decentralisation of water resource management through Catchment Management Agencies (CMAs) as the principal institutional vehicles through which to realise this intent. Originally, 19 CMAs were envisaged but this number was rationalised to nine by the Minister in March 2012. The NWRS2 published in 2013 reflects the intention to establish nine CMAs. Of these, six have been established to date (the Inkomati-Usuthu, Breede-Gouritz, Pongola-Umzimkulu, Limpopo-North West, Vaal and Olifants CMAs), of which only the first two are operational.

4. Future intended configuration

Figure 2 outlines the vision for a future institutional landscape that has been articulated across a range of policy documents. It demonstrates the manner in which this institutional configuration will succeed in separating functions. The discussion in the following sections on each of these institutions will examine the barriers to achieving this configuration and potential solutions for overcoming them.

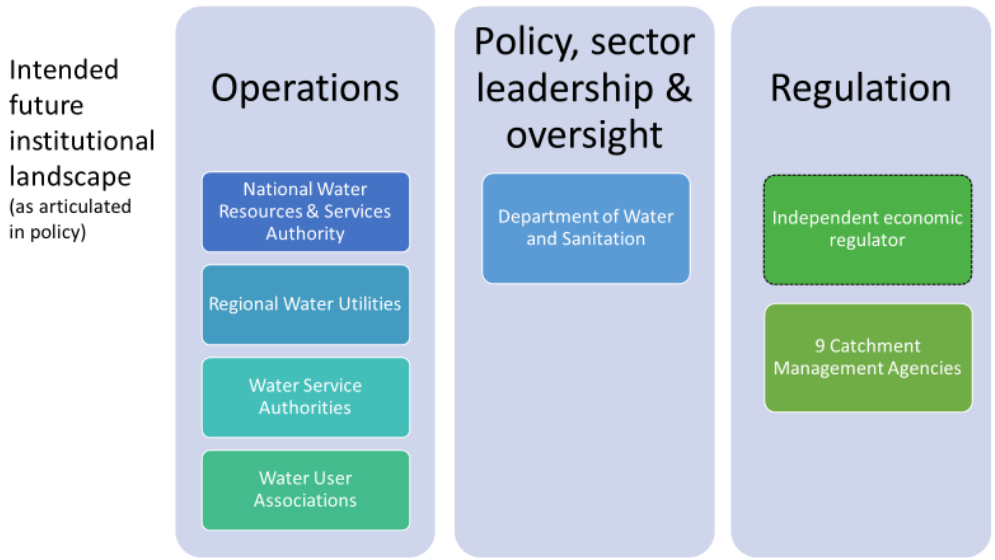

Figure 2: Intended future institutional configuration, as outlined in DWS policy statements. The dotted border for the independent economic regulator denotes that a final decision has not yet been made on whether to establish the regulator as a component within DWS or as an independent statutory body. Although the intended number of CMAs to be established currently stands at nine, it is possible that this may be rationalised in the future.

4.1 Operations

4.1.1 National Water Resources and Services Authority

The NWRS2 reflects the long-standing acknowledgement that current arrangements for managing national water infrastructure within DWS are not the most appropriate or efficient (DWA, 2013, p. 59). A model was put forward to combine the National Water Resources Infrastructure Branch of DWS, the Water Trading Entity (currently housed within DWS) and the TCTA into a single entity. The NWRS2 recognised the need for a phased approach, given the complexity of the required organisational realignment.

The process was given impetus by then Minister of Human Settlements, Water and Sanitation, Gugile Nkwinti, in his announcement in his 2018/19 Budget Vote speech of the establishment of a National Water Resources and Services Authority as one of five priorities for the department (Nkwinti, 2018). The National Water and Sanitation Master Plan (NWSMP) sets out a priority action, "Establish the National Water and Sanitation Infrastructure Agency (NAWASIA)"(DWS, 2018, p. 9_6), which is understood to be synonymous with that presented by the Minister subsequently. Work on setting up the National Water Resources and Services Authority has been included in the DWS 2020/21 APP, although formal establishment is projected for 2022/23.

4.1.2 Regional Water Utilities

The Strategic Framework for Water Services(2003) sketched a picture of a highly fragmented institutional framework for water services provision, with a substantial number of water services institutions acting as water services providers. This fragmentation risked incurring the loss of economies of scale, duplication of administration and technical functions, inability to attract and retain good management and technical staff, and inability to invest in the development and training of specialist skills. Regionalisation as an approach was put forward as an operating principle in instances when it will clearly yield advantages.

The Institutional Reform and Realignment process motivated for the reconfiguration of the 12 existing Water Boards into nine Regional Water Utilities (RWUs), on the basis that the regional nature of the institutions would enhance economic viability (DWA, 2011). The concept of RWUs as vehicles for managing regional bulk water and wastewater infrastructure is echoed in the NWRS2 (DWA, 2013, p. 63). The formula of 12 Water Boards into nine RWUs is picked up in the NWRS2 as a workable configuration for strengthening the development, financing, management, operation and maintenance of regional bulk water and wastewater infrastructure. Besides consolidation, an expansion in mandate is considered, with the range of contemplated functions including:

- managing bulk water services infrastructure and supplying bulk water to WSAs and their Water Services Providers, and to bulk water consumers;
- managing bulk sanitation infrastructure for wastewater treatment;
- operating existing regional water resources infrastructure;
- developing new regional water resources infrastructure;
- supporting municipalities by providing water services on their behalf to users or by providing services directly to municipalities on a contractual basis; and
- supporting CMAs to undertake water resources management functions (DWA, 2013, p. 64).

The amalgamation and expansion of mandates of RWUs forms one of the priority actions in the NWSMP, “Establish Regional Water Utilities (RWUs) to manage regional bulk water supply; assist municipalities to perform their primary water services mandate where necessary, manage regional water resources infrastructure, manage regional bulk WWTW” (DWS, 2018, p. 9_6).). To date the 12 existing Water Boards continue to function as separate entities.

4.1.3 Water Service Authorities

Despite clear signals that the WSA model requires revisiting, there is a lack of clear policy direction on how to tackle and potentially overhaul it. Its enabling legislation, the 1997

Water Services Act, predates keystone legislation that prescribes how the local government sphere will go about its business, in the form of the 1998 Municipal Structures Act and 2000 Municipal Systems Act. Some WSAs have now been in place for over 15 years without any major review of the performance of the model being undertaken. At least 33% of the municipalities designated as WSAs are included in the list of dysfunctional and distressed municipalities released by the Department of Cooperative Governance in 2018, and more than 50% have no or very limited technical staff (DWS, 2018).

There is, however, a lack of clear policy direction on how to tackle and potentially overhaul the WSA model. The NWSMP does not put forward any specific actions in this regard, although presentations by DWS staff on the NWSMP have proposed interventions to review institutional arrangements for WSAs, including financing, organisational structures and job responsibility models (Balzer, 2018).

It can be argued that one of the least effected elements of the legislation pertaining to WSAs is sections 76 - 78 of the Municipal Systems Act. Section 77 describes the occasions when a municipality must review and decide on the appropriate mechanism to provide a municipal service. One of these occasions is when municipalities are preparing or reviewing their Integrated Development Plans (IDP). It is common knowledge that the IDP review process lacks the necessary rigour and does little in terms of real community inclusion and participation in the municipal planning and budgeting processes. There is little interrogation, if at all, of communities' water uses and the appropriateness of the service being provided, resulting in the implementation of default water service delivery models. At IDP review time, WSAs hardly interrogate the decisions implemented by their Water Service Provider (WSP). There is hardly an example of a community-based organisation being appointed as a WSP, even where previously appointed WSPs have failed to deliver quality services and communities have stepped in to deliver such services themselves. The Multiple Use Water Services project has demonstrated that a community driven service delivery model is viable. It presents accountability measures at the correct level (Hofstetter et al 2020), with service providers, either officials or contractors, held accountable for the type of service they deliver. Also, the model presents opportunities for co-management arrangements of water services building on existing strengths and capacities of municipalities and communities.

4.1.4 Water User Associations (WUAs)

The NWRS2 outlined a set of strategic interventions focusing on the transformation of Irrigation Boards and WUAs. There is considerable urgency to convert numerous remaining Irrigation Boards to WUAs, to bring them into alignment with the objectives of the National Water Act. Further, it is also necessary to focus on supporting the transformation of existing WUAs and the establishment of new WUAs to facilitate access to water for irrigation

purposes by historically disadvantaged individuals, and enabling DWS to effectively regulate and support the irrigated agricultural sector (DWA, 2013, p. 67).

Subsequently, the 2014 National Water Policy Review put forward clear policy positions regarding the future existence of Irrigation Boards and WUAs: “The Minister will specify a date by which WUAs and Irrigation Boards (IBs) will cease to exist, with the appropriate functions related to a state-owned water scheme being delegated to a CMA or Regional Water Utility. The process of dis-establishment will be aligned to the establishment of CMAs and will ensure adequate measures are put in place to ensure a smooth transition from the existing arrangements” (DWS, 2014, p. 29). Further, “CMAs, together with DWS, will decide on the most suitable structures to co-ordinate water activities at the local level. This is in line with the provisions of the NWA. DWS will therefore use this prerogative through the actions of the Minister and ensure that objectives of transformation and equity are achieved without compromising local water management. The exercise of this prerogative will lead to the dis-establishment of IBs and WUAs and the restructuring of existing water management and water coordination activities at the local level” (DWS, 2014, p. 30).

To date, no further visible steps have been taken to give effect to these decisions around dis-establishment of Irrigation Boards or WUAs. There appears to be some reluctance on the part of DWS to implement the dis-establishment of WUAs and Irrigation Boards. This may be a result of a recognition of the role they are playing in managing water resources at local scale in the absence of functioning CMAs in most Water Management Areas. The NWSMP does not contain any priority actions relating to the future of WUAs and Irrigation Boards. If anything, it confirms the ambivalence within the department with the statement that, “A roadmap has been developed to transform all IBs and WUAs into local water resources management institutions” (DWS, 2018, p. 9_5). This does not appear to be in line with the existing policy prescripts.

In March 2020, the Minister revived the process for the remaining Irrigation Boards to either be transformed into WUAs or be disestablished. Targets to this effect have been included in the DWS 2020/21 APP and work is underway within DWS.

There are dependencies with CMA establishment that come into play and will influence if and how the process unfolds in different Water Management Areas. More visible within DWS is ongoing work to pursue the transformation of existing WUAs and Irrigation Boards in order to make these structures more inclusive and aligned to national equity and redress imperatives. It is important to note, however, that a WRC study found that emerging farmers do not see access to water as the only constraint to growing their businesses (Ncube, 2018). *Lack of ownership of the land*, or other mechanisms to secure tenure was identified as the biggest impediment in securing financing, disaster relief packages, training

and skills development which would enable them to grow their businesses. This may affect the long-term outcomes for livelihoods, food security and GDP of the recent announcement by the Minister of Agriculture, Land Reform and Rural Development, Thoko Didiza, to lease underutilised or vacant state-owned land to emerging farmers for a 32 year period, rather than transfer ownership.

4.2 Policymaking, sector leadership and institutional oversight

4.2.1 DWS

The NWRS2 creates a vision of DWS under the future scenario of separated functions, in which the department will no longer be directly involved in the development, financing, operation and maintenance of water resources infrastructure, nor economic regulation and the issuing of water use licences. Instead, it will focus on policy development, strategic planning, regulatory oversight and support. The DWS regional offices will provide institutional and technical support for water resource management and water services and will fulfil coordination and auditing functions (DWA, 2013, p. 62). However, until the necessary processes have been completed to establish and mandate the institutions that will take over the operations and regulatory functions, they will continue to be carried out by DWS.

The reconfigured DWS role includes:

- providing strong sector leadership;
- developing and revising national policies;
- providing oversight of all legislation impacting on the water sector (including the setting of national norms and standards);
- providing guidance on institutional roles and responsibilities;
- co-ordinating with other national departments on policy, legislation and other sector issues;
- promoting good practice; and
- developing national strategies to achieve water sector goals.

4.3 Regulation

4.3.1 [Independent] economic regulator

The current institutional arrangements of the economic or price regulator do not lend themselves to a clear separation of the policy, operational and regulatory roles (DWA, 2013, p. 72). Water Boards are not effectively regulated and some are performing poorly. A more appropriate and effective institutional model that averts conflicts of interest and ensures

coherent and consistent regulation of tariffs, efficiencies and performance across the length of the water value chain is required.

According to such a model, regulation could encompass:

- monitoring compliance and performance with respect to national policies and norms and standards (technical regulation);
- review of tariffs and investment decisions of the providers of water services (economic regulation); and
- ensuring that contracts between WSAs and Water Service Providers conform to national regulations, and oversight of the management and enforcement of contracts (contract regulation).

The possibility of an independent economic regulator to regulate tariffs, standards and performance along the full length of the water value chain (raw, bulk and retail) has been proposed. A business case for the establishment of an independent economic regulator (DWS, 2017a) was released by DWS for comment in 2017. However, no firm decision appears to have been taken yet on the model to be adopted (regulator as a component within DWS or as an independent statutory body). Strong differences of opinion exist within the sector and beyond, deriving partly from experience with economic regulation in other sectors.

This lack of certainty is reflected in the NWSMP, which sets out a priority action, “Establish an independent economic regulator”(DWS, 2018, p. 6_5) but also contains another priority action, “Determine the appropriate institutional arrangements for effective economic regulation of the water sector” (DWS, 2018, p. 9_6). This suggests the establishment of an independent regulator is not a foregone conclusion.

Other actions in the NWSMP relating to economic regulation include “Implement the Waste Discharge Charge Systems in the upper Crocodile, upper Vaal, and upper Olifants catchments” (DWS, 2018, p. 6_6), and “Review the raw water pricing strategy and implement the waste discharge charge” (DWS, 2018, p 9_6).

The DWS 2020/21 APP does not list any targets for moving this process forward, although a second business case is projected for 2021/22 and draft enabling legislation for an independent regulator is projected for 2022/23.

4.3.2 CMAs

The review in 2017 of institutional arrangements for water resource management by DWS culminated in the gazetting of a proposal to establish a single national entity, the National

Water Resource Management Agency (DWS, 2017b). The business case for this entity indicated that the "single CMA" would incorporate and convert to regional business units the nine CMAs that have either been established or are in the process of being established (DWS, 2017c).

The process to establish nine CMAs was reinstated by Minister Nkwinti in 2018, although no further formal announcements have been made since then. Of these, six have been established to date (the Inkomati-Usuthu, Breede-Gouritz, Pongola-Umzimkulu, Limpopo-North West, Vaal and Olifants CMAs), of which only the first two are operational. Proposals are on the table to rationalise the number of CMAs from nine to six.

The NWSMP sets out a priority action, "Establish financially sustainable CMAs (or one CMA) across the country, and transfer staff and budget and delegated functions, including licensing of water use."(DWS, 2018, p. 6_6). The wording of the NWSMP action contains the two most critical issues relating to CMA establishment. These issues were described by Pejan & Cogger (2011) as being fundamental to the ability of CMAs to fully realise the policy goals underlying their creation. The first is the establishment of CMAs as legal entities, through the procedures spelt out in the Act. The second is the delegation or assignment of powers, functions and duties that the Act envisages being performed ultimately by CMAs, beyond the "initial functions" listed in section 80 that are automatically activated upon establishment of a CMA.

The NWRS2 makes clear that the rate at which these functions will be delegated to CMAs will depend on their ability to carry out the functions to the required standards. A responsibility is placed upon DWS to assist CMAs in building capacity to carry out these delegated functions as soon as is practically possible (DWA, 2013, p. 65). Currently the two operational CMAs have only been delegated a limited set of functions. Considerable confusion was caused when DWS revoked some delegated functions in December 2015 without explanation. No further delegations have been issued since June 2016 (SAWC, 2017).

5. Key challenges impeding attainment of the desired future configuration

From the analysis undertaken in the preparation of this paper, it is clear that, in general, the key agenda setters for water sector direction in the short to medium term (NWRS2 and its implementation plan, and NWSMP) are both mindful of the urgency to complete the unfinished business of institutional reform. In most cases these documents list the next steps necessary for progress to be made.

There remains a larger, more pervasive but less visible set of factors that should be examined for their role in inhibiting the transition from current to the desired future institutional landscape. These focus on the need for strong, decisive leadership and addressing vested interests that may be intent on undermining the various institutional reform processes underway.

The acknowledgement of these impediments is not new and was clearly brought into the open in the 2010 Institutional Realignment and Reform process driven by DWS. The resulting strategy did not pull its punches in identifying the critical, unsubstitutable role that would need to be played by the Minister and top departmental management in achieving policy certainty and driving the required reforms to completion. There is a need for strong leadership that will result in timely and strategic decisions. Senior management and the Minister need to agree on the institutional design and oversee its implementation through the inevitable obstacles and resistance that occurs with any institutional reform process" (DWA, 2011, p. 26).

Particular risks and complexities are introduced to processes of institutional reform in the form of resistance to the proposed changes as a result of competing interests. It is inevitable that there will be individuals and groups who stand to gain or lose through such processes. These powerful interests cannot however be ignored. Where it is not possible to align interests to achieve the goals of the reform process, very strong and decisive leadership will be required to overcome vested interests that may be an obstacle to meaningful reform (DWA, 2011).

It could be argued that decisive leadership at both the political and administrative levels has been lacking in relation to the institutional reform process. Instability in leadership has the potential to affect all areas of DWS operations (AGSA, 2018, p. 10). A continued absence of strong reform champions to finalise and see through comprehensive reform plans will doom actions contained in any current or future iterations of NWRS and NWSMP to the same fate as their predecessors.

For example, there may be concerns that the establishment of CMAs might weaken government's ability to achieve its transformation and equity objectives (Merrey et al., 2009). The extent to which such perceptions have contributed to the lack of progress in establishing CMAs may require further investigation. A similar scenario is sketched around the future streamlining of DWS in line with the separation of functions. This would be accompanied by corresponding reduction in budgets and staff as these moved with the functions to their new institutional homes. This may be a factor restraining DWS from setting itself up for a downscaling in budget, together with any perceived loss of control or influence that may go along with this (Pejan & Cogger, 2011).

6. The water-energy-food nexus as a model for interaction of water institutions with other sectors

Policy coordination and formulation among major actors and stakeholders through the water-energy-food (WEF) nexus provides pathways towards integrated governance, not only in the water sector, but also in other linked sectors of energy and food. As water is both physically and economically scarce across major sectors such as energy and mining, there have been water, energy and food insecurities in the country in the recent past (Von Bormann and Gulati, 2014). This scarcity is mainly related to water use for energy and agricultural production (including irrigation under both aspects), and for drinking and domestic purposes.

Ninety-eight percent of the country's total water supply is already allocated (Blignaut and Van Heerden, 2009), there is little arable land, and approximately 54.4 % of South African households are food insecure or at risk of being food insecure (Shisana et al., 2013). South Africa also has a high dependency on 'condemned' coal-fired power as 90% of the country's electricity is generated from the fossil fuel, which is a major contributor to greenhouse gas emissions in the region (Ololade, 2018). Compounding the situation is the fact that large proportions of water are required to produce energy from coal, which can contribute to water scarcity (Ololade, 2018). There is already evidence of water scarcity in areas where coal reserves are located (Ololade, 2018). Estimates show that by 2030, 65% of South Africa's electricity will still be generated from coal (Von Bormann and Gulati, 2014). Another major challenge for the country is that coal deposits are located in the same area as the country's prime agricultural land (Gulati et al., 2013). These spatial complexities affect the effective management of WEF resources, making it a major challenge for sustainable development for the country (Von Bormann and Gulati, 2014).

The WEF nexus concept, if implemented correctly, can assist in uncovering synergies and detecting harmful trade-offs among the complex nexus resources of South Africa (Liu et al., 2018). The WEF nexus is aimed at providing opportunity for distinct, but interconnected sectors to meet each other and formulate integrated, transformative policy that transcends siloed sector-based approaches. This will help to ensure access for basic human needs, alleviate hunger, improve health, and build a sustainable economy. Only legitimate governance with robust institutions in place can provide for the equitable allocation of resources. Effective stakeholder participation in governance of the nexus is necessary and ensured when power asymmetries, interdependencies and rights are accounted for in principles of procedural justice. If institutions are adopting the nexus approach in this country, the fiscus in this country will be less stretched compared with the current situation. There would be less duplication of activities, resources will be put in one pot and these resources will be used in very effective and efficient manner.

There are several case studies across the globe which show that the current challenges faced by various countries need the nexus approach or understanding. Moreover, to ensure access to people in the WEF nexus, the distribution of the three resources and related rights must be delivered in an integrated manner. This is critical for enhancing adaptation to climate change and build resilient communities through informed mitigation of trade-offs and promote synergies among the resources as well as conserve the environment within the context of the Sustainable Development Goals.

7. Conclusion

Despite the need for the further development of some components, the intended future institutional configuration discussed in this paper is a coherent, structured bedrock upon which policy implementation and service delivery can be undertaken. The intended future configuration should be successful in giving effect to the principle of separation of policymaking, regulation and operations functions. This separation will best be achieved if the economic regulator is established outside of DWS, and if the full range of regulatory functions intended by the National Water Act to be carried out by CMAs is assigned to them. Another important building block is the rapid realisation of the completion of the Water Allocation Reform process as soon as possible. It is also clear that the skills set required for this new institutional landscape is greatly expanded and must be embedded in 21st century best practice.

It is clear that in general the key agenda setters for water sector direction in the short to medium term (NWRS2 and its implementation plan, and NWSMP) are both mindful of the urgency to complete the unfinished business of institutional reform. In most cases these documents list the next steps necessary for progress to be made. Beyond these, the 2010 Institutional Realignment and Reform process has also shed light on some of the key non-technical factors, such as resistance from vested interests favouring the status quo, that are impeding progress towards realising the vision for a future institutional landscape. This combination of technical and non-technical factors will require policy clarity, strong leadership, change management and suitable expertise underpinned by appropriate knowledge resources. With respect to the latter, reconfiguring the institutional landscape in the South Africa water sector should be informed or influenced by a strong evidence base generated by relevant research. The community of practice, policy makers and policy implementers should have common understanding in order for them to be able to take bold decisions based on latest science.

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