

## **Achieving Integrated Water Resource Management: the mismatch in boundaries between water resources management and water supply**

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*Central to the National Water Policy of South Africa and echoed in the National Water Act (Act 36 of 1998) and Water Services Act (Act 108 of 1997) is the devolution of water management and regulation to regional authorities that take the form of Water Services Authorities and Catchment Management Agencies. Our argument is that local government has a very narrow focus of responsibility within WRM – that is, a focus specifically on water supply - and that this is not planned within the WRM framework of the catchment. We suggest that in a new policy environment that talks to sustainability planning this represents a major oversight. Moreover, this situation is exacerbated by the different boundaries within which WRM and water supply operate. We illustrate this argument through examining the situation in the Sand River catchment and the Bohlabela Municipal District and highlights key issues that should be considered in charting a way forward.*

*Keywords: IWRM, South Africa, Sand River, water supply*

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### **Introduction**

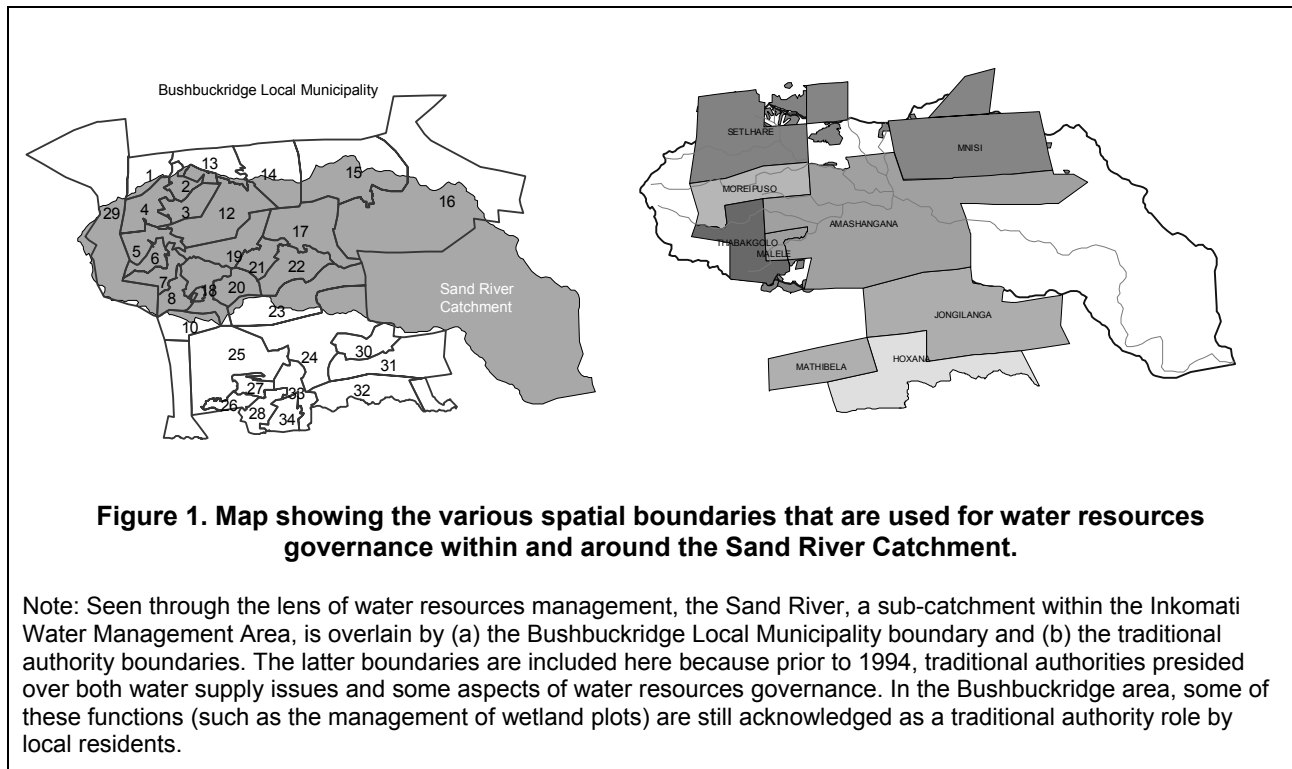
South Africa is at a point where, after the complete revision of its water and sanitation policies that accompanied democratic transformation, attention has turned to implementation. The new policies and associated legislation are not only about ensuring adequate quality and quantity of water for human need, they are also about protecting the resources available for current and future use so that the national slogan of ‘*some, for all, forever*’ can be realized. In a fundamental departure from previous approaches to water resource management, catchments are seen as the units for integrated water resources management (IWRM).

Another key development is the specific requirement to include local stakeholders in WRM. In its broadest sense this is to be undertaken by Catchment Management Agencies (CMA) which are tasked with the management of water resources at the scale of Water Management Areas or WMA. South Africa has been divided into 19 water management areas, each comprising a number of catchments. It is incumbent on the CMA to consider the sustainability of both the resource base as well as water delivery mechanisms. Theoretically, the CMA’s will be informed by local-level representation through Catchment Fora and/ or Committees, Water User Associations, Water Services Authorities and Water Service Providers. Local governance structures in the form of district and local municipalities are expected to participate in the water management and supply side as Water Service Authorities and Water Service Providers.

The management of water resources falls within the remit of the National Water Act (NWA, 1998) and is specific to catchments (natural boundaries) within water management areas. Water services provision, on the other hand, is largely the domain of the Water Services Act (WSA, 1997) and is mainly grounded in the provision of water services within municipal (administrative) boundaries.

This paper raises potential disjunctures that are emerging between water resources management and water services provision. We focus specifically on the role and planning frameworks of Local Government and the CMA, although many of the comments pertain equally to other stakeholder groups such as agriculture and industry. In the paper we seek to elaborate the situation by drawing on our experience in the Sand River Catchment and Bohlabela District (Figure 1), and by considering the implications that the various legislative and planning instruments might have for the implementation of IWRM at a local level as outlined by the National Water Policy (1997). We then go on to examine the implications that various policy and planning frameworks as well as different spatial (catchment, traditional authority and local government) boundaries might hold for IWRM. It is pertinent to provide with a brief description of the policy environment and the

imperative for democratic decentralization as supported by the National Constitution of South Africa (Act 108 of 1996).



Despite the requirements of the new National Water Act (1998) to work toward *Integrated* Water Resources Management, within the wider spirit of the Act (equity and sustainability), the current focus of most water-related institutions is exclusively on supply. We suggest that the split between water resources management and water supply, both legislatively and institutionally undermines the intentions of integration. We also maintain that there is insufficient focus on the sustainability aspect of water resources management within the supply sectors.

In our context of the Sand River Catchment, District and Local governance structures are tasked, by the Water Services Act, with a very specific aspect of WRM - that of water supply – although the NWA clearly invites them to participate in the wider sphere of IWRM. Nonetheless, given the urgency to meet domestic demands and to address the backlog of the apartheid regime inequities, it is hardly surprising that little attention is currently given to the broader aspects of WRM. Even so, we would argue that the current absence of planning within the broader holistic framework provided by the NWA and more recently, the National Water Resources Strategy (2002) will work at cross-purposes to the very principles and intentions of these new policies - namely, sustainability and equity. In particular, we argue that the aim of IWRM, which includes the supply of water, is confounded by the current mismatch between administrative and natural/catchment boundaries. We also suggest that the tasks of Local Government are often conflated with those of wider stakeholder platforms specifically constituted for IWRM- the catchment management fora/ committees and ultimately the CMA. Without a clear initiative to align and reconcile these conflations and mismatches, it is likely that the scenario of ‘planning in a vacuum’ will continue. This implies that water management and water supply will remain delinked.

## Background: policy and legislative environment

### Policy and acts

The national water policy (1997) sets out a framework for the management of water and provision of water services and forms the basis for the derivation of the two main laws: the National Water Act (1998) and the Water Services Act (1997). The approach adopted by the water policy can be summarized in the slogan: “*some,*

*for all, for ever*”, and captures the Constitutional obligation to provide access to “*sufficient food and water to meet basic human needs*” as a human right (“*some, for all*”). Additionally, the water policy recognizes the need to plan for sustainable management of water to ensure adequate water for present and future generations (“*forever*”). The “*some, for all, forever*” slogan is then articulated in the two legislative instruments and then translated into implementation plans and strategies at national, provincial and local levels.

The NWA, albeit far reaching in the changes that it heralds for water resource management in South Africa, is a framework act, leaving much of the detail as to how it will be implemented to regulators and operators to define within a local context. However, the Act commits us to the ideal of Integrated Catchment Management and recognizes the context for WRM as the catchment.

The provision of water services, on the other hand, takes its context from the administrative boundaries of District and Local Municipalities. The WSA details issues of water supply and sanitation and lays out some of the institutions associated with the water services provision such as water boards and water services providers.

### **Integrated catchment management**

Integrated catchment management (ICM) can be seen as a critique of the fragmented approach to managing water resources, rivers and the terrestrial activities that affect them. It is an approach underwritten by principles of sustainability planning. Fragmentation has typically been both sectoral and geographical. Sectoral fragmentation is sometimes referred to as the “silo” effect, where each set of activities is managed within the narrow scope of agriculture, forestry, irrigation, and so on. Geographical fragmentation has resulted in part from the lack of correspondence between administrative and natural boundaries. The rationale is that the catchment provides a natural framework within which to undertake integrated water resources planning and management. Adopting this orientation means that water cannot, and should not, be viewed or managed simply at the point of extraction or impact, but rather needs to be seen as a key linkage within a catchment system.

For the very reason that ICM has emerged by way of critique, it faces many challenges, which can be seen through key tensions (Hirsch and Pollard in prep). There are tensions between establishing models, or best practice approaches, on the one hand, and adaptation to context (ecological, political, developmental/economic, and social/cultural) on the other. There are questions about the significance of scale in determining what can and what cannot work. There are tensions between emphasis on form and emphasis on process in catchment management. There are tensions between more centralized/coordinated catchment governance, and more participatory, decentralized approaches. There is a tension between catchment thinking and other narrower orientations to issues such as meeting the backlog of water supply demands. This paper seeks to address the tensions that emerge from the mismatches between natural catchment boundaries associated with ICM and administrative boundaries linked to water services and supply.

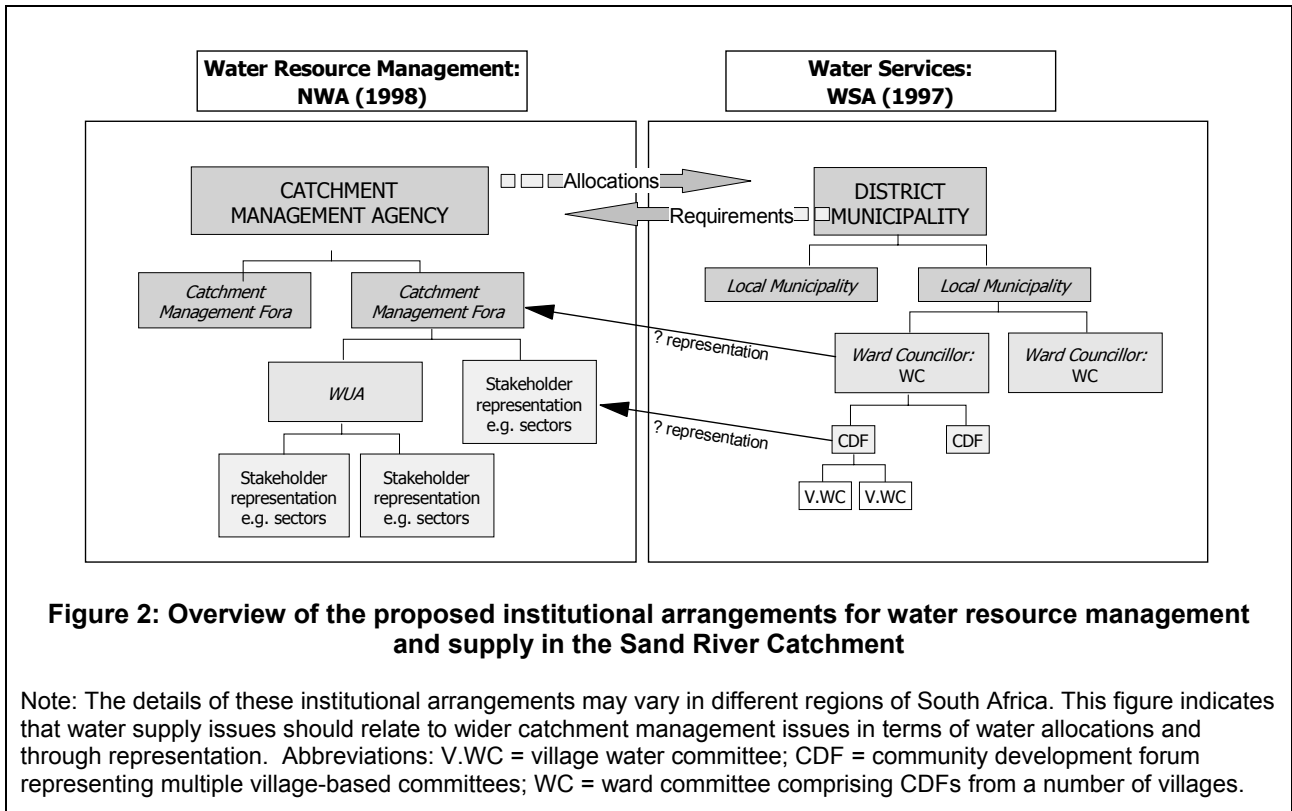
### **Institutional arrangements for water resources management and supply**

An overview of the proposed governance structures for water resource management and supply in the Sand River Catchment is given in Figure 2. Water resource management is governed largely by the National Water Act (1998) whilst water supply is governed principally by the Water Service Act (1997). Although still in the early stages of implementation, water supply governance is more advanced than water resources management.

In the case of water resource management, a CMA operates in one of the 19 water management areas of South Africa. Thus, sub-catchments within these are represented by catchment management fora, comprising representatives of stakeholder fora or water user associations. These fora will, in effect, make representations to the CMA for sectoral water allocations, including water demands for rural communities. The Sand River Catchment forms part of the Inkomati water management area which will be governed by a CMA, although this is not yet operative.

Our district municipality represents the water services authority that functions to ‘allocate’ water to the local municipalities, who act as the water service providers. The ward councillors will, in effect, make representations to the local municipalities regarding water demands for their villages of jurisdiction and communicate water supply constraints. They rely heavily therefore, on inputs from the village water committees. Local municipalities articulate these needs through their water services development plans

(WSDPs). The Sand River Catchment falls under the remit of the Bohlabela district municipality and specifically the Bushbuckridge local municipality.



**Figure 2: Overview of the proposed institutional arrangements for water resource management and supply in the Sand River Catchment**

Note: The details of these institutional arrangements may vary in different regions of South Africa. This figure indicates that water supply issues should relate to wider catchment management issues in terms of water allocations and through representation. Abbreviations: V.WC = village water committee; CDF = community development forum representing multiple village-based committees; WC = ward committee comprising CDFs from a number of villages.

### Devolution of water governance responsibilities

In seeking to bring coherence and integration to water resources management and at the same time address the issues of equity and sustainability, South Africa has embarked upon a process of decentralisation of management and regulation. The imperatives for public participation and stakeholder inclusion as required by decentralisation are expressed in the Constitution and articulated in both the NWA and WSA. In the water sector the process is given meaning through the development of various institutional arrangements represented by Figure 2 and explained in the previous section. These institutional arrangements are associated with the current democratic government but traditional governance and customary law continue to be important in terms of community issues, land allocation, conflict resolution and so on. Traditional governance structures include chiefs, *indunas* and advisors that provide an additional form of decision making and regulation in parts of the Sand River Catchment under communal land tenure. The devolution of decision making to a local level will need to occur within the context of institutional complexity demanding clear lines of communication between the various governance structures.

Although the devolution of decision making to a local/regional level has been welcomed, it represents a very new concept in water management in South Africa and can therefore be largely regarded as emerging practice. How WRM can be reconciled within a complex governance and decision-making environment still needs to be explored.

Part of the challenge is having to deal with institutional complexity superimposed upon mismatched boundaries associated with management and supply. Our experience indicates that there is a general lack of clarity and understanding of a) the need to manage water resources on the basis of a catchment, and b) the imperative to supply water within administrative boundaries of municipal district. Although the confusion is largely between water management and supply as devolved to catchment management and water services authorities respectively, it is worth noting that it is unclear how common-property governance regimes, such as over the use of a wetland or a spring for example, will be incorporated into the new decentralised model.

## Mismatch between management and delivery boundaries: the case of the Sand River Catchment

The following case study will explore the aspects of WRM in the Sand River catchment by examine both the status of water resources from a catchment perspective, and the needs of the domestic sector as articulated in the water services development plans.

**Table 1. Summary of the water resources availability and demands within the Sand River catchment (from Moriarty et al. 2004)**

Description		Resource	Infrastructure	Demand/ Entitlement
Surface-water availability	Median	75,200,000		
	Lower quartile	48,830,000		
Ground-water	DWAF est.	8,000,000		
	2%recharge	30,902,127		
	5%recharge	77,255,319		
	10%recharge	154,510,637		
ER	IFR 50% probability of exceedance		38,620,800	38,620,800
BHNR/RDP	25 lpcd			2,466,907
Domestic	100lpcd			9,867,629
	Bulk (drawn from the Sand)		6,329,100	
	Bulk (supplied to Sand communities)		5,901,533	
	Groundwater		5,110,000	
Agriculture	AWARD		22,286,129	22,286,129
	DWAF		12,170,000	12,170,000
Forestry	DWAF		4,888,415	4,888,415
	AWARD		6,755,706	6,755,706
Total (no transfer)	Median	75,200,000	64,060,806	62,489,335
	Lower quartile	48,830,000		

The Sand River catchment is a sub-catchment of the Sabie and together, they fall within the Inkomati WMA. Catalyzed by intense water resource constraints and the crippling drought of 1992, government and other stakeholders supported the development of a catchment management plan for the Sand sub-catchment to mitigate the problems of water resource constraints and associated land-uses (see Pollard et al. 1998; Pollard 2002). The governing principles for the plan reflected the intentions of the NWA and focused principally on

sustainability, equity and rehabilitation. The intention of the plan was to address the rehabilitation and sustainability of the Sand River Catchment. The implementation of various measures is being undertaken by a range of partners under the banner of the Save the Sand Project (or SSP) which is co-ordinated by AWARD, a locally-based NGO.

Since the development of the plan, various studies have also been undertaken to address shortfalls in information, or to test policy implementation. Two of these are pertinent to this discussion. One of these known as the WHiRL study, has developed an improved understanding regarding water security for the Reserve and for small-scale productive use in the Sand River (Moriarty et al 2004; Pollard et al. 2004). Earlier studies established that the catchment faced severe water shortage constraints (Chunnett, Fourie & Partners, 1990), Pollard et al. 1998) but were confounded by the lack of realistic estimates of water usage by each sector – mainly because no monitoring devices existed. Part of the study involved the development of an tool known as RIDE (Resources, Infrastructure, Demand and entitlements) for assessing catchment water resources and for modeling various water-demand scenarios (Moriarty et al, 2004). This study very clearly indicated that the Sand River Catchment is closed (Table 1). At most times of the year the requirements for the Ecological Reserve are flouted and the minimum domestic requirement (the Basic Human Needs Reserve - BHNR) can only be met if additional water is transferred from the neighbouring Sabie catchment together with the development of additional distributional infrastructure and/or localized groundwater supplies are exploited.

A second, and key programme of the SSP has been that of public awareness raising. In this case efforts have focused principally on developing the capacity of local-level stakeholders in terms of the new legislation. A major focus of the effort has been on assisting local government to play a stronger and more informed role in WRM issues in the catchment. Part of the process has been to raise awareness of the need to incorporate sound water management principles, including those of efficient, equitable, affordable and sustainable water supply into the planning instruments such as the Integrated Development Plans (IDPs) and the Water Services Development Plan (WSDP) for the Bushbuckridge Local Municipality (BLM, 2003). It is important to note that the current WSDPs are the first of their kind and are likely to undergo changes as learnings are brought to bear. Nonetheless, as they currently exist, they point to some important issues that need to be considered within the broader intentions of IWRM. The IDP vision talks quite clearly to the service delivery function although the sustainability of natural resources are implied: “All human beings living in the Bohlabela District Municipality must enjoy an interactive, transparent, self-sustainable environment and have access to efficient service delivery”. The priority issues which impact on water resources include economic development, water supply, health services and environmental management (which is interpreted simply as a reduction in environmental pollution – arguably a minor issue in the catchment in relation to other environmental issues such as declining water security). These priority issues are followed by sub-goals focused on water services and integrated water resource management (Table 2) and institutional arrangements.

**Table 2. The sub-goals of the Bohlabela District Municipality water services development plans that relate to water services and to Integrated Water Resource Management.**

Sustainable water services sub-goals	Details
Provision of basic water services (includes free basic water)	Provide access to free basic water to all by 2008
Provision of basic sanitation services	Ensure that all communities have access to basic sanitation by 2010
Higher levels of water services	Higher levels will be demand driven as and when the customers can afford the service levels
	Higher levels will be demand driven where it does not exist yet and existing services must lead to cost recovery by 2007
Higher levels of sanitation services	Provide access to free basic water to all by 2008

Integrated water resource management sub-goals	Details
Water resource protection	Support the Kruger to Canyons initiative, which will protect the Blyde major source.
	Promote cross border co-operation with EDM to ensure protection of the Sabie/ Sand source
	Improve sanitation to protect groundwater.
Water resource conservation	The Kruger to Canyons project will promote conservation of the Blyde source
	Promote better forest management
Demand management	Control demand by installing water meters.
	Reduce illegal connections
	Promote household water waste reduction

Note: As suggested in the paper, the latter sub-goals reflect neither the catchment orientation to WRM that is required in the Act nor realistic activities linked to each of the sub-goals (BLM, 2003).

An examination of water resource protection sub-goals points to a somewhat disparate set of loosely-affiliated institutions that do not hold – as their main objective - IWRM. Reference is made to the Blyde River as a key water resource, despite the fact that the main water resource for the Bushbuckridge area – the Sand River- receives only cursory mention. Moreover, its protection is vaguely assigned to the Ehlanzeni District Municipality which, in any event, would not be responsible for its protection. These sub-goals clearly demonstrate the level of confusion of roles, issues of subsidiarity in terms of the IWRM functions, and the conflation of functions that contribute to the broad umbrella of IWRM.

Given the highly precarious water resources situation in the Sand River Catchment, it would seem prudent to ensure close collaboration and integration between water resources management –aimed at achieving longterm sustainability- and water supply, aimed at redressing past inequities but not at the expense of achieving not only in the shorter term.

This case study highlights a number of disparities that are apparent within the ‘water sector’. The governance structures of water resource management and water supply operate at different spatial scales (catchments and districts) and their boundaries are not concordant. Thus, the WSDPs can draw on water services delivery from a number of catchments whilst the CMA manages water on a catchment basis. Water service development plans need to be formulated within the context of water resource management principles and vice versa. And yet, the WSDPs have already been developed - effectively in a water resource management vacuum. Understandably, the pressing need to meet the water demands of the rural poor have outweighed the lengthy process of water resource management in the country but these plans may be confounded by the allocation plans of the CMA once these come on track.

### Implications of a mismatch in water governance responsibilities

The BHNR is a statutory requirement and is not subject to the limitations of resource constraints (Pejan, 2004). In cases where a municipality straddles more than one catchment, the quantification of the BHNR will be based on population figures of the entire district whereas the CMA’s obligation for allocation is to the population within the catchment boundary. This will place responsibilities on Water Management Institutions (WMI’s) to recognise this mismatch and to compensate through additional collaboration, planning and monitoring and communicating procedures. Additionally, this has implications for the monitoring of infringements of the BHNR. It is not hard to envisage a similar issue arising with regard to the Ecological Reserve. For example, the current population of the BDM is estimated as 774,000 whilst that of the SRC is 420,000. Practically, the BDM cannot request water for the total figure from the Inkomati CMA. It would need to disaggregate these figures according catchment boundaries. If this is used to calculate water required over and above that to meet the BHNR minimum (25 l) the implications for the water resources and infrastructural planning could be

considerable. In our experience, the current first-generation IDPs have been developed with the support of consultants who themselves appear to be unaware of the requirement for better integration.

In our case, the first WSDPs produced by local government, through public consultation, can be regarded as ‘wish-lists’ because, amongst other reasons, they are not grounded in a broader water-resource reality of the catchment. They are thus seen as untenable. Nonetheless, it must be recognised that not only do they represent the first attempts to articulate water supply needs, but also that they have been developed in the face of capacity limitations and in a CMA-vacuum. If, however, this situation is not remedied so that broader WRM principles are reflected in future planning, the local government submission for water allocations is likely to be regarded as weak, especially for water required over-and-above the statutory requirements. Ultimately, the real need of the rural poor for access to water is likely to be undermined. If, however, local governments are supported to adopt holistic planning in the development of their own submissions they will be much better placed to negotiate support for their requests in a multiple-stakeholder environment such as the CMA, where each will have to not only justify their request but consider those of others (i.e. consensus-driven). This argument applies equally to other sectors, such as commercial agriculture, that may make its demands through a WUA.

The current mismatch in water supply and management boundaries also carries over into language and practice, reflected by the different ways that the concept of management is applied. Water supply and sustainable water resources planning are not likely to be reconciled in an environment where the concept of management and its application are not clarified. Divergent discourses around management for purposes of supply versus management for holistic and sustainability purposes are likely to hamper the attainment of holistic water resource management goals. What we are suggesting is that parameters for common practice need to be established using the overarching goals of the NWA as a point of departure (Box 1).

**Box 1. Seven goals for WRM (NWA, 1998)**

1. Sufficient water for Basic Human Needs Reserve
2. Sufficient water for the Ecological Reserve
3. Equal access for all
4. Water is not wasted and is used efficiently
5. Sufficient water for future demands and healthy economy and prosperous society
6. Users pay their fair share of water-use and that there is equity in payment
7. Honouring our obligations to our neighbours

Also clearing up of language and conceptual confusion is likely to support and promote co-operative governance and resource-use planning as called for by the IDP and WSDP. Current confusions hamper communication as different stakeholders do not clearly understand each others’ perceptions, parameters and practices.

Attention to clarity is particularly pertinent in the case of closed catchments, such as the SRC where currently, planning goes ahead without due recognition for resource constraints. Because plans don’t have to reference themselves against the realities of limited resources and the need to uphold the Reserve and the needs of others, they assume even if implicitly, that water resources are unlimited.

**Achieving synergy – an opportunity lost?**

The National Water Policy outlines the intention of National Government to deliver water services within a circumscribed set of 28 principles and forms the basis for the derivation of the two water laws (WSA and NWA). The intention is for the laws to work in tandem in order to meet with the Constitutional ideals of meeting basic food and water rights, in order to eradicate poverty and redress the inequalities of the past (Von Koppen, 2002). However, as suggested above, the practice derived from the two legal instruments does not necessarily emerge in a harmonious way. The intentions of WRM as expressed by the NWA and the WSA regarding roles and responsibilities for CMAs and local government are different. For example, the point of departure for a CMA is to understand and quantify water availability, whilst that of local government is to articulate the needs of consumers. Moreover, the WSA and NWA interpret the concept somewhat differently.



In many aspects it can be argued that by following a route that adopts different physical boundaries for different aspects of water resources governance, an important opportunity and facility for achieving synergy has been lost. A focus on administrative boundaries permits management procedures to short circuit the sustainability planning demanded by the NWA. Arguably, planning on the basis of supply alone is insufficiently rigorous in that it does not allow for checking over-allocation and over-exploitation. Moreover, planning instruments could - without sound management - exacerbate the divide. The instruments at hand (i.e. the Catchment Management Strategy and the Water Services Development Plans) are not necessarily in harmony with each other because one focuses on sustainability planning for a catchment while the other focuses on meeting the needs of domestic water supply. In addition to this, other sectors are responsible for articulating their own needs to the CMA outside of the WSDP.

Thus the question arises - how will the different levels of government work towards these ideals given the current complexity of structures and boundaries (that might either hamper or facilitate processes)?

### **Confusing channels for participatory practices**

The introduction of a participatory orientation to water management heralds a significant departure from previous approaches and opens the door for a more holistic coordination of water demands as expressed at a local level. Despite the clear expression of democratic imperatives for public participation and stakeholder inclusion in the Constitution and their articulation in both the NWA and WSA, there is considerable ambiguity as to how this will take shape within either WMA's or Municipal District boundaries.

Currently great uncertainty prevails - should civil society participate in water related issues through political structures, as outlined in the Municipal Systems Act (2000), or through specially designed catchment-based structures outlined by the NWA(1998)? Clearly the mismatch between administrative boundaries and catchment boundaries will have a significant impact on how the public and stakeholders will be able to engage with WRM in general.

We have witnessed considerable confusion in the SRC where people are unclear as to where and how they should participate, firstly, to address their specific water supply and sanitation needs and, secondly to deal with water management issues (licensing, allocation, etc.) The mismatch in catchment and administrative boundaries clearly has a confounding effect on participatory practices. Where a catchment straddles municipal boundaries a situation may arise where a village might be required to participate in water supply channels that are entirely different to the channels for water management issues. Much still needs to be done to clarify participatory practices against the backdrop of water management and supply boundary mismatches. These issues are taken up in a separate paper (Du Toit and Pollard, in prep).

### **Solutions and opportunities for reconciling the mismatches**

Attention is required in cases where District Municipalities straddle WMA's. The domestic demand (and potentially other demands) may actually represent demands beyond the catchment boundary. Not only should Local Government be aware of these WRM boundaries but lines of communication need to be established between neighbouring CMAs'. Since CMAs are being phased in sequentially there exists the potential for leaving gaps - unless of course the Department of Water Affairs and Forestry takes a proactive role. However, regional offices are severely under capacitated and national government has prioritised the roles of policy development and regulator for itself. Which institution then will play a co-ordinating role? Even once CMAs and CMC are operative, they will require considerable awareness raising and skills development programmes to support the realisation of integrated approach. In a very nuanced arena skills development programmes often fail to capture a holistic orientation.

### **Concluding comments**

Although the attempts of National government to provide enabling water policies and legislation are laudable they are not enough to set South Africa on a path to more sustainable water resource management. The enormous backlogs associated with water sanitation and supply are indeed a pressing concern but then so is the sustainable management of national water resources that are clearly overstretched (15 of the 19 WMA's

experience water demands that exceed or equal what is available). Clearly poor or non-existent management practices can no longer be entertained by a water sector that is increasingly having to face water deficit problems. Planning around supply cannot proceed without attention to issues of availability and management - yet the possibility exists within the water sector for such a situation to prevail.

Despite progressive legislation and a focus of efforts on a multidimensional approach that has demanded massive transformation (reviewing of water pricing, replacing inefficient water technologies, raising public awareness, a focus on integrated catchment management) much still needs to be done to facilitate governance and communication. We have attempted to show in this paper that this remains a considerable challenge given the separate legal instruments and the complexity of boundaries and borders associated with water management and supply. We maintain that there is a long road ahead before the transformatory ideals of the water sector can be met.

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## Acknowledgments

The authors would like to thank CARE South Africa for providing financial assistance for the preparation of this paper.

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