Strategy for Re-establishing the Ecological Reserve in the Sand River Catchment

Submitted to Sabi Sands Wildtuin

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1. Introduction

Sabi Sands Wildtuin (SSW) has appointed Linkd Environmental Services to develop a strategy for re-establishing the ecological reserve in the Sand River. On the basis of a through review of existing research documents and interviews with various stakeholders, this document sets out a recommended strategy to be followed, and is structured in the following way:

- The report examines the current situation with respect to water use and management within the Sand River Catchment, and contextualises this within the overall regulatory framework for water management in South Africa.
- The report analyses the institutional arrangements for water management, both nationally and in relation to the Sand River Catchment.
- The report identifies the key deficiencies within the current regulatory system that have impeded progress to date.
- Strategic pressure points are identified for securing the appropriate regulatory decisions, and the document maps out a strategy to be followed in re-establishing the ecological reserve of the Sand River.
- Having outlined this broader strategy, the report identifies elements of the strategy which Sabi Sands Wildtuin are well suited to tackle, and recommends how to go about doing so.

It must be noted that there have been numerous studies completed on the Sand River Catchment and that it is probably one of the most heavily researched catchments in South Africa. Given the extent of this research, which is well known to SSW, this report provides only a brief overview of the history of the complex situation in the catchment water management. Instead the report concentrates on identifying the key intervention areas which can be derived from the vast research on the Sand river catchment, and integrating these into an overall strategy.

2. Background

The Sand River Catchment, a sub-catchment of the Inkomati Catchment, is a small but important catchment within which water demand has already exceeded supply, rendering it to be closed in that the primary river in the catchment (the Sand River) periodically runs dry. This is compounded by poor water management within the catchment, which is neither equitable, efficient nor sustainable[1].

Water scarcity within the catchment can be attributed to a number of defining features, namely the highly variable rainfall along a steep catchment slope in which the majority of water users are centrally located along the main tributaries of the river. This has resulted in unregulated water abstraction preventing water generated at the top of the catchment from reaching the lower reaches of the catchment, where there is little rainfall[Error! Bookmark not defined.].

This context has been framed in a highly localised manner, in which apartheid policies are blamed for the unequal distribution of people, wealth, governance capacity and infrastructure along the catchment. While these factors are responsible for the specific permutations of the catchment, it must be noted that the situation resulting from these features is neither unique, nor uncommon. South Africa is widely acknowledged to be one of the driest countries in the world, at the same time having a high intensity of water usage aggravated by a disjuncture between the spatial pattern of economic activity and settlement, and the natural availability of water[2]. Internationally[3], high concentrations of

[1] Agterkamp, J.W. 2009 'Allocating contested water: A case study on the (non-) compliance with Environmental Water Allocations in the Sand sub-catchment, South Africa', Masters Thesis, Wageningen University.

[2] Nick Segal, "Does South Africa Face a Water Crisis? A report to Business Leadership South Africa", June 2009

[3] Molle, F. 2003. Development trajectories of river basins: A conceptual framework. Research Report 72. Colombo, Sri Lanka: International Water Management Institute.

poverty stricken people are increasingly located along previously marginal lands that now contain key water resources, enabling them to divert water from downstream users.

As stated in a recent Business Leadership South Africa assessment of the water situation[4]:

"The profound importance of water to human survival; the number and diversity of interests; the competition for access to water, locally and nationally as well as internationally; the technological choices for supply and treatment of waste water; ensuring reliable delivery of water of the appropriate quality to different classes of users and managing treatment of the resultant outflows; the use of price, licensing and other mechanisms for allocating water … these and other factors make water a sector of exceptional, and increasing, complexity."

Failed water provision infrastructure, lack of access to services and markets, and political marginalisation has placed the population in the catchment in a position in which downstream water users are the least of their concerns[5]. This creates a difficult situation in which a disenfranchised majority unexpectedly holds sway over a previously unrecognised, but increasingly important resource – water. The nuances of this situation cannot be ignored, and must be proactively engaged with throughout the process of attempting to access water in an equitable, efficient and sustainable way.

3. The current situation regarding water use in the catchment

The management of the Sand River catchment is mired in institutional deficiencies and a complexity of stakeholder issues, although the problems themselves can be relatively simply framed. Impoverished rural residents within the catchment are without adequate water services for domestic use due to institutional collapse, leading to lack of infrastructure and services within the Bushbuckridge Municipality. The catchment is characterised by an arid climate, frequency of drought and high population density[6].

Figure 1: Irrigation canal.

Three irrigation schemes currently in use, namely Dingleydale, New Forest and Champagne Citrus Farm, built in the 1960's, divert unregulated amounts of water off the various tributaries of the Sand River. These irrigation schemes were installed and maintained by the former homeland governments of Lebowa and Gazankulu. Previously farmer extension support was provided by the homeland government but since 1994 government has failed to maintain the canal infrastructure or to regulate the water flowing in the canals as an integrated system. The poorly maintained irrigation canals are utilised for agriculture, livestock and domestic purposes. Irrigation is

[4] Nick Segal, "Does South Africa Face a Water Crisis? A report to Business Leadership South Africa", June 2009

[5] Pollard, S. , Moriarty, P.B. ,. Butterworth, C.H., Batchelor, and Taylor, V. With contributions from G. Huggins, T. Thlou, & D. Versfeld. 2002 'Water resource management for rural water supply: implementing the Basic Human Needs Reserve and licensing in the Sand River Catchment, South Africa.' WHIRL Project Working Paper 6.

[6] Agterkamp, J.W. 2009 'Allocating contested water: A case study on the (non-) compliance with Environmental Water Allocations in the Sand sub-catchment, South Africa.' Masters Thesis, Wageningen University.

the main water user in the catchment and there are an estimated 1000 small scale farmers each cultivating a plot varying in sise between 1 to 6 ha.[7]

These canals are highly inefficient in their provision of water as water is allocated on a 'first come first serve' basis, where upstream farmers can divert water as they wish, depriving downstream water users access to water. The irrigators use all the dry season baseflow often causing the Sand River to stop flowing completely[8]. Mixed use of water from open canals further complicates the use of the water in the canals, leading to a high incidence of waterborne diseases[9] (cholera, diarrhoea, bilharzia).

Figure 2: Abstraction Weir

In addition to the canals, there are eight domestic abstraction points extracting water either from the canals or directly from the rivers. There are also four dams in the area, only one of which (Orinoco) sources its water from canals, but all of which impact on the availability of water in the catchment.

The combination of unregulated, unmaintained abstraction points and water scarcity has resulted in a closed catchment. These problems are compounded by the lack of effective institutional management structures able to upgrade failed infrastructure, allocate water fairly, provide water services or enforce abstraction regulations.

4. Understanding the problem

It is widely documented that 'resource capture' is a more common response to water scarcity than successful 'resource allocation'[10]. This is demonstrated very clearly in the Sand River Catchment, where allocation strategies are struggling to find footing while upstream users continue to illegally abstract water. Agterkamp (2009) indicates that the two main technical solutions for bringing the Sand River Catchment back into balance and meeting the Reserve are:

- Water transfer from the Inyaka Dam via a Bosbokrand Transfer Pipeline.
- Implementation of Operating Rules for the Sand River.

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[7] Agterkamp, J.W. 2009 'Allocating contested water: A case study on the (non-) compliance with Environmental Water Allocations in the Sand sub-catchment, South Africa.' Masters Thesis, Wageningen University.

[8] DWAF. (2009a). "*Inkomati Water Availability Assessment Study*." Report prepared by Water for Africa for Department of Water Affairs and Forestry, PWMA 05/X22/00/0808, Main Report, Draft format.

[9] Raab, E., Mayher, A., Mukamba, T., Vermeulen, A. 2008 'The Water Dialogues South Africa: Bushbuckridge Case Study October 2008.' WRC Report No TT 364/08 OCTOBER 2008

[10] Molle, F. 2003. Development trajectories of river basins: A conceptual framework. Research Report 72. Colombo, Sri Lanka: International Water Management Institute.

The Bosbokrand Transfer Pipeline from Inyaka Dam to supply water from the Sabie river catchment through water pumped into the Mutlumuvhi River, a tributary to the Sand river, to the Sand river catchment was proposed by DWAF in the Inyaka White Paper[11]. One of the purposes of building the Inyaka Dam and the transfer pipeline was to augment the low flows and provide ecological water requirements in the Sabie and Sand Rivers.[12] However due to pressure for supplying basic need water services, the use of the inter-basin transfer pipeline was changed to supply water for domestic water use and not for supplementing the water flow for maintaining the ecological reserve. The Bosbokrand transfer pipeline only pumps 'treated' water for domestic purposes and the same pipeline cannot be used to pump 'raw' water that is required for the ecological reserve. It was deemed too expensive to have two pipelines: one for domestic water and another one for raw water, however the infrastructure for the transfer pipeline outlet has been built but is not in use as no water is pumped to it. Also the municipality has attached domestic bulk water infrastructure to the Bosbokrand Transfer Pipeline. Agterkamp (2009) states that DWAF did not sufficiently control the process of changing the use of the Bosbokrand Transfer Pipeline and that several stakeholders are concerned about the measureless expansion of the supply of infrastructure from the municipality.

Figure 3: Bosbokrand Transfer Pipeline outlet at Mutlumuvhi River. Source: Agterkamp (2009).

Operating Rules were developed for the Sabie river catchment are currently the best available methodology to give effect to the Reserve. The Operating Rules were developed by a consultant for DWAF in 2003. The Rules prescribe a passive management of the irrigation abstraction weirs, where the basic rule is that any abstraction (irrigation and domestic) must release a minimum fixed proportion of 35% of the flow downstream. The ICMA is the central authority charged with developing and implementing the catchment management strategy, and the operating rules are the guiding principles for water management. The ICMA has completed the classification process, and has submitted the Reserve and a revised more participatory Operating Rules to the Department of Water Affairs for approval[13]. They are now required to conduct stakeholder consultations regarding the Operating Rules and the Reserve before they can implement water allocation regulations. The stakeholder group best able to mobilise a political lobby to legitimise their position are thus the most likely to influence the implementation of the operating rules[14].

Implementing compulsory water use licenses for abstractors of water is ultimately the solution for regulating the use of water in the catchment. However water licensing at the moment is ad hoc and only 'new water users' apply for water licenses and there is no regular monitoring or enforcement of the water that is abstracted.

[11] DWAF. 1994. "Report on the Proposed Sabie River Government Water Scheme (First Phase: Inyaka Dam and Bosbokrand Transfer Pipeline)." White Paper D-94, Department of Water Affairs and Forestry, Pretoria, South Africa

[12] Agterkamp (2009).

[13] Interview with Barbara Weston, DWAF, April 2010

[14] McCartney, M. P.; Lankford, B. A.; Mahoo, H. 2007. Agricultural water management in a water stressed catchment: Lessons from the RIPARWIN project. Colombo, Sri Lanka: International Water Management Institute. 52p. (IWMI Research Report 116)

Unregulated abstraction, coupled with demand exceeding supply, has resulted in a water scarce catchment. Both of these issues have been widely recognised[15], and strategies have been developed to deal with the infrastructure upgrades necessary to manage abstraction and augment water supplies.

Government, NGOs, the private sector and local residents have provided numerous human and financial resources over the last decade in support of various attempts to resolve the water scarcity issue, and yet little or no sustained successes can be recorded. The central problem then, is why, despite such a seemingly clear understanding of the problems at hand, and numerous commitments to change, has the situation become so intractable?

The absence of legally proclaimed operating rules and the Reserve, and lack of awareness of the principles underpinning them amongst water users and local branches of the state, is partly responsible for water regulation failing[Error! Bookmark not defined.]. This, coupled with a failure on behalf of the state to take proper responsibility for the maintenance, and in this case refurbishment, of the existing water use infrastructure, indicates a far-reaching inability to proactively engage with the situation.

We cannot, however, blame the failure to manage water scarcity in the catchment simply on lack of awareness and political will. An investigation into the main strategies to date reveals a number of substantive blockages that have prevented plans from being successful. These blockages can broadly be categorised into institutional, technical, socio-economic and political deficiencies directly impacting on water management[14]. Each of these categories contain elements that contribute to water scarcity by influencing who uses the water, what facilities they have to access water, how their use is regulated, by whom, in terms of what ideology and under what socio-economic conditions.

These deficiencies have been recognised by various researchers as contributing to water scarcity[16], and there are concrete examples of how limitations within each one of these categories have directly affected the successful implementation of strategies to deal with water scarcity in the Sand River Catchment. The problem then, is that issues relating to water in the catchment have generally been considered in relation to one or two directly obvious factors affecting the particular problem being solved, and not in relation to the broader range of factors affecting water scarcity.

The current discourse regarding scarcity in the catchment is polarised between a socio-economic lobby on behalf of the residents and farmers of Bushbuckridge, and an environmental lobby on behalf of the Sand River's ecology. This polarisation is compounding the effects of single-issue scarcity strategies by setting two central tenets of water management – meeting basic needs and protecting the ecological reserve - in opposition to each other, rather than in relation to each other. This has created a situation in which the two most important lobbies are loosing leverage opposing each other, rather than combining their leverages towards putting pressure on the institutions responsible for water management in the catchment.

The catchment management strategy currently being developed for the Inkomati Catchment is required by law to engage with all of these elements equally[17]. Unfortunately the lack of institutional capacity limits the ability of the ICMA to do anything more than identify the affecting factors and create a suitable regulatory framework. Thus there is an imbalance in the regulatory capital available regionally and nationally to manage water in the catchment, and the broad ranging scarcities affecting the implementation of these regulations[18].

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[15] AfriDev Consultants 2005 Komati Catchment Ecological Water Requirements Study. EWR Report: Quantity. Department of Water Affairs and Forestry.

[16] Mollinga, P. P., and Bolding, A. 2004. 'The politics of Irrigation Reform: Research for Strategic Action.' in The politics of irrigation reform: contested policy, P. Mollinga, P and Bolding, A, Ashgate Publishing Limited, Hants, England

[17] Inkomati Catchment Management Agency. 2010 'Inkomati Catchment Management Strategy Stakeholder Orientation Document.'

[18] Maluleke, T., Cousins, T. and S. Smits 2005 'Securing Water to Enhance Local Livelihoods (SWELL): Community-based planning of multiple uses of water in partnership with service providers. A case study on its application in Bushbuckridge, South Africa.' MUS project working paper. www.musproject.net

First, however, an overview of the regulatory framework governing water management in the catchment is needed.

5. Regulatory Framework

There are two primary regulatory frameworks that govern water catchments. The National Water Act 36 of 1988[19] (the Water Act) deals specifically with water management, and the National Environmental Management Act 107 of 1988[20] deals more broadly with environmental management, which includes the management of river ecosystems. This section briefly outlines the central tenets of each of these frameworks and how they affect the problems in the Sand River Catchment. The ways in which these frameworks could be used to force departments to act, to drive a litigation process, or to prompt ministerial intervention, will be discussed in the overall strategy.

5.1 The National Water Act

The National Water Act is the principle legislative framework governing water resource management in South Africa. The Act provides for the allocation of a set amount of water in each river to meet basic human needs and ensure the ecological integrity of the river (the Reserve). The Act also provides for the creation of a Catchment Management Agency (CMA) to govern the implementation of the Reserve and to allocate the remaining water to other water users in the catchment. Failing this, the Act also provides for ways to deal with appeals and dispute resolutions in the case of conflict over the allocation or use of water, or the failure of an organ of the state to properly implement their mandate regarding water management.

The determination of the Reserve is the key to unlocking the regulatory framework through which water allocation is decided, and implementation is enforced. While it is true that this regulatory framework cannot be implemented in isolation of the extreme poverty and institutional, technical, and political deficiencies in the area; it is also true that it is the strongest foundation from which to build a comprehensive strategy to open the catchment.

The Reserve means the quantity and quality of water required to satisfy basic human needs and to protect aquatic ecosystems. Its legal importance is that the Reserve has the first call on the use of water, prior to the allocation of water use for any other function. Once determined, the Minister, the Director-General, all organs of state and all water management institutions are obliged to give effect to the Reserve when exercising any power or performing any duty in terms of the Water Act.

A graphic illustration of how water allocation is prioritized in the National Water Resource Strategy is depicted in Figure 4 below.

Reserve is the legal level

[19] Republic of South Africa. National Water Act No 36 of 1998.

[20] Republic of South Africa. National Environmental Management Act No. 107of 1998.

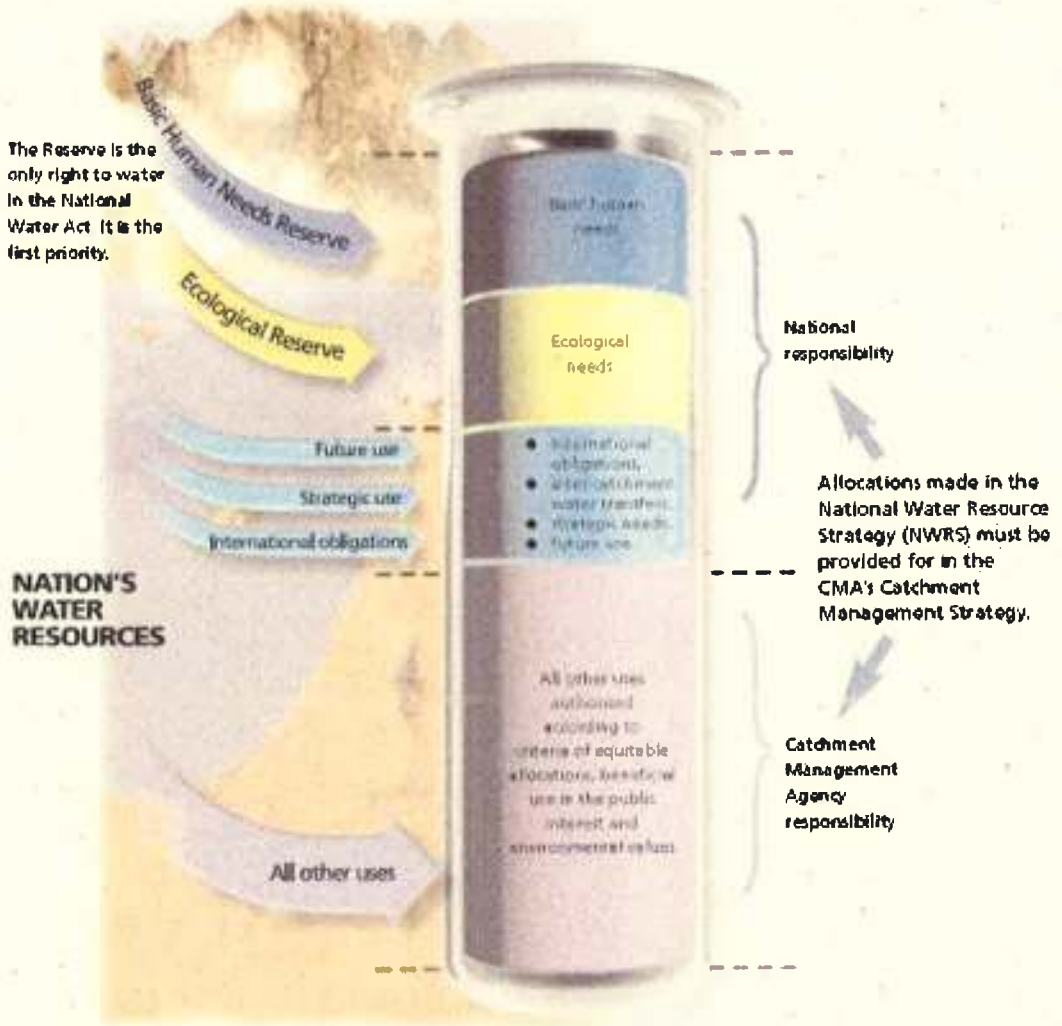

Figure 4: How water allocation is prioritised in the National Water Resource Strategy[21]

The Water Act sets out clear processes for determining the Reserve for each river, and then provides guidelines for the development of operating rules to ensure the proper management of the river in relation to the Reserve. The process of determining the Reserve in the Sand River has almost reached completion, after 3 years of classification research[22]. The final stages of determination involve stakeholder consultations and a high level review by the national Department of Water Affairs. Once the Reserve has been determined, the implementation of the operating rules by the Inkomati Catchment Management Agency (ICMA) will be the primary means of managing how much water is abstracted from the catchment, and by whom[17].

The ICMA is responsible for implementing the Reserve and the operating rules based on a national strategy to decentralise water resource management. This implies a transfer of responsibility and accountability from a centralised, state managed water regulation structure to a more devolved, user managed structure.

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[21] DWAF. 1998. Guide to the National Water Act

[22] Interview with Adishri Singh, April 2010

Currently the ICMA has a mandate to investigate and advise on water related issues, develop a catchment management strategy, co-ordinate related activities of water users, promote the co-ordination of the catchment management strategy and promote community participation in the catchment management strategy. It has further been assigned the functions of preventing and remedying effects of pollution, and controlling emergency incidents. It has not yet, however, been delegated authority to manage, monitor, conserve and protect water resources in order to implement the catchment management strategy. Neither is it yet able to make rules to regulate water use, establish management systems, alter waterworks or control, limit or prohibit use of water during periods of water shortage[17].

Once these powers have been assigned to the ICMA – following the determination of the Reserve – they will then have the power to further delegate responsibilities to Water User Associations and other local institutions to assist with the implementation of the Catchment Management Strategy.

The key tools for ensuring the Reserve is implemented are the issuing of water licenses to govern abstraction, and the enforcement of the operating rules to govern all water related activities in the catchment[Error! Bookmark not defined.]. The regulations surrounding the determination of the Reserve are very clearly outlined in the Water Act, but the procedures for maintaining and monitoring it are not yet clearly legislated[Error! Bookmark not defined.]. The implementation of licensing of users in a catchment can legally take up to 21yrs to be completed, and so it is the operating rules that provide the most tangible regulatory framework to ensure the Reserve is met[23].

There are two complicating factors affecting the implementation of the Reserve from a regulatory perspective. These are to do with the powers ascribed to the Department of Agriculture, Fisheries and Forestry (DAFF) to allocate water to irrigation schemes, and the Bushbuckridge Municipality's responsibility for meeting the Basic Human Needs Reserve (BHNR) by supplying domestic water[24]. The irrigation schemes were installed by the former homeland government and they also provided operation support and subsidies to the farmers, however with the change in government has left these irrigation schemes without continued support from DAFF. Both of these institutions are ultimately regulated by the Water Act, but they operate independently to the ICMA and have not demonstrated any particular willingness to fully participate to date.

Another leveraging point in the National Water Act would be through compulsory licensing. Compulsory licensing is regulated in the National Water Act where, the Minster may publish notices in the *Government Gazette* requiring *all* existing and potential water users, except for Schedule 1 users and users under General Authorisations, to apply for licences. Compulsory licensing may eventually be used everywhere to license water use, but the priority areas for compulsory licensing will be areas of water shortages (where current or future demand exceeds supply) or where pollution is severe (stressed catchments). The compulsory licensing process may also be used where it is required to assist historically excluded people to gain access to the resource as well as to:

- achieve a fair allocation of water from stressed water resources,
- improve the efficient use of water in the public interest,
- ensure efficient management of the water resource, and
- to protect water quality.

Figure 5 outlines the steps for in the compulsory licensing process.

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[23] Republic of South Africa. National Water Resource Strategy. First Edition, September 2004.

[24] Raab, E., Mayher, A., Mukamba, T., Vermeulen, A. 2008 'The Water Dialogues South Africa: Bushbuckridge Case Study October 2008.' WRC Report No TT 364/08 OCTOBER 2008

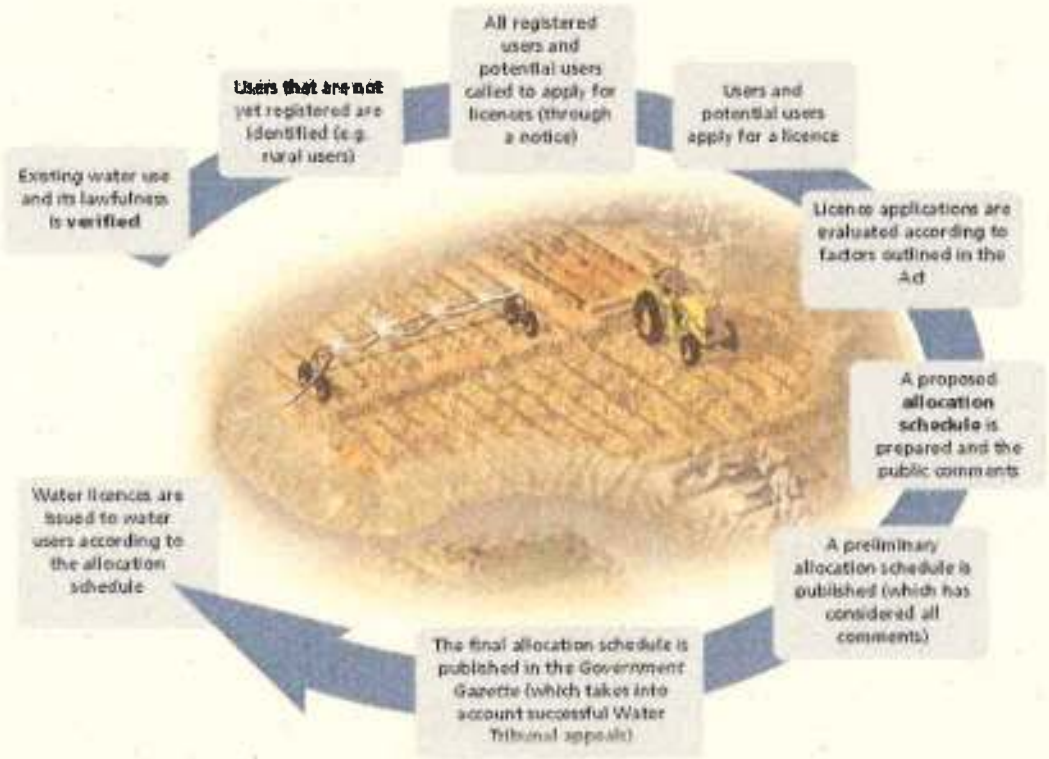

Figure 5: Compulsory Licensing process[25]

5.2 The National Environmental Management Act (NEMA)

NEMA provides a broader set of principles for the management of natural resources than the Water Act, and as such may be useful for broader issues concerning the regulation of water use in the Sand River Catchment. There are three clauses of NEMA that are particularly relevant to water issues in the catchment, as they could be used to hold organs of the state accountable for failing to manage it properly. In particular, the principles of environmental management to which all organs of the state must abide (outlined in Annexure 2); the sections of the Act which relate to compliance with environmental management plans; and the section on duty of care and remediation of environmental damage.

According to the Act[20]:

> *'The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and – a) apply alongside all other appropriate and relevant considerations, including the State's responsibility to respect, protect, promote and fulfill the social and economics in Chapter 2 of the Constitution and in particular the basic needs of categories of persons disadvantaged by unfair discrimination…'*

All of the principles are relevant to situations in which the state has been responsible for the degradation of the environment, but there are a few which are particularly relevant to the Sand River Catchment:

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[25] DWAF. 1998. Guide to the National Water Act.

- Principle E states that government departments must take responsibility for the environmental health consequences of any of their policies, programmes and projects throughout their life cycle.

- Principle P states that the costs of remedying environmental degradation, and or the costs of controlling or minimising further environmental damage must be paid by those responsible for harming the environment.

- Principle L states that there must be intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.

- Principle M states that actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.

- And Principle N states that global and international responsibilities relating the environment must be discharged in the national interest.

Effectively, all of the departments currently responsible for the negative ecological effects on the Sand River resulting in unregulated water use could be held to account, forced to co-operate, and forced to pay for the minimising of further damage, in accordance with these principles. The ways in which this could be done will be discussed more in the overall strategy, but it is important to note that this presents a regulatory framework within which some of the factors preventing the effective implementation of the Reserve could be dealt with.

The Department of Environmental Affairs, which now shares the same Minister as the Department of Water Affairs, uses Environmental Management Inspectors commonly know as the "green scorpions", and new legislation is proposed for the "blue scorpions" to have the mandate to prosecute National Water Act offenders. They already have precedent in other similar cases where upstream users have been fined for taking all of the water out of a water resource preventing downstream users having access to water. It is suggested that further investigation on how the "blue" scorpions can assist be undertaken as part of this project.

6. Key Stakeholders

Decisions regarding water use, and particularly decisions made in relation to the Sand River Catchment, are inherently political[Error! Bookmark not defined.]. They are driven by an underlying political-economic agenda on behalf of the state, and used as a point of subaltern resistance by small holder farmers. In between, a spectrum of role players have contributed to the creation of an impasse within which no one's water needs are being properly addressed, and negotiations around solutions are becoming increasingly tense[26].

The manner in which the problem is defined plays an important part in how each stakeholder interacts with it and uses it to further their broader agenda. Each stakeholder group will try to frame the issue according to their needs, and in relation to broader problems that they think will lend legitimacy to their position. Each stakeholder will present their interpretation of the problem as an objective one, and most will believe that their interpretation is in fact the only legitimate way of understanding the problem.

In order to engage effectively with the management of the Sand River Catchment, it is important to understand how each stakeholder identifies the problem, and construct a problem statement that strategically situates SSW in a position from which they can benefit from other stakeholder lobbies rather than be placed in opposition to them. In other words, SSW need to ensure that their problem statement makes maximum use of the leverage held by other stakeholders towards meeting their goal – the implementation of the ecological reserve.

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[26] Swart, J. 2010 'A brief in support of legal action to preserve the instream flow requirements and ecological integrity of the Sand River.' Strategy Document, Sabi Sand Wildtuin.

6.1 Regulatory authorities

The government departments and agencies directly involved in the management of water and irrigation in Bushbuckridge are described below. Within each of these organs, there are various institutional structures assigned with the task of managing the catchment.

6.1.1. Water related institutions

The Department of Water Affairs (DWA) is responsible for the management of water resources, including infrastructure such as dams and water transfer schemes. Post apartheid the then Department of Water Affairs and Forestry took on responsibility for water services (largely domestic water supply), and since 2001 has been steadily handing over this responsibility to municipalities designated as Water Service Providers in terms of the Water Act.

- The national DWA office is responsible for implementing the National Water Act, including water resource planning, water policy formulation and regulation (such as development of a national water resource strategy), and joint management of international catchments. An infrastructure branch is in charge of bulk water schemes. Specific responsibilities of relevance to this report are the comprehensive Reserve determination process, and the development of the Operating Rules for the Sand River Catchment.

- The DWA regional office is located Nelspruit. The regional office is responsible for implementation of the passive control at the weirs. Recently a Compliance Monitoring & Enforcement Unit has been established at the regional office signaling the increased intentions of the Department to exercise regulatory control. It should be noted that until March 2008 there was only one person responsible for compliance monitoring in the whole country. The proto ICMA originated from this regional office.

- DWA is in the process of devolving local catchment management authority to the Inkomati Catchment Management Agency (ICMA). The ICMA is in the process of developing the Inkomati Catchment Management Strategy and a stakeholder forum for the catchment has been established to provide input into this strategy.

- It is planned that the ICMA will establish one Water User Association (WUA) in 2010/11 for all the water users in the Sand River Catchment which will include farmers and private game reserves and potentially other water users. According to the Water Act, WUAs can apply for an irrigation water use license and may be granted the right to use water under specified conditions.[27]

6.1.2. Environmental regulation

The Department of Environmental Affairs (DEA) is responsible for the ecological integrity of the river, but is a largely inactive player in the Sand River Catchment saga. Significantly the Department of Water Affairs and DEA now have the same Minister.

- The Environmental Management Inspectorate (EMI) was created in terms of an amendment to the National Environmental Management Act that came into effect May 2005, which empowers the Minister or MEC to create environmental management inspectors (i.e. green scorpions and blue scorpions). The blue scorpions are an environmental crime fighting unit which can tackle water related crimes[28], such as diverting water from a water course to the extent that downstream water users cannot use the water.

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[27] Information on DWA national and regional responsibilities sourced from Agterkamp (2009).

[28] SouthAfrica.Info. 2009. Website article drafted by Warby, V. *"South Africa gets serious about water"*

6.1.3. Agricultural regulation

The Department of Agriculture, Fisheries and Forestry (DAFF)[29] is responsible for allocating water to small holder farmers and providing them with agricultural support, mainly through the provincial Department of Agriculture. Agriculture in the catchment is controlled by several levels in the department[30];

- Province: The provincial DoA is located in Nelspruit and is responsible for sustainable resource management in Mpumalanga province. Although water is one of the key agricultural inputs it is not formally considered in their planning. DoA through its Comprehensive Agricultural Support Programme is planning to increase its support to the irrigators in the catchment [DWAF, 2007b].

- District: The Ehlanzeni district office is located in Thulamahashe and is responsible for all DoA farmer support activities in the district. The maintenance unit is controlled from this office.

- Field: Several field offices are located in the catchment (Bushbuckridge, Dingleydale and New Forest). The DoA extension officers and water bailiffs are based in these offices. Currently there are three extension officers at the schemes. Unfortunately, they have little resources and they only provide advice and some training. There used to be a DoA training facility to train farmers at Dingleydale.

- Farmers: Irrigation management committees (Dingleydale Irrigation Scheme Water User Association and New Forest Management Committee) and dam committees assisted by consultants have been established by the farmers using the irrigation schemes. The members of the committees are elected by the farmers every 5 years.

- The Agricultural Research Council (ARC) is the principal agricultural research institution in the country. The irrigation sector became a major activity of the institute, they are involved in feasibility studies, planning and design. As part of the Save the Sand program ARC wrote a rehabilitation proposal for Dingleydale and New Forest in 1999.

- Department of Forestry now under DAFF is the manager of the State Forest plantations and indigenous forests located in the upper Sand River Catchment.

In this year's State of the Province Address for the 2010/11 financial year the Province will continue its support of the Masibuyele Emasimini programme, in order to alleviate poverty confronting the rural poor by ensuring that land lying fallow is tilled. Through this programme they support the rural poor with tractors, fertilisers, seeds, training and mentoring.

6.2 Local role players

6.2.1. Bushbuckridge Local Municipality & Bushbuckridge Water Board

The Bushbuckridge Municipality (BM), together with their water service provider, Bushbuckridge Water Board (BWB), are responsible for the provision of domestic water. Due to water scarcity within the catchment the main strategy for domestic water provision has been the Basin Transfer Pipeline from the Inyaka Dam. The BWB is heavily subsidised by DWA as its major challenge is cost recovery from water users. Lack of funding has lead to sporadic negative changes in water quality when water treatment works become faulty for various reasons.

[29] In May 2009 the Department of Water Affairs and Forestry split into two departments: Department of Water Affairs and the Department of Agriculture, Fisheries and Forestry.

[30] Information on stakeholders sourced from Agterkamp (2009).

6.2.2. District Municipality

The Ehlanzeni District Municipality has a Local Economic Development programme whose key focus areas include but are not limited to:

- Promoting communal farming projects.
- Co-ordinating the development of existing game farming through the Department of Agriculture and Land Administration to availing farmers support grants.
- Promoting the establishment of game lodges and other tourist attraction facilities.

6.2.3. Tribal Authorities

There are three tribal authorities in Dingleydale namely Moreipusho, Moletele and Sehlare and one tribal authority in New Forest, the Amashanga.[31] They have limited authority in terms of water use since the formation of the wards and municipalities in the area.

6.2.4. Non-Governmental Organisations

The Association for Water and Rural Development (AWARD) is an NGO in South Africa that works on water supply in the broader context of managing water resources and their wise use, with a focus on learning about water security issues in the Sand River Catchment area.

The Maruleng and Bushbuckridge Economic Development Initiative (MABEDI) is a four year project. The project is funded by the Business Trust of South Africa and the Department of Local Government, and commenced in 2006. The aim of the project is to work with resource poor farmers and to uplift these small scale farmers through various linkage components including; infrastructure, input linkages and market linkages31. The project works Bushbuckridge (Sand River Catchment) and the agricultural part of the project is coordinated by two NGO's, namely Teba development and Lima. In cooperation with the irrigation management committees Teba development wrote a proposal to rehabilitate the irrigation infrastructure.[32]

6.2.5. Water Users

In the current context, the small holder farmers in the central part of the catchment form the largest water user group as they are able to abstract unregulated amounts of water. There are only an estimated 1000 farmers, but water diverted into the irrigation canals is also widely utilised for domestic purposes by the rural residents of Bushbuckridge, only 16% of whom have access to piped water[Error! Bookmark not defined.]. Thus, despite the farmers representing a relatively small group of people, their abstraction feeds into a much broader community context. This broader stakeholder group holds the most political capital in the process in that they represent over 400 000 potential voters, and are thus an important constituency in local politics[9]. Community development forums, ward committees, and traditional leadership structures represent the residents.

None of these forums have to date been particularly useful in responding to the water needs of their constituencies, but they still represent the most important political hurdle to opening up the catchment.

In the upper part of the Sand river catchment there are previously afforested commercial plantations run by the now DAFF, which provided jobs to local communities. An environmental lobby successfully convinced DWAF to remove the plantations and hand the land over to conservation as part of the proposed Blyde River Canyon National Park, however due to the Mpumalanga Parks and Tourism Board not taking over the financial liability to rehabilitate the clear-felled plantation land this transfer has not happened yet. A local political lobby has almost successfully reversed the decision mainly

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[31] Agterkamp (2009).

[32] Agterkamp (2009)

due to the plantations being an economic driver in this area. This part of the upper catchment has the highest rainfall, and thus is integral to the amount of water available in the catchment.

Downstream from Bushbuckridge are predominantly rangelands (utilised by residents of Bushbuckridge), peri-urban settlements and Sabi Sands Wildtuin. Kruger National Park is further downstream, but is less affected as it is fed by the water rich Sabie river. These downstream users do not need to abstract significant amounts of water, but they require the ecological reserve to be met to maintain the integrity of their conservation areas and rangelands.

6.3 Conservation agencies

SANParks manages the contiguous Kruger National Park, which covers a vast area of roughly 1,9 million hectares, which is faced by similar water constraints across the entire length of the park. This makes SANParks a natural ally in the overall strategy to reestablish the ecological reserve. SANParks is a statutory public entity established in terms of the National Parks Act, 1976, and subsequently replaced by the Protected Areas Act. It has been empowered to enter in agreements with organs of state, local communities, individuals or other parties for the co-management of protected areas. In 2009 the Protected Areas Act was amended to make it possible for the Minister to assign to SANParks the management of any protected area, national or provincial, including World Heritage sites, and giving SANParks exclusive rights to the management of declared national parks.

The Mpumalanga Tourism and Parks Agency's (MTPA's) protected areas are clustered mainly along the escarpment, and it does not face the same level of challenge regarding ecological integrity of its river systems. Nevertheless it is also a natural ally in the overall campaign, and will be a useful interlocutor in the internecine politics of the province. MTPA is a recently amalgamated provincial government agency responsible for the management of 2 713 km^2 in 31 protected areas across the province. The MTPA's mandate is to manage tourism and conservation in the province towards the sustainable utilisation of natural resources and the development of a sustainable provincial tourism economy. The Agency is empowered to enter into 'agreements and ... public private partnerships' with related organisations towards the fulfillment of any of the agency's functions, and the MTPAs' the strategic plan outlines a number of neighbouring tourism and management authorities with which it is cultivating strategic partnerships. Nature conservation more broadly in Mpumalanga is governed by the Nature Conservation Act, 1998, which is largely based on the old Transvaal Ordinance.

6.4 International role players

South Africa is a signatory to the IncoMaputo Agreement with Mozambique and Swasiland, an agreement for co-operation in the protection and sustainable utilisation of the Incomati and Maputo watercourses. For the first time, it provides Mozambique, the most downstream country, with protection against over-exploitation of the rivers by upstream neighbours. The IncoMaputo Agreement requires that all future infrastructure development is investigated to protect other basin states against significant adverse effects. Implementation will entail the development of operating rules, institutional development, capacity building and the application of these in the sustainable management and protection of these watercourses.[33]

The above role players have been summarised in Figure 6, which outlines the primary institutions and water users in the Sand Catchment.

[33] Tripartite Permanent Technical Committee between the Republic of Mosambique, the Republic of South Africa and the Kingdom of Swasiland. 2002. Media Release. Signature of the IncoMaputo Agreement on water sharing.

↓ LANDSCAPE

Figure 6: Sand River Catchment Stakeholders

7. Overall Strategy

Several strategies have been designed, and are in various stages of implementation, to deal with the water deficit in the catchment. The three main strategies in place that need implementing are the inter basin transfer pipeline from Inyaka dam, the operating rules, and water licensing. These strategies, however, fall into the single-issue strategies discussed previously, and thus cannot be viewed as being sufficient as they do not proactively engage with broader institutional deficiencies affecting water control. They are also not the only strategies currently in place. Figure 2 categorises existing strategies into three types of responses to water scarcity:

- Allocation.
- Supply Augmentation.
- Conservation[34].

[34] Adapted from Molle, F. 2003. Development trajectories of river basins: A conceptual framework. Research Report 72. Colombo, Sri Lanka: International Water Management Institute.

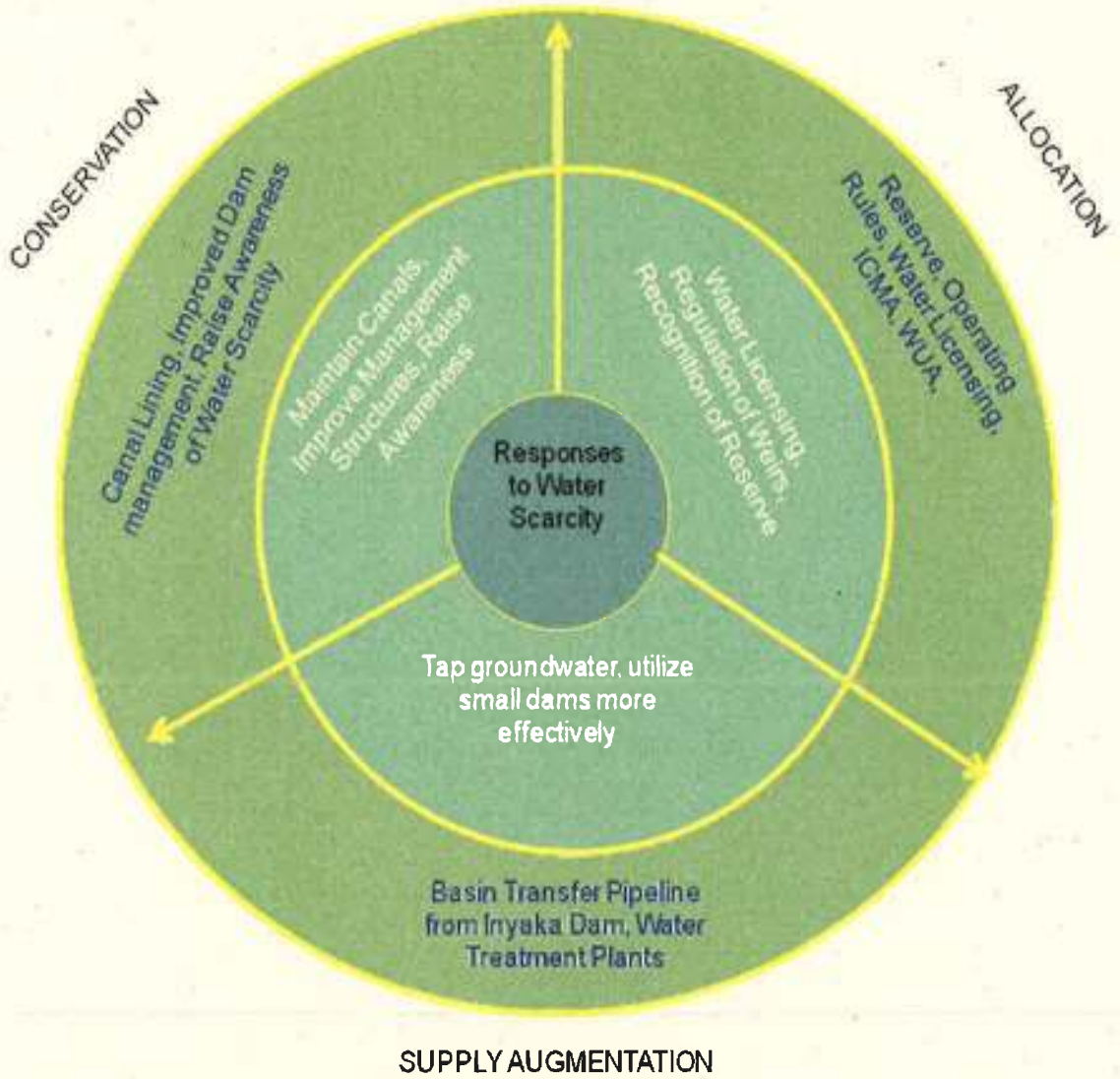

Figure 5: Responses to Water Scarcity

If effectively employed, these strategies should reduce water shortages and improve allocation practices. However, institutional reordering and weaknesses and lack of sustained financial support have led to erratic responses interspersed with long periods of inactivity.

There are five levels at which water control is necessary to make a catchment management strategy work: regulatory, institutional, technical, socio-economic and political. These levels of control relate directly to the different kinds of scarcity associated with a closed catchment, namely physical, economic, managerial, institutional and political[35]. This is important because it denotes clearly that

[35] Mollinga, P. P., and Bolding, A. (2004). 'The politics of Irrigation Reform: Research for Strategic Action.' in The politics of irrigation reform: contested policy, P. Mollinga, P and Bolding, A, Ashgate Publishing Limited, Hants, England

the closed catchment is linked to more than just the actual scarcity of water, but scarcity of a number of resources necessary to ensure the proper management of the little water that is available[36].

In constructing a strategic response to the closed status of the Sand Catchment, SSW needs to consider each level and decide where they are best placed to apply pressure. SSW's strategy does not need to engage with all elements of water control, but they must ensure that they understand what strategies are in place to deal with each element, and monitor progress at all levels. Engaging exclusively with a technical or regulatory issue when there is insufficient attention being applied to institutional and socio-economic issues will prevent interventions from being successful, or sustainable.

This was clearly demonstrated with an earlier victory by SSW when the threat of legal action forced the Champagne Citrus Farm to release water during a drought[37]. Despite this success, the water never reached Sabi Sands as it was immediately abstracted by the next water user along the catchment. As a single issue response dealing with an isolated cause of water scarcity, it was not able to ensure broader adherence or the flow of water needed.

The overall strategy thus needs to engage with the following strategic processes:

1. Regulatory building blocks of water management.
2. Institutional development of bodies responsible for water management.
3. Rural development in Bushbuckridge.
4. Infrastructure development.
5. Implementation and enforcement of the operating rules.
6. Litigation against institutional failing to meet their legal mandates.

7.1 Regulatory Building Blocks

In order for the regulatory framework outline in section two to be effectively engaged, the Reserve determination process must be successfully completed. The operating rules must then be constituted in line with the Reserve determination, and every effort must be made to ensure that the Sand River Catchment is treated separately to its water rich neighbour, the Sabie. The reason for separating the two is that their issues are very different, and mobilising resources for the Sand will require a clear understanding of the issues affecting it within the ICMA.

To ensure the ICMA is properly able to fulfill their mandate, DWA needs to delegate the necessary authority to them to enable them to implement the operating rules and enforce compliance where necessary. Once this has been done, the ICMA is empowered to further delegate responsibility, creating an opportunity for technically empowered institutions such as SSW and Kruger National Park to participate in the monitoring of implementation[19].

The Catchment Management Strategy needs to be finalised, and should be aligned with the Reserve and the operating rules. This requires active engagement with broader political lobbies that hold sway over stakeholder consultation processes.

It will be important to advocate for functioning monitoring staff employed by DWA[38]. In partnership with KNP and the River Health Programme, technical scientific support should be provided to the ICMA in establishing their monitoring system for the implementation of the operating rules. Involvement in this is key to collecting sufficient evidence to develop a water-tight legal strategy if this proves necessary.

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[36] Pollard, S. No Date Given 'Navigating the waters of policy and practice: Lessons from the Save the Sand Project, South Africa - an Integrated Catchment Management initiative.' Association for Water and Rural Development (AWARD)

[37] See Agterkamp 2009 for full case study

[38] Agterkamp (2009). Water bailiffs control the main canal at New Forest irrigation scheme. The water bailiffs were instituted during the homeland government and in 2009 there were 2 bailiffs left. There are currently water bailiffs employed by DAFF but they have no authority to enforce regulations and are sometimes threatened by farmers for doing so. The farmers operate the gates for the Dingleydale canal. There is a lack of communication between the water bailiffs and the water irrigation committees.

Once these regulatory building blocks are in place, SSW can begin to engage a legal strategy to complement the implementation of the operating rules and enforce their implementation if there are system failures. SSW can further enlist the regulatory support of the Department of Environmental Affairs with regard to maintaining the ecological integrity of the river[39].

The most important regulatory pressure points available to SSW are the Reserve, the Operating Rules, the catchment management strategy and the options they present for forcing the government to take action. A strong legal case, however, requires more than simply waiting for the Reserve to be determined and implemented (or failed to be implemented)[40]. It also is not necessarily the most cost or time efficient pathway to opening up the catchment. In light of this, the possibility of developing a strong legal case against the Departments of Water Affairs and Agriculture, Forestry and Fisheries must be built into a broader strategy of engaging with the process of determining and implementing the Reserve, while concurrently persuing a number of other avenues for applying pressure to stakeholders within the catchment.

7.2 Institutional Strengthening

The catchment management agencies are recognised by DWA as the appropriate institutional and governance mechanisms to perform water resource management tasks. Completing the process of establishment of the ICMA is therefore an urgent priority. In order to ensure the necessary institutional support, the ICMA needs to be engaged with regarding its weakness and capacity gaps. Properly understanding their institutional capacity will assist in developing a fundraising strategy to ensure the implementation of the operating rules. Given that this is the only agency which has established over the last ten years, it is possible to persuade DWA to assign additional project management capability and capacity dedicated to this task.

The Water Users Association is the primary stakeholder vehicle for ensuring implementation of the operating rules. This forum still needs to be formally constituted, and SSW needs to ensure they have adequate representation within it. Other stakeholders need to be proactively engaged so that supportive partnerships can be built from the very start of the forum[Error! Bookmark not defined.].

The monitoring and control of water services ultimately occurs at a municipal level, so it is imperative that the Bushbuckridge municipality functions effectively[41]. DWA has serious concerns related to the performance of municipal water and sanitation systems across the country, and Bushbuckridge is no exception. There are four underlying causes to these problems:

- Poor governance (that is, poor choices made by local elected representatives).
- Poor management (inadequate skills and/or experience, or wrong choice of person).
- Inadequate technical skills and/or experience (difficulty in recruiting the necessary skills, or poor choices made).
- Inadequate resources (tariffs are too low and/or equitable share allocated to service is not sufficient).

The solution to these problems is not simple, and various local government interventions are being driven by national and provincial government to support municipal capacity. Institutional instability regarding changes in municipal boundaries has had an adverse effect on domestic water augmentation processes to date, and attempts to improve domestic water supply[9]. These changes

[39] Cousens, E. and Dent, M. 2006 'Finding NEMA: The National Environmental Management Act, the De Hoop Dam, conflict resolution and alternative dispute resolution in environmental disputes.' In P.E.R VOLUME 9 No 3.

[40] Cousens, E. and Dent, M. 2006 'Finding NEMA: The National Environmental Management Act, the De Hoop Dam, conflict resolution and alternative dispute resolution in environmental disputes.' In P.E.R VOLUME 9 No 3.

[41] Cousins, T., Dlamini, V., Smits, S. and Maluleke, N. 2006 'Planning for a Multiple Use System Approach at Local Level: experiences from Bushbuckridge, South Africa.' WarfSA Paper

have now stabilised and should present a more supportive institutional framework at the municipal level.

It will be important for SSW to actively engage in processes designed to support and strengthen the role played by Bushbuckridge municipality, and attempt to influence these processes in order to secure a positive outcome.

7.3 Rural Development and the Wildlife Economy

The government has largely failed to effectively engage with the rampant poverty in Bushbuckridge[42]. Despite this, or maybe because of it, they are at pains to appear to be working towards meeting the needs of the poor. This is the primary reason why the polarisation of issues between the socio-economic and environmental lobbies is so dangerous. Unless the catchment management strategy, the operating rules and the Reserve can be framed in relation to rural development, and unless they are able to positively affect the availability of services in Bushbuckridge, the political support necessary to ensure their effective implementation will not be forthcoming[43].

There are numerous socio-economic issues that need to be resolved in Bushbuckridge, few of which will be solved by the proper implementation of the Catchment Management Strategy. There are three central issues, however, that have direct bearing on the management of water, and the way in which this management is viewed by the residents of Bushbuckridge:

- The provision of water for domestic and agricultural use.
- The creation of employment opportunities.
- Increased access to support services and markets for small holder farmers[9].

If the implementation of the Reserve is seen to actively engage with these three elements of poverty, it is likely to gain the support of local residents and thus will be able to positively mobilise the political lobby they wield.

Engaging simply with the farmers will not be sufficient to ensure support. Should SSW want to further expand on the "economy of wildlife", the value chain of SSW procurement of goods and services should be examined to determine where additional local suppliers can be utilised. SSW has to date already spent considerable financial resources lobbying for the removal of the State Forest plantations in the upper catchment, while the main user of water is the farmers abstracting water from the irrigation canals. The farmers are looking for a way to increase their revenue by finding a better market for their produce. Looking internally, SSW could possibly source additional agricultural products locally, and investigate the feasibility of growing produce in the area that they could use. By working together with the farmers they are more likely to get support for altering or upgrading their irrigation system. This in turn would receive broader political support from the municipalities and the province.

Strategies to augment domestic water supplies from Inyaka Dam need to be integrated into plans to implement the operating rules, so that residents support the process[9]. MABEDI's refurbishment proposal[44] is already designed to be labour intensive, once the proposal has been refined and adopted this needs to be advertised to the local municipality and local residents to garner further support. Small holder farmers need to be engaged and the Department of Agriculture, Fisheries and Forestry needs support in providing agricultural extension services and improving market access to farmers.

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[42] See Raab et al 2008, Pollard 2005, Agterkamp 2009

[43] Pollard, S. and Biggs, H. 2008. 'Towards a Socio-Ecological Systems View of the Sand River Catchment, South Africa: An Exploratory Resilience Analysis.'

[44] Funding Application for the refurbishment of the New Forest and Dingelydale Canals. Teba Development. 2009

SSW's intention to start actively lobbying for the wildlife economy to be integrated into rural development strategies is well suited to frame their engagement with broader social development issues. In order to start mobilising this lobby through the Catchment Management Strategy, ecological issues need to be reframed in relation to rural development. This would involve both an internal reimaging process and an eternal awareness campaign to educate residents and politicians about the positive interlinkages between conservation and rural development. SSW is a major economic driver in this area and provides a large amount of employment. Review of how SSW can enhance job creation in the area through the use of more localised services could be explored which could also be a potential cost saving for SSW.

Cousins et al[Error! Bookmark not defined.] suggest that a ward level, participatory water management plan is the best scale at which to ensure the effective implementation and monitoring of water delivery schemes in the rural areas. The two NGO's working in Bushbuckridge that engage directly with rural water concerns – AWARD and MABEDI - are well placed to implement local level water management schemes, but seem to require funding and support from local government to implement their preferred water management programs.

The Department of Rural Development and Land Reform needs to be engaged to proactively participate in pursuing poverty relief strategies that will assist with the implementation of the operating rules. SSW needs to frame their Corporate Social Investment strategy towards engaging directly with the residents of Bushbuckridge. This is discussed more in the next section. SSW staff need to be empowered to become a lobby group able to demonstrate the clear economic benefits of maintaining the ecological integrity of the river.

7.4 Infrastructure Development

While engaging regulatory and institutional frameworks are integral to the implementation of the strategy, real success will ultimately be determined by what actually happens on the ground in relation to monitoring stream flow, ensuring proper operation of the weirs, and ensuring the basin transfer pipeline is properly implemented and managed. The strongest political and social lobby against implementing the ecological reserve will come from people affected by failing irrigation schemes and lack of domestic water. While this is not the core business of SSW, it is the most critical hurdle to re-opening the Sand Catchment. SSW needs to investigate what level of pressure they are able to apply to practical processes, what kind of technical support they can offer, how they can apply consistent politically supported pressure to the institutions responsible for managing the technical aspects, and devise a strategy to ensure that that pressure is consistent and politically supported.

The operating rules suggest that the best way to meet the reserve is through a passive system that ensures that water diverted does not exceed 75% of the available water[Error! Bookmark not defined.]. This requires upgrading of the weirs, and monitoring to ensure that they are operated properly. Developing sufficient buy in amongst weir operators is critical.

The Reserve and the operating rules are designed to deal with unregulated abstraction, which has to date been cited as the single most important cause of the catchment's closure. However, we don't know yet exactly how much water is being lost in the canals, nor who is extracting exactly how much water, because data is not consistent, and loss has not been accurately monitored[Error! Bookmark not defined.]. Evapo-transpiration in canals and dams has also not been factored into the water loss equation. Also water users along the irrigation canals have the power to simply stop flow downstream by manually diverting the flow which is not currently monitored.

Canal refurbishment is a central part of the ICMA's management strategy for the Sand River[45], and is broadly believed to be an important step in realising the implementation of the operating rules. Once the canals have been refurbished, however, domestic water use will be the next big issue in the catchment[46]. Communities are already complaining that farmers get more water than they do, so it is

[45] Interview with Brian Jackson, ICMA, April 2010

[46] Interview with Sharon Pollard, AWARD, April 2010

clear that the issue of water loss in the canals is not simply a farmer issue, but a broader water supply and allocation issue affecting all the residents of Bushbuckridge.

Elements of an infrastructure strategy that must be implemented for other interventions to be successful include:

- Ensure weir upgrade strategy is technically sufficient and support its implementation and enforce operating rules.[47].
- Analyse the canal refurbishment proposal by MABEDI to ensure it is technically sufficient and the best way to ensure the proper maintenance of the canals. Investigate alternative, water saving technology for irrigation.
- Investigate the technical issues affecting the supply of water through the basin transfer pipeline and consider ways to monitor water. This is critical for augmenting domestic water supply and meeting the ecological reserve. NEMA provides a broader set of principles for the proper management of natural resources than the Water Act, and as such may be useful for broader issues concerning the regulation of water use by organs of the state.
- In partnership with dam operators, provide technical scientific support to the proper management of dams in the catchment.
- Support fundraising efforts to refurbish canals and weirs and ensure BTP is properly implemented.

7.5 Enforcement & Litigation

Both NEMA and the Water Act provide regulatory recourse for the resolution of disputes relating to water use and the failure to effectively regulate water use and implement the catchment management strategy. In parallel with the above interventions, it will be important to develop an alternative strategy focused on enforcement of regulatory responsibilities and ultimately litigation to ensure that the rights of SSW are protected. While this should not be the first choice in pursuing the above strategy, it will be an important option to keep open during the process. Some pointers for such a strategy are highlighted below.

7.5.1. Water Act

The Water Act provides clear guidelines regarding the protection of water resources (Chapter 3), which includes the classification of a water source, and the determination of the Reserve. In relation to ensuring the Reserve is met, the Water Act provides several channels through which regulatory recourse may be sought.

Most importantly, in Chapter 7: Part 3: Operation of a Catchment Management Agency, the Water Act outlines the delegation of authority that should be assigned to a Catchment Management Agency (CMA), as well as the extent to which a CMA can further devolve authority to stakeholders within the catchment, and how it is able to raise funds. This section of the law also outlines details of documents relating to litigation – all of which will be necessary for ensuring the ICMA is able to fulfill its mandate and open up the catchment again.

There are both retrospective and proactive approaches in terms of which the Water Act could be used to ensure the implementation of the reserve:.

Once the Reserve has been determined it will take some time before the agencies responsible for the implementation and monitoring of the reserve can be considered to have been given sufficient time to implement the reserve. Only after a number of years have elapsed would it then be appropriate to retrospectively appeal to the regulations governing the implementation of the Reserve to try and force

[47] Agterkamp (2009). Water bailiffs control the main canal at New Forest irrigation scheme. The water bailiffs were instituted during the homeland government and in 2009 there were 2 bailiffs left. There are currently water bailiffs employed by DAFF but they have no authority to enforce regulations and are sometimes threatened by farmers for doing so. The farmers operate the gates for the Dingleydale canal. There is a lack of communication between the water bailiffs and the water irrigation committees.

the DWA to take action to ensure the reserve is met. The case should be built primarily through monitoring the implementation of the operating rules, which is the responsibility of the ICMA. The ICMA have indicated that they plan to ensure the reserve is met by supporting MABEDI's proposal to refurbish the agricultural canals, however, they are not clear as to how they plan to support it, and where they plan to source the funds from.

Chapter 4 of the Water Act (Use of Water) provides several regulations that could be utilised to ensure the reserve is met proactively - by applying for strict measures regarding the extraction of water from the river to be implemented. In particular, Part 4: Stream flow reduction activities, allows for an appeal to be made directly to the Minister of Water Affairs to 'regulate land based activities which reduce stream flow, by declaring such activities to be stream flow reduction activities'[48]. Any activity which 'is likely to reduce the availability of water in a watercourse to the Reserve, to meet international obligations, or to other water users significantly' may be declared as a stream flow reduction activity. It is not common, but a precedent application could be made for the weirs and canals in their current state of disrepair to be declared streamflow reduction activities until properly refurbished. Part 8 of Chapter 4: Compulsory licenses for water use in respect of specific resource, provides further preventative regulatory measures to prevent activities in areas which are 'soon likely to be under water stress ..., where demands for water use are approaching or exceed the available supply, where water quality problems are imminent or already exist, where the water resource is under threat, or where it is necessary to review prevailing water use to achieve equity of access to water'[48].

7.5.2. National Environmental Management Act

The principles set out in NEMA (outlined under 'Regulatory Frameworks' above) can be activated through a number of DEA facilitated conciliation processes. Section 35 indicates that the Minister and every MEC or municipality may enter into environmental management cooperation agreements with any person or community for the purpose of promoting compliance with the principles in the Act. Such cooperation could be focused on getting DEA to support attempts to force DWA and DAFF to manage water in the catchment more effectively.

Facilitating cooperation from DWA and DAFF can also be done under Section 17 of the act by requesting the Minister, the MEC or a Municipal Council to appoint a facilitator to conduct meetings for the purpose of reaching agreement. Time limits may be set on these processes, helping them to be expedient.

Section 19 of the act provides for a difference or disagreement regarding the protection of the environment to be referred to arbitration by the Department of Environmental Affairs.

As noted earlier, amendments to NEMA have resulted in the establishment of the Environmental Management Inspectorate. There are grounds for a case against water users prohibiting the flow of water downstream into the Sand River. Engagement with the Environmental Management Inspectorate's "blue" scorpions is needed in order for the Sand River Catchment case to be presented to them. All of the research done to date on the catchment will be an important component of the evidence for such a case.

8. SSW Strategy

SSW's strategy to date has been driven by an environmental lobby. Armed with a thorough understanding the regulatory framework governing the use of water in the catchment, they have attempted to utilise a growing recognition of the value of ecosystem services to the local economy to drive a process of engagement with the responsible government departments and local water users[26]. Unfortunately, this position has contributed to the perception of the Reserve as being ecologically biased, and in direct conflict with the needs of the poor. The polarisation of the issues into socio-economic versus ecological camps will ultimately prove detrimental to the effectiveness of SSW's

[48] Republic of South Africa. National Water Act No 36 of 1998.

lobby. Situations of water scarcity present important opportunities for an environmental lobby to gain momentum. The kind of social resources available to deal with water scarcity, however, strongly influence whether a society will be able to adapt, or whether conflict and social unrest will result.

SSW have focused their strategy around two central issues – ridding the catchment of forestry plantations in the upper reaches, and attempting to hold the Department of Water Affairs legally responsible for their failure to manage the catchment[26]. Several positive steps have been made on both of these fronts although a lack of sustained pressure and unclear legal frameworks have prevented SSW from making any lasting progress. At the same time the implementation of the Water Act and NEMA has been ongoing and there is now a catchment management agency developing a strategy. There is also the promise of stronger enforcement through the use of an Environmental Management Inspectorate.

The overall strategy outlined in the preceding section provides a broad framework for the activities that will be necessary to ensure the catchment is successfully opened up, and remains open. This strategy is extensive and too broad any individual organisation such as SSW, but SSW needs to situate itself within such a strategy, and seek to influence other stakeholders' to participate in the process of opening up the catchment. This section briefly outlines some of the internal constraints affecting SSW strategies to date, and then outlines key elements that could be incorporated into SSW's strategy going forward.

8.1 SSW Strategy Internal Issues

Despite some excellent work, there are several issues that have hampered SSW strategies to date. These need to be examined and critiqued before embarking on any strategic shifts, in order to ensure that internal issues don't compound the multitude of external ones.

Firstly, positioning themselves within a technocratic approach has made it difficult for SSW to proactively engage with the more political aspects of catchment management[49]. This is based on the assumption that an environmental lobby is sufficient. The technical skills of the SSW team are a clear asset in supporting the monitoring and implementation of the CMS, as well as in building up a strong evidence base to support any legal action they may choose to pursue, but these skills need to be situated within a broader framework to avoid alienating themselves from other less technically minded stakeholders.

Secondly, the reliance on a techno-scientific lobby contributes to the polarisation of issues between socio-economic and environmental. SSW is clearly representing an environmental lobby, but this needs to be situated within a more nuanced approach that is better able to develop partnerships and mobilise other lobbies towards the same goals.

Thirdly, a relatively narrow legal strategy to date (focused only on the Water Act) has prevented SSW from engaging all the possible regulatory avenues available to them. A successful legal strategy will encompass a host of regulatory pressure points that collectively ensure Departments are unable to slip through loopholes in legislation.

And lastly, the inability of SSW to engage directly with small holder farmers and domestic water users in Bushbuckridge make it difficult for these stakeholders to view them as anything more than a threat.

These key elements are taken up in the SSW strategy outlined below.

[49] Malsbender, D., Goldin. J., Turton, A. and Earle, A. 2005 'Traditional Water Governance and South Africa's "National Water Act" – Tension or Cooperation?'. Paper presented to International workshop on 'African Water Laws: Plural Legislative Frameworks for Rural Water Management in Africa', 26-28 January 2005, Gauteng, South Africa.

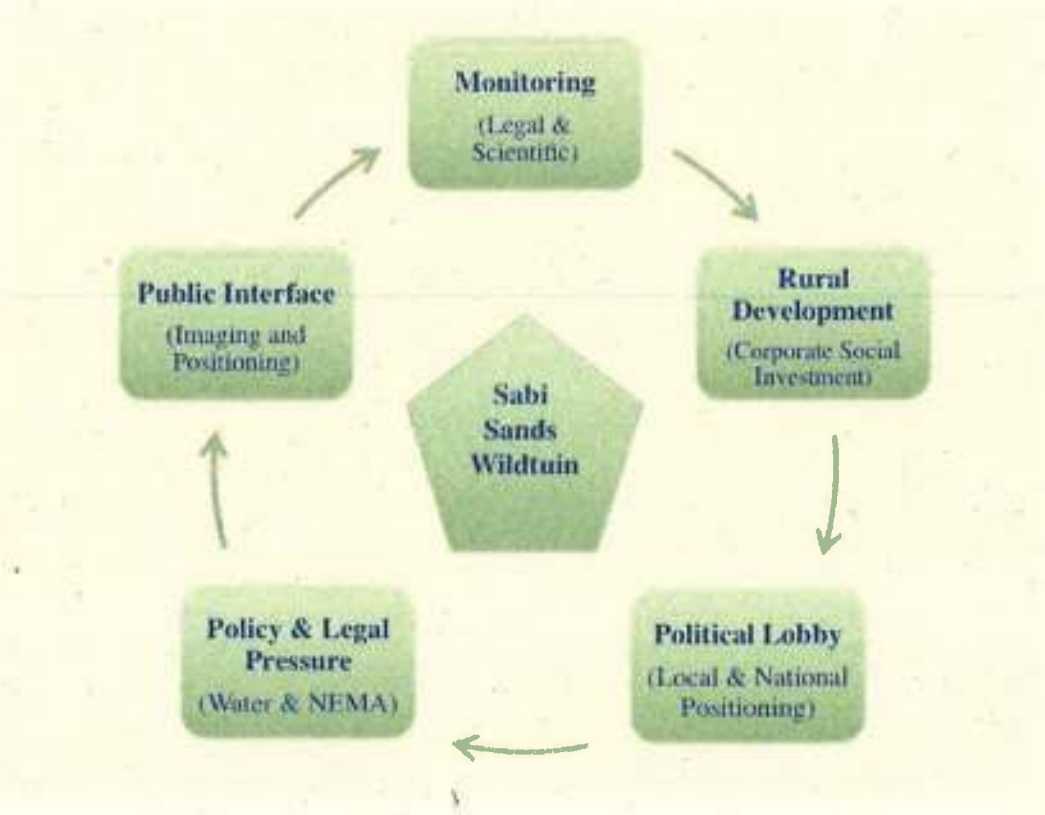
8.2 SSW Strategy and Institutional Arrangements

In designing a strategy SSW need a clear idea of which elements of water control they want to engage directly with, and which elements they want to monitor and influence other people's engagement with. Once this has been decided, an internal evaluation of what institutional, financial, political and social resource they have available to them is necessary. Key elements of SSW internal structures such as a staff lobby, and the creative utilisation of their CSI strategy can broaden the effectiveness of their strategy and the way in which their resources are mobilised towards achieving it. Effectively, opening up the catchment needs to become part of the core business of the organisation in that all SSW stakeholders – from the CEO to the cleaners – need to be creatively mobilised in a way that does not add to their existing jobs, but utilises these jobs to educate and empower people at all levels of society to participate in opening the catchment. A staff contingent of 1500 people, for example, presents SSW with a powerful local lobby to spread information and opinions into the neighboring communities.

Once the key elements of the SSW strategy have been selected, it is important to decide on some activities that will deliver short term wins and long terms successes. This will enable SSW to monitor the effectiveness of their strategy.

Based on a recognition of the complexities of water control in the Sand River Catchment, there are five elements that should form part of SSW's strategy. These are situated to mobilise existing resources towards influencing various elements of the broader strategy. Figure 3 outlines these five elements.

Figure 6: Sabi Sands Wildtuin Strategy Diagram



Drawing on actions outlined in the overall strategy, SSW needs to build a supportive institutional framework to ensure that they can support and sustain a strategy operating on all five fronts. Table 1 outlines potential activities and actors that can be engaged to support such a strategy:

Element	Key Activities	Internal Support
Monitoring and influencing	Monitor and influence: • Reserve determination process. • Operating rules enforcement. • Functioning of the ICMA. • Domestic water service provision. • Stream flow. • Canal & weir refurbishment process. • Forestry developments.	Technical team (Jonathan Swart) Staff that reside in Bushbuckridge Legal team
Rural Development	Develop a coherent rural development strategy. Agricultural support through access to SSW market. Job creation through refurbishment and monitoring processes and through analysing the entire value chain of where SSW gets is goods and services (not only focused on agricultural products). Education about the importance of the wildlife economy to rural development. Education about the importance of the Reserve and the Operating Rules to catchment management.	Corporate Social Investment Team Public Relations Team Procurement team
Political Lobby	Implement a planned and coherent political strategy. Lobby national government for high level support. Lobby local politicians to integrate environmental lobby into rural development lobby. Lobby local stakeholders to hold politicians and local government to account. Lobby WUA to effectively utilise their potential authority in implementing operating rules successfully.	Leadership of SSW SSW staff (mobilise union) Assign a local staff member to be responsible for lobbying each stakeholder group and properly empower them to actively pursue lobby. Empower technical team to effectively integrate a political lobby into their activities.

Element	Key Activities	Internal Support
Legal Pressure	Follow a long term and carefully planned legal strategy. Engage the conflict resolution mechanisms outlined by the Water Act and NEMA to force government departments to work together and finance necessary activities. Collect evidence to support legal action within NEMA framework. Collect evidence to support legal action within framework of the Water Act. Engage the Blue and Green Scorpions to apply legal pressure.	Technical Team. Legal Team.
Public Interface	Reimage SSW towards a focus on the wildlife economy and rural development – away from a purely conservation image. Actively pursue a local and national media strategy to spread image. Ensure all public engagements include reference to the benefits of the wildlife economy to rural development. Promote SSW's corporate social investment strategy.	Public Relations / Marketing Team.

All of the above activities need to be mobilised towards putting legal and political pressure on the national Departments of Water Affairs; Agriculture, Fisheries and Forestry; Rural Development and Land Reform; and Public Works to provide the necessary financial support to implement the overall strategy.

There are numerous resources within SSW that can be mobilised towards the implementation of their strategy to re-open the Sand River Catchment. In order to drive this process, however, and ensure it remains coordinated and strategic, SSW needs to appoint a catchment champion to lead a coordination team. To date Jonathan Swart has fulfilled this role, and he may still be best suited to drive the process, but SSW needs to decide who would be best suited to drive an organisation wide strategy and mobilise all available resources. Andrew Parker, as the new CEO, may be better positioned to be the overall champion, but whoever it is, the champion will need to be able to make a considerable investment of time and effect in order to ensure success.

9. Strategic Positioning

There are several levels on which water management issues in the Sand River Catchment are political. There are the general politics associated with access to water outlined in the introduction, and then there are the specific politics between participating institutions and between different lobby groups. Institutional politics affect the willingness of institutions to work together on issues that require collaboration, while lobby politics affect the ability of processes that require stakeholder consultation to progress effectively.

In order to influence, and capitalise on the rampant politicking in Bushbuckridge, it is necessary to engage in the formation of strategic alliances with local and national politicians. This politicking will not provide actual solutions, and can become extremely tiresome, but it is essential to ensuring that politics do not block other implementation strategies, and that lobbies can be mobilised to source funding from national government and put pressure on local institutions.

The SSW strategy needs to be strategically positioned in relation to the overall strategy and in relation to key stakeholders in order to be successful. A summary of how SSW needs to position themselves in relation to key stakeholders follows:

9.1 Regulatory

Forming strategic partnerships with both the Department of Water Affairs (DWA) and the Department of Environmental Affairs (DEA) national and regional compliance units is essential. Nationally, the blue and green scorpions can be utilised to drive an independent legislative process to compliment any legal process the SSW chooses to engage in. They are severely under-resourced, so utilising these units will require collating good evidence which can be passed on to them to utilise in the development of their cases.

The National Director of Strategic Planning at DWA is currently engaging with enforcement and compliance issues relating to the implementation of Reserves nation-wide[50]. It would be integral to the success of SSW's strategy to raise his awareness about the situation in the Sand River Catchment, and the potential for legal action if nothing is done about it. While solving issues in the Sand River Catchment is ultimately a local exercise, generating national pressure is integral to gaining the necessary local institutional momentum.

Regionally, SSW needs to engage with the local mechanisms set up to regulate the enforcement of the Reserve, namely the Inkomati Catchment Management Agency and the still to be properly constituted Catchment Management Forum. Strategic alliances should also be formed with the regional DWA and DAFF representatives. While these institutions have to date failed to produce any significant results, they will ultimately be responsible for implementation, and must be proactively and positively engaged. The building of capacity within the ICMA to effectively monitor and regulate water use in the Sand River Catchment is a crucial intervention, and effort should go into mobilising resources to this end.

9.2 Technical

There are numerous resources available to support the SSW technical team in monitoring activities and in utilising the results of this monitoring to effect change. Most importantly, the Kruger National Park and the River Health Programme need to be enlisted to proactively collect their own evidence and feed it into a broader monitoring strategy.

The local operators of dams, weirs and canals also need to be engaged, and possibly paid to collect data on site. This should be framed in a supportive manner, as getting on the ground officials to monitor the operation of their infrastructure is a critical factor in the long term sustainability of refurbishment strategies. It is important to think creatively about how to engage these people, as direct engagement from SSW may not be the most effective. The local River Health Programme officials may be best placed to drive such a monitoring initiative, alternatively the regional DAFF and DWA officers. However, SSW can support them in designing simple monitoring systems, and in training operators in their use.

NGO's in Bushbuckridge are also well placed to support monitoring efforts, and to support upgrading of infrastructure. The refurbishment of the irrigation canals proposed by MABEDI should be supported, and funds for this project actively solicited. If MABEDI's refurbishment proposal is successful, they will be a key partner in monitoring its implementation and maintenance. AWARD can

[50] Interview with Dirk Versfeld, Senior Consultant, DWAF, April 2010

also be engaged to utilise students to monitor social and ecological processes around the implementation of the reserve and the health of rivers. At least one student per year should be enlisted to participate in monitoring processes, and SSW could possibly use their CSI strategy to provide some support to students to ensure they feed data directly to SSW.

9.3 Rural Development

Rural development will never be the core business of SSW, and so their CSI strategies must be carefully aligned with existing development organisations to ensure their success. MABEDI and AWARD are suitable organisations to partner with, although it will require some careful positioning to ensure that collaborations are directly relevant to SSW's overall strategy to open up the catchment and not diverted into the numerous other possible activities in the region.

The national and regional Department of Rural Development and Land Reform must be proactively engaged, and pressure applied to enlist their support in implementing development strategies that will positively impact on the catchment.

Ward councillors and local farmers from Bushbuckridge would be well worth engaging with, although how and when to do this needs to be carefully considered. The best people to drive such an engagement are staff that work for SSW that come from Bushbuckridge.

9.4 Political

High level political support will be invaluable to SSW's strategy, and enlightening key individuals in national government to the benefits of the wildlife economy and the need for regional government to be pressured into supporting the opening of the Sand River Catchment. In particular the Ministers of Water and Environmental Affairs; Agriculture, Fisheries and Forestry; and Rural Development and Land Reform need to be collectively engaged. In preparing for such an engagement, it will be important to ensure a high degree of unity between the conservation players. The head of the Mpumalanga Parks and Tourism Agency is also a key player with national influence that would be worth proactively engaging; as is the national director of South African National Parks Board.

10. The Way Forward

This scoping document has attempted to bring into focus the key issues, stakeholders and regulatory frameworks affecting the Sand River Catchment. None of these issues are new to SSW, neither are many of the recommended courses of action. However, to date SSW has engaged with issues relating to the opening of the catchment unsystematically and primarily from a single-issue technical perspective. If SSW is to successfully mobilise their resources towards influencing the flow regime of the Sand River, they now need to change track and begin to mobilise an organisation-wide strategy.

The following steps need to be taken to begin implementing the SSW strategy:

1. The leadership of SSW needs to decide what level of commitment there is within the organisation to engage in a more holistic strategy.
2. Once there is high level commitment to the process, decisions need to be made regarding what resources are available, and which staff members will be driving what elements of the process.
3. A strategy must be decided on.
4. Decide on what role Linkd can play in implementing the strategy, or further preparing SSW to implement their strategy.
5. The strategy needs to be internally communicated and the necessary institutional arrangements made to support it.
6. Gain high level political support through hosting a series of meetings of the key political stakeholders outlined in the preceding section.
7. Use this political support to develop a fundraising strategy to support the necessary local processes such as the functioning of the ICMA, the refurbishment of the canals, etc.
8. Begin the process of engaging regional stakeholders and campaigning on the importance of the ecological reserve.
9. Begin to apply regulatory pressure to institutions responsible for implementing the Reserve and the operating rules.
10. Engage with CSI activities in Bushbuckridge.
11. Prepare evidence for multiple litigation processes driven by different compliance units.

Key to the successful implementation of the strategy is internal coordination and external timing. Developing partnerships and applying pressure at the right moments will determine the success of activities. A litigation process started too soon, or a rural development strategy promoted but not implemented could prevent activities from being successful. The most important aspect, however, is for SSW to remain committed to, and consistent in the implementation of, whichever strategy is decided on.

Linkd is available to assist in all aspects of developing the strategy further and preparing for implementation. Areas in which Linkd can lend particular support:

1. Consulting with the Environmental Management Inspectorate to help build a case against illegal water users in the Sand river catchment.
2. Engaging a national political lobby.
3. Organisational support and training within SSW to prepare for the implementation of the selected strategy.
4. Investigation into the appropriateness of proposals to refurbish canals and get the basin transfer scheme working.
5. Develop the foundations of a fundraising strategy for infrastructure development.
6. Prepare the foundations of an enforcement strategy and engage national compliance units.
7. Imaging and public relations support.
8. Developing a CSI strategy.
9. Applying pressure to institutions responsible for implementing the Reserve and the operating rules.

Annexure 1:

Primary Functions of the Inkomati Catchment Management Agency

Primary functions of a catchment management area (CMA):

1. Investigate, and advise interested persons on, the protection, use, development, conservation, management and control of water resources in its Water Management Area,
2. Develop a Catchment Management Strategy,
3. Co-ordinate the related activities of water users and water management institutions,
4. Promote the co-ordination of the implementation of the Catchment Management Strategy (particularly with local governments Water Services Development Plan),
5. Promote community participation in its functions,
6. Manage, monitor, conserve, and protect water resources,
7. Make rules to regulate water use,
8. Require establishment of management systems by water users,
9. Require alterations to water works,
10. Temporarily control, limit or prohibit use of water during periods of water shortage,
11. Issue and periodically review general authorisations and licences in respect of water use subject to conditions,
12. Promote 'one stop shop' licensing,
13. Require registration of existing lawful water uses,
14. Suspend or withdraw entitlements to use water,
15. Enforce license conditions,
16. Dam safety,
17. Monitor releases of waste water and impose penalties for pollution,
18. Establish and manage Catchment Management Committees and Water User Associations.
19. Enforcement and Litigation

Annexure 2:

Principles enshrined in the National Environmental Management Act 107 of 1998

NATIONAL ENVIRONMENTAL MANAGEMENT PRINCIPLES

2. Principles

(1) The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment –

(a) Sustainable development requires the consideration of all relevant factors including the following:

(i) That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;

(ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;

(v) that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;

(vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;

(vii) that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and

(viii) that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

(c) Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.

(d) Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.

(e) Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.

(f) The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.

(h) Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.

(i) The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.

(l) There must be intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.

(m) Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.

(n) Global and international responsibilities relating to the environment must be discharged in the national interest.

(o) The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.

(p) The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

(r) Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

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