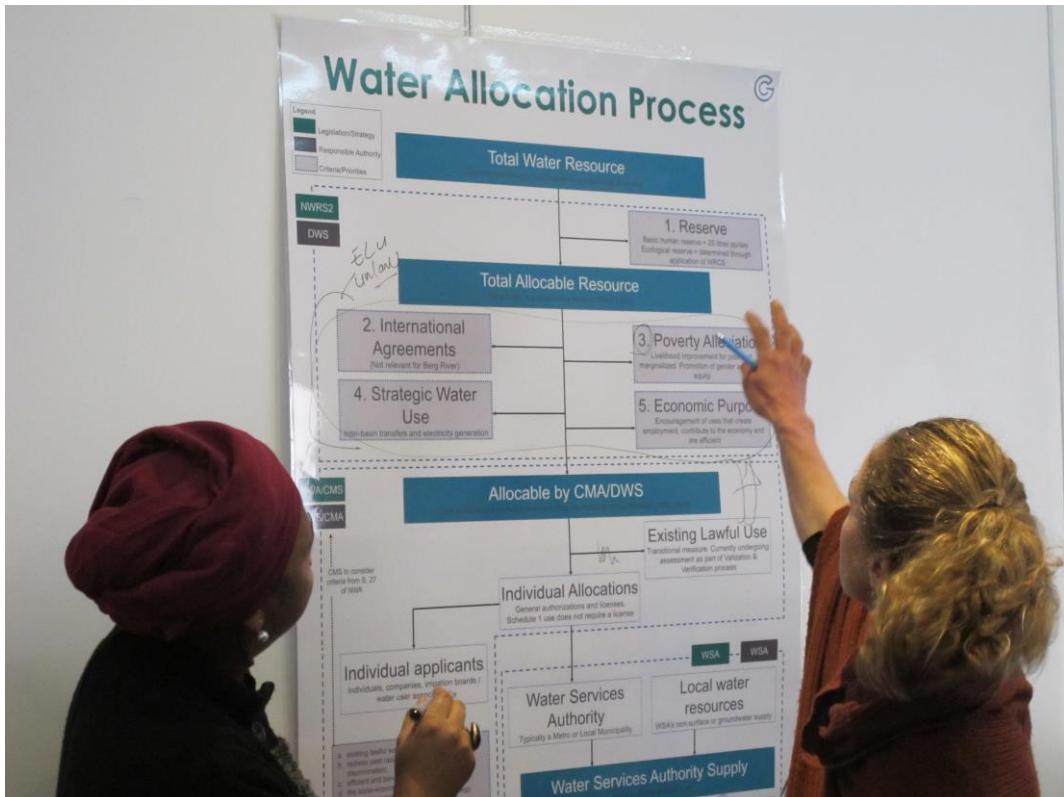




Testing Tools Workshop Report



Western
Cape
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This progress report forms Deliverable 4 of WRC and DED&T Co-Funded Project:
**K5:2453 Towards Sustainable Economic Development in Water Constrained
Catchments: Tools to Empower Decision Making**

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List of acronyms

ACDI	African Climate and Development Initiative
CBA	Cost – Benefit Analysis
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
CoCT	City of Cape Town
DEA&DP	Department of Environmental Affairs and Development Planning of the Provincial Government of the Western Cape
DED&T	Department of Economic Development and Tourism of the Provincial Government of the Western Cape
DM	District municipality
DoA	Department of Agriculture
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
IDP	Integrated Development Plan
IDZ	Industrial Development Zone
LM	Local municipality
MCDA	Multi-Criteria Decision Analysis
NWA	National Water Act
NWRS2	National Water Resource Strategy 2
PGWC	Provincial Government of the Western Cape
RBIG	Regional Bulk Infrastructure Grant
SBLM	Saldanha Bay Local Municipality
SDF	Spatial Development Framework
SIP	Strategic Infrastructure Projects
TCTA	Trans-Caledon Tunnel Authority
UCT	University of Cape Town
WC/WDM	Water Conservation/Water Demand Management
WCDM	West Coast District Municipality
WCIP	West Coast Industrial Plan
WCWSS	Western Cape Water Supply System
WMA	Water Management Area
WSDP	Water Services Development Plan
WRC	Water Research Commission
WSA	Water Services Authority or Water Services Act

1. Project background

1.1. Motivation

Water Research Commission (WRC) project K5/2453, “**Towards Sustainable Economic Development in Water Constrained Catchments: Tools to Empower Decision Making**” was awarded in response to an unsolicited proposal submitted in 2014. The project is co-funded by the WRC and Department of Economic Development & Tourism (DED&T) of the Provincial Government of the Western Cape (PGWC).

There is widespread recognition that the combined effects of climate change, population growth and continued urbanisation are exerting pressure on limited water resources. At the same time economic growth is vital to alleviate poverty. Given that growth is required in the face of natural resource constraints, the Green Economy has been promoted most broadly as an approach to maintain growth whilst not depleting natural resources (PGWC, 2013).

In terms of water resources and development, the Department of Water and Sanitation (DWS) has been careful to point out that whilst water is essential to development, its availability is not a driver to, nor constraint on, development (DWA, 2009 and DWA, 2010). This position of DWS is based on the view that as much water can be made available as is required (via desalination for example). In the case of a catchment where all readily available water is allocated (referred to as a ‘constrained catchment’), a proposed economic development scenario or future would require additional water resources. These in turn require new infrastructure, which comes at a cost. This cost would be borne in part by the economic development in the proposed scenario, via capital levies or direct water charges. If the industries or activities considered in the economic development scenario are unable to bear this cost, then the cost of provision of water becomes a constraint to economic development. Therefore, the ability of these industries or activities to carry the cost of this proposed water infrastructure should be taken into account in determining the viability of the proposed economic development scenario (GreenCape, 2014). The project proposal therefore recognised that the cyclic interdependency of economics and water resources therefore needs to be taken into account in development planning (a proposed “key intervention”).

It also follows that given the potential constraint of (the cost of) water, allocation should be towards those developments that maximise environmental and socio-economic benefits for the water used. Of course economic benefit is challenging to quantify, and there are complex links to considerations of socio-environmental benefits for water use or allocation. But at the least, enviro-socio-economic benefit considerations need to be incorporated in water allocation decisions to promote the ‘smartest’ use of water (a proposed “key intervention”) – something that is also promoted by DWA (2009) and WRC (2013).

Furthermore, it follows that in constrained catchments, there may simply not be “enough for all, forever” and allocation decisions between competing uses or development options may need to be taken that have trade-off or knock-on effects. For example, what is the impact on the economy of diverting more water towards agriculture in a bid to promote food security? Conversely, what is the impact on the food processing industry and on food security, of a

decision to promote more economically lucrative uses of water than agriculture? In a perfect water market, market forces would dictate the allocation of water resources between competing users. However, water is identified as a basic human right in the South African Constitution giving priority to domestic use. Meeting the Ecological Reserve is also a priority as dictated by the National Water Act (Act 36 of 1998). Also, water's role in food security ensures that high priority is given to agricultural use. Therefore allocation decisions have to be made while achieving sustainable enviro-socio-economic growth. This need for sustainable growth requires that each potential economic use of water be assessed for its costs and benefits, and that the trade-off and knock-on effects of this use be mapped (a proposed "key intervention").

Driven by a similar motivation to that behind the key interventions highlighted above, a recent WRC project (WRC, 2013) investigated the links between water resources and the economy in the Western Cape, and attempted to understand how water flows through the economy. The applicability of various tools for linking water and economics, such as virtual water and indices such as rand per drop, were assessed. The project unpacked and promoted some critical paradigm shifts required in order to assess water and economics as one linked package (WRC, 2013). Other projects are also applying complex systems thinking approaches to try to unpack water resources planning and the inherently linked considerations such as economic development, and management of the water-energy-food nexus (such as Muller, 2013 and Palmer, 2014). Another research team has also been working on creating a regional resource flow model to develop a baseline for the resource efficiency of the Western Cape economy, benchmark sectors and particular commodities in these, with the aim of identifying interventions to increase the resource efficiency of the various sectors and the economy as a whole (Janse van Vuuren & Pineo, 2014). These studies may improve our current understanding of how water moves in the economy. However they fall short of being live or coded systems for testing scenarios and informing current development decisions.

In addition, a model has been developed for demonstrating the importance of water in the South African economy, while providing a means for quantifying the impact of different water policy strategies and demand/supply scenarios (WRC, 2012). This study also focused on forecasting the demand for water on both a national and a regional level in line with the overall expected socio-economic developments. The model allows comparison of the benefits of water use between various sectors using weighted average multipliers (GDP, number of employees, households) per Rand per m³ water used, and also allows for growth scenario analysis and the aggregated effects of different policy interventions such as increasing water tariffs. However, this existing model does not take into consideration the full complexity of the system, to quantify trade-off or knock-on effects of different water uses. For example, whilst demonstrating that agriculture uses water less 'efficiently' than other sectors, the analysis does not take into consideration issues such as the value of food security and regional imbalances in the prevalence of poverty. The model also excludes the impacts of various proposed water uses or developments, and of various water resources interventions. In addition, the model does not consider the spatial relationships between economic growth and the variability of water availability and quality across the catchment. Finally, although the model considers economic indicators (GDP and jobs contribution at a macro-scale) it does not include social impact indicators such as changes in well-being.

As yet there are no known examples where the required integrated cyclic planning (key intervention above) has been implemented, along with indices and trade-offs quantified for

proposed developments (key interventions above), in order to inform current decisions over proposed developments.

1.2. Focus on Saldanha Bay

Whilst the interventions discussed above are theoretically relevant to any constrained catchment, there is an urgent need to implement these interventions to inform economic development decisions in the Saldanha Bay area, within the constrained catchment of the Berg River (GreenCape, 2014). In baseline research and a series of interviews with decision makers in economic development planning and water resources planning, the following challenges have been observed for Saldanha Bay (GreenCape, 2014):

- Water resources and economic development plans are generally each treated as independent variables in the planning of the other. The linked system is not fully recognized in decision-making. For example, those responsible for water resources development planning reflect that there is a lack of information on economic development planning, and as such are forced to make broad assumptions for future water requirements. On the other hand, the approach in which water resources and economic development plans are generally each treated as independent variables in the planning of the other, is entrenched by the planning protocols such as Integrated Development Plans (IDPs), Water Services Development Plans (WSDPs), and Master Plans.
- This disconnect in the planning system has led to the current situation in which a desalination plant is proposed by the local municipality and is in pre-feasibility stage. A desalination plant is not supported by DWS. The full cost/benefit of the water resources interventions have not been assessed and the desalination proposal is not supported by existing and proposed industry developments, who consider the capital levies too high for the planned development to proceed. Conversely, the disconnect in the planning system has also led to the current situation in which those responsible for water resources allocation assume that industries with high water demand should be ruled out for the area. However, consideration should be given to the possibility that economic productivity from these industries may outweigh the costs of the required water infrastructure. This can only be assessed if a systems approach to planning is implemented, and if the total socio-economic-environmental cost/benefit of development options or water resources allocations are assessed and used in decision-making.
- Some of those in the planning system recognise the above two challenges, and reflect that there is no current alternative. Projects are currently assessed on an individual basis (i.e. in an environmental impact assessment or a water use license application), rather than strategic assessments of development scenarios. Local-scale planning depends on Provincial Government for this strategic oversight role. At this level, the full spatial complexity of the linked socio-economic-resources system needs to be taken into account. The need therefore for a tool to quantify trade-offs and knock-on effects has been reflected by people in the planning system.

Other work has noted similar challenges to those listed above for Saldanha in other catchments. Palmer et al (2014), for example, noted similar challenges when unpacking the reasons for slow implementation of the National Water Act, and motivates that a new paradigm is required for

water resources planning and associated development planning, which incorporates a linked systems approach to assess trade-offs between competing uses (Palmer et al, 2014).

1.3. Project Aims

In response to the interventions listed in the sections above, this project aims to contribute to the development of an integrated development planning approach, complete a cost benefit analysis of proposed economic developments, water allocations, and resource interventions, and develop a regional tool to quantify trade-offs and knock-ons. The intended outcome is to collectively i) address the above listed challenges, ii) avoid water-related constraints on economic development for Saldanha Bay and thus iii) inform ‘smart’ development planning in Saldanha Bay.

Although the proposed research responds to the challenges in Saldanha Bay, these challenges and the proposed interventions listed above are common to other resource-constrained settings, hence the methods and lessons from this case study are expected to be transferable to other areas.

In summary, the project aims (as listed in the proposal) are:

1. To develop a guideline for a planning approach that recognizes the cyclic interdependency of economics and water resources
2. To conduct an economic, social and environmental Cost Benefit Analysis (CBA) and Cost Effective Analysis of economic developments and water resource interventions
3. To build a spatial hydro-economic model for use as a tool to manage regional allocations in constrained catchments, which can be customized for use in other regions/ contexts
4. To develop research products in close collaboration with decision-makers, and implement research outcomes to address current development challenges

1.4. Purpose of this report

This report documents the “Testing Tools” Workshop, and forms the fourth deliverable.

Box 1-1 A note on terminology

The proposal for this project referred to a “Hydro-Economic Model”. During inception of the project (and through consultation with stakeholders and various experts) it was deemed that this aspect of the project could not be realised through a single Masters study and should be split into two complementary studies: a “spatial water footprinting model” and a “value of water study”. This approach was agreed to at the reference group meeting, and the combination of the two studies will meet the requirements of the intended intervention.

2. Workshop Purpose and Structure

2.1. Workshop Purpose

The “Testing Tools” workshop aimed to provide a platform for the initial findings from the project research team to be tested and verified with key project stakeholders. This involved presenting the “tools” that had been developed thus far in the project, gaining technical feedback on the tools, and then working with the workshop participants to identify how the tools could be used within their decision-making processes. The overall purpose for the workshop was to ensure that the “tools” were meeting the challenges identified by the decision-makers and would therefore be more likely to be implemented when the project completes its research. Key to this process was the mapping of the decision-making processes, verifying their accuracy and then determining where the tools could best fit in.

2.2. Workshop Context

The Testing Tools workshop is the second annual project workshop. The previous workshop in June 2015, validated the challenges that were identified in the scoping study that preceded this project (refer to the User Needs Workshop report). Fundamentally these challenges centred on the lack of integration between water and development planning and a lack of tools for strategic oversight. The project’s proposed solutions to these challenges largely relies on the concept of smarter water allocation where the maximum impact in terms of investment, job creation and improved community welfare is achieved through more strategic water allocation decisions. In order to achieve these smarter allocation decisions, the project team is developing decision support tools. And it was these proto-tools that were the focus of the June 2016 Testing Tools workshop.

2.3. Workshop Event Details

The “Testing Tools” Workshop was held on the 20th June 2016 at Lagoon Beach Hotel, Milnerton, Cape Town. The event started at 9.30am and finished at 3.30pm. The workshop location and timing was designed to maximise attendance of participants from Saldanha Bay. Please see Appendix 2 for a copy of the invite that was sent out to invitees. The workshop was facilitated by Mr. Nico Elema, an experienced facilitator who is currently contracted with the University of Stellenbosch’s Water Institute.

2.4. Workshop Structure

The structure of the day was broadly broken into three different sessions:

1. The first part of the day provided the participants with some project background and context. The tools were then presented in a plenary session. Time was included for questions on the tools, yet this session largely focused on the project team providing technical information to the attendees without much participation requested. The information provided to the participants was to be utilised later on in the day when they were asked to consider how the tools the project team are developing could be used.
2. The second session was centred on discussion of key development planning processes with the participants broken into break-away groups around the planning process they

felt they could contribute most towards. This was a highly interactive session with the participants working through the decision-making processes outlined, highlighting challenges with the representation of the processes, verifying previously-identified challenges and considering the best use of the project tools within these processes.

3. During the final session of the day, after lunch, the participants were challenged to think through some hypothetical decisions and to consider what criteria would be most relevant in these decisions. They were first introduced to the basic principles of Multi-Criteria Decision Analysis (MCDA) and then broken into 2 groups for an interactive discussion. This session was forward-looking, considering the criteria that may need to be included in the tools for them to be more encompassing of the considerations that are relevant for the decision-makers. These criteria will aid the project team in building towards policy scenario testing in the workshop scheduled for April 2017.

Table 1: Workshop Agenda

Time	Agenda item	Speaker
09h30	Arrival tea, coffee and snacks	
10h00	Welcome and introductions	Mike Mulcahy
10h10	Purpose and objectives for the day	Nico Elema
10h15	Recap of identified challenges and proposed solutions	Claire Pengelly
10h25	Presentation of workshop posters	Claire Pengelly
10h35	Presentation of tools: regional and local	Claire Pengelly; Marthinus van der Walt; Jacob Muller, Prof Mark New and Dr Hugo van Zyl
11h30	Tea break	
11h45	Break-away groups: Validation of governance processes and challenges	Facilitated discussion
12h30	Break-away groups: Placement of tools in decision-making processes	Facilitated discussion
13h00	Lunch	
14h00	Brief Overview of Multi-Criteria Decision Analysis (MCDA) Principles	Prof Theodor Stewart
14h15	Hypothetical decisions and associated criteria	Facilitated discussion
15h15	Wrap-up for the day	Dr Lauren Basson
15h30	Meeting closed	

2.5. Attendee Details

The invite to the workshop was extended to 62 stakeholders, many of whom were also invited to the workshop held in June 2015, and included the following stakeholders:

- Saldanha Bay Local Municipality (bulk water management, engineering services, councillor, strategic planning, IDP management and environmental management)
- West Coast District Municipality (bulk water services)

- Department of Water and Sanitation (Catchment Management Agency leadership, regional officials involved in Berg River management, national water resource planning and license authorisations)
- Western Cape Provincial Government (Department of Environmental Affairs and Development Planning, Department of Economic Development and Tourism, Department of Local Government and Department of Agriculture)
- City of Cape Town (Water and Sanitation department)
- Academics (Universities of Stellenbosch and Cape Town)
- Industry in Saldanha (Arcelor Mittal)
- Private consultants with closely associated projects (WWF, Pegasys, Worley Parsons, Palmer Development Group, The Green House, Aurecon and other independent consultants)

Of those that were invited, 47 responded: 34 positively and 13 negatively. On the day, most of those that had responded positively attended, with some last minute apologies from a few stakeholders that could not make it. In total, there were 31 participants at the workshop, including the project team members. See Appendix 1 for the workshop register.

3. Project Tools

The project approach is outlined in Figure 1 below. The “tools” are effectively a consolidation of a number of different applied research studies. The “Local Tool” as it described by the project is the MCDA of Water Approvals highlighted in blue below and is focused on the Saldanha Bay Local Municipality (SBLM). The “Regional Tool” models the Berg River Catchment and is a combination of three complementary studies: water requirements, the economic value of water and the social value of water. The “Planning Guidelines” support the overall project outcomes and inform how the tools could fit into the decision-making processes.

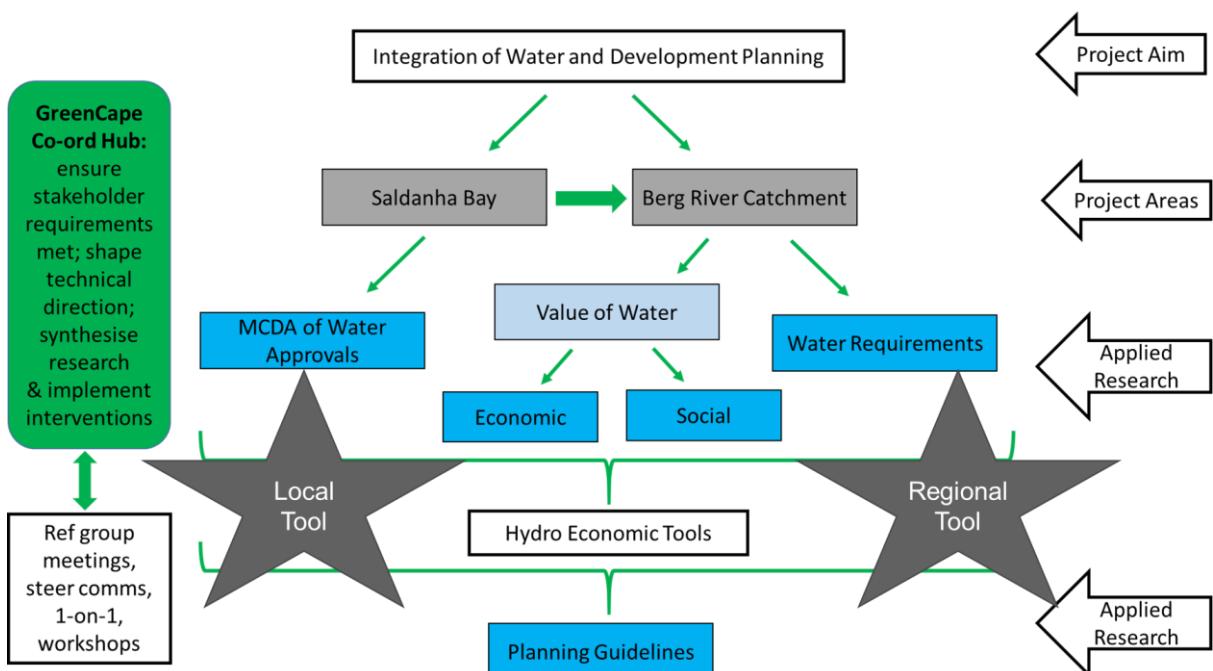


Figure 1: Project Approach

3.1. Tools discussion insights

The tools were presented to workshop participants, see Appendix 4 for the presentation, and discussed during the first session of the workshop. The full notes from the workshop are included in Appendix 5, with the key insights summarised below:

- The regional tool can provide valuable insight at a regional and local level, but the long-term support of the dataset and model needs to be considered. Who is going to take responsibility for keeping it up to date?
 - The local tool was seen to support the SBLM in their decision-making, yet the consideration of criteria outside of those in the current data-set was encouraged – such as probability of the proposed development producing their forecasted benefits and environmental impacts. The inclusion of additional criteria for the regional tool was also proposed with the full agricultural value chain needing to be analysed to understand the true value of agriculture.

These considerations and questions listed above are highly relevant to the project and largely relate to implementation challenges that the project faces, namely:

- The project team needs to identify the relevant “owners” and champions of the research in order ensure the longevity of the research outputs
- The design of the tools need to be sufficiently flexible and transparent to allow for future inclusion of other criteria and updated data. For the research to remain relevant and supported, it must be dynamic and editable. The project team has acknowledged that all of the considerations that are relevant to decision-makers cannot be incorporated into the scope of the current project so the design of the models must be open enough to allow for future iterations and updates.

The project team will address these comments during the remainder of the project.

4. Planning Guidelines

Subsequent to the presentation of tools, the focus of the workshop turned to the development of the “Planning Guidelines”. The guidelines will be developed through a thorough understanding and evaluation of the existing processes governing the water allocation and development planning processes. The initial findings from this research were visually represented on three large posters. These posters formed the foundation for the workshop contributions on the day and are included in Appendix 3. The posters were A0 in size and laminated. Colour A4 copies were also included in the workshop hand-outs so participants could keep a copy of the posters on hand for writing their own notes. The posters were designed to allow for an ease of interpretation at a superficial level, with additional layers of data included when interrogated more closely. Presentation of the findings from the governance research in a visual form at the workshop, as opposed to a report, enabled stakeholders to more easily interact with the project governance findings and provide their feedback.

Three processes were outlined in the posters:

1. Water allocation
2. Water resource and services development
3. Development planning

The workshop participants were requested to select a process they felt they could contribute to most. Each group sat around their poster while a poster group leader (member of project team) took them through the following steps:

- Examine the process outlined. Is it accurate? What is missing/should be added?
- Your group leader will place identified challenges and questions on the posters. Verify the challenges, respond to the questions and add your own.
- Your group leader will place the tools within the proposed decision-making process. Do these placement make sense? Who should “own” the tools? Do they fit within the existing decision-making process or are institutional/process changes required?

The posters were written on and sticky notes placed on them to represent certain elements: pink = identified challenge; yellow = question and green = tool. After each of the groups had concluded with their discussions, the participants gathered together for a report back session around each poster. This was to allow for some cross-learning between groups and to consolidate the understanding of the poster discussion.

Below are some selected pictures from the process as well as the images of the final “edited” posters:



Figure 2: Helen Seyler explaining the Development Planning poster



Figure 3: Ashia Petersen (DWS) assisting Nadine Methner in explaining the Water Allocation process



Figure 4: Claire Pengelly explaining the Water Resource & Services Development poster



Figure 5: Chrizelle Kriel (DEA&DP) reporting back to the workshop group on Development Planning poster insights

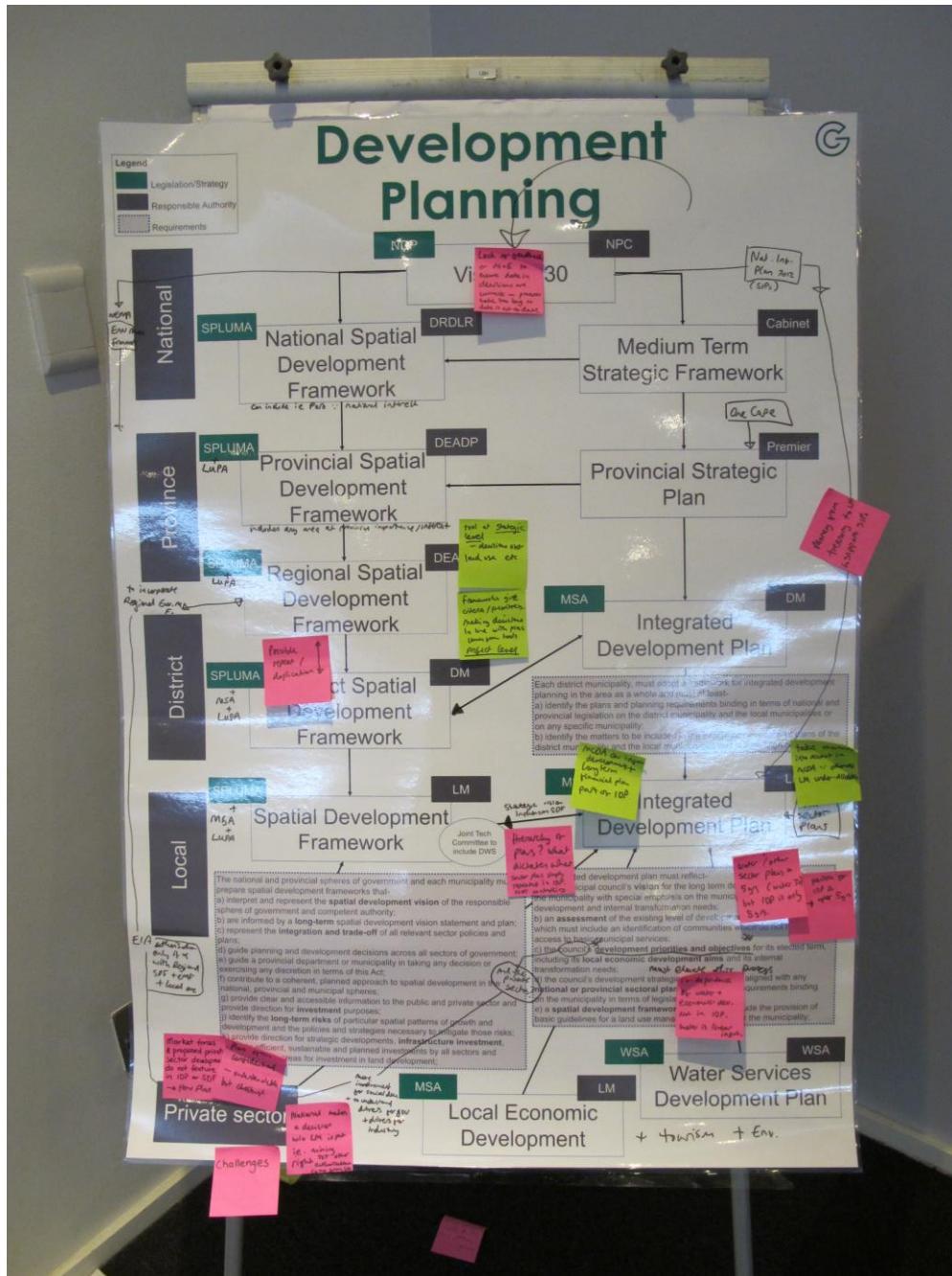


Figure 6: Development Planning poster including workshop edits

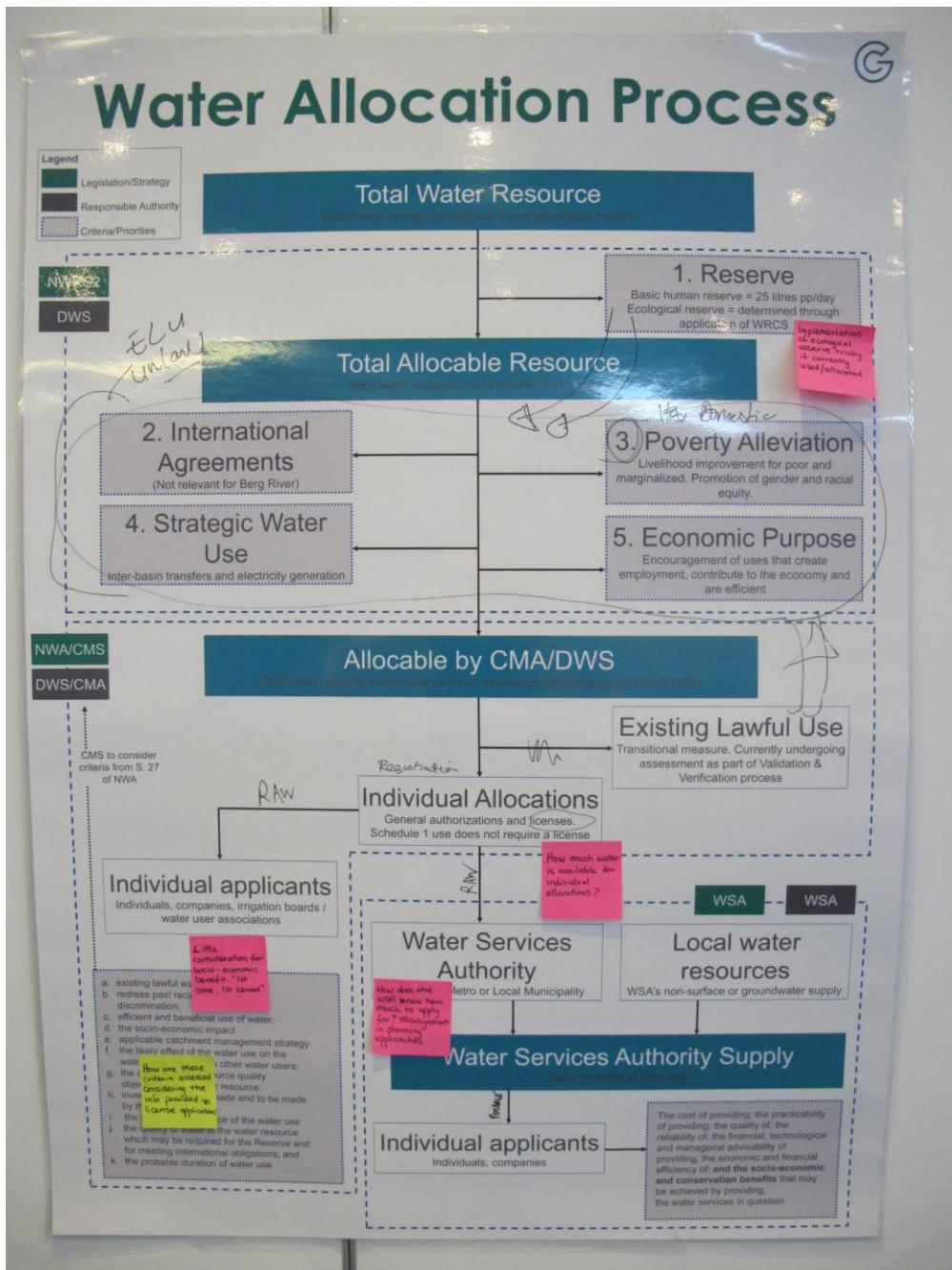


Figure 7: Water Allocation Process poster including workshop edits

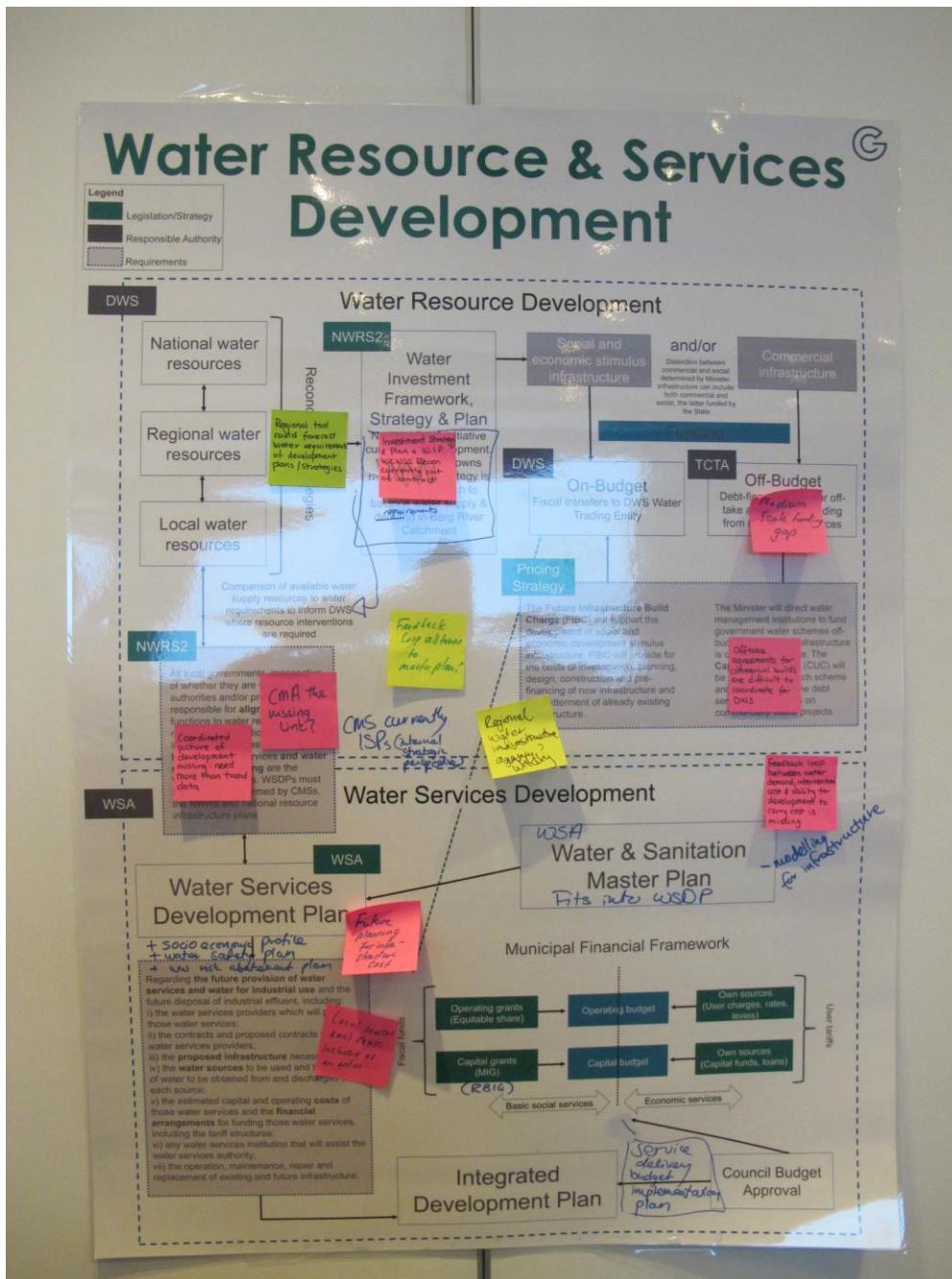


Figure 8: Water Resource & Services Development poster with workshop edits

4.1. Workshop poster discussion insights

The poster sessions were highly interactive and lively with most participants seeming to feel that they were able to contribute to the discussion, ask questions and discuss challenges. The poster format illustrated the value of visual representation for aiding discussion and understanding of process. The feedback gathered from the workshop will be used to update the representation of the planning processes, for use in the planning guidelines.

The full notes from the break-away session are included in Appendix 5 and the major insights from each session are included below:

4.1.1. Water allocation poster discussion insights

- The discussion surrounding the water allocation priorities encapsulated in the National Water Resource Strategy 2 (NWRS2) mirrored some confusion that the project team had as to how water allocation is prioritised. For instance, NWRS2 priorities also include some legal constraints such as international agreements. But what did become clear is that the “reserve” is only actually applied to the ecological reserve, and what was termed in the poster as the human reserve would fall under the priority 3, poverty alleviation. Additionally, “existing lawful use” should not be indicated as an allocable volume for the CMA/DWS to allocate as this has already been historically allocated. Therefore the criteria for allocation are all encapsulated in the National Water Act (NWA), section 27.
- The application to DWS/CMA for additional water allocation from a WSA will be first be evaluated against their ability to manage the resource they currently have access to. For instance, how well are they managing their operations and maintenance, non-revenue water, water conservation and water demand management and have they explored all available local resources? Core to this discussion is the All Towns Reconciliation Strategy for their area. The applicant must have followed those recommendations before applying for additional water. Regardless, there is no water left in the Berg Catchment to allocate and reallocation is currently not possible until the Verification and Validation process is completed (this is currently underway).
- Compulsory licensing is the process by which reallocation may take place in the catchment, but it was emphasised that this would be a last resort for DWS.
- It was also noted that there is a difference between the allocation from DWS/CMA and the WSA to individual applicants (i.e. tap connection) as the type of water they are requesting access to. The WSA gives access to potable water while DWS/CMA allocates raw water. This distinction was important to include on the posters to clarify the different processes.
- It was also felt that the NWA criteria required to evaluate license applications are included in the applications themselves, although it is not clear how these criteria are prioritised. It was emphasised that every normal application must include a minimum of 30% equity for historically disadvantaged individuals. Additionally, the Catchment Management Strategy (CMS) would provide direction as to which priority sectors to support in the catchment. Provincial and local authorities need to provide the CMA with information on what their development priorities and plans are to develop the CMS in a collaborative manner.
- The water allocation process required some time from the participants to understand. This meant that there was little time to discuss the tools and their placement in the decision-making processes. It was therefore suggested that a separate session is held with DWS to discuss this in more detail (see Conclusions).

4.1.2. Water resource and services development poster discussion insights

- One of the challenges suggested by the project team was that there is lack of clarity on how new water resource infrastructure was determined to be social or commercial. This is important as infrastructure that is classified as “social” by the Minister of Water and Sanitation will be funded by the state (through funding mechanisms such as the Regional Bulk Infrastructure Grant (RBIG)), whereas “commercial” infrastructure funding will need to

be raised by the municipality through capital investment tariffs. However a participant at the workshop indicated that this was not the challenge, but rather that the Water Services Development Plan (WSDP), which is the primary water services planning document, should have been planning for this water requirement 10 years before it was needed and raising funds for this significant capital outlay. This is not typically done, and results in a situation where the municipality as the Water Services Authority (WSA) does not have the capital budget to be able to fund the commercial proportion of the infrastructure required. This is what happened with the Saldanha Bay Municipality, where the proposed R500 million desalination plant was considered 60% social (with DWS agreeing to fund R300 million from RBIG) but the remaining commercial component of R200 million was unaffordable for the WSA and the project did not go ahead. The lack of capital funds for water infrastructure projects is compounded by the fact that current WSA budgets often do not even cover rehabilitation and maintenance.

- Adding to this challenge, is that there is no straight-forward way for the WSA to raise the funding from private sources. The Trans-Caledon Tunnel Authority (TCTA) is the authority that typically raises funds from commercial financiers for large water resource infrastructure projects that are classified as off-budget. However, they only work on large projects (upwards of R2 billion) so projects that are smaller, which is where most local water resource infrastructure development projects are likely to fall, do not have a funding entity to assist them. The DWS participant clarified that this gap may be filled by a proposed regional water utility. This regional water utility will focus on infrastructure development and still needs to be established.
- There is potential for private companies to develop their own water supplies, through an agreement with the WSA, but this is not ideal as it doesn't take into account the broader efficiencies and economies of scale that could be achieved.
- The challenges associated with planning for future water requirements was highlighted:
 - There is a requirement for the WSDP to align with the All Towns Reconciliation Studies produced by DWS. However there is a lack of engagement between DWS and the WSA on how these studies are determined. If they are not in alignment, then the WSA will not get approval for their WSDP infrastructure plans. The CMA may be able to fill this gap.
 - The WSA is largely reactive and only develops plans for new water supply when it becomes apparent there is a problem. This is difficult for the WSA to solve as these types of infrastructure plans are expensive to develop and they typically don't have budget for them.
 - Development plans are developed without a proper consideration for the water requirements of these strategies. Example was given of the IDZ in Saldanha, which was driven by job creation and political considerations without thinking about the local water scarcity.
- The challenges listed above relate to other challenges raised previously in this project, including the lack of a "coordinated picture of development". This concern was echoed by other participants at the workshop discussing other posters. It was suggested that the regional tool proposed by the project could assist in understanding the water requirements of proposed development plans at a regional level and therefore feed into the regional reconciliation strategies.

4.1.3. Development planning poster discussion insights

- The level of detail contained within development plans differs at the different levels. National scale planning has a greater strategic focus, although will name individual projects where

these are of national significance. For example, the national spatial development framework can include mentioning of Saldanha Port because it is of national importance.

- Participants supported the SDF and the IDP as the two primary development planning processes influencing development planning. It was emphasised that the IDP is simply a coordination and amalgamation of sector plans (including the WSDP). It was also noted that the importance of the SDF has grown in recent years, and although the strategic vision of the IDP influences the SDF, there is current discussion within planning spheres as to which process (SDF verses IDP) is paramount and which feeds into which. The participants proposed that two additional processes should be added to the development planning process flowchart:
 - Environmental planning. The national environmental management act allows for the development of a national environmental management framework, which has a provincial and local government equivalent. The regional environmental management framework is then incorporated into the regional SDF. The process is important as it is a key link between all key aspects of development planning (environmental, spatial, and integrated), and determines whether a private sector project initiates: the project will only be awarded an EIA if it is aligned with the various environmental management plans. The plans will also dictate the content of the EIA.
 - National Infrastructure Plan 2012. This plan listed Strategic Infrastructure Projects (SIPS), and has relevance in areas where a SIP is located, of which Saldanha is one (the IDZ is SIP5).
- Lastly, it was highlighted that the main link between water and development is via repetition of the information in the WSDP within the IDP. However, this is a fairly linear process that does not look at water and development holistically recognising their co-dependence. Furthermore, the WSDP focusses on water services with little to no discussion of water resources. It was suggested that the Catchment Management Strategy can play a role here and should be considered as input to an IDP.
- Participants mentioned that the timing of various planning processes do not always align, sharing the example that the IDP looks at the future 5 years only, yet the WSDP has to look forward 20-30 years. Participants mentioned that it was therefore sometimes difficult to integrate the information into the IDPs.
- The local municipal structure where councils change every 5-years can also introduce challenges. Priorities may shift, and previously prioritised projects become less important and hence funding suffers and a backlog of projects can build up. The previous financial crisis also hindered the development process as less funds were then budgeted for LM development (i.e. from Treasury). This lack in funds within LM increases rates and taxes of residents, which in turn slows the recovery from financial situation.
- Although planning processes are tiered from national to local government, and each level intends to inform the one below, each planning process is also associated with an (often long) timeline required to complete the required process. Participants raised that this leads information being outdated once it is to be implemented at the local level. Furthermore participants spoke of a disconnect between the different tiers of planning where decisions may be taken on national level for required implementation at local level, without the adequate input of planners at the local level. The decisions may interfere with the planning and budget that the LM has completed within their various sectors and IDP. The LM is then obliged to implement the decisions made at National level yet the decisions often come without funds attached.

- Generally it was felt by participants that communication, interaction and coordination between the private sector (specifically industry) and local government required strengthening. This was agreed to by key representatives from provincial government, local government and industry. The current status quo is that the private sector is generally (understandably) unwilling to disclose specific development plans, to protect market competitiveness, and also due to related impacts on land use and property prices. The LM is then only consulted once permission or expansion authorisation is needed. This situation is sub-optimal as if the LM is aware of future industrial development plans, it can factor in municipal services and associated projects accordingly. Furthermore industry felt that they could play a key role in economic and social development. If better transparency could be generated, it was felt that the LM could put together a more informed IDP that is considerate of industry's needs. Specifically, it was suggested that the visioning stage of an IDP needs to be strengthened with much greater input from industry, and all other spheres. Furthermore it was suggested that the LM and Private sector need to also meet more regularly to understand the drivers for development from a LM perspective and from industry's perspective, and discuss sometimes competing or differing needs. This meeting could be supported by province.
- Participants saw the use for the regional tool to support strategic planning at SDF stage (at provincial, district or local level). Furthermore the various frameworks provide the criteria or priorities for development, and the regional tool could also be used to assess individual projects against these criteria or priorities.
- The local tool (or at least the MCDA approach and methodology) has traction at the IDP stage, to inform development choices, and to provide input to the long-term financial plan within the IDP.

5. Testing Implementation

A core requirement of this project is the implementation of the tools that are produced. The workshop gave the project team an opportunity to test where the tools could be used (the workshop poster session) and how they could be used: in the final session of the day the participants were provided some hypothetical decisions where it was felt that the tool could be used, and the participants were asked to think through what criteria they would consider most important for making this decision. This process fulfilled a couple of functions:

- The building of a foundation for the overall project methodology that will be utilised later on in the project when the final tools are tested within different policy scenarios. The approach suggested utilises Multi-Criteria Decision Analysis (MCDA), and a more comprehensive set of criteria are required for this methodology to be viable.
- The use of hypothetical decisions creates some context for how the tools could be used to inform the decision-making process.

First, a presentation was made on the basics of MCDA and then two hypothetical decisions were discussed, one on development planning and the other on water allocation:

1. The Western Cape Province is evaluating its strategic plan and wants to decide whether to promote agro-processing or mineral beneficiation or both in a particular region. How do they decide?
2. Additional supply from the Voëlvlei-augmentation project comes online in 2021, who should DWS allocate the water to?

These questions relate to the two processes that the project is trying to better integrate with each other (i.e. economic development and water resources), so this choice was a deliberate one. The session was also designed to allow participants not normally involved in these processes to hear what is important for decision-makers and to voice their opinion on what is important to consider. Once the criteria had been decided upon, each participant was requested to place a sticky note on their top three criteria. This prioritisation process would help narrow down the list of criteria to the target range of between 5 and 9. The photos below illustrate the process the participants went through as well as the results of the criteria and subsequent prioritisation exercise.



Figure 9: Placing priority stickers on water allocation decision criteria



Figure 10: Nico Elema running through the criteria for development planning

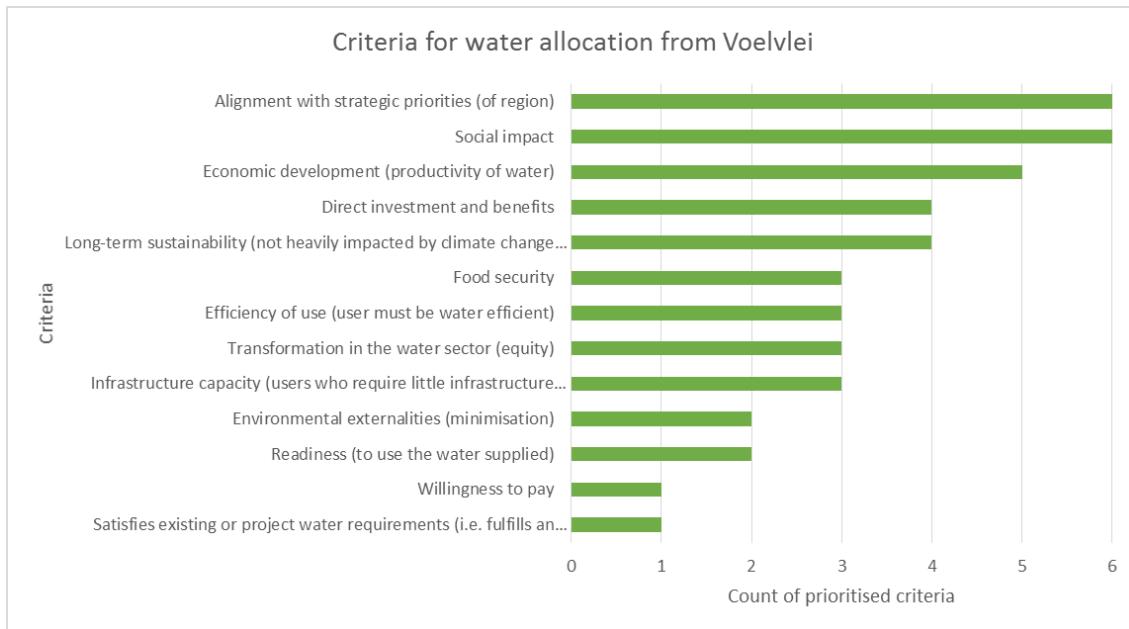


Figure 11: Prioritised criteria for water allocation from Voëlklei

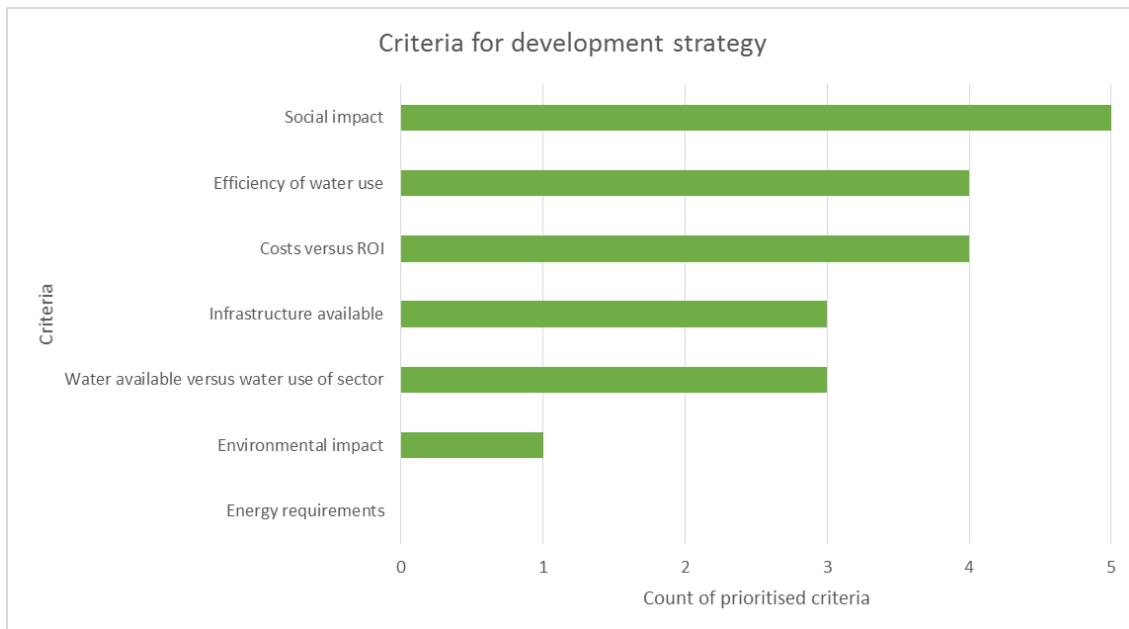


Figure 12: Prioritised criteria for development strategy

5.1. Insights from the hypothetical decisions and their associated criteria discussions

- The criteria that are already proposed within the tools that the project team are developing rank very high on the list of criteria that are important to decision-makers and the workshop participants: i.e. economic and social impact. However, for these tools to be comprehensive,

many additional criteria will need to be included. Whether the existing tools can be moulded to include these criteria, within the existing project, needs to be addressed. This session emphasised the importance of building models that are flexible to new data requirements.

- Many of the criteria could be consolidated into more comprehensive categories, this is particularly the case with the water allocation criteria.
- The participants clearly understood the message of the workshop regarding the importance of integration between development and water planning, with both hypothetical decisions prioritising the other's importance. For example, the water allocation decision prioritised strategic alignment with regional priorities and the development strategy highlighted efficiency of water use of the sector and water availability.

This was a very brief example of a more in-depth process to be run next year and provided the project team with some key learnings on how to approach these types of interactions in future:

- Sufficient time should be allowed for the participants to become familiar with the existing processes and criteria. It should not be assumed that the level of knowledge across the workshop group will be consistent. It is also vital that all participants understand the existing legal precedent of the decision-making process so that suggestions are not completely out of alignment with existing policy.
- The selection of criteria is an iterative process that should involve all members of the group to ensure that all voices are heard and perspectives understood, this will assist with the overall goal of integration.
- The prioritisation of criteria could start as an individual exercise, but then will need to be done as a group to provide transparency in terms of the trade-offs that are often implicit in the ranking of criteria. This group agreement on the prioritisation will also ensure consistency on the final results.

6. Conclusions

The Testing Tools Workshop provided a good opportunity to interact with stakeholders, introduce them to the proto-tools that have been developed and enhance the project team's understanding of the decision-making processes that the project aims to influence. The tools were well-received and appeared to address the challenges identified at the previous workshop. The use of posters to visually guide our discussions on the decision-making processes proved effective. These will be updated and used as a feedback device in future.

Some of the key insights that emerged from the workshop for the project team included:

- The importance of inviting a diversity of stakeholders to workshops to interact and discuss challenges. This workshop provided an important information flow and knowledge enhancement opportunity between different spheres of government. This should be continued where possible in order to strengthen planning processes.
- However, trying to combine such diversity of participants into a single workshop setting where in-depth and technical content requires feedback is challenging. It may be better to focus technical feedback within smaller groups and present the final products to larger groups. One of these suggested workshops was proposed by DWS and should be held directly with the DWS stakeholders at their offices.
- There is no single solution or answer that this project can provide to the challenges identified. It is going to be an iterative process that challenges stakeholders to think in different ways and self-identify where the knowledge this project is producing could be most useful. Our aim is not to provide answers but to provide information, data and tools to help analyse the problems so that solutions can be found. This requirement, along with the point provided above it, again highlighted the need for the tools to be "owned" by research champions. The implementation of the tools relies on there being a long-term plan for their usage.
- The project tools as they were presented are meeting the expectations of the participants but there was an appetite for further sophistication and development of the models, highlighting the potential for future research and/or collaboration with other researchers.

7. References

Department of Water Affairs (DWA) (1998). *National Water Act (Act 36 of 1998)*. Government of South Africa.

Department of Water Affairs (DWA) (2009). *Water For Growth and Development Framework*, version 7

Department of Water Affairs (DWA) (2010). *Integrated Water Resources Planning for South Africa, A Situation Analysis, 2010*. JA van Rooyen and DB Versfeld. DWA report number P RSA 000/00/12910. 2010

GreenCape. (2014). *Synthesis Report on Water as a Constraint on Economic Development, 2013-2014*. Compiled by H. Seyler, and N. Chimboza.

GreenCape. (2015). *Synthesis Report on Water as a Constraint on Economic Development, 2014-2015*. Compiled by H. Seyler.

Janse van Vuuren & Pineo (2014). *GreenCape 2013-2014 Synthesis Report on Regional Resource Flow Model*.

Muller, M. (2013). *The Wicked Challenge of Sustaining South Africa's Water Security*. South African Academy of Engineers (SAAE) Open Lecture, 7 November 2013.

Palmer, T. (2014). *New paradigm for implementing the National Water Act*. Key Note Lecture at Catchment management: enhancing the understanding workshop 27th May 2014, WISA Conference. And: Towards a New Paradigm in water resources management. Lecture at Integrated Water Resources Management and RPMS workshop 27th May 2014 WISA Conference

Provincial Government of the Western Cape (2013). *Green is Smart: Western Cape Green Economy Strategy Framework*.

WRC. (2012). *Econometric model to predict the effect that various water resource management scenarios would have on South Africa's economic development*, by Conningarth Economists. Water Research Commission. WRC Report No. 1570/1/12

WRC. (2013). *Water in the Western Cape Economy*. Report to the Water Research Commission, by Guy Pegram and Hannah Baleta. WRC Report No K5-2075. Draft, December 2013.