



Report on User Needs Assessment



**This report forms Deliverable 1 of WRC and DED&T Co-Funded Project: K5:2453
Towards Sustainable Economic Development in Water Constrained Catchments:
Tools to Empower Decision Making
June 2015**

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List of acronyms

CBA	Cost – Benefit Analysis
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
DTPW	Department of Transport and Public Works of the Provincial Government of the Western Cape
DWA	Department of Water and Sanitation
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
IDP	Integrated Development Plan
IDZ	Industrial Development Zone
LM	Local municipality
PGWC	Provincial Government of the Western Cape
SBLM	Saldanha Bay Local Municipality
WCMD	West Coast District Municipality
WCIP	West Coast Industrial Plan
WCWSS	Western Cape Water Supply System
WEN	Water Exchange Network
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSP	Water Services Provider
WRC	Water Research Commission
WWTW	Waste water treatment works

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, environ-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 of 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 environ-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 workers 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 is currently 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 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 environmental costs or 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 workers have 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 develop an integrated development planning approach, complete a cost benefit analysis of proposed economic developments, water allocations, and resource interventions and developing a regional model 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 outcomes of a workshop held at the start of the project and forms the first deliverable.

Box 1-1 A note on terminology

The proposal for this project referred to a “Hydro-Economic Model”. During inception of the project it was deemed that this title is misleading and that a spatial water footprint model could be feasibly constructed by a Masters student, and that this would meet the requirements of the intervention.

The proposal spoke of “key interventions” required to respond to challenges. For simplicity this workshop report refers to these as proposed “solutions”.

2. Workshop Purpose and Structure

This project builds on baseline research which essentially forms the scoping phase for the current work (GreenCape, 2014). The scoping phase documented the status quo for water resources and economic development in Saldanha Bay, and documented the current water resources and economic development planning challenges experienced. These challenges are based on GreenCape's interpretation of the status quo from literature and data analysis, on perspectives of those involved in water resources and economic development planning from informal interview, and on feedback received at a workshop held during the scoping phase.

These challenges identified led to the key interventions (or solutions), contained within the proposal for this project, and summarised in Section 1. Prior to commencing work on these proposed solutions, the first deliverable for this project was a "user needs workshop". To meet this deliverable, a half-day workshop was held on 23 June 2015, 09h00 – 14h00, at the River Club in Cape Town. The workshop was externally facilitated by Mr. Peter Willis, Independent Sustainability Practitioner.

The intended purpose of the workshop was to "align proposed project solutions to the needs of those involved in water resources and economic development planning, and those impacted by this planning" (quote taken from workshop invitation, Appendix 2). Essentially the first aim of the workshop was to verify whether these challenges are relevant, critical, affecting development, and whether there were any missing. Once a collective picture of challenges could be established, the second aim of the workshop was to collect stakeholder feedback on the proposed solutions; to identify whether these solutions would add value, whether there is buy-in for them, shape them to be most relevant, and identify decision-makers who would adopt the research outputs. With these two aims in mind, the workshop started with introducing the project team's picture of the current challenges and describing how these were identified, followed by discussion. Subsequently the proposed solutions were tabled, followed by discussion (Table 2-1).

The invited participants to the workshop include the following stakeholders (Appendix 1):

- Those involved in water resources planning and provision at local municipal and district municipality
- Those involved in the oversight for water resources planning from DWS
- Those involved in the management of the Berg catchment DWS
- Those involved in water resources allocation decisions from DWS
- Those involved in environmental and development planning from the local municipality (EIA manager, strategic services, IDP manager, municipal manager)
- Those involved in the oversight of economic and infrastructure development, spatial planning, environmental management from the provincial government
- Representatives from major current and future industry in Saldanha
- Private consultants where their projects are closely related to this one

Attendance at the workshop was positive but there are some "lessons learnt" for future engagements (discussed further in Section 5). In total 29 stakeholders participated (including project team), ranging from local, district, provincial and national government, industry and the private sector (see Appendix 1). The invitation was sent ~4 weeks prior to the event, and in the ~2 weeks prior to the workshop GreenCape had telephone conversations with all critical invitees. However, a few key decision-makers, at which the research is aimed, had responded positively but did not attend, and representation from industry was notably low. Based on this experience approaches for future stakeholder engagement are discussed further in Section 5. A breakdown of the attendance shows (see Appendix 1):

- 46 people were initially invited, but the total number of (known) invitees increased to 66, mostly through the invitation being passed on to colleagues of invitees, or invitees recommended other attendees
- 29 attended
- 28 people responded with confirmations prior to the event, not all of whom attended
- 17 did not respond, some of whom attended
- 21 sent apologies

The workshop venue was structured with 4 fairly small rectangular tables to maximise interaction (circular tables are often so large communication rests only with your neighbours). Each table consisted of one 'chair' (project team student supervisors and lead researchers) and 1 scribe (project team researchers and students).

Table 2-1 Workshop Agenda

Item	Description	Presenter	Time
1	Registration, welcome and Introductions	Peter Willis	09h00 – 09h15
2	Results of GreenCape Scoping Phase	Helen Seyler	09h15 – 09h40
3	Discussion: verification of challenges	All	09h40 – 10h30
4	Tea, coffee	All	10h30 – 11h00
5	Overview of proposed solutions <ul style="list-style-type: none"> • Water Exchange Networks • Cost Benefit Analysis • Spatial water footprint model • Governance 	Helen Seyler Jim Petrie Anton Cartwright Mark New Kevin Winter	11h00 – 11h30
6	Discussion: shaping solutions	All	11h30 – 12h30
7	Plenary session, summary, and way forward	All	12h30 – 13h00
8	Lunch	All	13h00 – 14h00

3. Challenges

3.1. Outcome of Scoping phase

The challenges identified in the scoping phase (GreenCape 2014, updated in GreenCape, 2015) and described within this project proposal, were re-assessed in preparation for the workshop, in order to present a clear motivation for their identification and definition. This motivation was presented in the first session of the workshop (presentation contained in Appendix 3), based on GreenCape, 2015.

The following 6 statements form a summary and grouping of the challenges identified during the scoping phase. They represent a mixture of challenges in water supply, and also challenges in coordinated development planning. There is overlap between each of them.

1. Water demand may outstrip supply in 2017-2018
2. A misalignment in planning approaches, makes it difficult to strategically assess a set of development options, and to know whether there is sufficient water
3. There is no feedback loop between water demand, intervention cost, and whether the development can support the intervention cost, and development go-ahead
4. Although work has been done on the economic productivity of various water uses or economic sectors, this had not yet been used to inform the allocation of water resources, nor what development scenarios to promote for Saldanha
5. Projects are awarded on project-by-project basis, without strategic oversight and quantification of competing resource demands / trade-offs. Tools to enable this are lacking
6. The building block is missing: a coordinated picture / repository of planned development

3.2. Perception of challenges

Subsequent to the presentation outlining the 6 challenges, each of the 4 tables (each with 6-8 participants), hosted a discussion in which participants were asked:

- (How) Are these challenges affecting you? Can you prioritise them?
- Are there any key (water & economic development) challenges missing?

The full minutes of the workshop discussions at each table are included (in note form) in Appendix 4. The host of each table reported back a selection of insights from the discussion at the table and considerations for missing challenges. Key insights from the discussion are as follows:

Allocation / planning / Governance

- The planning process is a top-down one (national government determining allocation). What would a different planning model look like that gave more voice to all stakeholders and allow more bottom up-planning?
- There are different scales / levels of planning and allocation, and feedback loops, i.e. DWS towards individuals and WSPs, WSPs to industries and people.
- At the Local Municipality level, water is usually allocated on a first come first served basis.
- Regarding allocation and planning, opinions vary between needing very clear (nationally and provincially set) planning priorities, in terms of priority commodities / industries, to it being an open / free market, and as such government must respond rapidly to market factors and it is impossible to plan with any uncertainty

- Allocation decisions do currently require consideration of socio-economic benefit of the water use, but (for a WSP), this is simply met by indicating the % of historically previously disadvantaged individuals in the supply area.
- It was highlighted that in terms of allocation, economic productivity can't be the only measure, as there are ecological considerations.
- Discussion over the demand/supply situation and future Berg River allocation to the WCDM (for the Withoogte scheme), highlighted significant frustrations towards DWS. Frustrations derive from a lack of direct response to the WCDMs application, a lack of clear picture of available / unallocated water resource in the Berg River, a bias in allocation, and a lack of feedback on the proposed alternatives to the Berg River (desalination / re-use). Other participants also reflected a lack of communication within the allocation process, and a lack of transparency within the infrastructure decision process.
- Regardless of the supply/demand outlook, and the picture of challenges painted by these (and previous) participants, it was reported that there is optimism within the LM, that solutions are on the table and in the process of implementation (desalination, re-use). Does this suggest that those making the decisions "on the ground" in SBLM are not experiencing these challenges, or are not perhaps aware of some of the issues?

Coordination / oversight / governance

- In line with the scoping phase, it was highlighted that the IDP process is intended to meet integrated development aims, guided by legislation. However, the IDP process is not fulfilling this status at present. Furthermore, regional integration of infrastructure (beyond IDP boundaries) is not happening in coordination with IDPs.
- It was highlighted that there is a need for shared resources and opportunities (across political boundaries), however methodologies differ between regions and spheres of government. Specifically it is difficult to coordinate between the CoCT and the PGWC.

New technical insights and actions for follow up

- The stepped increase in WCDMs applied for allocation from the Berg River, is based on water demand based on assumed growth and anticipated growth from IDZ area, separated into 5 year blocks chosen "to coincide with 5 year application process for additional water allocations from the WMA". Given the reflected opinions on the issues with the current planning/allocation process, this 5 year application process requires further investigation under the governance thesis.
- The future research should look at international examples of approaches to allocation in water-scarce areas is addressed.
- Energy security was raised by several participants, as a closely linked challenge given certain water resource solutions require energy security to be addressed. Whether the future research should incorporate energy (and the resources nexus) more explicitly must be considered.

Additional challenges

The following 4 challenges were raised by participants:

7. There is not enough focus on demand management through water pricing
8. New supply options are not concrete / not actioned rapidly enough
9. There is not enough attention on water conservation / fixing leaks
10. There is inadequate consideration of the multiplier effect of development

Summary

The discussions held generally confirmed the status quo developed during the scoping phase. The same perspectives emerged, and the key insights remain. This highlights that the 6 challenges identified are still relevant.

3.3. Prioritisation of challenges

Each challenge was listed on large posters, including the 4 newly identified challenges, hence a total of 10 challenges were listed. All participants were asked to add 4 (coloured) post-it notes, labelled 1 (yellow), 2 (yellow), 3 (green), 4 (green) to the 4 challenges they feel are a priority, and in order of priority. Hence, a participant feeling that “lack of tools for strategic oversight” is what they perceive as the biggest challenge for water resources and economic development in Saldanha, would add a ‘1’ to this poster. The results are presented in Figure 3-1, Figure 3-2, Figure 3-3, Figure 3-4, and also analysed in Figure 3-5. This shows:

- Although people felt it necessary to raise 4 additional challenges, one of these received no priority “votes”, and a further two received the fewest votes. This suggests the dominating challenges were captured by the scoping phase. Participants may have felt the need to raise issues that are linked, but these appear to not be central to the group present.
- The challenge that stakeholders feel is the most relevant, or biggest challenge for water resources and economic development in Saldanha, is that there is a misalignment in the planning approaches.
- The second biggest challenge for water resources and economic development in Saldanha, is that there is a lack of tools for strategic oversight, followed by the lack of feedback loop (between planned development, water demand, cost of water resources intervention, whether the development can afford this cost and whether development should proceed).
- One of the additional challenges did receive several votes: not enough focus on demand management (via water pricing) is considered 4th most important challenge.
- The lack of a coordinated picture of development is considered 5th most important, however as reflected in the discussion comments, rectifying this seems more straight forward hence it may not be seen as important.
- The result that water demand may outstrip supply in 2017-2018 is (joint) 6th most important. As reflected in the discussion comments, people consider this less important because it is considered the result or outcome of the other challenges i.e. if the others are prioritised and addressed, this one is also addressed.
- The challenge of economic productivity not informing allocation, is (joint) 6th most important. This is surprising, given the wide ranging opinions over what developments are appropriate for a particular setting (highlighted at the scoping workshop, GreenCape 2015). It may be that the use of indices to understand the most beneficial use of water resources, is seen as 1 potential tool for strategic oversight.

The discussion of the perception and the prioritisation of challenges, clearly highlights misalignment in planning and governance to be the central issue. One participant summarised that a new governance framework should hold the highest priority as this challenge links all the other ones: a governance framework would define the feedback loop, and new tools are required to implement this new feedback loop process. The tools therefore become enablers of the feedback loop. The coordinated picture of development is a fundamental data input to it these aspects. This statement neatly links the challenges, and proposed solutions.

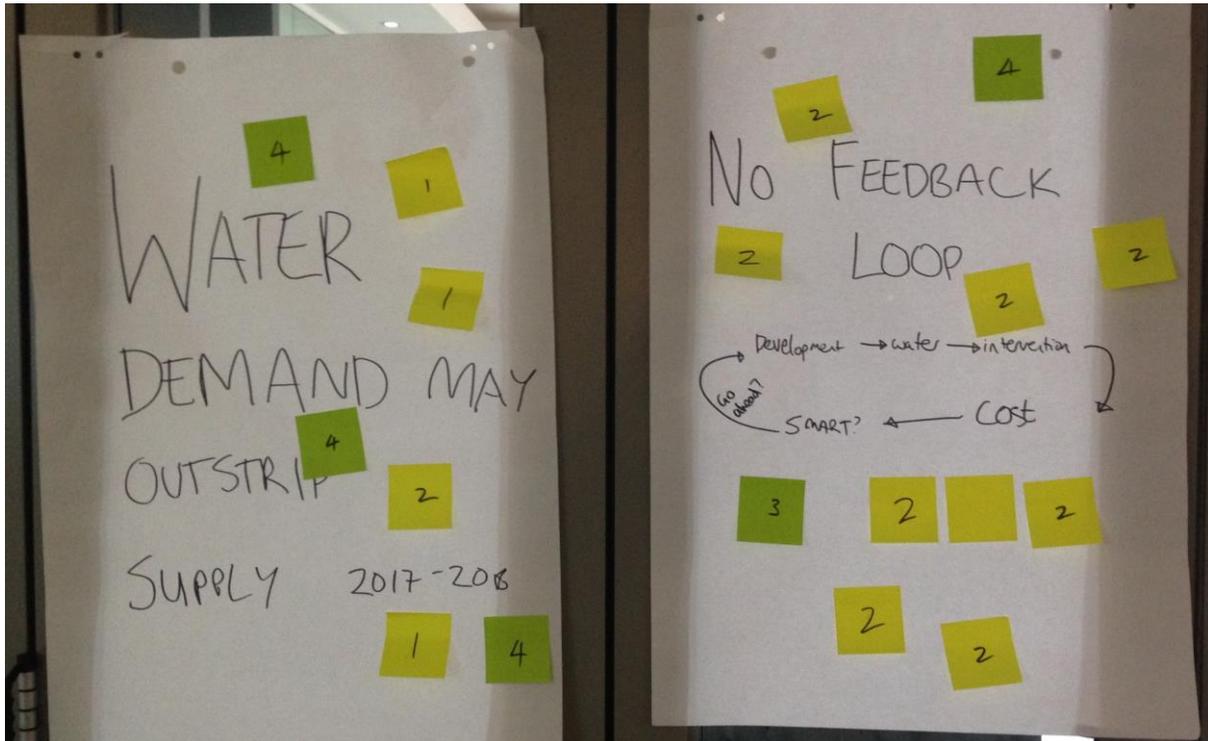


Figure 3-1 Photograph showing stakeholder response to challenges (1)

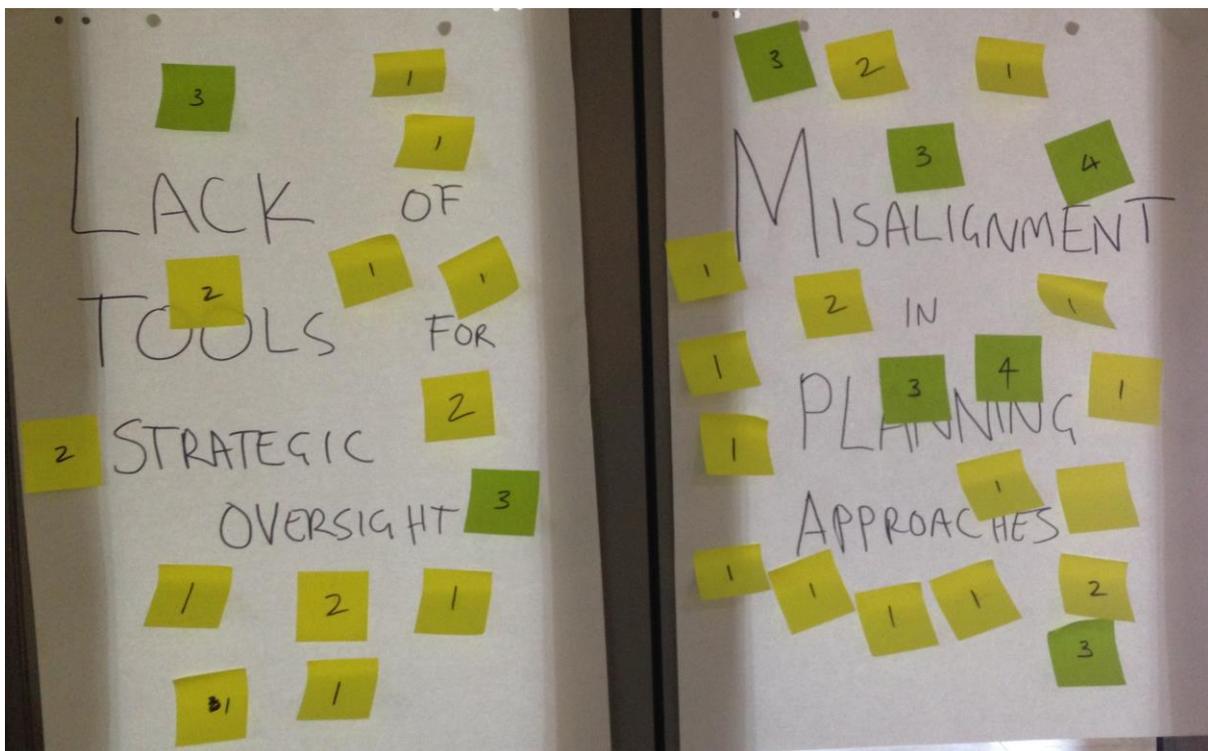


Figure 3-2 Photograph showing stakeholder response to challenges (2)

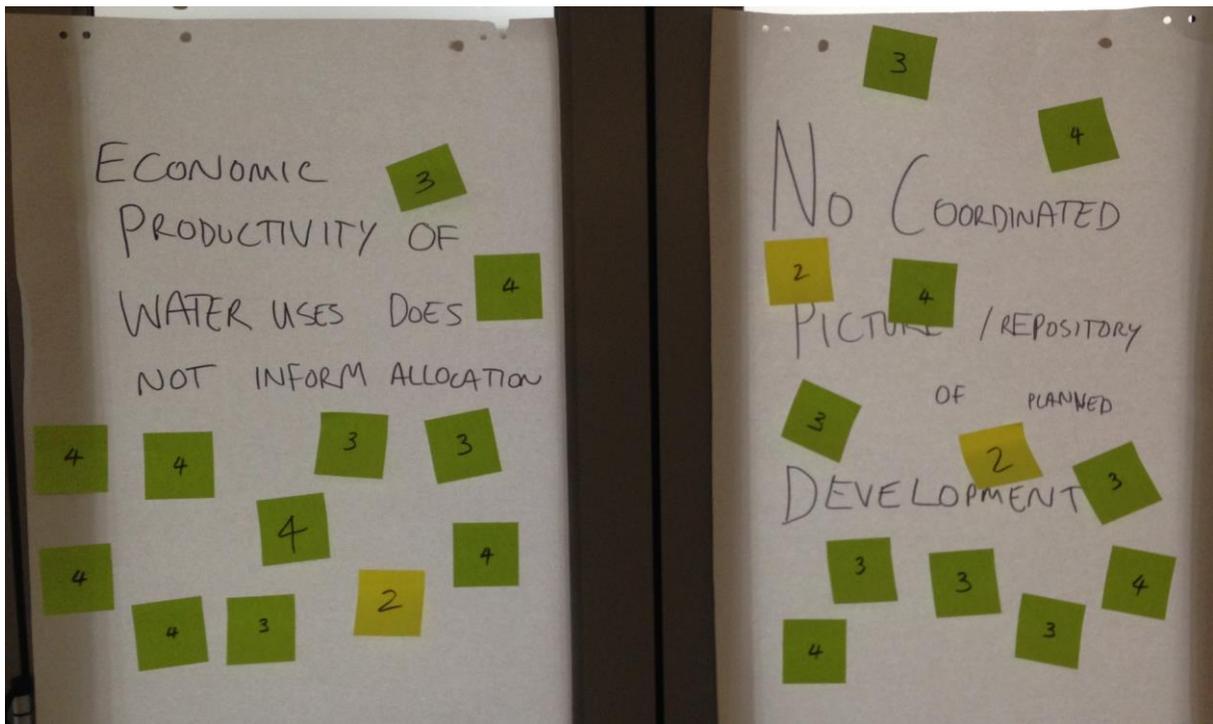


Figure 3-3 Photograph showing stakeholder response to challenges (3)

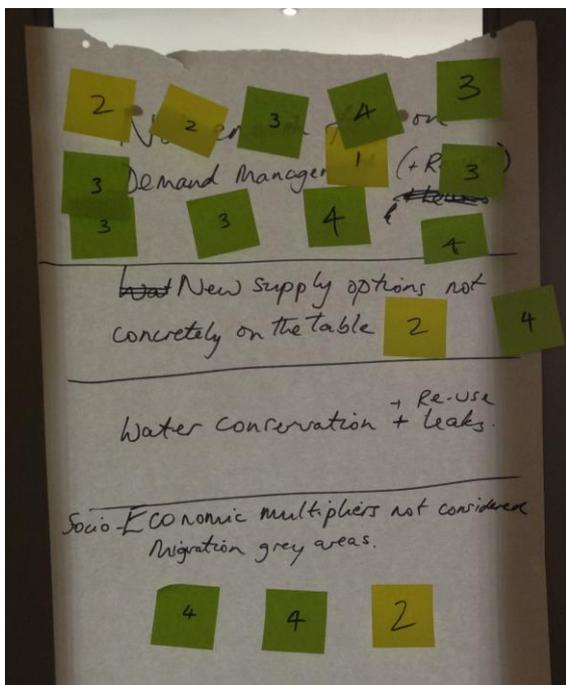


Figure 3-4 Photograph showing stakeholder response to additional challenges

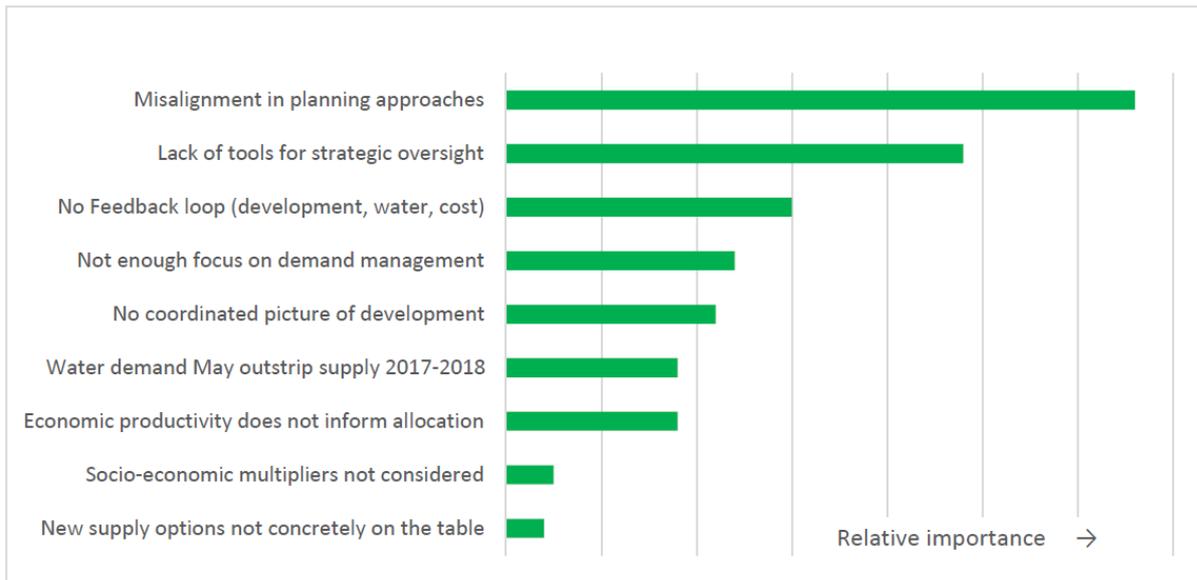


Figure 3-5 Stakeholder perspectives on the relative importance of challenges identified

4. Proposed solutions

4.1. Solution Overview

Several research products (“proposed solutions”) were listed in the proposal for this WRC and DED&T co-funded phase of the work, which aim to address the challenges identified. A short presentation provided an overview of these proposed solutions (Figure 4-1), and an overview of the structure of the project going forward (Figure 4-2). Each proposed solution was then outlined in a 5 minute presentation by the solution ‘champion’ (the research supervisor). These presentations are contained in Appendix 3.

The solutions rely on a “coordinated picture of development”, which responds to the challenge that this does not exist. However, addressing this is not included as a potential solution, because DED&T has commenced an internal programme to generate this coordinated picture for Saldanha, as part of the West Coast Industrial Plan (WCIP), which builds on the list of developments collated in the scoping phase (GreenCape, 2015).

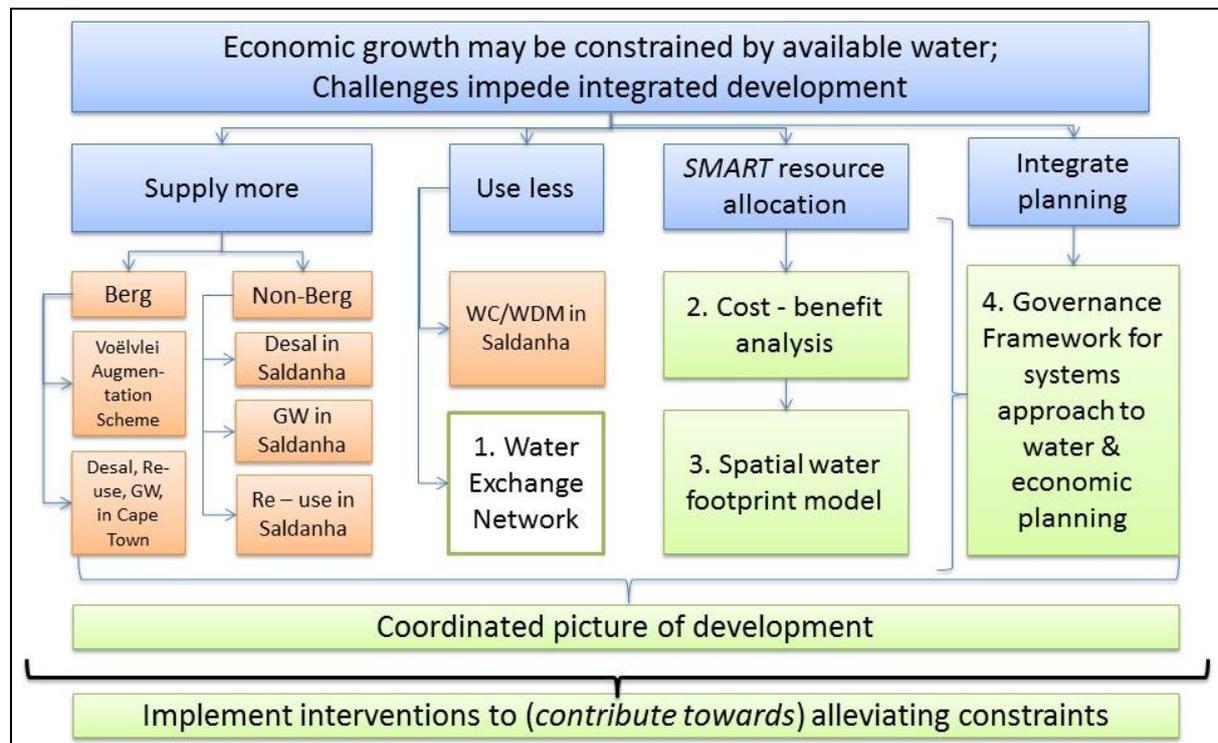


Figure 4-1 Overview of proposed solutions and their context¹

¹ Orange highlighted solutions are underway by other stakeholders, green highlighted are incorporated into WRC/DED&T co-funded future project phase, the solution outlined in green is to be pursued by GreenCape but funding is not yet sourced

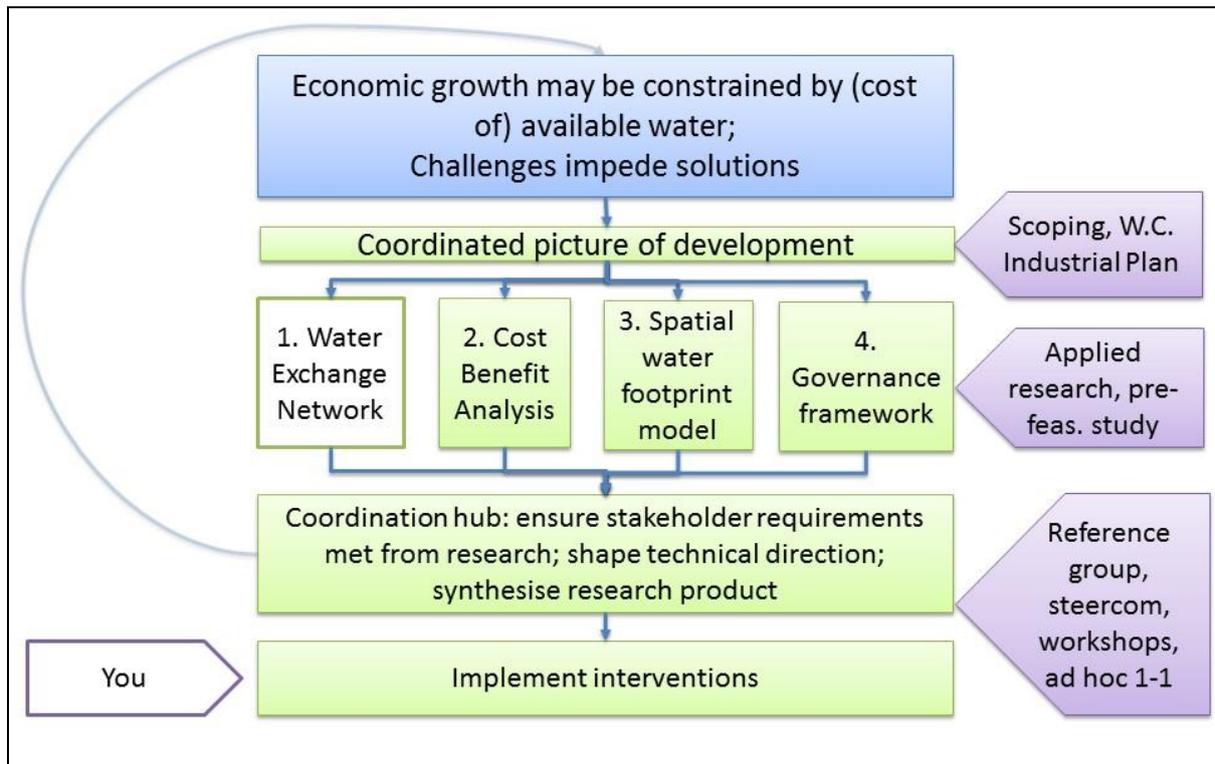


Figure 4-2 Framework for implementing proposed solutions²

Box 4-1 Inclusion of a Water Exchange Network

A Water Exchange Network is considered a potential solution to the current water and economic development challenges in Saldanha Bay (GreenCape, 2015). The proposal to the WRC for this project phase excluded a Water Exchange Network (WEN), mainly because the proposal was written in mid-2014, for commencement in April 2015, and the proposers felt that the necessary work into a WEN would be well under way through alternative funding mechanisms by April 2015. Preliminary work was completed prior to April 2015, however, funding to take this to pre-feasibility level has not yet been sourced. Sourcing funding and supervising a pre-feasibility study into a WEN is a task that GreenCape will pursue in 2015-2016 (under the DED&T portion of funding). The potential solution was included within the workshop discussion, regardless of the funding status, because the 4 proposed solutions respond as a package to the challenges identified.

Subsequent to the presentation, each table hosted a discussion on 1 of the solutions (i.e. each “champion” sat at a separate table). A “world-café” style discussion session followed whereby the participants were asked to select the solution they felt most drawn to. After 20 minutes the participants were rotated and visited another table. There were two rotations hence each participant visited 3 of the 4 tables (solutions), and each table therefore had 3 separate conversations on the proposed solution. The following two questions were posed to direct the discussions:

- Would these solutions be effective for you?

² This figure is taken from the presentation provided at the workshop, hence “You” refers to the participants, i.e. decision-makers in water and economic development planning for Saldanha and the broader region

- Can you see a way to improve the proposed solution?

Headline insights were provided from each table conversation and these are listed in the sections below. The full minutes are included in note form in Appendix 4, and the project team's interpretation of the insights emerging from the discussion, and the initial implications for methodology is given in Section 5.

4.2. Shaping a Water Exchange Network

There was support from all participants for a WEN concept, and for what this implies in terms of governance (i.e. elevating industry players to something more than end user), and for decentralized systems. However, various challenges were raised:

1. There are already plans / actions for upgrading WWTW infrastructure. There is uncertainty on how this might integrate with a WEN. A centralised WWTW provides re-use on a large scale, but may negate the opportunity of a WEN. The timing and scheduling of the plans are important.
2. The governance model for implementing a WEN was repeatedly raised: how can industry players exercise a voice?
3. This is an opportunity to open the debate for paying different prices for different qualities – which will have an impact on LM revenue

4.3. Shaping a Governance Framework

Throughout the discussion of challenges and solutions, participants reflected the need for new governance approaches, and as such there appears to be support for a new governance framework. The governance discussion reflected:

1. The need for a common development vision.
2. The necessity for planning to proceed with an explicit understanding of water resources base / status quo
3. A query over the spatial dimension for a new governance framework, and how planning in Saldanha links to the wider catchment area (and other users).

4.4. Shaping a Cost- Benefit Analysis

There was support from participants for a CBA approach, and for what this implies in terms of allocation. Various technical considerations were raised including:

1. The CBA should only be applied to allocable water. Allocable water excludes the “ecological reserve”, the “human reserve” (25 litres per person per day) which is, in terms of the act (although not practice), not up for negotiation. Strategic water uses (historically Eskom) also represent a tricky case under the NWRS, but should be included in a CBA.
2. Whether the CBA is between sectors, or between individual projects (as per the free market)
3. The area of consideration was queried, given the links between (Berg River) water use in SBLM and upstream uses. Downstream industrial water uses may generate higher revenue compared to upstream agricultural use, which has other benefits.
4. One benefit to be considered will be jobs, and this should be disaggregated to the level of skill for those jobs. Jobs for unskilled people are very important in social system, however jobs for highly skilled people are better for economic development.
5. What water (bulk or grey), what “benefit”, “who” benefits and who carries the cost need to be stipulated up-front the CBA.

There was reflected as a sobering thought, that currently, allocation is merely on a 1st come 1st serve basis, and if you can pay for the water application, you get it. A disconnect therefore exists between this proposed CBA solution, and the current practice on the ground.

4.5. Shaping a Spatial Water Footprint Model

Participants generally reflected that if the tool was successful it would be very beneficial for spatial planning. The following technical considerations were raised:

1. How will bottom up calculation of water footprint be verified
2. How will the seasonality of a water footprint be incorporated?
3. Would it be possible to assess water footprints disaggregated for different qualities (i.e. Berg River water, treated water), linking the water footprint to source and quality

5. Summary and Way Forward

5.1. Summary insights: Water Exchange Network

There was strong support for the WEN concept. The intervention can reduce effluent in addition to reducing raw water demand, which is attractive as effluent quality is also a problem for Saldanha Bay.

Several governance considerations were raised in relation to implementing a WEN, as the operational risk to the LM increases with decentralised infrastructure. The greater number of “hands to the wheel” can make it hard for the LM to manage. In addition, the LM may not have the depth of water resources experience, given that the WCDM has been acting as their WSA, and will now shift to act only as a WSP. These complexities are further compounded when industry players are introduced in the mix. How payment is structured, the ownership of infrastructure, and the responsibilities between industry, LM and DM would all need to be identified, resulting in an uncertainty in how to take the first steps. It was reflected though that if GreenCape could manage a pre-feasibility study which proved the concept in greater detail, the relevant authorities would almost be forced to then take steps to implement.

The relationship between the WEN idea and potential plans for centralised re-use need to be clarified. There is a potential for waste from 3 WWTW (Saldanha, Langebaan Vredenberg) to be centralised, and treated for re-distribution for use in Saldanha. This is in concept stage, and the treated effluent has not been allocated. This may be a compounding factor to the LMs slow response to Arcelor-Mittal wanting to use more treated effluent (a challenge that GreenCape identified in the scoping phase, and intends to contribute towards a solution for going forward). Nevertheless, a WEN at least between industrial users is likely to be beneficial, regardless of the centralised / decentralised municipal WWTW.

5.2. Summary insights: Governance

A key theme, repeated at various times, was the perceived limitation in understanding how a full range of planning ordinances, policy directives and local by-laws, all operating a slightly different scales and with different levels of authority, could be responsible for directing the developing of the Saldanha region. These planning directives are poorly aligned with each other, and reference was made to the NDP, IDP, SIP 5, SIP 8, All Town Reconciliation Plans, LUPO, National Water Act and a recent initiative currently being undertaken by the Greater Saldanha Task Team. The IDP for example, is supposed to act as the overall coordinating plan, in articulation and translation of plans in to implementable actions. It is intended to guide development in an integrated manner, however, it was felt that the IDP process is falling short, and the municipality simply appoints a consultant/consulting firm to do the IDP.

The topic of the need for a common vision for the development of the region was also raised several times in the discussion, as something that could support coordination of planning efforts. The common vision wasn't discussed in further detail (what it looks like, who holds it), however this requires further investigation as input to a governance framework.

Based on the insights gained, there's a need for the research work to begin by identifying the planning tools that are currently in place and understand how these are being used for what purpose and at what scale. At the same time it will be necessary to understand the integration between these planning tools. The next step is to meet with stakeholders – officials, politicians, private enterprises and civic groups – to explore the networks further and the role of each in governance. As one participant put it, 'It's important to understand space, define functional regions and actors'. This will require, among others, one-on-one interviews and focus group discussions to illicit a better understanding of governance structures, its functionality and how plans and policies are responsible for directing decision making.

One participant recommended that the study should draw on key decision makers, to interact in the development of a framework, and suggested that the framework should aim to be proactive as opposed to reactive. These initial stages are preliminary in the investigation, but should provide baseline information to help identify any assumed gap in planning and economic development. The final stage might result in the identification, refinement and confirmation of framework that could be used to direct development in a water constrained region.

5.3. Summary insights: Cost-Benefit Analysis

The initial discussion on challenges focused on the critical need for local water governance as a means of rationing scarce water, rather than 1st come 1st serve allocation, knee-jerk reactions or technical solutions to water scarcity. Who will do this (make the tricky trade-offs) in the absence of a robust CMA, and the dearth of recent work on the role of water in the economy in a water scarce country?

South Africa's water allocation and water allocation reform conversation stalled after 2005, in spite of a considerable (costly and protracted) effort from the (then) Department of Water Affairs supported by the Department for International Development, aimed at developing and implementing guidelines for compulsory licensing and the establishment of local water allocation institutions. The workshop conversations covered all the same issues as the conversations in 2002-2005, but this conversation was had by people on the ground – water users (industry and the local municipality) – which was not the case a decade ago. This is a significant difference and is symptomatic of the on-the-ground need for a better water allocation; a more authentic and legitimate basis for planning water allocation reform.

A participant articulated the feeling that a cost-benefit approach “was the only scientific approach to water allocation” because it enabled dispassionate and sensible allocations. This perception of scientific rigour is of course not entirely accurate and one of the problems with CBAs more generally is the context of economic exclusion in South Africa and socio-economic inequality. The values/ benefits that people put to water are subjective and under conditions of inequality can vary greatly. Recognising subjectivity and the source of the value variations can be central to effective water allocation, but is not enabled when benefit is conflated into a single number that is assumed to represent all interests.

“Cost and benefit of what and for who”, respectively, needs to be carefully considered. CBA works best when being applied to either the supply-side decisions (there is a given need for water, how might it be best supplied) or the demand-side decisions (what is the best allocation of a given quantum of water). Applying a CBA to both supply and demand at the same time requires a dynamic equilibrium model that is likely to be beyond the scope of this study. Hence the proposed focus is: *what is the best allocation of a given quantum of “allocable water”*. This is the question that the LM must currently answer to award projects (and correspondingly allocate water).

The NWRS (Chapter 6 – Equitable Water Allocation) stipulates criteria that should be considered in allocating “allocable water” (existing lawful use, historical disadvantage, gender). The guidelines need to be factored into any water allocation decision support tool, suggesting the need for a multi-criteria approach to CBA. Alternatively the hierarchy of water allocation stipulated by the NWRS needs to be accepted and the CBA applied to decision within a particular category of water allocation.

The point of a CBA is to show which sectors/ projects deliver the greatest benefit from a quantum of water. But whether this should be done across sectors simultaneously (in which case agriculture may not fare well) or for specific projects within a specific sector requires consideration. Arguably, a balance should be struck between inter-sector competition for water and the need to maintain economic diversity by ensuring all (some) sectors get some water.

If employment creation is considered alongside GDP contribution or profit (as is proposed) this can provide a useful counter-criterion. Typically agriculture generates quite low profit but does employ people. This could be further refined based on a distinction of the type of employment created (low skilled, high skilled) and “employment for who”. A conventional CBA would prioritize a high paying job based on its contribution to GDP, but in the SA context priority might be given to the types of work that currently unemployed people could do.

The CBA should be specific about the extent of benefit derived from different quanta of water (i.e. report benefit and volume of water) and how benefit changes for different amounts of water. For example, is one sector able to use all the water beneficially or are their decreasing benefits as consumption increases. This will depend on supporting factors of production for what is being produced – land, markets, labour, capital.

The study runs a risk by only considering projects in Saldanha of ignoring the merit of these projects relative to upstream projects. In so doing it may not be able to motivate for more water to be released downstream, or may unduly lay claim to water that could be better-used upstream. The Act is clear that the catchment should be the unit of analysis for this exact reason, but the project takes a different approach by only focusing on Saldanha projects.

The municipality provided a sobering reflection saying that they actually allocate water on a first-come-first-serve basis as long as people can pay (for the capital water levies?) i.e. there is no long term strategy and not normative basis for water allocation. As a result, water almost certainly fails to fulfill its full economic or transformational capacity. This approach could be amended by introducing a minimum threshold of “benefit” that applicants would need to satisfy in order to qualify for a license (or allocation from the LM). Similarly if the fee charged for water licenses reflected actual water value they could constitute a form of cost-benefit water allocation. The difficulty with a charge that attempts to reflect the true value of water, is that water value should reflect water scarcity, which varies from season to season, and accordingly the price should vary too. If pursued this approach would encourage the private construction of storage dams that enabled water abstraction during times of abundance at lower rates, for use during times of scarcity. One of the reasons why the municipality claim to have has this approach is that they do not have the data (especially from the IDZ) that would allow them to conduct a rational assessment of the respective benefit from for different applicants. They could, however, provide broad guidelines of the type of benefits that they look for when approving applications.

5.4. Summary insights: Spatial water footprint model

The workshop discussions highlighted the lack of a coordinated approach for development, and elevated the lack of tools for strategic oversight to the second most pressing challenge. A regional model that could quantify resource trade-offs between development decisions, and thus support strategic decision-making, was proposed to respond to this challenge.

The proposed model will attempt to present current water footprints and those of proposed activities. It would then be possible to analyse water consequences related to planning and development. The baseline of the model will be current reality. Effects of changes to the current status quo will then be calculated based on whatever changes are made. Although support was received for the tool, the key decision-makers that will utilise the tool need to be determined. Whereas the CBA is directly related to (LM) decision-making over allocation, the direct result of this regional Berg catchment tool, and thus the implementer would be beyond the LM, and likely to be the DWS (or proto-Berg CMA).

5.5. Summary insights: Stakeholder liaison & research implementation

Workshop outcome

Overall, the following insights suggest that the workshop was “successful”:

- The GreenCape scoping phase (and the engagement carried out therein) appears to have provided a good base for this project phase as participants arrived at the workshop knowledgeable, and ready to contribute. The people in the room were there because they wanted to be, and the material discussed was extremely relevant to participants. The background preparation worked well in bringing participants into the room in the right frame of mind.
- The presentations were crisp and on-point, which helped the participants to engage.
- The intentions of the workshop were met: the challenges were verified as relevant to the stakeholders present, and positive feedback was received on all of the proposed solutions to address these challenges

Research stakeholders

There is a wide range of stakeholders for whom this research is relevant, evidenced by the number of invitees to the workshop. This ranges from economic development planners and water resources planners in the various spheres of government, to related elements such as infrastructure, spatial and environmental planning. It also includes those impacted by the planning i.e. industry in Saldanha, and the environment in Saldanha (represented by environmental groups). Furthermore it includes researchers and consultants involved in similar initiatives.

It is certainly beneficial at the start of this research to bring all these tiers together in a workshop style interaction. The setting, however, has limitations. Institutions may feel unable to speak honestly about their real challenges for fear of retribution from other institutions. Individuals may feel unable to speak honestly about their challenges for fear of negative impact on the perception of their ability to carry out their mandate, or for fear of retribution from more senior participants (i.e. hierarchy).

To support the development of a stakeholder engagement plan, these stakeholders can be subdivided into various tiers:

1. Tier 1 **Implementers**: the decision-makers who are targeted to implement the research findings, new approaches, for Saldanha
2. Tier 2 **Benefiters**: role players for whom the research findings can benefit (i.e. industry, other decision-makers facing similar challenges)
3. Tier 3 **Assisters**: Professionals who can serve as technical advisors to the project (perhaps involved in similar initiatives)
4. Tier 4 **Periphery**: Those with whom the project should remain in contact with for keeping informed of other interventions

Relevant stakeholders for the project have been collated in a database, and divided into these tiers. All identified Tier 1 Implementers were invited, and telephoned prior to the workshop. However, several were notably absent from the workshop. Several of these confirmed attendance but did not attend, or had sent apologies. Those absent include:

- Those responsible for the IDP process at the LM
- Those responsible for water allocation / planning decisions at the LM
- Those responsible for water allocation / planning decisions at DWS
- The catchment manager / CEO of the proto-CMA, at DWS

An overarching intention of the project is to ensure that the research is relevant, implemented, and fundamentally contributes to a change in the water resources and development situation, and how these

are planned, for Saldanha. Although the workshop outcomes were positive overall, the challenges and potential solutions were discussed almost in an abstract way, as if they affect something external to the room, when (some of) those directly responsible for addressing the challenges listed were in the room. This lack of urgency or perhaps passion for the proposed solutions, and the absence of (some) Tier 1 implementers, has highlighted that the project needs to identify **champions** of the proposed solutions.

Required Champions

It is straight forward to identify problems and debate solutions (almost in an abstract fashion, as noted at the workshop). There is a gulf between the conceptual possibility of a solution, and changing the well-formed decision-making habit, especially when this habit is the one enshrined in governmental mandates, and legislated planning processes. Crossing this gulf requires behaviour change. Identification of champions – individuals who own the research, shape it, consider it their own support mechanism – is the only way to bridge this gulf from conceptual buy-in of a solution, to action and implementation.

The champions must therefore be those able to implement the change: i.e. (enough of) the Tier 1 implementers. Their championing of the research solutions needs to be secured through 1-1 conversation, between someone with a grasp of the proposed solutions (i.e. GreenCape researchers in the 'coordination hub') and the person managing the system. There is a place for workshops and larger discussions, but for someone to become comfortable with owning and championing way of doing things, they have to be helped over the gulf from solution to action, their *particular* queries, "stupid questions" dealt with in conversation, in a face to face way, avoiding the fears of sharing this honesty in workshop setting.

What is being offered to champions from this project is therefore almost as a personal service: at their service they have a group of people, busy addressing their most frustrating problems. Their challenges will continue to be heard and translated to shape the research direction; the research outcomes will be translated to something meaningful to them and as such the decision-maker is mentored in a new way of doing things; and the decision-maker is allowed to walk at own pace (across the gulf) into the solution space. It is intended to be an empowering and enriching engagement.

Measures of project success, and parallel implementation

One measure of success for the project as it progresses could therefore be that these champions begin to turn to the project routinely over the coming 3 years, start calling when a challenge emerges, and start contributing to shaping the solutions. It is this kind of engagement that dictates the difference between a research project, and a transformational change project.

"Implementation" needs to be on-going throughout the project: there are current challenges in Saldanha that require intervention and can be addressed by the project team. One of these for example is Arcelor-Mittal wanting to use greater volume of treated effluent, from the current WWTW (also highlighted in the scoping phase, GreenCape 2015). The project team could get involved here through getting the right people to come to a common picture of the problem (a task for the coordination hub), and assessing the appropriate way forward which may have legal complexities (a task within the governance thesis). The framework for implementing proposed solutions presented in Figure 4-2, should be amended to show implementation as continual throughout the project. As such, measures of success of the project should incorporate the interventions realised throughout the 3-year process. The project can be considered to be meeting its objectives if the researchers feel they have got a deep understanding of the challenges and required solutions, and the champions feel their capacity stretched, insights enriched and that they are acting differently, long before the project end.

Because of the parallel process of research into solutions, and close engagement with champions to understand the needs, and shape the solutions, it is almost a redundant question to pose whether the proposed solutions address the user needs for Saldanha (an intention of the workshop). There is still a lot of work to be done on developing solutions, and in parallel the curiosity and trust needs to be built with champions, to shape and guide the solutions. As the project progresses how the solutions need to be shaped will become clear, and those that are practical will be implemented.

Therefore, in parallel, the project needs to move in parallel towards building the next level of research insights and building implementation, first through securing champions via 1-1 interaction.

5.6. Recommended next steps

Based on the input from stakeholders and the insights summarised above the project priorities between now and next deliverable (Deliverable 2, progress report, due October 2015) are:

- Secure research champions for each proposed solution, through 1-1 interaction with Tier 1 implementers (GreenCape)
- Shape the methodology to be implemented for each solution, to where possible meet the technical suggestions and challenges raised in this report (section 3 and section 4), as suggested in the (section 5) summary of insights (student researchers, and supervisors)
- Source funding to proceed with a WEN pre-feasibility study (GreenCape)

6. References

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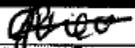
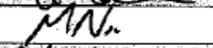
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7. Appendix 1: Workshop Attendance Register

Table 7-1 Workshop Attendance Register


User Needs Workshop
23 July 2015
The River Club

First Name	Last Name	Organisation	Signature
Cathy	Pineo	GreenCape	
Evan	Rice	GreenCape	
Helen	Seyler	GreenCape	
Eiman	Karar	WRC	
Herman	Jonker	W.C. Dept Economic Development & Tourism	
Marthinus	Van der Walt	UCT	
Mosa	Makutsoane	UCT	
Kevin	Winter	UCT	
Anton	Cartwright	UCT / African Centre for Cities	
Nadine	Methner	UCT	
Mark	New	UCT	
Peter	Willis	Independent facilitator, advisor	
Gavin	Williams	Saldanha Bay LM	
Quinton	Williams	Saldanha Bay LM	
Beau	Adams	Saldanha Bay LM	
Gary	Tomlinson	Saldanha Bay LM	
Nazeema	Duarte	Saldanha Bay LM	
Marius	Meiring	Saldanha Bay LM	
Johann	du Plessis	Saldanha Bay LM	
Henk	Matheé	West Coast DM	

User Needs Workshop
23 July 2015
The River Club

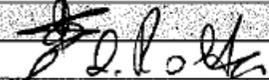
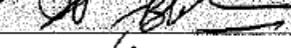
Nic	Faasen	West Coast DM	
John	Roberts	Dept. Water & Sanitation	
Mashudu	Murovhi	Dept. Water & Sanitation	
Deborah	Hene	Dept. Water & Sanitation	
Hannes	Marais	Saldanha IDZ LicCo	
Annabel	Horn	W.C. Dept Env Affairs & Development Planning	
Chrizzelle	Kriel	W.C. Dept Env Affairs & Development Planning	
Wilna	Kioppers	W.C. Dept Env Affairs & Development Planning	
Frans	Hannekom	W.C. Dept Transport & Public Works	
Marco	Morgan	W.C. Dept Transport & Public Works	
Zofia	Rokita	W.C. Dept Local Government	
Jim	Petrie	Private	
Gillian	Sykes	Palmer Development Group	
Brett	Cohen	The Green House	
RAJIV	PA LADH	PDG	
Fernel	Abraham's	DEBAT	
Gerrie	Freundse	DEADP	
Michelle	Hyde	WCDW	
Cesalá	Vrolijk		

Table 7-2 Apologies received prior to workshop

First Name	Last Name	Organisation	Role
Chris	Millson	GreenCape	GreenCape Resources Theme Leader
Jane	Turpie	UCT	Resource economics HoD
Julian	Smit	UCT	Geoinformatics unit
Gerrit	Smith	Saldanha Bay LM	Head of Water & Sanitation Department
David	Joubert	Saldanha Bay LM	IDP Manager
Louis	Scheepers	Saldanha Bay LM	Municipal manager
Ashia	Petersen	Dept. Water & Sanitation	CEO of Berg-Olifants Proto CMA
Isa	Thompson	Dept. Water & Sanitation	Chief Engineer: National Water Resources Planning, South
Nkhetheni	Nthungeni	Dept. Water & Sanitation	Licence Authorisations - Department of Regulation
Elmien	de Bruyn	Duferco	Environmental Manager
Christo	Van Wyk	Saldanha Water Quality Trust	Chairperson
Danielle	Manuel	W.C. Dept Transport & Public Works	Provincial Infrastructure Policy and Strategy
Tammy	Evans	W.C. Dept Economic Development & Tourism	Head: Ministry Economic Opportunities / Project Khulisa
Jenny	Cargill	W.C. Office of Premier	Special Advisor
Harro	Von Blottnitz	UCT	Chemical Engineering
Jacobus	du Plessis	University of Stellenbosch	Civil Engineer, Department of Water and Environmental Engineering
Jessica	Wilson	EMG	Similarly aligned WRC project on community engagement in CMAs
Christine	Colvin	WWF	Freshwater Research Unit

Table 7-3 Remaining workshop invitees (unable to secure responses)

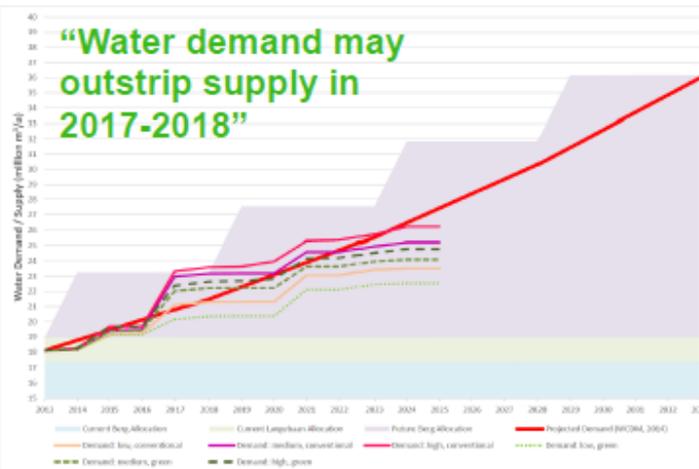
First Name	Last Name	Organisation	Role
Joanne	Johnson	W.C. Dept Economic Development & Tourism	DED&T
Frank	Pronk	Saldanha Bay LM	Councillor and economic development at LM
Flip	du Plessis	GLS Consulting (and West Coast DM & Saldanha Bay LM)	Consultant
Rashid	Khan	Dept. Water & Sanitation	Regional Director
Derril	Daniels	Dept. Water & Sanitation	Berg Catchment Manager
Rodrick	Schwab	Dept. Water & Sanitation	Specialist Engineer: Economic and Environmental Studies
Reinet	van Zyl	Arcelor Mittal	Arcelor Mittal
Cliff	Timlin	Tronox Namakwa Sands	Tronox Namakwa Sands
Jaco	de Waal	Arcelor Mittal	Arcelor Mittal
Johan	Jacobus Le Roux	Tronox Namakwa Sands	Environmental Specialist
Stuart	Smith	Frontier Rare Earth	VP Exploration
Paul	Hardcastle	W.C. Dept Env Affairs & Development Planning	Director planning & policy coordination (Saldanha EMF)
Peter	Keuck	W.C. Dept. of Agriculture	DoA
Paul	Rhode	City of Cape Town	CoCT - Water & Sanitation
Peter	Flower	City of Cape Town	CoCT - Head Water & Sanitation

8. Appendix 2: Workshop Invitation

INVITATION	
<h1 style="color: green;">USER NEEDS WORKSHOP</h1> <p style="color: green;">Tuesday, 23rd June 2015 09h00 to 13h00, lunch thereafter @ The River Club, Cape Town (http://riverclub.co.za/)</p> <p>GreenCape, in a collaborative effort with the University of Cape Town's African Climate and Development Initiative (ACDI), has commenced a 3-year project entitled: "Towards sustainable economic development in water constrained catchments: tools to empower decision making". The project is co-funded by the Water Research Commission and the Department of Economic Development and Tourism of the Western Cape Government.</p>	
<h3 style="color: green;">Workshop Objectives</h3> <p>The project aims to develop new solutions and approaches for water resources planning and allocation, economic development decision-making, and governance for water and economic development, with the overarching aim of alleviating potential water constraints to development. Saldanha Bay and the Berg Catchment forms the project focus area, yet the solutions generated will be applicable to development in other water-constrained catchments.</p> <p>The proposed solutions are based on initial scoping carried out by GreenCape in 2014. Some of you have already been part of this scoping through discussions with GreenCape and previous a workshop. We have recognised that you may have an interest in the outcomes of this project, and also that you have valuable insights. GreenCape and ACDI are hosting a "User Needs Workshop" to align proposed project solutions to the needs of those involved in water resources and economic development planning, and those impacted by this planning. Your input will help ensure relevancy for the results of this project and promote ultimate implementation of new solutions.</p>	<h3 style="color: green;">Workshop Program</h3> <p>Welcome and Introductions <i>Evan Rice, GreenCape</i></p> <p>Results of GreenCape Scoping Phase <i>Helen Seyler, GreenCape</i></p> <p>Discussion of identified status quo, gaps & challenges. <i>All</i></p> <p>Overview of proposed solutions <i>Helen Seyler, GreenCape</i></p> <p>Cost-benefit analysis to inform resource allocation and resource interventions <i>Anton Cartwright, ACDI</i></p> <p>Regional hydro-economic model for quantification of resource trade <i>Mark New / Julian Smit</i></p> <p>Governance Framework <i>Kevin Winter</i></p> <p>Discussion of proposed solutions <i>All</i></p>
<p style="color: green;">R.S.V.P.</p> <p>Please RSVP to: claire@green-cape.co.za by Friday, 12th June 2015</p>	

HEADLINE Results of Scoping Phase for status quo of water resources and economic development in Saldanha Bay

To detail the short-term growth in water demand, GreenCape collated all potential industrial developments for the Saldanha area and the Wittoogte Water Supply Scheme, and developed a water demand projection based on these. Under the 'conventional' medium and high growth, and the 'green' medium and high growth scenarios, projected water demand is higher than the planned-for water demand, until at least 2021.



“A Water Exchange Network could reduce freshwater demand by 15% and reduce effluent by 76%”

A Water Exchange Network (WEN) is fundamentally different to regional water reuse, which treats only the treatment plant as a potential source of water. A WEN sees all users as potential sources and based on water quality requirements and effluent generation, an optimum network can be defined to cascade water between users. Using data from major existing industries, the concept of a WEN for Saldanha Bay was tested. Preliminary results show that the freshwater demand of the users can be reduced by 15%, and effluent reduced by 76%. This 15% equates to a saving of 1 million m³/a, and could remove the near-future constraints (where demand could outstrip supply in 2017-2018). The assessment will now be up-scaled to include more current and future industries.

“Water resources & economic development planning need to be more closely aligned, and new tools are required to support this”

Perspectives of those in water resources and economic development planning suggest:

- A misalignment in planning approaches make it difficult to strategically assess a set of development options, and know whether there is or is not enough water
- There is no feedback between development go-ahead, water demand, intervention cost, and whether the development can support the intervention cost
- Projects are awarded on project-by-project basis, without strategic oversight, and there is a lack of tools to enable this
- The building block is missing: a coordinated picture of development

The proposed solutions of the project going forward aim to respond to challenges highlighted by these perspectives.

9. Appendix 3: Workshop Presentations

9.1. Presentation 1: Results of Scoping phase (Challenges)

User Needs Workshop: Results of Scoping Phase

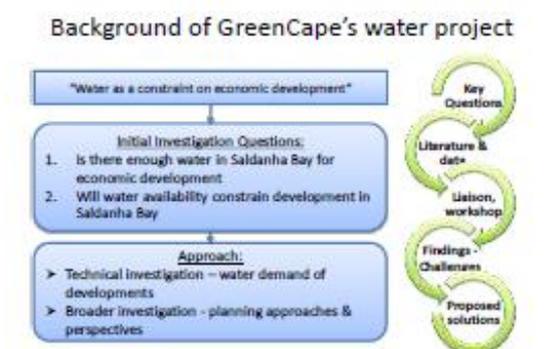
Helen Seyler

Purpose

- Project:**
 - “Towards sustainable economic development in water constrained catchments: tools to empower decision-making”
 - Developing practical solutions & new approaches ultimately to alleviate potential constraints to economic development posed by water
- Workshop:**
 - Proposed solutions based on our understanding of challenges
 - Verify our picture of challenges
 - Feedback on proposed solutions
- Presentation:**
 - Challenges, outcome of GreenCape Scoping Project

6 Challenges

- Water demand may outstrip supply in 2017-2018
- A **mismatch in planning approaches**, makes it difficult to strategically assess a set of development options, and to know whether there is sufficient water
- There is **no feedback loop** between water demand, intervention cost, and whether the development can support the intervention cost, and development go ahead
- Although work has been done on the **economic productivity** of various water uses or economic sectors, this had not yet been used to inform the **allocation of water resources**, nor what development scenarios to promote for Saldanha
- Projects are awarded on project-by-project basis, **without strategic oversight** and quantification of competing resource demands / trade-offs. Tools to enable this are lacking
- The **building block is missing**: a coordinated picture / repository of planned development



Technical Investigation led to a broader one



Some planning perspectives

- "We couldn't get information on possible developments so had to make assumptions" [for water resources planning]
- "We are forced to make broad assumptions because there is no clear picture of the planned development" [When planning water resources]
- "We can't get any firmer information from the IDZ or anywhere else on what projects are likely, so we have to apply cautious approach and apply various water demand growth percent's"
- "Economic development considers short-term, water demand planning must consider long-term so we end up making our own predictions"

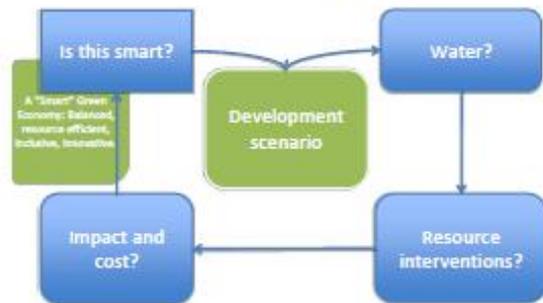
- **Misalignment in planning processes**
- **No coordinated picture of planned development**

Some planning perspectives

- "There is always enough water in the sea. It's the economics of water provision that could constraint development"
- We are asking the wrong question

What are the "right" sources of water, at what quality, for the "right" development, at the "right" price?

Framework to answer right question



Are we succeeding?



Are we succeeding?



More perspectives

- "The IDP process should be meeting coordinated water & economic development... but the LM is looking to the IDZ to fulfill this role"
 - "There is no need for this project because the plans have been completed... the funding application is in for the desalination plant..."
 - "We need to be assessing the cumulative impact of projects and the viability of development options, and have no mechanism for this ... firstly there is no consolidation of the intended development"
- Lack of tools for strategic oversight
➤ No coordinated picture of planned development

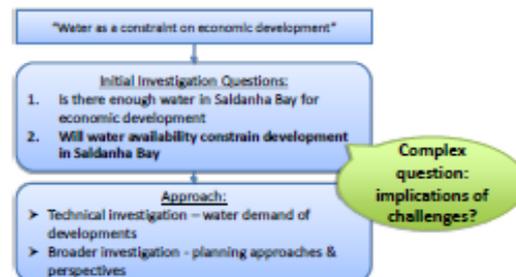
More perspectives

- "There is no tool for strategic assessment of the direction of an area and assessment of a group of developments... Water Use Licenses, EIAs, are all currently assessed project by project"
 - "At the time of the IDZ feasibility studies there was a lot of collaboration and coordination looking at the environmental impact and infrastructure requirements of development... This effort has fizzled out because the LM now thinks "we'll just put in a desalination plant and all will be well" ... But the LM must take a step back and decide which industries, and then which projects, should go ahead, and start to say no based on water availability"
- Lack of tools for strategic oversight
➤ Economic productivity of water uses does not inform allocation

6 Challenges

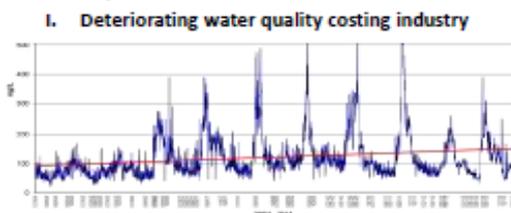
1. Water demand may outstrip supply in 2017-2018
2. Misalignment in planning approaches
3. No feedback loop
4. Economic productivity of water uses does not inform allocation
5. Lack of tools for strategic oversight
6. No coordinated picture of development

Implications



Implications

- Are the challenges leading to constraints?
- Evidence of water currently impacting development:



Implications

- Are the challenges leading to constraints?
- Evidence of water currently constraining development:
 - I. Deteriorating water quality costing industry
 - II. Frontier Separation Plant & Chlor-Alkali Plant secured water for phase 1; phase 2 conditional of SBLM desalination plant
 - III. Desalination unaffordable (industry perspective)
 - IV. WCDM licence not awarded

Summary

- Origin of 6 Challenges:
 - Outline of GreenCape's scoping project
 - Water demand planning results: demand may outstrip supply
 - Process revealed planning perspectives
 - Addressing the wrong question - cyclic planning required
 - Further challenges prevent implementing cyclic planning
 - Implications? Resulting in tangible constraints

Thankyou

Discussion questions:

(How) Are these challenges affecting you? Can you prioritise them?

Are there any key (water & economic development) challenges missing?

9.2. Presentation 2: Proposed Solutions

User Needs Workshop:
Proposed Solutions - Overview

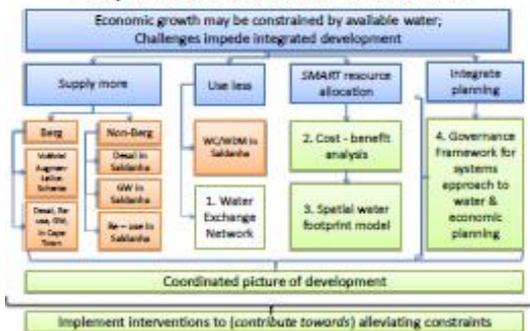
Helen Seyler



Springboard: challenges to solutions

- Urgently (<2 years?!) need practical SOLUTIONS to the water constraint for area
- Need at same time to develop TOOLS to overcome the challenges that impede solutions
- These can be applicable in other water constrained catchments

Proposed solutions, & context



How? A framework



1. Water Exchange Network

Jim Petrie



- A Water Exchange Network could reduce freshwater demand by **15%** and reduce effluent by **76%**

...keep listening for how

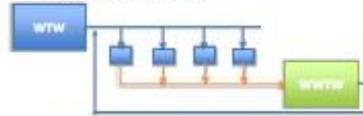
Why re-use?

- Several water resources planning reports:
 - 2009: additional 2.35 million m³/a available from GW, a 2nd wellfield recommended
 - 2009: cost-benefit analysis places surface water options first, followed by water re-use options, desalination came last, groundwater not considered
 - 2010: recommendations made for desalination citing assurance of supply
- Proposed desalination costs have spiralled
- Surface water options are dependent on Cape Town
- Berg quality deteriorating
- Groundwater is an option
- Re-use is an option

West Coast District Municipality, Investigation into alternative water sources for the West Coast District Municipality Water Supply Report Volumes 1 - 4 (2008) and Condensed Executive Summary (2012) Compiled by Research Engineers

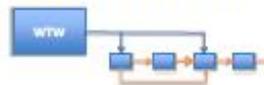
Premise

- Traditional re-use



Central treatment & reticulation
One potable water quality, sold at 1 price

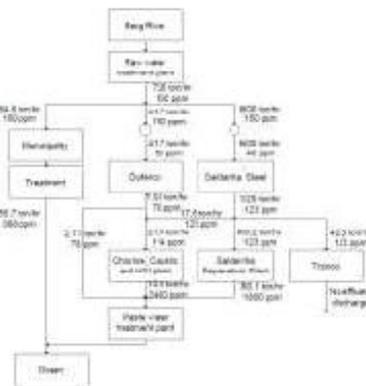
- Water Exchange Network



All users are potential sources
Different water qualities used for different purposes

Results

Optimised network for 15% freshwater saving
57% effluent saving



Results

- A Water Exchange Network could reduce freshwater demand by 15% and reduce effluent by 76%
- Context: 15% = 1 million m³/a
 - 6.75 million m³/a - current total to Saldanha
 - 6.00 million m³/a - current industry
 - 3.30 million m³/a - 3 major current industries
 - 7.50 million m³/a - current total + 2 major proposed industrial projects
- A WEN between only 6 nodes (LM + 3 current + 2 future industries) reduces proposed demand to 6.3 million m³/a - a 15% saving, >1 million m³/a - Greater savings with more current & future users?
- Shortfall 2015-2018: < 1 million m³/a

Where next?

- Feedback from the LM & industry
- Study included domestic use, 3 current industries, 2 future industries. -Expand
- GreenCape seeking funds to proceed with pre-feasibility study
- Based on outcomes, LM & industry partnership to lead feasibility study, GreenCape can assist.

2. Cost benefit analysis

Anton Cartwright, Jane Turpie



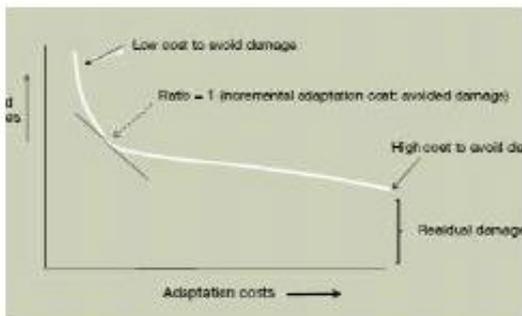
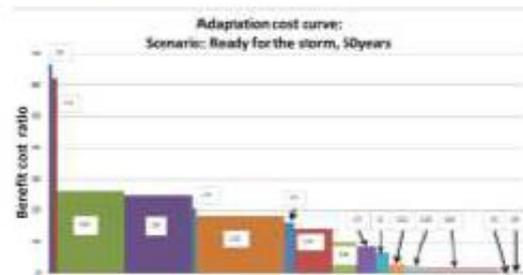
WATER RESEARCH COMMISSION



Why cost benefit analysis?

- Water is a scarce resource
- Its allocation has economic, social and environmental consequences
- In an ideal world water would be allocated to optimise the economic, social and environmental benefits (over time)
- This sometimes requires investment in water supply and management.
- Water allocation decisions need to be consistent and “defensible”

Many ways of reporting cost-benefit



Proposed CBA methodology

- Need to be specific about what is being evaluated
- Costs are usually easy, but need to be specific about “costs for who”
- Because water is simultaneously an economic, social and environmental good, benefits require consideration of multiple criteria (and the weighting of those criteria)
- Need some way of dealing with time and uncertainty – discount rates
- Inequality confounds the analysis
- Process of gathering data can be useful in generating water allocation capacity
- Method should reflect NWA and NWRS

Outcome

- Improved water allocation (economic, social, employment, environmental)
- Improved water allocation capacity
- Sense of options and improved capacity to manage tricky trade-offs

3. A Spatial Water Footprint Model of the Berg Catchment

To support evaluation of socio-economic trade-offs between competing and complementary development options

Julian Smit, Marthinus van der Walt, Mark New



WATER RESEARCH COMMISSION



Why a spatial water footprint model?

- Water for Saldanha Bay (SB) part of wider Berg River (BR) system
- Future demands on water in SB compete with other BR demands
- Need to be able to integrate competing demands across BR
- Spatial water-footprint model can provide such an integrated picture

The footprint modelling approach

- Any land use (including industrial) has a water footprint
- Examples: municipal, industrial, agricultural, conservation
- Growing data available on water footprint of different activities
- We have a spatial GIS database of over 80 layers
- Combining land-use and water footprint data allows us to estimate spatial patterns of water demand across BR



What could the footprint model tell us?

- Current water footprint – from point scale to catchment scale
- How the footprint might change with...
 - Shifts in land use – between different types of agriculture, industry, human settlement, conservation regimes
 - Climate change – especially irrigation demand, but also underlying water resource availability
- With socio-economic cost-benefit data
 - Allow evaluation of different economic development options across the catchment
 - How does option “X” in SB compare of option “Y”, in SB or elsewhere

4. What would be an effective governance framework for integrated development planning in the Saldanha Bay Area

Team: Mosa Mokutsoane,
Kevin Winter, Nadine Methner

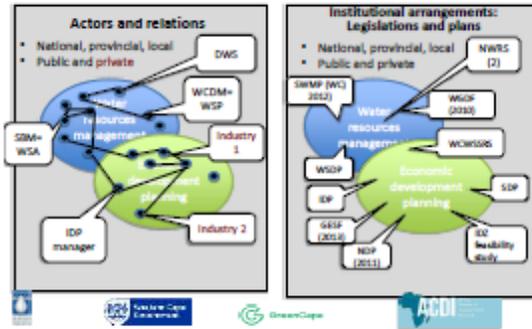


Initial Steps

- Map the alignments and misalignments between the water & economic planning processes
 - Conduct interviews with key role players
 - Participation in existing planning forums
 - Review and analyse policies and planning instruments (e.g. IDP, WCWSSRS);
- Develop a typology of decision making for various actor types
 - What are the key criteria of decision making for economic development planning and for water resources planning
 - Which policies and other actors are consulted in the decision making process
- Create a better understanding of the governance system



The governance system of the Saldanha Bay area



The proposed solution

- Currently: two parallel planning lines that are not optimally integrated

Economic development planning

Water resources planning

- We know we can solve the problem if we get a process that combines these processes



- Are these adjustments to IDP / WSDP system?
- Do we need to create new collaborative platforms?
- Should coordination take place through a centralised or decentralised system?
- How and where can the two tools assist in achieving an integrated planning?

Thankyou

Rotating discussion questions

- Would these solutions be effective for you?
- Can you see a way to improve the proposed solution?

10. Appendix 4: Workshop Minutes

10.1. Commencement

1. Registration, welcome and Introductions:

- GreenCape CEO, Evan Rice, welcomed all to the workshop, and thanked participants for sharing their time.
- The facilitator Peter Willis then opened the workshop with an outline of the purpose of the day, including logistical arrangements and an outline of the agenda.
- All participants introduced themselves to their table, and shared their particular interest in the project / agenda for the day.

10.2. Challenges

2. Results of GreenCape scoping phase

Helen Seyler presented the results of the scoping phase carried out by GreenCape. See presentation in Appendix 3.

Subsequent to the presentation outlining the 6 challenges, each of the 4 tables (each with 6-8 participants), hosted a discussion in which participants were asked:

- (How) Are these challenges affecting you? Can you prioritise them?
- Are there any key (water & economic development) challenges missing?

3.1 Table Discussion 1 (Jim Petrie host)

General Discussion

Jim Petrie: These challenges aren't approaches to solving problems, they are about framing what the problem is (i.e. once you understand and frame the problem you can solve it). We need engagement to frame the process of planning to solve a problem, it is about problem structuring.

Jim Petrie: The other thing implicit in what is being said – we have a top down planning process.

What would a different planning model look like that gave more voice to all stakeholders and allow more bottom up-planning?

Brett Cohen: the challenge re: tools incorporate a lot of the other challenges: tools can look at the coordinated picture of development, economic productivity could be an element of a tool, the required feedback loop can be under a tool.

Jim Petrie: is there a set of steps that make it very clear where the different stakeholders exercise their input to planning process? This flow chart would highlight gaps

Jim Petrie: we are looking at this as a unique process and shouldn't. Are we comfortable that DWS are implementing state of the art approaches for allocation? Should we look at best practice elsewhere? What have other places with resource constraints done? Include this in the future research?

Herman Jonker summarized: New tools are required to implement a new process in place, that follows the feedback loop. The tools are enablers of the feedback loop – the feedback loop (governance) is the highest priority. The coordinated picture is the fundamental data input to it these aspects.

Challenge re: Demand Projection

Herman Jonker: supply – demand tensions are an outcome of not addressing the other challenges.

Jim Petrie: we know existing industry is feeling the pinch already i.t.o. water quality

Brett Cohen: the projection only shows a 2-year gap with some constraints (2017-2018), but this all depends on certainty of projects.

Jim Petrie: Planning for uncertainty is a classic problem

Marius Meiring: In an open market we can't plan – we don't know which projects are coming. A better proposal may come 1 year later, after a lesser attractive one has been awarded the resources

Jim Petrie: The water scarcity imposes some discipline on the system – good decisions – how do you keep that discipline when there's enough water? Can tariffs solve this? Need much better clarity on the price trajectory.

Chrizzelle Kriel: the overarching problem is the non-establishment of the CMA for Berg – there is no one from the top strategic planning – links to the misalignment in planning approaches

Herman Jonker: Is the water question resolved if we have enough energy – if we have gas, we can pay for desalination, hence have enough water?

Jim Petrie: No even with gas the energy costs remain high, so desalination remains high

Challenge re: Lack of Tools for Strategic Oversight:

Herman Jonker: How sophisticated does the package of tools need to be? A mechanisms to change behaviour?

Brett Cohen: Behaviour needs chancing in all spheres i.e. industry come with low water solutions?

Challenge re: lack of coordinated picture of development

Herman Jonker: The WCIP building on the GreenCape scoping addresses this

Helen Seyler: however the mechanism to house it so all can access (online for decision-makers, industry etc), routinely update it is (as yet) missing

Missing Challenges:

Jim Petrie: DWS award licences to meet demand because don't want to over-allocate a system (i.e. want to allocate only what is required. But is this approach actually constraining development? Will DWS constraint development so that it fits the 3% growth curve – to fit their allocation projection?

Jim Petrie: not enough focus on demand management – and the links from this to water pricing, behaviour change.

3.2 Table Discussion 2 (Kevin Winter host)

Nazeema Duarte: Queried the 1st challenge re: supply / demand challenges, indicating that SBLM has had 20 years of discussion on water resources. There is an optimism within the LM that treated effluent and desalination is going to solve the water resource demand.

Other participants challenged these assumptions:

Fernel Abrahams: indicated these types of treatment are energy intensive, and energy security for the area is also a challenge.

Fernel Abrahams: appears to be a lack of direction: it is unclear which kinds of developments SBLM wants, and which are best for the sustainability of SBLM.

Nazeema Duarte: the problem is that decisions are being made on a first come first served basis – that's how plans and developments seem to occur. Then EIAs are taking place but we don't know if the projects are going forward. The market decides. There is a poor feedback loop of information.

(?): Tools appear to be absent or at least they are being applied in an adhoc manner. Problem too is that development plans are being driven by the NDP and these don't relate to SIPs e.g. SIP5. Also uncertain about how SIP 5 relates to SIP 8. How do tools integrate all these ideas, strategies and plans.

3.3 Table Discussion 3 (Anton Cartwright host)

Challenge re: Demand outstrips supply in 2017-18

And indirectly Challenge re: Misalignment of planning approach

And Challenge re: Economic productivity of water use does not inform water allocation

Nic Faasen: Demand already outstrips allocation: 2 million m³/a over the allocation in terms of abstraction from Misverstand (17.44 allocation), also get water from aquifer (1.44 allocation). Also experience problems with the aquifer, the allocation was lessened by 10% due to concerns over sustainability. Already seeing a decline in projects because they cannot ensure supply (e.g. particular mine project, 2.4 million m³/a required).

Anton Cartwright: Asked for clarification on the stepped increases in the increased allocation from the Berg

Nic Faasen: Summed water demand based on assumed growth and anticipated growth from IDZ area (inc project applications), and based on this, 5 year blocks chosen to coincide with 5 year application process for additional water allocations from the WMA

Mashudu Murovhi: expressed concern that the graph may not be representative and that outcomes of workshop may not be representative of all stakeholders – thus the water demand and planning may not be put in greater context

Evan Rice: provided background to project, and that the study came out of increased development along West Coast corridor – concerns about water supply (which is the wrong questions) – now shifted to availability of affordable water and economic viability of projects

Wilna Kloppers: highlighted that in terms of allocation, you cannot measure everything using economic productivity - use as a tool for prioritization of projects

Nic Faasen: No info is provided to WCDM from IDZ and from DWS people allocating water from Berg River– he is forced to make assumptions, graphs based on the info they have and assumptions they've had to make

Wilna Kloppers: Water reuse potential not adequately considered

Nic Faasen: WCDM did a study to look at alternative water sources (2007-2010), which showed Berg River is the cheapest source (even with treatment costs). His challenges are:

- WMA never gets back to them, applications remain unanswered, not sure what is available in the Berg River, he is forced assume no extra allocation is available – thus look at other options for WCDM, specifically desalination plant.
- Raised concerns on the transparency of the decisions for infrastructure – the dam they chose to build appears to be more expensive than the transfer scheme proposed, cannot investigate any further – not their mandate.

Anton Cartwright: Asked Mashudu Murovhi if the Berg River water has been fully allocated?

Mashudu Murovhi: could not say so

Nic Faasen: there are several complex issues with Berg River allocations: originally the Berg is supposed to supply the West Coast area, but:

- High proportion goes to CT area
- Agriculture does not necessarily use it
- WC cannot access excess when need it
- WCDM has approached farmers for excess water – huge payments demanded from farmers – way more than they have paid for the allocation (overcharging)

Challenge re: No feedback loop for plans for development

And Challenge re: Lack of tools for strategic oversight

Evan Rice: pointed out that we've discussed insufficient communication within the allocation application process – and queried the planning process feedback loop: is the outcomes of pursuing alternative water sources communicated to industry? E.g if desalination costs 5X the current rate per kL, is this fed back to industry / proposed projects, for companies to make decisions?

Nic Faasen: WCWSS Recon Strategy Steercom is supposed to be a means of this coordination– everyone puts needs forward. Supposed to provide a means to get a balanced view. From the WCDM perspective the current allocation is biased:

- CoCT and WCDM both apply for water from Berg

- CoCT has over allocation and they have to buy it from them at a much higher cost
- Anton Cartwright: confirmed - allocation has a hierarchy with agriculture as a low priority
- Nic Faasen: Disagreed – although agriculture appears to be a low priority the water allocation reform says you have to use it or lose it so it can be redistributed – nobody enforces this in agriculture

Nic Faasen: regarding required feedback loop, gave an example of how he heard no response regarding his applications for additional Berg allocation: he only heard it had been declined at the WCWSS Recon Strategy Steercom– nobody informed him or WCDM directly.

Evan Rice: Queried is there a defined feedback mechanism from government to business and business to investors, can they plan according to phases and costs of water?

Nic Faasen: in response, Saldana has been asked to coordinate application process and discuss the applications with them at WCDM. Problem is IDZ industries apply with all sorts of water saving systems in place but no consideration of knock on effects and spinoffs (e.g. additional water required for housing and growth in other local industries/sectors)

Evan Rice: Queried that there are several different players involved in water planning – how do we link them?

Mashudu Murovhi: highlighted there are also different sets of feedback loops (different levels of water planning and allocation) each with different needs:

- Small scale: WCDM feeds info to industries on water availability within their allocation
- Large scale: DWS feeds back info to people who want water directly from Berg (who apply directly for water use license from Berg) – this includes municipalities and other users who want to use the water directly (i.e. don't require infrastructure provided by municipality)

Anton Cartwright: The NWA and NWRS could have provided feedback loops – or at least they were documents that were planned to have this level of insight. We need a framework which allowed big industries to pay for additional infrastructure to support their development e.g. Grey water systems put in place by mining industries in Limpopo.

Challenge 5: Economic productivity of water use does not inform water allocation

Wilna Kloppers: Concerned with idea of economic productivity of water

Evan Rice: queried DWS whether this is taken into consideration for allocation in terms of setting up a hierarchy?

Mashudu Murovhi: highlighted that various questions asked and a framework used for assessment. This includes some socio-economic factors are taken into account

Nic Faasen: Allocation decision requires a socio-economic consideration – but this is simply a response with the indication of % of historically previously disadvantaged individuals in my area in terms of benefit. How do I measure how infrastructure investment (e.g. pipeline, services) that can broadly benefit everyone?

3.4 Table Discussion 4 (Mark New host)

1. Water demand may outstrip supply in 2-3 years' time.

Gottlieb Arendse: Other sectors are also relevant i.e. agri-processing - water is a constraint for agriculture. Agri-processing is part of the greater economic activities in Saldanha LM. Demand is growing in the industry. There is also groundwater to consider.

Henk Mathee: At the LM level, water is usually allocated on a first come first served basis, not enough planning goes into the decision making.

Gottlieb Arendse: How would we go about prioritising different sectors, collating interests, bring together national and industrial agendas? Planning needs priorities - clearly defined priority commodities.

Gottlieb Arendse: Urgencies tend to complicate planning and coordination.

2. No feedback loop

Gottlieb Arendse: There is a need to integrate smaller scale development planning into larger scale development.

Marco Morgan: Regional infrastructure planning is not happening in coordination with the IDP.

Gottlieb Arendse: Regional planning is beginning to delineate planning approaches.

3. Lack of tools for strategic oversight

Zofia Rokita: At a high level strategic oversight is considered to come from the IDP, that the IDP is an integrated planning approach, guided by legislature. But it doesn't have that status at present, it mainly consists of internal processes.

Marco Morgan: IDP is very constraining.

4. Misalignment in planning approaches

Marco Morgan: Everybody has their own priorities and their own preference, own planning abilities, and there seems to be little or no coordination, no clear overall picture for development.

Gottlieb Arendse: Social, environmental and economic planning should all be coordinated, still in preliminary phases on a regional level.

Zofia Rokita: All the resource needs (Water, electricity, roads, skills demand) of the biggest 25 industrial developments, need to be assessed for their needs and benefits.

5. The economic productivity of water uses do not inform allocation.

Gottlieb Arendse: The level of urgency of growth and jobs creation may force planning decisions.

Mark New: So there is no strategic assessment of the SIPS?

Gottlieb Arendse: Some strategic assessment can be applied.

Marco Morgan: There is a need for shared resources, shared opportunities, but methodologies differ. It is difficult to coordinate planning between the CCT metropol and the WC province.

6. There is no coordinated picture

Zofia Rokita: There is a need to integrate various processes at a regional level.

Gottlieb Arendse: There is also the economic multiplier effect, where proposed development drives migration into a region, affecting local resource usage.

Marco Morgan: Assumptions need to be made in planning to forecast human development, settlements.

Zofia Rokita: There are difficulties in accessing information on the IDZ: national level is not very well integrated.

3.5 Plenary Feedback on missing challenges

Jim Petrie: there is not enough focus on demand management through water pricing isn't implemented (*Challenge 7*)

Evan Rice: water re-use is not being looked at and has great potential

Nadine Methner: it seems that options for alternative water resources are available but they are not put into action rapidly enough. There are optimistic views because of them, but they are not implemented.

E.g. desalination & grey water: these are talked about but not implemented – or slow to implement due to red tape. Slow transition to action. (*Challenge 8*)

Gerald Vrolijk: Supports this challenge, because Saldanha Steel have been trying to get hands on grey water and had talks with LM for years – for time to time – but decisions and movement has been so slow

Fernel Abrahams: queried whether fixing leaks etc before new options has received enough attention.

Nic Faasen: loss / leakage reduction falls under water demand management [in water resources planning approaches]

However, consensus disagreed and people would like conservation as a separate challenge (*Challenge 9*)

Mark New: it seems the multiplier effect of development (incoming migration to area – people coming into area adding to demand projection) is not fully considered (*Challenge 10*)

Herman Jonker: this is not so important to understand, as important as it is to know when big industrial projects are coming. Because of the high industrial water use projects, 1 project has huge impact (20% growth in total demand), and the population growth with it may be high, but their supply is a much smaller % of the total, so it is less of a water supply demand problem – not a supply / demand issue but a reticulation issue.

Nik Faasen: 5% of water even at household reticulation problem is huge problem

4. Tea, coffee

Each challenge was listed on large posters, including the 4 newly identified challenges, hence a total of 10 challenges were listed. All participants were asked to continue discussions into the Tea break, and on the way to tea, to add 4 (coloured) post-it notes, labelled 1 (yellow), 2 (yellow), 3 (green), 4 (green) to the 4 challenges they feel are a priority, and in order of priority.

10.3. Proposed Solutions

5. Overview of proposed solutions

Helen Seyler presented an overview of the proposed solutions to address the challenges identified in the scoping phase, which forms the future phase of the project: i.e. the WRC and DED&T co-funded phase. Each proposed solution was then outlined in a 5 minute presentation by the solution ‘champion’ (the research supervisor). See presentation in Appendix 3.

6. Discussion: Shaping solutions

Each table hosted a discussion on 1 of the solutions (i.e. each “champion” sat at a separate table). A “world-café” style discussion session followed whereby the participants were asked to select the solution they felt most drawn to. After 20 minutes the participants were rotated and visited another table. There were two rotations hence each participant visited 3 of the 4 tables (solutions), and each table therefore had 3 new conversations on the proposed solution. The following two questions were posed to direct the discussions:

- Would these solutions be effective for you?
- Can you see a way to improve the proposed solution?

6.1 Table Discussion 1: Water Exchange Network (Jim Petrie host)

1st Group

Jim Petrie: started by prefacing what has been done so far – the preliminary investigation was a final year Chemical Engineering undergrad project, which mainly had support from 3 main industries, each of which expressed concerns of the quality of the water they can access. The project assessed if we only look at salinity, is there an option to combine water through the system that optimizes it? We are now interested in the perspective from the LM & DM, as we (DED&T & GreenCape) and these 3 players would like to see it expanded / done in more detail / along with upgrading WWTW.

Henk Mathee:

- A WEN it is something that will have to be done. The main stumbling block is who initiates it. How will the treatment costs be handled? (All treatment is SBLM responsibility, provision is outsourced to WCDM). The WCDM used to act as WSA, now only acting as a WSP. Hence, assets are going to be transferred to LM, the WCDM is only going to do purification and distribution on their behalf.

- The implementation of a WEN (decentralised treatment) links to a decision on large-scale centralised re-use. Thus – we need a decision in terms of where we are going – are we upgrading the central WWTW for re-use or not (because of desalination or additional from Berg)?

Marius Meiring: there are expansions on the table at moment for Saldanha WWTW, to get waste from 3 WWTW to a central WWTW (Saldanha's), and reticulated for re use. This option is on table, to treat for future use, but the future use hasn't been allocated. Some going to Saldanha Steel, some to IDZ.

Jim Petrie: I sense it is done on first come first serve basis. Or leverage based on size of end user – whoever is prepared to co-fund the pipeline for it to be done.

Henk Mathee: Confirmed, SBLM would ask proposed projects / water users to pay for the pipeline. It is currently a problem that water is too cheap.

Jim Petrie: decision made?

Marius Meiring: it is a strategic objective, not funded – just a concept at this stage.

Helen Seyler: queried the responsibility split between re-use and desal, between the WSP and WSA (or WCDM and SBLM)

Henk Mathee: indicated that re-use is SBLM to implement, not WCDM, because it is a local supply and using the local infrastructure. Desal would be WCDM because feed into Bassantsklip, and main Withoogte pipeline, and therefore regional scheme.

Jim Petrie: this raises question about operational risk between decentralised infrastructure – more hands to the wheel – makes it hard for the LM to manage, and the LM hasn't got the experience (WCDM has been acting as their WSA – must now shift to WSP only). These complexities are further compounded when introduce industry players in the mix.

2nd Group

Jim Petrie: provided an introduction shaping the discussion to follow on from the 2st, that a WEN is a decentralised system and a demand management opportunity. It requires a more interactive relationship between supply from district, water management and wastewater management by LM, and industry productivity. It places industry as users more centrally into the matrix – rather than a taker of water and a handover of effluent. He questioned the participants if they see value in exploring further – and how this should be taken forward.

Nik Faasen:

- I see the WEN as an absolute opportunity. The WCDM supplied potable water isn't right for their processes, they don't want the added lime / added chemicals/ natural salinity. WCDM is producing to potable standard but can't treat to their standard. Industry therefore use membrane technology. There is a responsibility from end user to re-use, and use as effectively as possible. And yes, they will pay less for this.
- Water that's not being used for potable will take huge strain off the potable scheme – so anything that can takes off the scheme is real benefit. Must move away from using potable water to spray for dust like at the shipyard. We should make industry look at desal as well, but make it their responsibility to bring online. Take industry off the scheme completely.

Jim Petrie: this approach places industry in a much more pro-active position- the governance structures need to accommodate this.

Rajiv Paladh: eThekweni won the recycling project from implementing WWTW re use for industry. Challenge came in for cost for connector infrastructure from WWTW to industry. If short distance it works well.

Gottlieb Arendse: The 15% reduction in demand can have an interesting implication for SBLM – money income.

Nik Faasen: indicated this is not a concern, the capital levies would be raised to make the shortfall

3rd Conversation

Jim Petrie: provided an overview of discussions so far, and highlighted that he is keen to understand what is the net impact of pricing of this, and where if you think methodology has merit, how we make it more robust?

Jim Petrie: starting with Arcelor-Mittal (A-M), what are their water (quality) requirements?

Gerald Vrolijk: the LM isn't listening. For 5-6 years we wanted to use more treated effluent. I know at one stage we were ready to put the pipeline from Vredenberg to our works, it was for some reason halted. It got complicated in dealing with other industry offtakes. A-M got no assistance from the LM / province.

Wilna Kloppers: sounds great, makes sense, use a lot of cooling water – why use clean water for this? Effluent quality is a problem for the bay too – so this solves two problems.

Herman Jonker: summarised that actually there are 2 potentially competing proposals:

1. to centralize the waste from 3 WWTW for the LM to distribute for re-use (Saldanha, Langebaan Vredenberg) which is only viable with a large volume. It may be because of this project that the LM doesn't want to allocate treated effluent to A-M – they want to keep the large volume until there's more certainty
2. decentralised WWTW across the area,

Herman Jonker queried whether a WEN between industries can be implemented in either case, however a decentralised local WWTW in Saldanha could perhaps more easily participate in a WEN than a large central plant

Jim Petrie: Operational and cost considerations on whether to centralize or decentralize – better able to manage centralized plant.

Zofia Rokita: This area is large and centralised WWTW would require large connection of waste water & long pipelines. This is very far and costly. Furthermore, the centralisation of 3 plants will not work – the 3 being considered for consolidation have each been upgraded already.

Wilna Kloppers: the WEN is a similar thing then to the Waste sector (i.e. GreenCape's WISP programme). However, for water it is far more complex because of governance – in waste it is an open market, but now it takes into account decision makers, the Act. If water was a free market it is simpler. How would a WEN be started and implemented?

All: GreenCape to do the pre-feasibility, and government will have to (find a way to) start once feasibility is proved

2.2 Table Discussion 2: Governance (Kevin Winter host)

Kevin Winter: Would a governance framework be useful? The weak spots have to be addressed. Based on earlier discussions, it is clear that there are gaps within existing mechanisms aimed at integration within the governance systems. We can't overlook the fact that a number of policies and forums exist aimed at integration.

Marco Morgan: There is a lack of coordination. Before proposing solutions it's important to begin by understanding the existing framework and then identify the weaknesses. After identifying the weaknesses, only then can practical solutions be put into place. There are multiple forums and stakeholders all looking at Saldanha, there is a need for an extensive critique of existing governance.

In the public sector what makes integration difficult is that fact that everyone is working within their mandate and jurisdiction. Focus is placed on the tasks you have to do and not so much on what other sectors or even colleagues are doing. Different criteria's for decision making are used and this further contributes to a lack of coordination.

Nazeema Duarte: We've often found that mandated IDPs take up so much time making it difficult to tie in other policies. In government decisions are be made based on policies. Policies differ, the question to ask is Where can we best make joint decision making? The Greater Saldanha task team is trying to address these issues of governance misalignments. It is important to look at the strategic level of things (district, local, provincial) decisions are made on a strategic level and at the operational level and these will obviously influence how you make decision making

Nazeema Duarte: Saldanha is difficult and it's challenging because plans and initiatives are being made from local to national. When working at the local level, decisions from the top (Provincial/National) are passed down to us (LM) and we follow. Matters of hierarchy must be taken into account. You will find that decision making is highly top down.

General discussion:

- You might find that forums might not be integrated themselves, which is also problematic.
- What we have found is that there isn't a clear provincial vision, everyone has conflicting and diverse visions, and different departments speak different languages. This is problematic with regards to an integrated governance system if everyone has a different perspective.
- What would be useful? A system that would improve or contribute to the different levels (provincial, local or collectively).

2nd Conversation

Evan Rice: Interest lies in seeing the gaps in governance. Furthermore, as much as Saldanha is a case study, how can the findings be used Saldanha as a case study, how can findings be applied in other contexts/be used broadly?

Marius Meiring:

- The IDP is supposed to address these issues (the gaps). It is intended to guide development in an integrated manner. However, the municipality appoints a consultant/consulting firm to do the IDP. But working with consultants impedes consistency. Consultants come and go, are taken on board in one phased and in another phase we might work with a completely different consulting firm. IDP's have become more compliance driven, there is no sense of ownership to the IDP by the municipalities themselves.
- It's important to have a common vision for Saldanha (by local to provincial, national). At this point local municipality is just reacting to vision passed down by the national. Linkage should be within the IDP. There is also an added issue of budget lead planning versus planning to inform budget. .

Herman Jonker:

- Water planning brings different components of planning, often water planning doesn't address water issues. Allocation and implementation is an outflow of planning.
- It's important to identify what does the legislation say about water planning, then look at projects, how do they translate what the rules say about planning. Find out what principles are subscribed to guide planning. Look at what are the outcomes of these plans i.e. is it resource optimization, employment etc.
- Different spheres of influence and thinking exists between water resource management and these should be taken into consideration.

- Water is used for different purposes and by different users and this will have a great influence on the thinking behind planning and decision making across and within departments and legislations. (for example just between Department of Environmental Affairs and Department of Water and Sanitation planning and regard of water will differ).

Nadine Methner: There seems to be a lot of abstract thinking, wishful thinking. Resource constraints must be considered prior to planning. Constraint informed or lead planning is required.

3rd Conversation

It is important and necessary to understand the governance system and structure of SB area. Find out about the existing processes, gaps and challenges. Once this is known we can identify main components of the framework

Mashudu Murovhi:

- How can integration be improved? At the moment approach to governance is transversal. We should be looking at how can we plan better and the different role players involved (provincial, national). It's important to consider the complexity of the governance structure.
- Look at the All Town Reconciliation studies. These address future water plans.
- We are the authority in terms of water authorizations, discussions here seem to be over potable water and the department isn't really involved in this. Potable water is for the municipality to provide, the department provides water to the municipalities.

Annabel Horn: It is important for you to investigate on what industries are going to be there. Find out what is happening with the infrastructure, businesses are changing their minds. Even SHELL doesn't know who to ask if they should leave or stay. Finding this information can aid industry. Find out what is happening with the harbour. The rise and fall of oil must also be looked at. At the moment it isn't feasible to bring in an oil industry.

Mashudu Murovhi: Draw key decision makers, where they can interact on and this should form part of the framework. The framework should aim to be proactive as opposed to reactive. Governance structure can be a pool factor where it's about drawing in the right people. You need to pool the most relevant government structures, actors, everyone that plays key roles, start by looking at the department then municipality (work your way down).

2.3 Table Discussion 3: Cost-Benefit Analysis (Anton Cartwright host)

1st Conversation

Nic Faasen: Supports that this method is the only way to look at allocation objectively and scientifically, and balance science with personal social and political agendas. It's a tool to make a decision – filter technique. But it still highly dependent on your weighting system – needs to be stakeholder agreement on criteria and weighting. Some things are not subject to analysis (the reserve). Analysis can be used as a tool to prioritize projects

Anton Cartwright: What was the unit of measure for the WCDM study on alternative water sources?

Nic Faasen: Several factors considered (socio-economic factors, cost to end user), mainly expressed as availability of water

Mashudu Murovhi: Positive about this analysis – it needs this sort of intelligence. It corresponds well with their intentions, and links to their government departments and legislative strategies for strategic water use (Section 27:NWA) – we will listen to a cost benefit approach. Need to also consider job creation and other considerations in NWA

Annabel Horn: Concerned about environmental elements in cost benefit analysis – often contain contrived / subjective estimates, also job numbers and other social estimates are essential component to have the analysis taken seriously (e.g. Table Mountain study by WITS).

- Exact considerations used in their allocations with additional measures (e.g. HDI inclusivity).
- HDI also varies between sectors (e.g. agriculture 40:60 while other industries may be 30:70)
- Applicants form a trust to get around requirements – different mechanisms

Nic Faasen: To look at the bigger picture industry has to be supported as well as agriculture, although agriculture is a large part of economy water needs to be made available for other sectors

Annabel Horn: Need to consider who are the real end-consumers of our water

- 70% of agricultural produce is exported
- Agriculture is always associated with food security when its linked to exports
- 40% BR water is allocated to agriculture where 70% of outputs exported to EU, where there is huge amount of food wastage

Cathy Pineo: Look at whole system / value chain and available reserves, not just a sector approach.

Anton Cartwright: Direct focus to where you can make the most money

Cathy Pineo: possibly need to trade-off with job creation

2nd Conversation

Henk Mathee: Definitely a useful approach but depends how it is used and implemented

Anton Cartwright: How does water allocation work for existing users and new applications?

Henk Mathee: In LM water is allocated on a first come first serve as long as you can pay for your licence and the water - most likely using more than in reserve

Anton Cartwright: What about future projects that may be better?

Nazeema Duarte: We just find water for projects, nobody ends up losing out or having water reallocated but desal water will be very costly – no real mechanism for reallocation of water within industry

Henk Mathee: R4.60/kL in Saldanha to R12 /kL for desal water

Nazeema Duarte: We should mix the water to lower cost of desal, also CoCT and many other municipalities are looking at greywater systems and we're not.

Anton Cartwright: Could you implement thresholds to screen projects and allocation? E.g. Project has to be able to pay at least R2/kL to be considered, job creation, water efficiency benchmarks

Henk Mathee: Difficult for other sectors (e.g. agriculture) – pay very low rates for water

Nazeema Duarte: Required for food security and jobs

Nazeema Duarte: Food is not grown for export in Saldanha area – dry land agriculture, water used for household use

Gerald Vroilik: Industry perspective – we're doing fine, no problems with cost of water but not sure of the supply capacity available to us

Henk Mathee: Water is still too cheap for industry, not an incentive for conservation efforts

Gerald Vroilik: Ideally like to pay less but more concerned with availability. Want to use LM grey water but struggling to get LM to come to the table

Anton Cartwright: This analysis won't look at alternatives but at how to allocate available water – would you feature highly on a job per drop basis?

Gerald Vroilik: We employ 600+ workers

3rd Conversation

Anton Cartwright: Do we look at water allocation per sector or per project (do we make sectors compete?)

Gillian Sykes: We want sectors to compete, various trade-offs are happening (usually just a focus on jobs) but we are not made explicit on the underlying assumptions

Rajiv Paladh: Agree but run analysis and let outputs drive debate about the competition between sectors

Evan Rice: Is the analysis purely economic?

Anton Cartwright: Multi criteria – jobs, socio-economic, profit – not just GDP

Evan Rice: So it is mainly economical – suggest breakdown of jobs into rural and urban for decision-making purposes

Anton Cartwright: Tricky as projects will be submitted via Saldana or West Coast – difficult to look at rural jobs, however possible water use can be traced along the value chain to broader areas (?)

Rajiv Paladh: Can we quantify the value of a project to a Saldanha resident – jobs in agriculture sector benefit the resident how?

Gillian Sykes: Analysis assumes there's finite water – not necessarily the case, also types of job should be considered and made explicit (i.e. skilled, unskilled) in addition to economic benefit and multiplier effects

Fernel Abrahams: Also consider within a project or area how much water is available for reallocation

Gillian Sykes: WCDM using some of CoCT unused allocation

2.4 Table Discussion 4: Spatial Water footprint model (Mark New host)

1st Conversation

(Gottlieb) It could be an important tool for spatial management, with huge benefits for the BR and other catchments.

(Mark) How would you use it if you had it available?

(Gottlieb) It would be interesting to consider agri-processing versus other sectors' demand, looking at the water demand of other products, the cost to produce, intensity of agricultural production, also looking further along the value chain, including processing.

(Chrizelle) Will the tool be used for the entire BR?

(Mark) Yes, for the whole catchment.

(Gottlieb) It would also be interesting to consider the impacts of alien clearing, measuring the water lost to alien vegetation, to estimate the cost of action vs inaction. It could be used to inform on what interventions are feasible, in terms of quality and availability, and to determine the greatest impact of interventions. It would be a useful tool to apply in determining criteria, finding optimal applications.

(Chrizelle) It could help to establish a common vision for Saldanha, taking into account what happens in the whole BR area. It could allow for priorities to be more transparent, clearer.

(Gottlieb) It could be used to determine the differences in water usage between different land uses, between economic activities, even commodities, housing/social, to help determine the best allocation.

(Chrizelle) The BR is also an attraction, conservation is important.

(Zofia) Money is spent on water treatment, and the provincial government approves projects based on perceived economic gains, but more information is better for planning; to indicate the viability of options.

(Gottlieb) The catchment management would certainly use the tool as it is better to rely on data. It can be difficult to access information, and the agricultural space is particularly problematic (data incomplete, inaccessible). It is important to also consider the scale of the planning - more local level planning would be enabled by an integrated data tool.

(Mark) There is always some uncertainty involved. However, this would provide a good opportunity for ground-truthing and refining estimates. We know more or less what best practice, common practice and worst practice will deliver.

(Gottlieb) It is important to consider how to improve, verify the data, to improve regulation.

2nd Conversation

(Mashudu) What data do you currently have?

(Mark) We have a large collection of government sources, from which we will extract relevant data.

(Mashudu) I assume that there will be the development of a formula to calculate various parameters, determine errors? What methodology will be used to determine water footprints?

(Mark) We need to acknowledge that the tool will essentially work as a lookup table for records, find estimates based on best practices/common practices, to come up with a range within which our footprint should fall. It will be calculated mainly from theory, and we will hopefully then verify our calculations/estimations. We can use our estimates to verify the data by asking users for their own estimates/records to contrast and compare.

(Annabel) Pegasys used global figures for estimation, our model does not take local factors into account.

(Mark) We will be using more local indicators, more tailored estimates.

(Mashudu) There seem to be many established models doing the same calculations, but not getting the same results.

(Mark) This is about taking what is known and incorporating it as best we can.

(Marco) Will it be like a snapshot of water use?

(Mark) Not exactly, estimates are more related to bulk water supply.

(Mashudu) What about water licenses?

(Mark) We know how much water is allocated and how much is taken out, with an independent measure of how much water is allocated. This footprint model will attempt to reproduce/approximate that.

(Annabel) A useful tool would be an online interactive tool, to be used by consultants, where one may plug in variables and get a result out. But the formulations and assumptions must be made available/transparent.

(Wilna) How much detail will be included?

(Mark) The model will definitely be able to differentiate between different crop types, some commodities can be even more specific.

(Mashudu) It would be good to set up a meeting with the department to look at verification processes.

(Annabel) You could start with the Breede-Gouritz CMA, look at what they are doing in terms of validation.

(Mashudu) the project is also about the principle, contribution from government.

(Annabel) It would be good to look at the history of water allocation, for example, per crop. Also to consider the regional development in an historic sense, taking into account the justice aspect.

(Mark) Yes, managed conservation areas are included.

(Wilna) Are natural/conservation areas included? It would be good to indicate the quality of tributaries and sources, where they may influence water quality.

3rd conversation

(Mark) The model will attempt to present current water footprints and those of proposed activities. It would then be possible to analyse water consequences related to planning and development. The baseline of the model will be current reality. Effects of changes to the current status quo will then be calculated based on whatever changes are made. This tool will be designed for strategic decision making processes. Water use will be determined; supply vs demand.

(Nic) What is the typical demand per industry? An overall picture would be useful.

(Brett) Do we have layers of existing industry?

(Mark) We can do estimates for certain sectors, we don't have those layers at the moment, but we are looking at accessing them.

(Mark) What is entailed in master planning?

(Nic) Essentially the planning of infrastructure, the direction of development, and those applications that are being considered. It tends to be more zonal, while municipalities are more focused on a smaller scale of service delivery. The GIS system can be a "check" system, used for finding correlations.

(Marius) We also need to look at seasonal variations.

(Nic) Some of the major challenges include offsetting fluctuations. The master plan indicates overall water demands.

(Marius) What about water storage in peak rainfall for use in drier seasons?

(Brett) It would also be useful to break down water demand according to water quality.

(Nazeema) Would the GIS include other water sources, such as aquifers?

(Mark) We could use the model to analyse demand vs supply, considering outside sources, but we are not trying to balance supply and demand, simply to model current and proposed demand.

(Nic) The model should be for collating demand and analysing demand, not allocating water.

(Nic) The main industries for Saldanha comprise quite a substantial part of the water demand.

(Nazeema) Why does the supply graph show only one point where there is not enough supply?

(Nic) that is based on licence allocations, although projected increases in supply are not yet approved.

10.4. Plenary, summary and way forward

Each table host shared some key insights from the café conversations (incorporated in the main body text, section 4).

Helen Seyler thanked all for giving up their time for the workshop, and described the way forward:

- the workshop report will be shared with all stakeholders
- the project team are committed to ensuring that the research is relevant to the needs of decision makers and is implemented, hence close collaboration with stakeholders is required. GreenCape will be in touch with stakeholders to constitute a steering committee and reference group. Furthermore, individual aspects of the project will require 1-1 participation with certain stakeholders.

As closure, each participant was asked to share a parting comment, either reflecting what they felt was positive from the workshop, or raising any unanswered concerns they have:

- Marco Morgan: congratulated the project on spending lots of time understanding the problems and challenges. We often rush into plans and frameworks without understanding the challenges
- Henk Mathee: concerned that the key people from SBLM are here, and questioned the reason. Helen Seyler indicated those in water resources planning were invited, confirmed, but have not attended.
- Zofia Rokita: highlighted that the WEN is particularly interesting – but – implementation will be a challenge
- Gillian Sykes: So useful for background context for WCIP – better understanding the different drivers
- Gottlieb Arendse: hopes the tools will be useable upstream in the Berg also, and link with the BRIP
- Marthinus Van der Walt: Interesting conversations and suggestions, will see how unfolds
- Mark New: Discovering we can make use of the water master plan
- Mashudu Murovhi: the research is asking correct questions, but it is also important not to ask questions at each and every point otherwise we miss key point, become too diverse in a mist of questions – focus
- Evan rice: enthused by the variety of people interested in the proposed solutions
- Annabel Horn: where is water information sitting (DWS), and how do we repair the databases to understand the detail. This is the only way to get to the reality of where water is. Perhaps it isn't something for this project to take on, but in future by ACDI
- Nik Faasen: lots of good ideas and getting a tool or model of coordinated decision makers will be useful – but it must come to action at end of day, not more meetings.

- Cathy Pineo: overwhelmed by the complexity of it – great response of how people want to tackle it and navigate and assist. Concern regarding a sector based approach to CBA, this doesn't often take into account value chains/ greater picture.
- Anton Cartwright: water sector 10 years ago discussed the same issues as we did here, in 2005 when we talked about water allocation reform (WAR), but the difference is back then it was with funders and international support and (then) DWAF, but today it is including users. This is a major shift.
- Wilna Kloppers: the 4 proposed solutions are amazing package, if they can be integrated the outcomes will be really positive. Then apply wider catchment.
- Herman Jonker: Neat digestible package of a framework. Concerned that water issues are really just planning issues – good planning is difficult
- Brett Cohen: The implementing interventions should start right at the start, throughout the 3 years
- Chrizelle Kriel: encouraged the project to continually share info and data. We cannot wait until 3 years when the product is ready.
- Jim Petrie:
 1. I'm not sure I understand how the decision-making processes work around water allocation. No one at the tables knew. We know DWS ultimately approves the allocation. But, we need, in relatively short order, a decision tree as to who makes what decision when with what info and when were what stakeholders are consulted. This will show gaps in our knowledge and gaps in the process.
 2. CBA – I hate that term because it is loaded. Careful not selling something other people assume is different. We are in values based decision making paradigm.
 3. A comment to Mark and ACDI: we are not being ambitious in this project – to the academics – there is no need for a MSc thesis to take 2 years. The WRC is a good funder of this work – they would fund more students – my challenge to you is to get 2 master's thesis per project
- Helen Seyler: it's a very positive outcome for me to take ideas you've developed over some time with various 1-1 inputs and small group inputs, and present to a wide group and get such positive feedback. However we now have our work cut out for us as the workshop raised more complexities with the status quo, and with the potential solutions.
- Marius Meiring: highlighted need for coordinated planning – and is positive that the interventions are on the right track.
- Fernel Abrahams: a very complex set of exchanges need to happen – data and information, stakeholders, interest groups. I'm curious about how we actually implement. When do we start doing that? In 2 yrs? What kind of buy in form political leadership across 3 spheres.
- Kevin: governance frameworks are in an academics space. I'm scared of them for water as there is a wide range of stakeholders in water, and we're often wrong when trying to understand them. Having spoken to various government stakeholders does give us an opportunity to understand the gaps, find out where the decision making is taking place. Perhaps the typology is the first place to start.
- Nadine: this type of interaction is so important - especially as academics.
- Rajiv Paladh: innovative, interesting, concerns: issues around communication in stakeholders – then how will the findings be implemented??
- Mosa Makutsoane: appreciated the different insights received – I came in v confused about governance – still confused – have a lot of work to do – existing how decision are made important
- Gerald Vroilik: the actions are good, lots of barriers, lack of tools.... Break lots of barriers.
- Nazeema Duarte: the issues are important, and you should find them important too, ensure you bring all these results and get to the right people at the right time