

A case for integration: water resource and development planning in the Berg Water Management Area



Main insights

The Berg Water Management Area's (WMA) planning systems are not structured or equipped to undertake integrated decision making. In the system, water resource development and economic development planning are viewed as separate rather than interdependent and necessary processes for achieving local and regional development goals.

In the absence of a regional water utility, the Western Cape Government should play a more prominent role in (a) supporting municipalities to include water resource and economic development planning in integrated development plan (IDP) processes and in (b) providing local authorities with capacity to implement future water resource augmentation projects.

Whom this policy brief is for

The brief is written for **government planners, consultants, and associations** involved in **water services, water resource and economic development planning**. It focuses on the economic risks associated with future water constraints in the Berg WMA and advocates for the use of integrated planning approaches to ensure the smartest use and development of water resources.

What is covered

The brief provides answers to the following questions:

- How will future water constraints impact the Berg WMA economy?
- How are water resource and development decisions made in the Berg WMA?
- Which factors are limiting integrated water resource and development planning?
- How can Western Cape Government and local municipalities plan for 'smart' use and development of water resources in the Berg WMA?

How will future water constraints impact the Berg WMA economy?

The Berg WMA is a heavily utilised system, supplying water to a number of local municipalities, including the City of Cape Town metro. It is also a 'constrained catchment', meaning **all readily available water is already allocated**.

The Berg WMA will require 45% more water by 2040 due to population growth and climate change

Cape Town currently uses the most water in the region, and the city's future population growth will place a major strain on water resources. By 2040, the city will account for 80% of all urban water requirements and 45% of total water required within the region.

Due to predicted changes in temperature and rainfall, the region's largest agricultural water users, Swartland, Drakenstein and Stellenbosch, will need more water to remain sustainable. The most important crops in the region – grapes, stone fruit, and citrus fruit – are expected to respectively need 34%, 29%, and 35% more water.

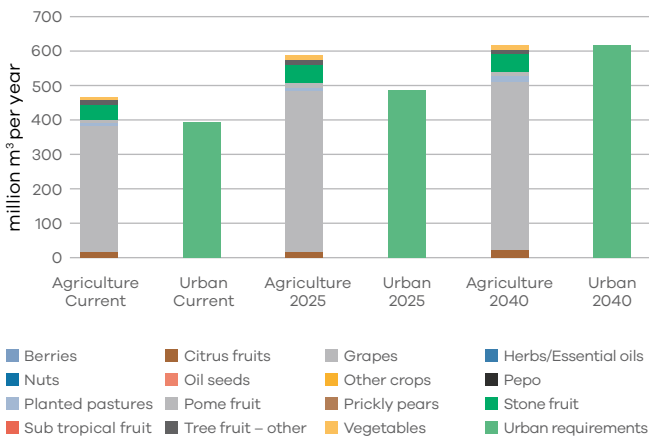
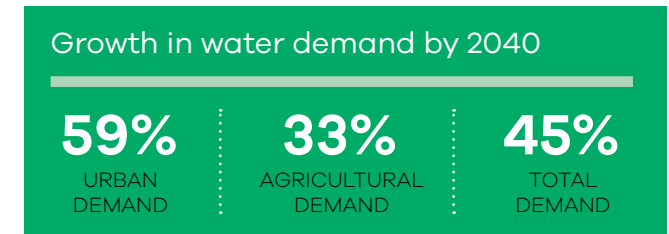
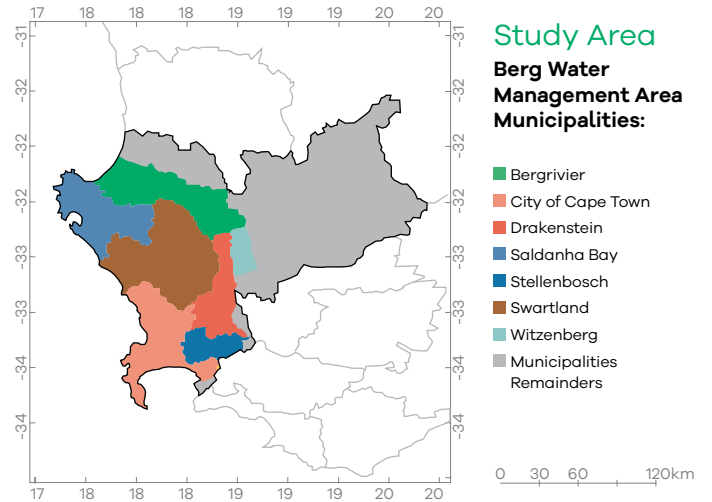


Figure 1: Irrigated agriculture and urban water requirements per year (current, 2025, 2040)



In 2025, the supply deficit will be most keenly felt in the agricultural sector, accounting for 87% of the total deficit.



Growing demand for water could result in major supply deficits across the Berg WMA

Barring any additional allocations or augmentation schemes (see green box), **the water supply deficit is forecast to be ~300 million m³ per year by 2040, 36% of the current regional water requirement.**

In 2025, the supply deficit will be most keenly felt in the agricultural sector, accounting for 87% of the total deficit. However, this picture changes dramatically by 2040, with an almost even split between the supply deficit of the urban and agricultural requirements, driven largely by population growth in the City of Cape Town.

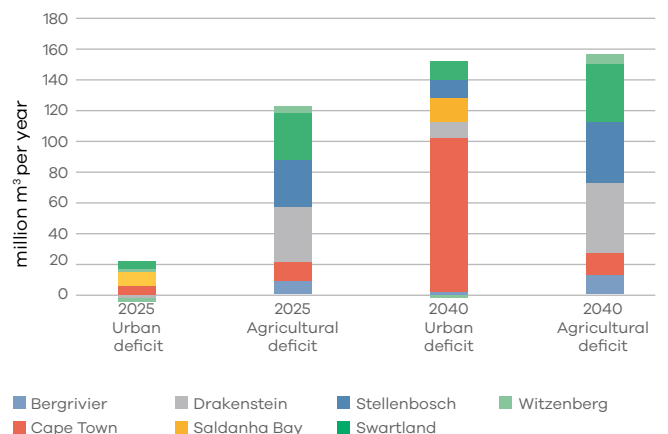


Figure 2: Urban and agricultural supply deficit in 2025 and 2040 m³ per year

Future water constraints could severely impact economic growth and job opportunities

The future water supply deficit is projected to cost the region more than R146 billion and almost 650,000 jobs per year by 2040.

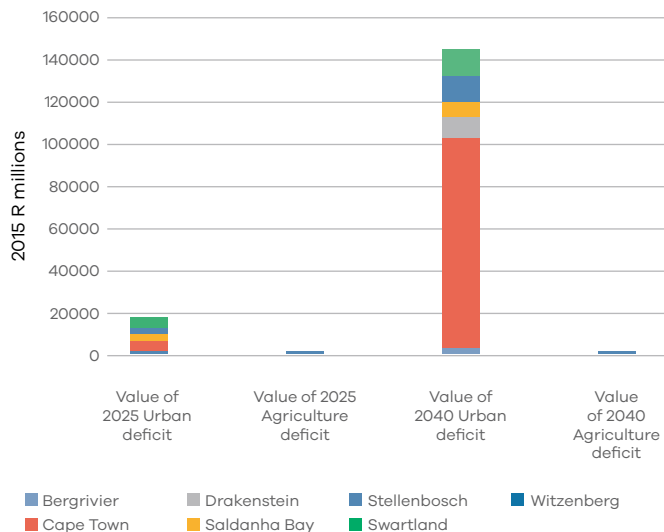


Figure 3: Value of water supply deficit in 2015 R billions as suggested above for agriculture and urban sectors in 2025 and 2040

By 2040, the City of Cape Town's opportunity costs, at R100 billion per year, far outstrip any other municipality. As the primary driver of economic growth and employment in the region, this could have severe economic and social impacts for the entire region.

While the magnitude of Cape Town's opportunity costs justifies investment in water supply augmentation for the city, Cape Town alone should not be the entire focus of water conservation or water supply interventions. Smaller economies, especially those most reliant on agriculture, particularly Swartland, Drakenstein, and Stellenbosch, will require substantial volumes of water for irrigation and growing populations.

Integrated planning approaches are needed for smart water and development planning

The augmentation schemes being planned and implemented may not be enough to meet growing water needs. Strategic decisions will need to be made to prioritise water resource development and to allocate water to development projects that generate the most economic and social value.

Strategic decision-making will require consideration of competing and often equally important economic,

social, and environmental priorities. However, the current institutional structures and planning processes in the Berg WMA either (a) lack the appropriate structure, alignment, and/or mandate for this integrated planning approach; or (b) are appropriately structured for integrated planning, but not meaningfully implemented due to lack of tools, knowledge, capacity, and/or time.

On the ground, this translates to a planning system that is ill-equipped to address the challenges that are inherent in a constrained system.

The future water supply deficit is projected to cost the region more than R146 billion and almost 650,000 jobs per year by 2040 if no new water resources are developed.

Both urban and agricultural sectors will feel the water supply deficit equally by 2040. That said, 99% of the opportunity cost of the supply deficit will be generated by the urban sector due to the vast difference in economic value generated by water in agricultural and urban sectors.

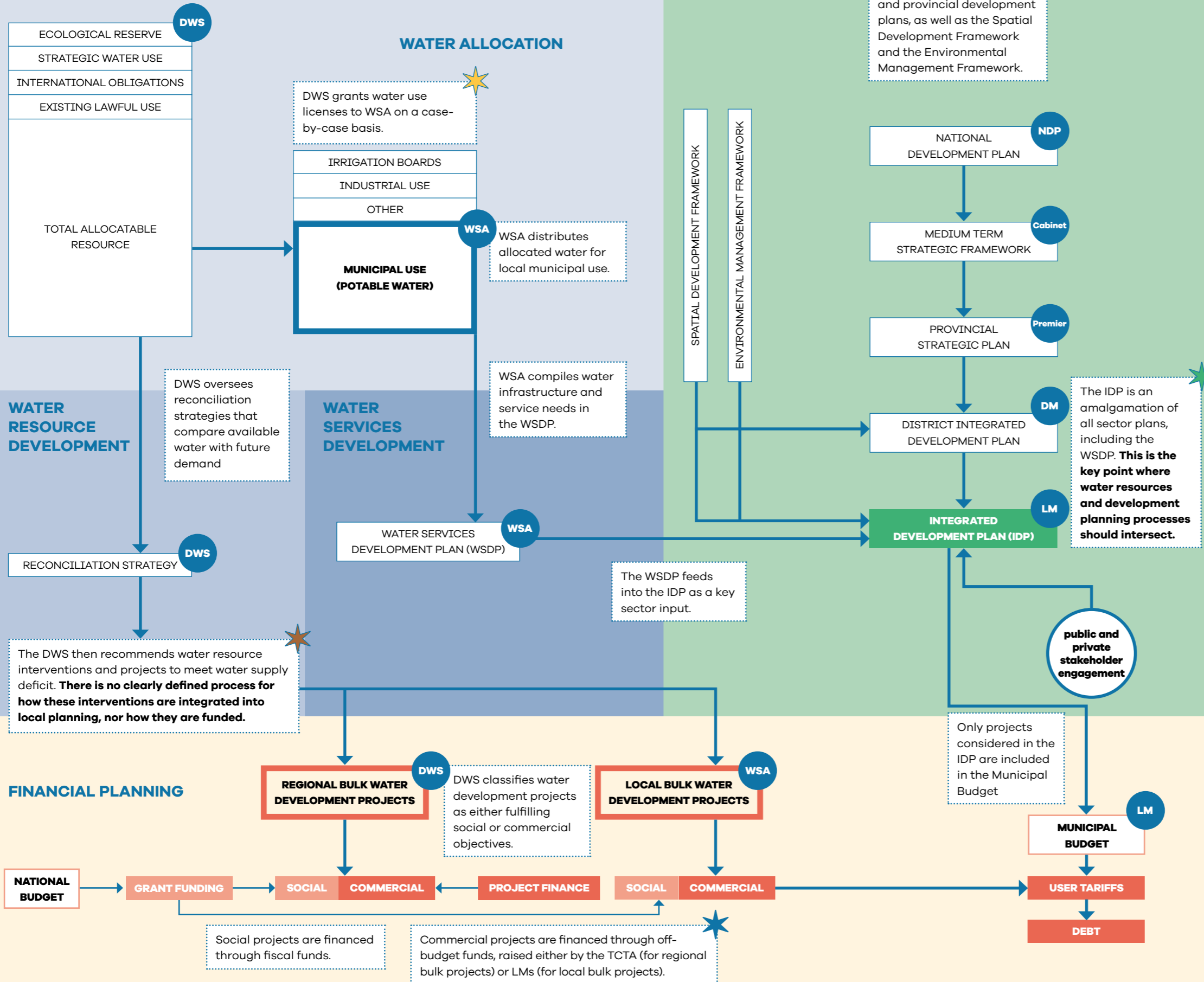
Berg WMA augmentation schemes

In response to the 2015 – 2017 drought, several water augmentation schemes for the Western Cape Water Supply System (WCWSS) are in various stages of planning and implementation. However, even with the addition of the earliest possible supply augmentation scheme, Voëlvllei (predicted to come online in 2021), and the implementation of new emergency schemes for the City of Cape Town, the total system yield will still fall short of total allocations. A number of new supply schemes will need to be implemented urgently to meet the continued growth demands of the system.

The magnitude of future supply deficits justify the urgency to secure new supply schemes, which must be implemented rapidly to avoid significant economic impacts. (As noted, the deficits quoted in this brief do not take into account planned augmentation schemes. The purpose is to demonstrate the opportunity cost of not developing augmentation schemes in time.)

How are water resource and development decisions made in the Berg WMA?

The planning system comprises four relevant planning processes – **development planning, water allocation, water resource development and water services development**. Within these processes, water and economic development are each generally treated as independent variables in the planning of the other.



Which factors are limiting integrated water resource and development planning?

- ★ **Planning processes function in a top-down manner**
National development goals inform local planning but are not necessarily compatible with the local municipality's (LM) available resources, budgets and capacity. There are few feedback loops for LMs to voice their constraints, ask for support or to call for changes in overarching plans and strategies.
- ★ **Projects are assessed on a first-come, first-served basis**
If a water use licence application or an environmental impact assessment meets the required criteria, it cannot be declined in favour of an application, not yet submitted, which may produce a more socially or economically favourable outcome.
- ★ **Water Service Authorities (WSAs) are often unable to develop local water resources due to lack of capacity and resources**
WSAs are responsible for local bulk water resource development, but this is a role that they have struggled to perform. In the absence of a water board or regional water utility, WSAs turn to the Department of Water and Sanitation (DWS) to solve water supply issues through the development of regional bulk water schemes, which often do not adequately address local water development needs.
- ★ **The IDP is not required to consider water availability and demand, nor does the IDP process demand a discussion of how development will impact natural resources**
The IDP simply includes a recognition of currently available water resources and potential future water availability, as informed by the WSDP. It does not provide meaningful considerations of future water resource or supply interventions, which is often missing in the WSDP. Therefore, high water-demand development is often planned without assessment of available water resources.
- ★ **Municipalities lack the capacity to raise off-budget finance for water infrastructure projects**
Because grant funding from the state is only relevant for water infrastructure projects that fulfil a social objective, if a project is deemed 'commercial' or a mixture of the two, a percentage of the cost will need to be raised by either the Trans-Caledon Tunnel Authority (TCTA) (a public entity responsible for the development of off-budget bulk water infrastructure projects) or the municipality. Local projects typically fall below the TCTA's financing threshold, which means responsibility is often left to the municipality. This presents a major challenge for LMs because they often lack the required capacity and creditworthiness to raise off-budget project finance.

How can Western Cape Government and local municipalities plan for 'smart' use and development of water resources in the Berg WMA?

In order to ensure the smartest use and development of water resources, local and regional institutions need to adopt strategic approaches to better integrate water resource and economic development planning.

They should prioritise the following interventions:

- **WCG should support WSAs in coordinated water resource development planning**

In the absence of a regional water utility or water board, involvement of provincial government is the most obvious way to provide a feedback loop within planning processes from local to national levels of governance, as well as to incorporate water resources challenges into regional development decisions. Provincial government's Sustainable Water Management Plan (SWMP) is the 'best fit' existing forum to adopt integrated planning.

- **WCG and LMs should advocate for the development of a regional water utility or water board for the region**

A regional authority would coordinate regional water supply needs and consider economies of scale between WSAs to prioritise the most cost-effective and resource-efficient water resource development interventions prior to being submitted to DWS for consideration. A facilitated discussion over mandate and the potential for the formation of a separate entity is recommended between WCG, the WSAs and DWS.

- **Municipalities should apply a strategic, comparative approach to prioritise water uses**

The decision-making process should consider the

economic benefit and water intensity of different water uses, as well as the ability of future development to fund water resources interventions. This does not necessarily require an additional or separate study to be conducted, it rather requires coordination, tools for weighing trade-offs, a platform, and information sharing.

- **DWS and WCG should integrate hydro-economic modelling into decision-making**

DWS should use hydro-economic modelling to prioritise water augmentation interventions in areas where the water deficit will most constrain economic growth. WCG should use hydro-economic modelling to help assess the appropriateness of development plans and to identify which municipalities need targeted support.

- **WCG should support WSAs and LMs to integrate water resource planning inputs into the IDP process**

Considerations of water availability, water demand, and how these factors will be affected by future water resource interventions and economic development should be integrated into IDPs. Provincial government should provide support WSAs in this process.

- **WCG should support LMs to build off-budget financing capacity**

LMs need support in the preparation of project finance applications to DWS and other funding mechanisms, including commercial financiers. WCG should provide support to LMs for these applications and/or the establishment of a regional water fund to assist in the financing of water resource infrastructure.

Find out more

This brief covers key findings from a three-year study, 'Managing water as a constraint to development with decision-support tools that promote integrated planning: the case of the Berg Water Management Area', funded by the Western Cape Government and Water Research Commission and conducted by GreenCape, with support from the University of Cape Town (UCT) African Climate and Development Institute (ACDI). The aim of the study was to better understand the interdependent relationship between the Berg WMA economy and current and future water availability. It also aimed to develop actionable tools

and insights for decision-makers to integrate water resource and development planning.

For the full project report and the decision-making tools developed, visit: <https://www.green-cape.co.za/content/focusarea/water-for-sustainable-development>.

For support on taking further action, contact: Claire Pengelly, GreenCape's Water Programme Manager, claire@green-cape.co.za or call 021 811 0250

