



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD



UCT Sustainable Water Management Strategy

Executive Summary

Version 0.1

October 2020

Message from UCT



Water is one of Africa's most precious resources, that we all need every day, not just in our homes, but also in our places of learning, business and recreation. We cannot live without water.

In 2017 and 2018 in the Western Cape we came very close to running out of water. This was a terrifying thought, something we could not have imagined would happen. It shook the City of Cape Town and UCT, but at the same time we learnt a lot more about water and how we can save this very precious resource.

At UCT, going forward, we want our relationship with water to change. We want to treat it as the precious resource that it is, and reorganise ourselves and our infrastructure to do so. This strategy is central to making this possible and this is why UCT supports the roll out of this strategy 100%.

- Director: Environmental Sustainability at UCT - Manfred Braune



DOCUMENT PREPARED BY

aurecon *now rebranded as...* **ZUTARI**

Key Aurecon / Zutari staff members in development of this document:
Carshif Talip, Fareed Nagdi, Hirna Bhikha, Jonathan Webb, Dr. Lloyd Fisher-Jeffes, Matthew Phillips,
Naseera Mohamed, Rebecca Ilunga, Ryan Alexander

UCT's Environmental Sustainability Directorate commissioned and directed this work in consultation with various UCT stakeholders including the Department of Student Housing, Properties & Services, Future Water and students.

The realisation of this Sustainable Water Management Strategy has been advanced through funding received from the Department of Higher Education and Training (DHET), particularly for implementation of water savings projects in student housing facilities at UCT, where water consumption is highest.

Executive Summary

Vision

The University of Cape Town aspires to be an internationally recognised community of water-wise individuals who are committed to creating a Net-Zero, Water Sensitive Campus.

Our Vision and Commitments

The University of Cape Town (UCT) aspires to be an inclusive and engaged research-intensive African university that inspires creativity through outstanding achievements in learning, discovery and citizenship. UCT is committed to engaging with the critical issues of our natural and social worlds through outstanding teaching, research and scholarship (UCT Council, 2016).

UCT has for many years been pioneering in its research the application of **Water Sensitive Urban Design** (WSUD) and has established the Future Water Institute to drive trans disciplinary, collaborative and impact-driven research and facilitate the uptake and use of research across policy, practice and industry. In response to this research, and in light of the recent drought affecting the City of Cape Town, UCT commissioned the development of a campus wide **Sustainable Water Management Strategy**. This **Sustainable Water Management Strategy** is UCT's commitment to ensure Business Continuity and to achieve a state of water **Net-Zero** by no later than **2050**.

This **Sustainable Water Management Strategy** has been developed through a collaborative process with the aim of developing a new vision, understanding, appreciation, and relationship with water at UCT. The strategy's primary objectives are as follows:

- Reduce UCT's overall demand and dependence on municipal water supply and wastewater treatment;
- Maintain business/operational continuity during periods of unprecedented low rainfall and water restrictions;
- Reduce the overall overall spend on water (a scarce natural resource) through appropriate investments;
- Provide a diverse, resilient and sustainable combination of water resources; and
- Mitigate UCT's overall impact of runoff on downstream water quality.

This **Sustainable Water Management Strategy** further answers the City of Cape Town's call for all individuals to be custodians of water as a finite resource and will see UCT match its ambitious research agenda by realising its **Vision** of being an "internationally recognised community of water-wise individuals who are committed to creating a Net-Zero, Water Sensitive Campus." As part of achieving this **Vision**, the strategy is centred around the following five (5) core commitments:

- Know Our Water;
- Ensure Business Continuity;
- Be a Water-Wise Community;
- Become Water Net-Zero, and
- Become a Water Sensitive Campus.

If adequate resources (time and money) are devoted to each of these commitments, UCT will succeed in reducing its current municipal water demand from approximately 650 ML per year to 360 ML per year, and doing so in a water sensitive manner.




Know Our Water

Know Our Water – The foundation of the strategy is ensuring that, as UCT, we 'know our water' – after all "you can't manage what you don't measure", and you can't measure it if you don't know where it is. This commitment begins with consolidating infrastructure records and the installation of additional smart water meters to obtain an improved understanding of water use across the University. Thereafter, the University commits to monitoring how water is being used, how much water is being lost to leaks and demand fluctuations at a building level which are required to better inform and direct social or infrastructure interventions . To support this, it will be necessary to develop a Digital Water Strategy inclusive of an updated Water Dashboard and Decision Support System and a digital record of all UCT's main water reticulation system between, to and from buildings.



Ensure Business Continuity

Ensure Business Continuity – Failing to maintain business continuity during a drought or supply disruption would severely disrupt academic activity. This would place tremendous strain on UCT and ultimately threaten its reputation as a leading university. The interventions proposed as part of the strategy will enable UCT to continue to operate during periods of water scarcity and will build capacity to withstand future droughts that will occur in the Western Cape.



Become Water Net-Zero by 2050

Become Water Net-Zero by 2050 – Water Net-Zero, as defined for the UCT Sustainable Water Management Strategy, is when the water demand met from municipal supply equals the water demand met from alternative supply options such as rainwater harvesting . Transitioning to a 'Water Net-Zero' University will further reduce the volume of wastewater and stormwater discharged from the University's campuses, which in turn will have numerous environmental benefits. In line with this objective, UCT commits to becoming 'Water Net-Zero' by no later than 2050. This will be achieved through progressively implementing new innovative systems and alternative water supply options, based on sound technical advice and informed by reliable data.



**Be a
Water-Wise
Community**

Be a Water-Wise Community – UCT commits to inform, empower and educate visitors, staff and students to better utilise water as a finite and vulnerable resource, essential to sustain life, development and the environment. In doing so, UCT recognises the various co-benefits associated with water. Further, the University commits to ensuring its leaders at all levels – academic, administrative, policy, maintenance – are engaged, aware of how water is being utilised and trusted with its stewardship throughout the University. The University will draw on its wealth of transdisciplinary skills to achieve this. A key component of this commitment will be the development of UCT as a Living Lab that will feature the latest thinking and hands on research through “living” real estate projects on campus that allow a lived student experience of water sensitive design through the campus facilities.



**Become a
Water Sensitive
Campus**

Become a Water Sensitive Campus – The City of Cape Town’s Water Strategy (2019) commits the City of Cape Town to becoming a Water Sensitive City by 2040. As one of the City’s largest single water users, UCT commits to supporting the City’s Water Strategy by becoming a water sensitive campus which optimises and integrates the management of water resources to improve resilience, business continuity and liveability for the staff and students of UCT.

To achieve this ambitious Vision, UCT is embarking on an **Action Plan** that involves a combination of infrastructure upgrades; operational optimisations; and community awareness programmes. This **Action Plan** requires significant resources, and will take several years before the benefits are fully realised. The realisation of this **Sustainable Water Management Strategy** has been advanced through funding received from the Department of Higher Education and Training (DHET), particularly for implementation of water savings projects in student housing facilities at UCT, where water consumption is highest.

The funding received from DHET was R70 million to which UCT added R 10 million to establish a total project current budget of R 80 million. Although the budget in terms of implementation is targeted mainly on student housing initiatives, it also covers the establishment of the overarching **Sustainable Water Management Strategy** and various enabling projects that are required to help direct and prioritise the nature of all implementation projects. While this budget has been established and will cover particular projects, the **Sustainable Water Management Strategy** will require various other projects and operational procedures outside of this budget to be put in place by UCT to allow for the successful implementation of the **Sustainable Water Management Strategy**.

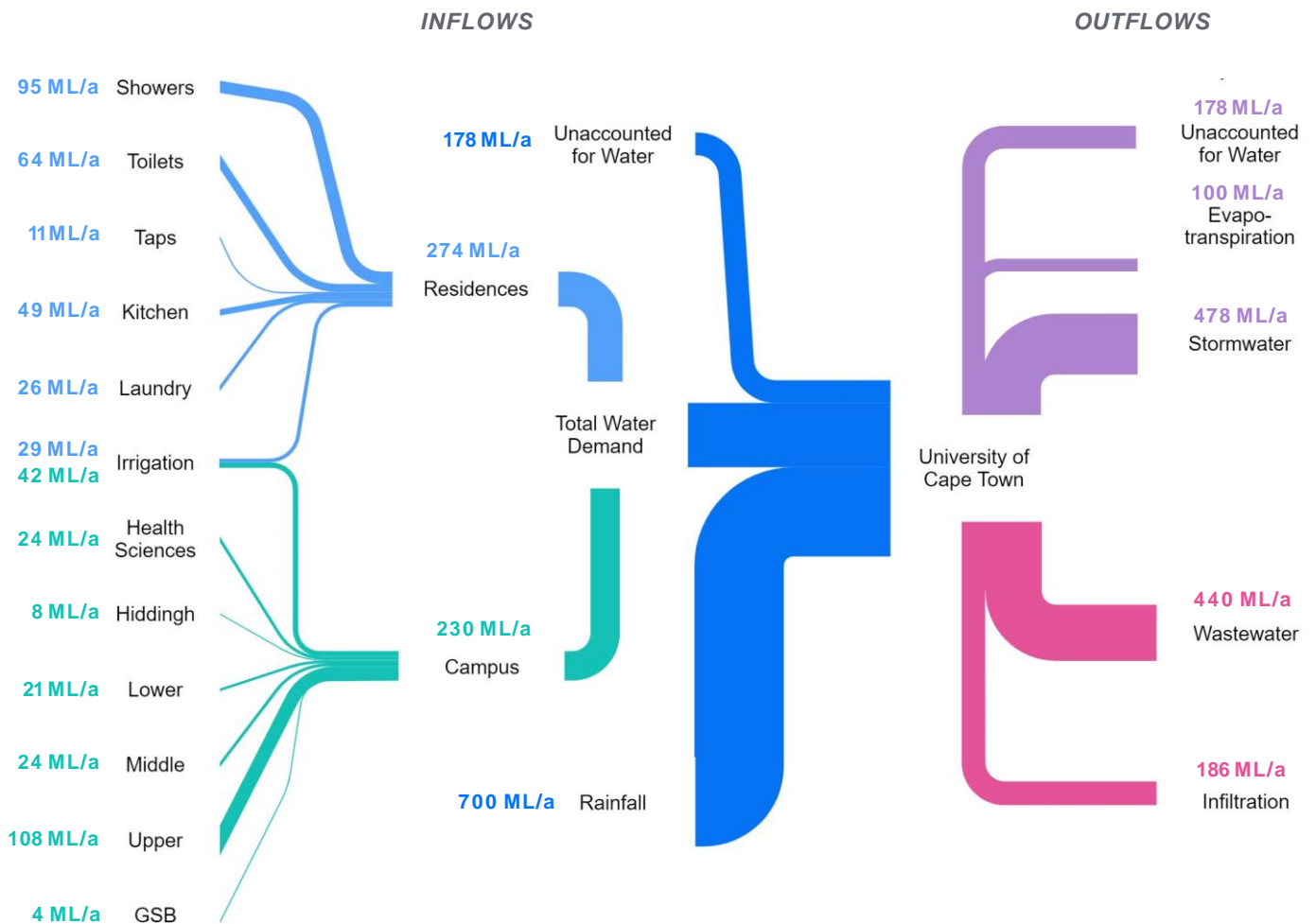


Figure i UCT Water Flows

Understanding UCT water flows is a critical part of this journey – these flows have been mapped in broad strokes, but this requires further work to understand these flows in much more detail.



Critical to the strategy is the concept of the UCT campus becoming a Living Lab, where students can learn and undertake research on the campus facilities such that real estate projects become accessible and present opportunities to learn from. Further to this, the strategy also reinforces the leading role that UCT plays in producing leading graduates and research in relation to water and its importance as a precious resource to all of society – in this context the Future Water Institute is the leading stakeholder to drive this element of the strategy forward (<http://www.futurewater.uct.ac.za/>).

Action plan for prosperity and water security

The **Action Plan** outlines the specific interventions for UCT to address each of the five (5) commitments and assumes a 30-year planning horizon to achieve the **Vision** of a water sensitive campus that is water-net-zero by 2050 – at the latest.

A wide range of possible interventions were identified and evaluated in terms of its potential to achieve water savings, ease of implementation and expected return on investment (ROI). These included both campus-wide initiatives as well as targeted interventions for individual buildings. The approach to sequencing projects is premised on: first **reducing** water demand, then **reusing** available water; and only then considering potential **augmentation**. The investment required for each of these categories is shown in Figure i. In addition to these infrastructure projects, several enabling projects were also identified.

REDUCE				
TOTAL COST (R MILLION)			TOTAL WATER SAVED / PRODUCED (ML/a)	
22	19	Taps / toilets / showers	119	291
	3	UAW	172	

REUSE				
TOTAL COST (R MILLION)			TOTAL WATER SAVED / PRODUCED (ML/a)	
110	11	Blackwater	9	91
	67	Greywater	27	
	32	Rainwater harvesting	56	

AUGMENT				
TOTAL COST (R MILLION)			TOTAL WATER SAVED / PRODUCED (ML/a)	
45	45	Groundwater	78	78

Figure ii Investment analysis per category (reduce, reuse and augment)

These enabling projects are required to ensure efficient and sustainable operations, business continuity, and inform the design of subsequent infrastructure. The list of priority interventions has been developed into a proposed implementation plan, which specifies the committed interventions for the next 5 years and potential interventions after that. These are summarised in Figure iii.

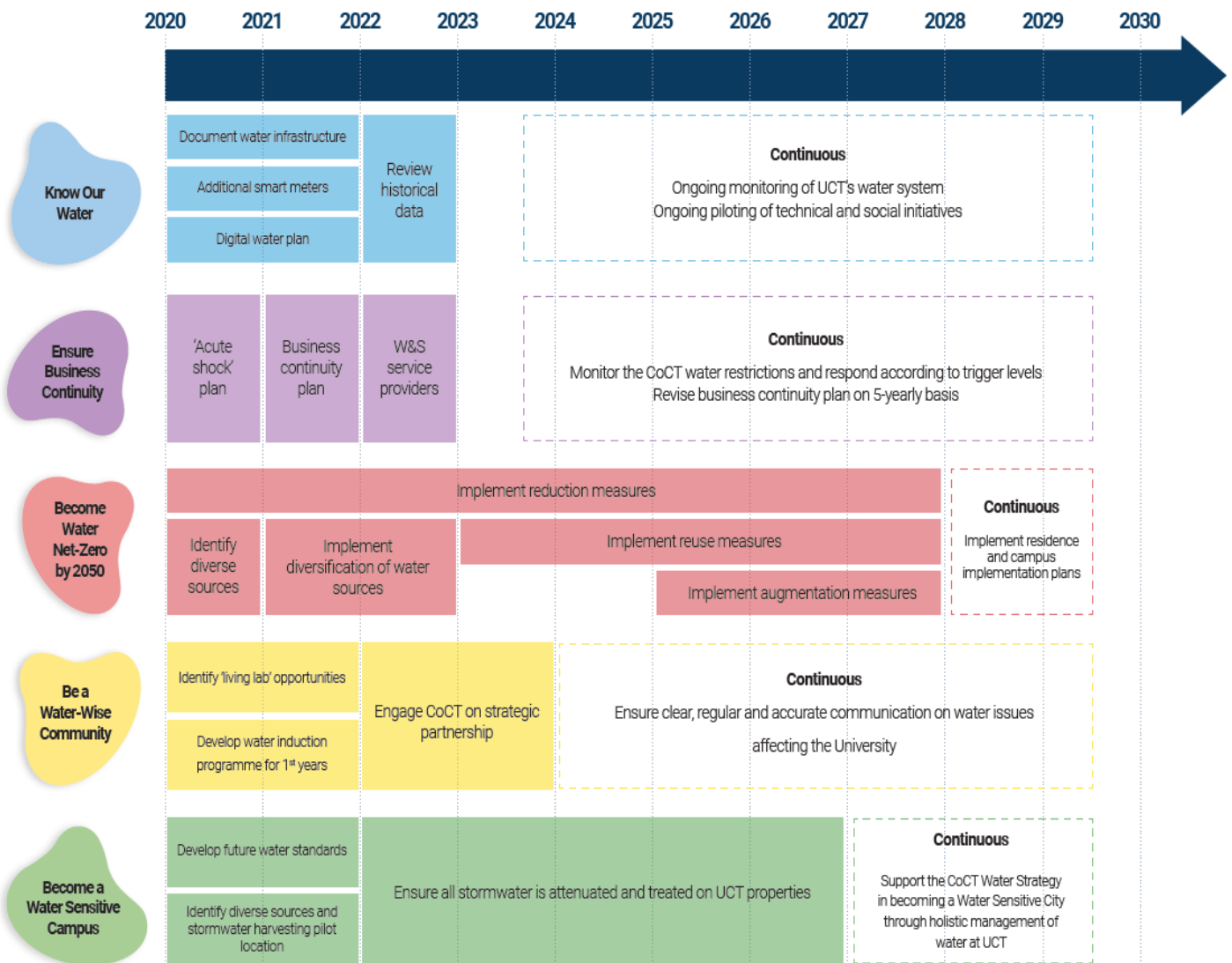


Figure iii Overview of the UCT Sustainable Water Management Strategy Action Plan

To achieve this, the estimated committed annual investment in implementing water-saving measures will be **R 70 million** for the next five years and will result in total estimated direct savings of over **R 62 million over this period (and R 21 million annually thereafter)** as shown in Figure iii. With the price of municipal water continuously increasing there is a strong business case for these water-saving initiatives, many of which have a very favourable return on investment that should generate significant savings every year (in addition to the water saved).

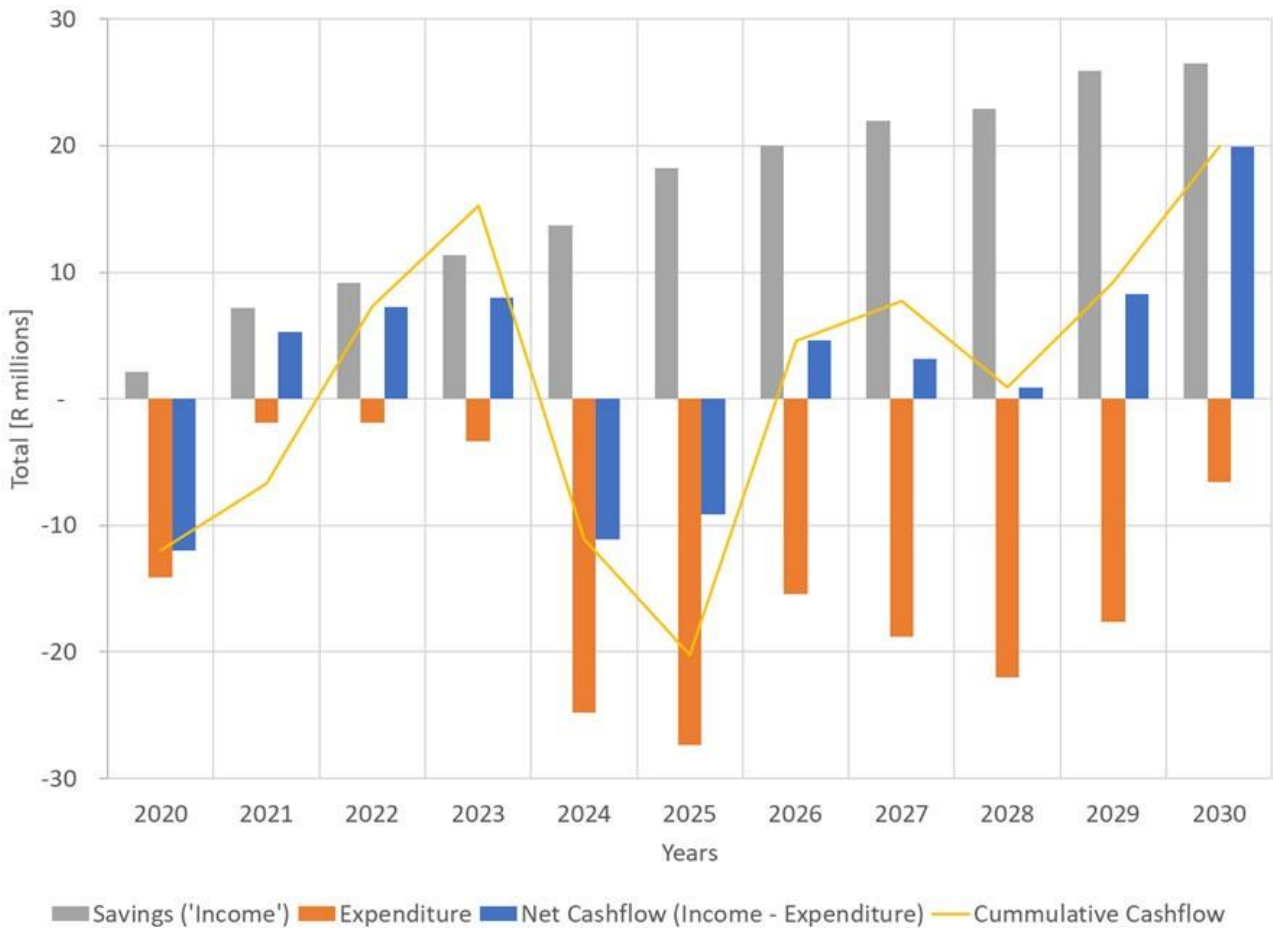


Figure iv UCT Sustainable Water Management Strategy Projected Cash-flow (Expenditure, savings, net cashflow)

After **five years** the strategy and implementation plan will be **reviewed and adapted** where needed.

The strategy thereafter is to be a living document that is reviewed and updated regularly (approximately every 3-5 years) to ensure that the strategy is current with adapting to risks, changing environment, legislation changes, climate change and shifts in responsibilities. This will enable UCT to have a proactive response to the various challenges relating to water management while also ensuring business continuity, rather than a knee-jerk reactive response.

