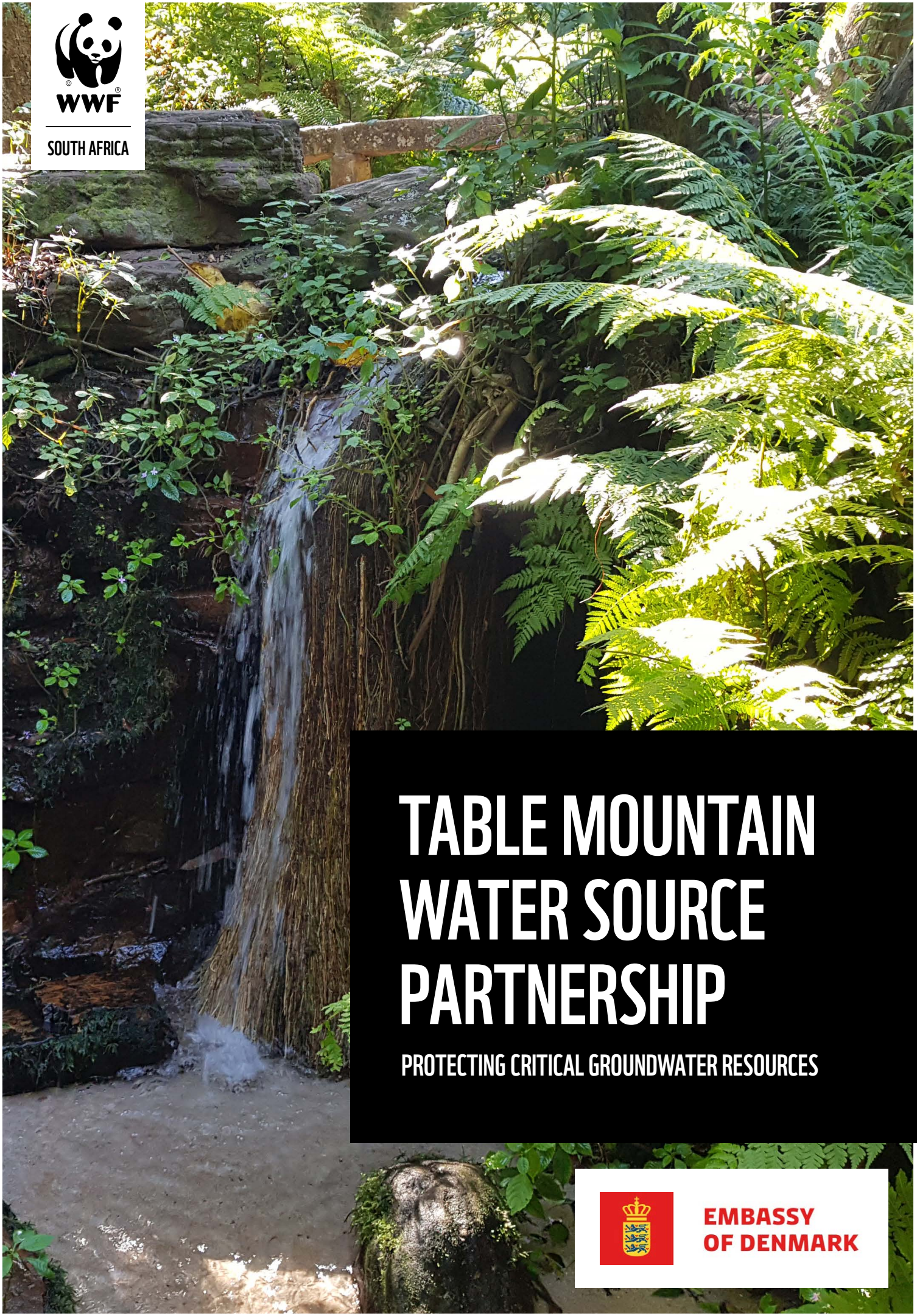

WWF

SOUTH AFRICA

TABLE MOUNTAIN WATER SOURCE PARTNERSHIP

PROTECTING CRITICAL GROUNDWATER RESOURCES

EMBASSY OF DENMARK

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Cover photo: © Roxanne Frizlar

Citation: WWF. 2022. *Table Mountain Water Source Partnership: Protecting critical groundwater resources*. WWF South Africa, Cape Town, South Africa.

This report is available online at: https://www.wwf.org.za/report/table_mountain_water_source_area_partnership

The annexures to this report are available online at: https://www.wwf.org.za/annexures/table_mountain_water_source_area_partnership

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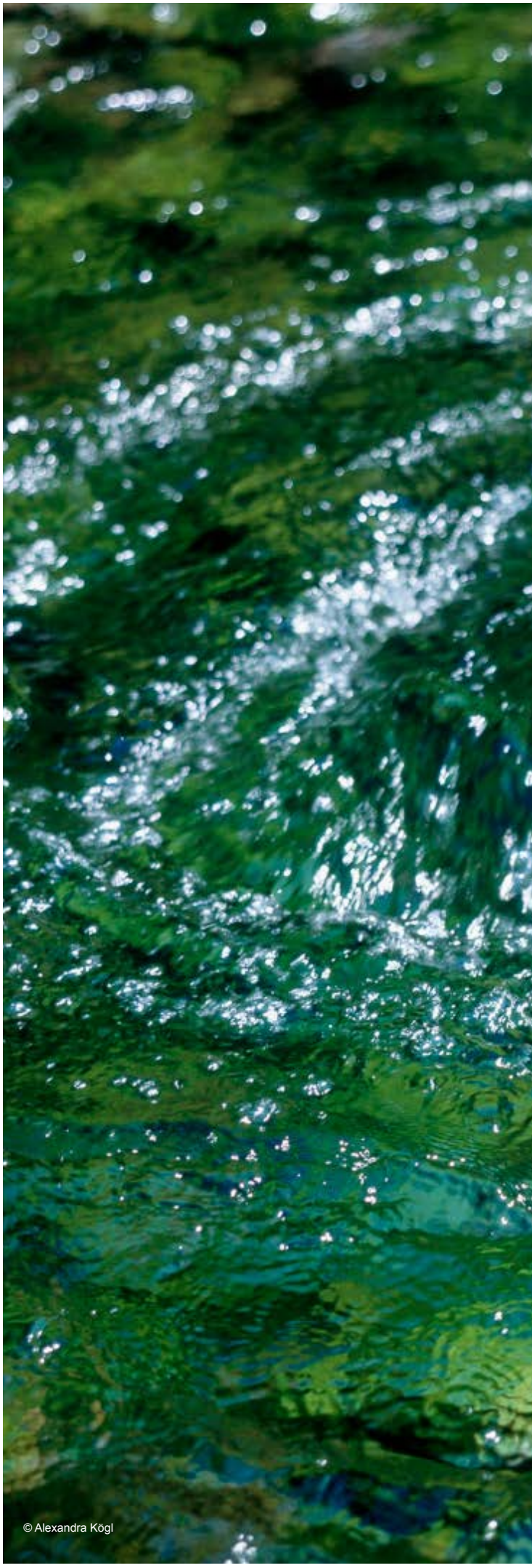
Acknowledgements

We acknowledge the following organisations and institutions for their contributions:

- The Royal Danish Embassy for the funding of this project
- The founding partners of the Table Mountain Water Source Partnership for advice, review, involvement and co-creation
- Everyone who contributed materials to this report: DHI Water & Environment, GEOSS, Green Anglicans, Greenpop Foundation, iComms, Immo Blecher, OneWorld, and Jessica Wilson, Sue Soal and Jane Burton for the monitoring, evaluation and learning (MEL) review.



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ABBREVIATIONS AND ACRONYMS

BWDSS	Bulk Water Decision Support System
CoCT	City of Cape Town
CSIR	Council for Scientific and Industrial Research
DWS	Department of Water and Sanitation
IWRM	Integrated Water Resource Management
MEL	Monitoring, evaluation and learning
NGA	National Groundwater Archive
NGO	Non-governmental organisation
SANBI	South African National Biodiversity Institute
SAWS	South African Weather Service
SWSA	Strategic Water Source Areas
TMSWSA	Table Mountain Strategic Water Source Area
WMO	World Meteorological Organization
WMS	Water Management System
WRC	Water Research Commission
WSA	Water Source Areas

KEY MESSAGES

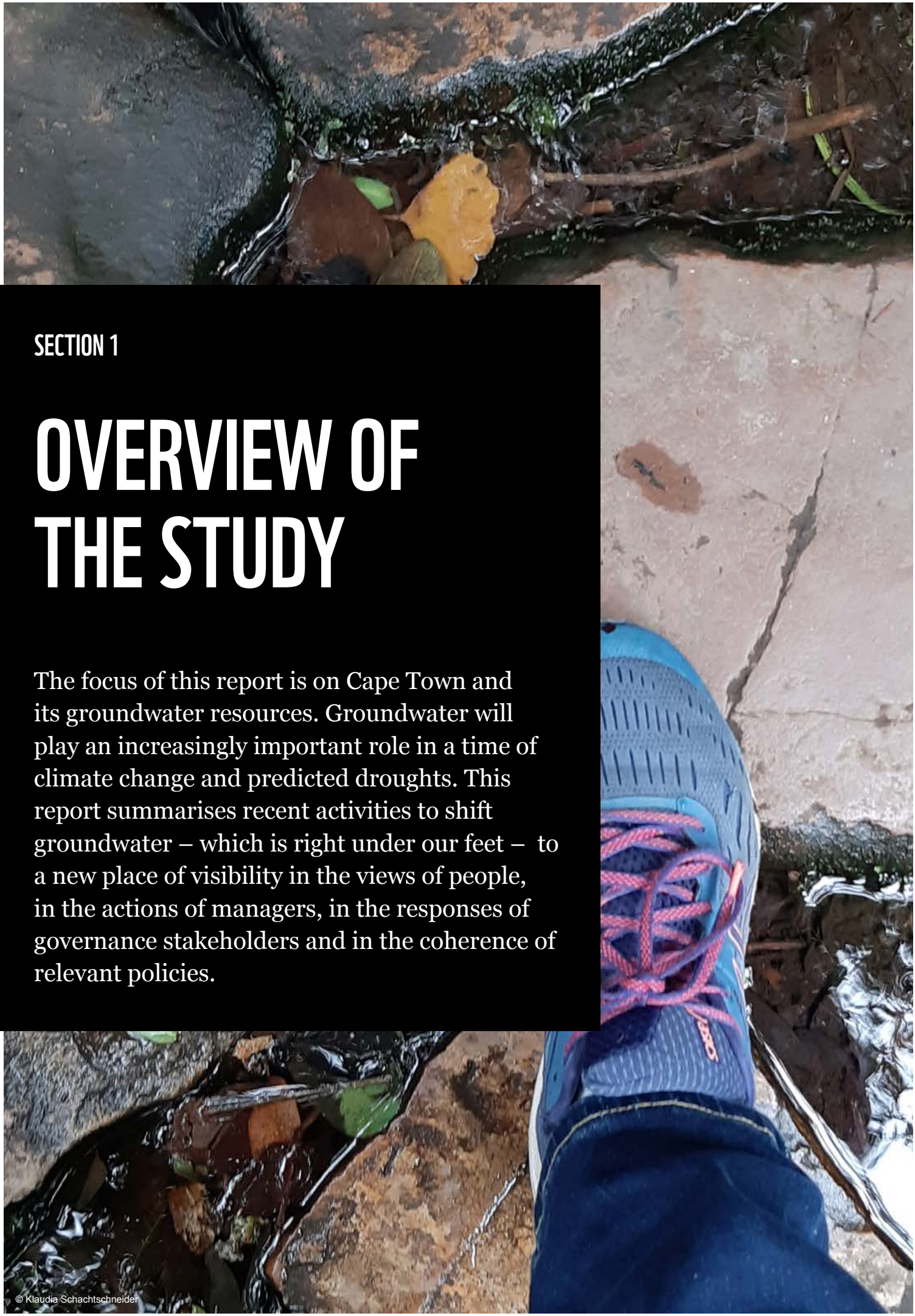
The ambitious Table Mountain Water Source Partnership groundwater project, funded by the Royal Danish Embassy, addressed groundwater at multiple fronts simultaneously:

- The faith awareness project brought the components of value and sacredness to groundwater, going beyond economic value. Six publications reached over 36 000 people and uptake by the International Council of Churches has made materials available globally. Thirteen young “Water Disciples” were educated on groundwater and faith and are now inspiring their own communities across Cape Town.
- The school awareness project reached over 2 000 Grade 4, 5 and 7 students with teacher and student groundwater materials and lesson plans. Altogether 130 pupils participated in a poster competition, with the winning poster inspiring two video billboards that ran at 33 locations across Cape Town for three months, being shown over 300 000 times each.
- To raise public awareness, two groundwater awareness murals were supported with funds, technical information and communication support. The murals were unveiled at Makers Landing, V&A Waterfront in Cape Town on 5 May 2022.
- Groundwater monitoring was extended to six residential and business areas of Cape Town. Added to Newlands and Epping Industria are Brackenfell, Constantia/ Bergvliet, Noordhoek and Scarborough/Kommetjie. A total of 683 boreholes and wellpoints were counted as part of the hydrocensus (only 333 are registered on the CoCT database). Seventeen volunteer residents and businesses across these areas have agreed to datalogger placements to monitor groundwater levels.
- The groundwater data from the dataloggers is uploaded to the public groundwater dashboard for Cape Town, which was launched on 24 March 2022. The dashboard is available at: tablemountain.groundwaterinfo.africa.
- A learning exchange between the Danish company DHI Water & Environment and the City of Cape Town enabled groundwater data integration into the Bulk Water Decision Support System. This learning exchange will result in better planning and management of future drought periods through strengthened capacity.
- An analysis was undertaken of existing groundwater-related policy, legal frameworks and strategies related to groundwater governance in South Africa. It recommends to evolve the current Table Mountain Water Source Partnership model into a flexible but clearly mandated institutional arrangement, supported by the national Groundwater Management Strategy (2015), which devolves responsibility for groundwater management to local government.
- A team of monitoring, evaluation and learning (MEL) experts was on board from the outset, allowing for continuous realignment, checking, learning and documentation.
- Nine founding members launched the Table Mountain Water Source Partnership on 15 November 2021. They continue to co-create the partnership vision, structure and function, supporting groundwater-related work in the Table Mountain Strategic Water Source Area.

SECTION 1

OVERVIEW OF THE STUDY

The focus of this report is on Cape Town and its groundwater resources. Groundwater will play an increasingly important role in a time of climate change and predicted droughts. This report summarises recent activities to shift groundwater – which is right under our feet – to a new place of visibility in the views of people, in the actions of managers, in the responses of governance stakeholders and in the coherence of relevant policies.



ABOUT THIS REPORT

The featured topic of this report is groundwater – and how a host of co-occurring activities have aimed to shift a largely invisible and unknown resource into more prominence. The location for this work is confined to the Table Mountain Strategic Water Source Area, a key water "factory" that largely overlaps with Cape Town. Globally, the city recently became associated with the concept of "Day Zero" and the risk that an urban hub could actually run out of water. Many residents, businesses and the city itself turned to alternative water sources – such as groundwater – in the time of need. Due to increased drilling, borehole establishment and bulk abstraction plans, groundwater suddenly reached new levels of use and importance. Yet, awareness, measurement, management and governance of the resource remains disjointed, scant and insufficient. This needs to shift urgently, if groundwater resources are to be managed and governed in a sustainable manner.

This report summarises two years of a multi-layered effort to shift the status quo of groundwater in the Table Mountain Strategic Water Source Area. Funds from the Danish government allowed for awareness-raising, groundwater-level monitoring, data collection and display, policy review and the establishment of the Table Mountain Water Source Partnership, which ultimately enables collective action on groundwater in the form of project management and governance support.

This report provides:

- A background to the activities under the Danish-funded Table Mountain Water Source Partnership project, also touching on the two years of pilot work that preceded it.
- Summaries of awareness-raising, monitoring, data display and use, policy review, partnership building and monitoring, evaluation and learning (MEL) that all occurred simultaneously under the umbrella of the Partnership project.
- The large amount of materials generated for every activity in a separately accessible list of Annexures.

This report serves as a reference point after four years of groundwater work in the Table Mountain Strategic Water Source Area. It summarises what has happened to date, points out challenges and spells out aims for going forward. The work was originally driven and facilitated by WWF South Africa, but with the launch of the Table Mountain Water Source Partnership, future groundwater work will be driven collectively by the founding partners, as well as any new partners joining the Partnership in due course.

The founding members are the City of Cape Town, the Royal Danish Embassy, the Western Cape and national Department of Water and Sanitation, GreenCape, SAB - AB InBev, the University of Cape Town, the University of the Western Cape, the Water Research Commission and WWF South Africa.

BACKGROUND

The climate in southern Africa is affected by strong seasonal rainfall patterns, which are increasing in intensity. The 2015 to 2019 drought in the Western Cape sketched a potential "Day Zero" scenario for Cape Town, catching global attention.

According to the United Nations, South Africa is already the 39th driest country in the world.[1] The sixth IPCC assessment report and specifically the Fact Sheet for Africa[2] states that a wide range of weather extremes (droughts and floods) are to be expected on the African continent in future. Similarly, the WWF Water Risk Filter[3] highlights an increase in projected drought throughout most of South Africa (Beraki, 2019).

THE IMPORTANCE OF STRATEGIC WATER SOURCE AREAS

The sombre outlook for the future highlights the absolute importance of South Africa looking after its key surface and groundwater sources. Strategic Water Source Areas (SWSAs) are the areas of the country that produce a disproportionate amount of surface water run-off in relation to their size (10% of South Africa's land provides 50% of the country's surface water), or they have high groundwater recharge (9% of South Africa's land contributes to 42% of base-flow), or both (Le Maitre et al., 2018).

These SWSAs are highlighted in South Africa's National Water and Sanitation Master Plan as critical to protect. In a coordinated effort, WWF, the Council for Scientific and Industrial Research (CSIR), the Department of Water and Sanitation (DWS), the Water Research Commission (WRC) and the South African National Biodiversity Institute (SANBI) have defined and mapped the SWSAs nationally (Figure 1). In 2018 this resulted in an official designation of 22 surface and 37 groundwater SWSAs around the country, which are considered to be strategically important at national level for water and economic security.

The Table Mountain SWSA (465 km^2) is the westernmost and smallest surface SWSA, and overlaps with the Cape Peninsula and Cape Flats groundwater SWSAs (59,5 km^2). Cape Town and surrounding areas fall within these two overlapping SWSAs (Figure 2).

Historically, these SWSAs provided the first source of water for a growing City of Cape Town, and were incorporated directly into the urban and industrial landscape. Currently, they provide just under 2% of the city's bulk water supply, because most water is obtained from surface water sources outside of the city, namely from the six big dams in the Boland Water Source Area (WSA).

[1] fao.org/aquastat/en/data-analysis
[2] ipcc.ch/report/ar6/wg2/about/factsheets
[3] waterriskfilter.org/explore/map/south-africa

STRATEGIC WATER SOURCE AREAS FOR SURFACE AND GROUNDWATER

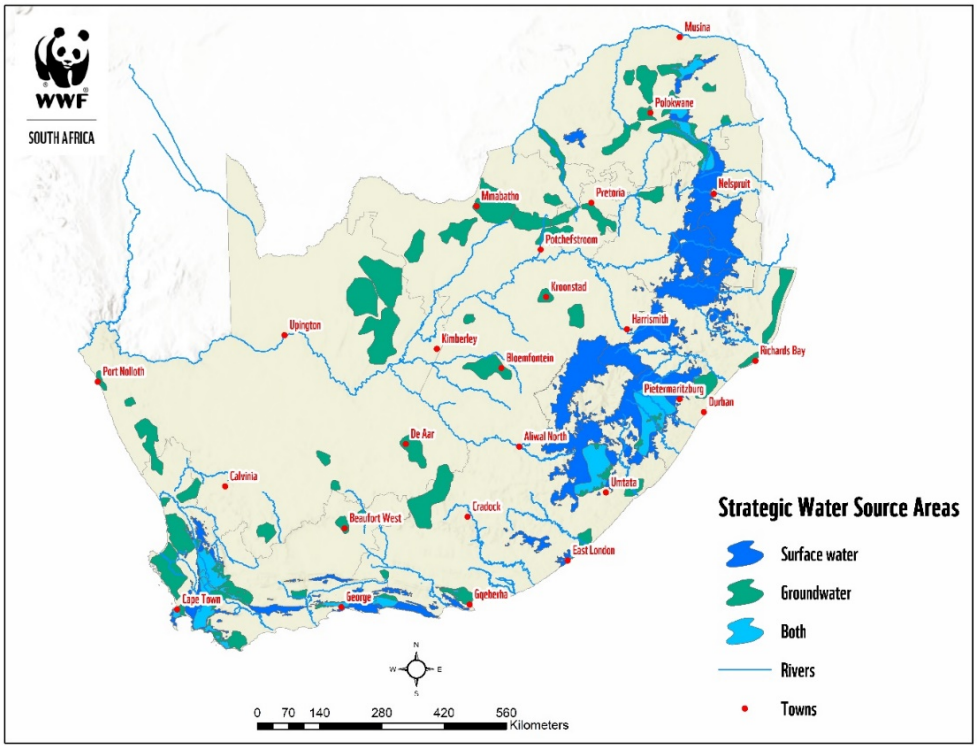


Figure 1: Strategic Water Source Areas (SWSAS) for surface and groundwater

OVERLAPPING SURFACE AND GROUNDWATER SWSAs OF THE CAPE PENINSULA

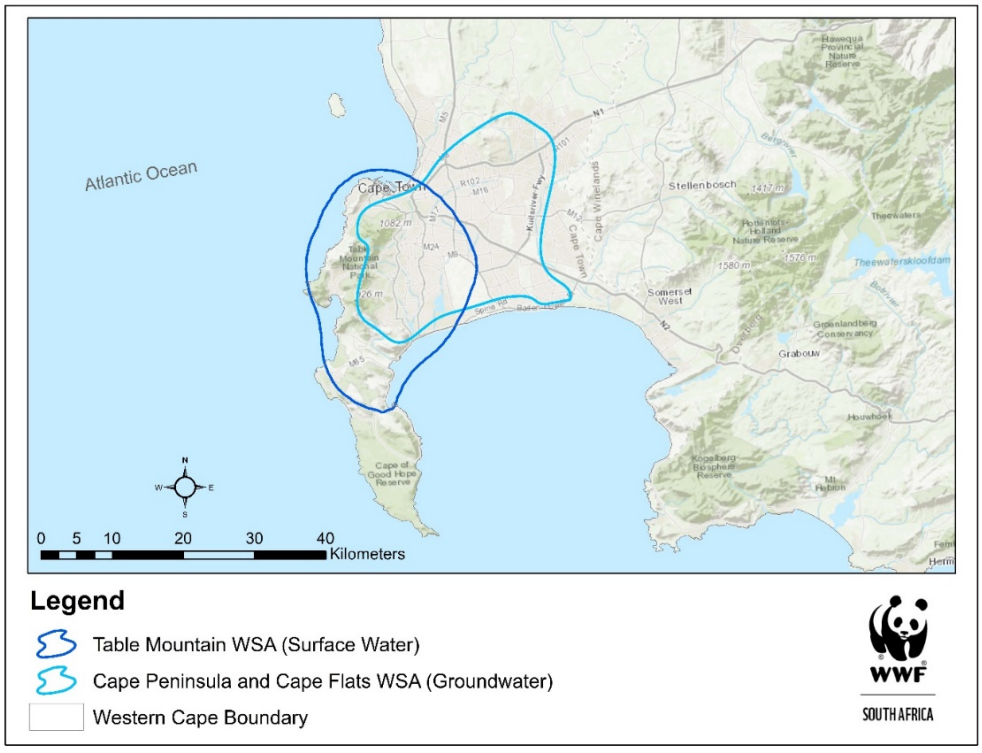


Figure 2: The overlapping surface and groundwater SWSAs of the Cape Peninsula

A GROUNDWATER PILOT PROJECT FOR CAPE TOWN

The 2015 to 2018 drought and the associated "Day Zero" period – when the taps were expected to run dry – have been pivotal for Cape Town to focus on its needs and the options for alternative water supplies going forward. As part of its water strategy, the City of Cape Town is looking to diversify its water sources and to have groundwater make up 7% of its overall bulk water supply by 2040 (CoCT, 2019). The "Day Zero" period saw an unprecedented spike in borehole installations across the city and this increasing number of private boreholes is highly likely to have been driving the observed reduction in Cape Town's bulk water consumption, meaning that residents and businesses are now using private boreholes instead. However, the actual number of boreholes, the volume of private use, whether use exceeds recharge rates and the impact on ecosystems, still need to be determined.

In 2018, WWF South Africa and AB InBev joined forces on a groundwater pilot study, mobilising a citizen-science groundwater-monitoring programme.[4] The aims of the project were to test residents' appetite for a groundwater dashboard (Jacobs, 2020), to start pulling together partners for a Table Mountain Water Source Partnership,[5] and to help build a clearer picture of Cape Town's groundwater use and resource sustainability over the long term. Tackling groundwater issues together for two years gave the project partners a good insight into the many gaps that were evident regarding groundwater in Cape Town.

THE TABLE MOUNTAIN WATER SOURCE PARTNERSHIP PROJECT IS BORN

The successful pilot phase with AB InBev was instrumental in building a strong argument for continued work and laying the foundations for the Table Mountain Water Source Partnership groundwater project. Funded by the Royal Danish Embassy, the two-year project ran from October 2020 until April 2022. The sizeable funding enabled the simultaneous operation of a multifaceted and complex undertaking, which addressed groundwater gaps at multiple levels simultaneously.

GOALS AND OBJECTIVES OF THE PROJECT

The **impact goal** of the Table Mountain Water Source Partnership groundwater project was that the Table Mountain Strategic Water Source Area be well managed, including the sustainable use of groundwater, to ensure the continued provision of water to South Africa, supporting its people and ecosystems.

The **project goal** was that by 2022, effective joint management systems would be in place for the sustainable management and sustainable use of groundwater in the Table Mountain SWSA.

[4] wwfafrica.awsassets.panda.org/downloads/wwf_groundtruthing_report_1oct20.pdf
[5] wwfafrica.awsassets.panda.org/downloads/wwf_groundwater_fact_sheet_1oct20.pdf

The drought in the Western Cape was the catalyst for pushing groundwater use into the foreground. Groundwater increasingly became a viable water source for bulk and private water provision. At the same time, the framework of groundwater policies, regulations, by-laws, monitoring and institutional mandates, which would ensure the sustainable use of groundwater by various governance bodies and stakeholders, were – and are – not in place, not well understood, or operational.

The **objective** of forming the Table Mountain Water Source Partnership was to support the mandated government bodies in enacting their groundwater role and mandate, and to further inform and mobilise the public – local communities in particular, as well as the private sector. The formation of the Table Mountain Water Source Partnership was a critical step to build a long-term local governance structure that can help guide and shape a better understanding of groundwater, its monitoring and regulation as a critical water resource. To that end, activities were designed to address groundwater at various levels and for various audiences (residents, local government and other governance bodies).

For residents, groundwater awareness-raising **activities** were designed for schools, faith groups and business (the latter could not be pursued due to Covid-19 restrictions; instead, support was offered to a Danish Embassy public awareness initiative of two murals with a groundwater theme that were created at the V&A Waterfront). Groundwater-level **monitoring** in residential and business areas, which had already commenced in the pilot phase in two areas, was extended into four additional residential and business areas with high borehole numbers. The online and public groundwater **database and dashboard** is built on the groundwater-level monitoring data and other datasets, displaying the information transparently for Capetonians. A learning exchange output allowed for an engagement between Danish groundwater specialists and the Bulk Water Supply Department of the City of Cape Town. Here the focus was groundwater **data integration** into the overall Bulk Water Decision Support System. A well-rounded groundwater **policy analysis** summarises the complex policy environment for groundwater in South Africa. It recommends a way forward and a potential structure for the Table Mountain Water Source Partnership. The development of the **Table Mountain Water Source Partnership** has been documented, highlighting key lessons and insights along the way, as well as the current status and shared view going forward.

THEORY OF CHANGE TO GUIDE THE PROJECT ACTIVITIES

Originally outlined as stand-alone outputs, the project activities were pulled into a Theory of Change framework to help make sense of the required steps to reach the desired short-, medium- and long-term outcomes.

The five different components in the Theory of Change each addressed gaps that needed focus if groundwater were to obtain a more prominent position as a water source in the water management and governance space. With project progress, the project was enriched by interlinkages between the components and project activities, supported by a Monitoring, Evaluation and Learning (MEL) process.

TABLE MOUNTAIN WATER SOURCE PARTNERSHIP
Protecting critical groundwater resources

PROJECT OBJECTIVE

By 2022, effective joint management systems are in place for the sustainable management and sustainable use of groundwater in the Table Mountain Strategic Water Source Area (SWSA).

IMPACT INDICATOR

Monitoring of groundwater in the Table Mountain SWSA is well established, recorded and communicated through the effective collaboration of the Table Mountain Water Source Partnership.

BASELINE: 2020

Very little monitoring, recording and awareness of groundwater in Cape Town exists and no joint management systems are in place for the sustainable management and use of groundwater in the Table Mountain SWSA.

TARGET: 2022

An effective joint management system is in place for the Table Mountain SWSA and groundwater in the Table Mountain SWSA is well monitored, recorded and communicated.

OUTCOME

Short-term outcome:
The maturing of the Table Mountain Water Source Partnership, with clear mandates and responsibilities lays the foundation on which collective groundwater management around Cape Town becomes possible.

Medium-term outcome: The expansion of groundwater monitoring, its data collection and communication are refined, allowing for effective groundwater management in the Table Mountain SWSA.

OUTCOME INDICATOR

Regularly convening the Partnership with clear action points; steadily growing a database from a growing number of monitoring areas in Cape Town.

BASELINE: 2020

A partnership is formed, but roles and responsibilities are undefined. A groundwater-monitoring network is formed, but underdeveloped. Databases exist, but are uncoordinated and require housing in one spot. Public awareness of groundwater lacking.

TARGET: 2022

Mature and fully functioning Table Mountain Water Source Partnership that coordinates the monitoring, capturing and communication of groundwater information in the Cape Town area.

1

OUTPUT 1

Good governance, policy and regulation systems are in operation for the Table Mountain SWSA.

OUTPUT INDICATOR

Table Mountain Water Source Partnership terms of reference for partners, strategy and action plan.

BASELINE: 2020

New launch of Table Mountain Water Source Partnership and initial meeting complete

ANNUAL TARGET: 2021

Review of policy and best practice complete; lessons shared in a national level workshop

ANNUAL TARGET: 2022

Strategy and action plan define way forward for Partnership

2

OUTPUT 2

A sound knowledge base and database are in place for the Table Mountain SWSA.

OUTPUT INDICATOR

Operational groundwater database for the Cape Town area.

BASELINE: 2020

Groundwater data is available, but widely scattered and in different formats

ANNUAL TARGET: 2021

Understanding of groundwater data mandates by the Table Mountain SWSA partners, as well as reviewing available data and a suitable database (with adaptation as required and jointly agreed by the Table Mountain Water Source Partnership)

ANNUAL TARGET: 2022

Population and streamlining of database and final housing in mutually agreed location

3

OUTPUT 3

An expanded citizen-science programme for groundwater monitoring is in place.

OUTPUT INDICATOR

Data collected by citizens in four more city areas over and above Newlands and Epping Industria, feeding into the database.

BASELINE: 2020

Monitoring in place for Newlands and Epping Industria areas only

ANNUAL TARGET: 2021

Expansion of monitoring into two more city areas, including hydrocensus, making it four areas

ANNUAL TARGET: 2022

Expansion of monitoring into two more city areas, including hydrocensus, making it six areas

4 OUTPUT 4

The public is aware and understands the importance of groundwater and the need for its sustainable management.

OUTPUT INDICATOR

Awareness materials are produced and distributed to public, churches and schools. Surveys show that public awareness has increased in citizen-collection areas.

BASELINE: 2020

Cape Town residents have a limited understanding of groundwater and its monitoring; complete assessment of the type of information that citizens are interested in about groundwater

ANNUAL TARGET: 2021

Material production and distribution

ANNUAL TARGET: 2022

Surveys to determine improvement in understanding

5 OUTPUT 5

Table Mountain Water Source Area partners and national SWSA stakeholders have increased capacity through sharing of international best practices and Danish groundwater management expertise.

OUTPUT INDICATOR

Record of Danish and SWSA stakeholders engagement and lessons shared.

BASELINE: 2020

Positive experience of Danish expert stationed in Cape Town for five months in 2017

ANNUAL TARGET: 2021

Table Mountain SWSA engagement with Danish experts leads to understanding of the special skill sets the Danish have to offer; type of capacity exchange is defined

ANNUAL TARGET: 2022

Capacity exchange completed and visible adoption of skills within relevant partners of the Table Mountain SWSA

OVERVIEW OF REPORT STRUCTURE

A continuous Monitoring, Evaluation and Learning (MEL) component has accompanied the project process since inception. The Mid-term Review produced by the MEL experts added a dimension to the Theory of Change, pointing out the mutual reinforcement and connections between the different activities. Through this process it was realised that almost every activity had an underlying awareness-raising component for various audiences, even if that was not initially intended or understood (Figure 3). These will be explained in each activity summary.

Over and above that, the project also initiated discussions for WWF about its own structures, their relationship to groundwater and a potential way ahead. Throughout the Table Mountain Water Source Partnership project, there was an active effort to communicate components or the whole project to a wide variety of audiences. Communication materials, originating from WWF, are summarised as an additional output (Annexure 9, Appendix B).

This project has generated a large volume of materials. Hence the report is structured according to the key outputs identified in the Theory of Change, starting with awareness-raising, then monitoring, the groundwater dashboard, learning exchange, policy review, partnership feedback and the MEL process. The institutional perspective of WWF and the project communications summary are described separately.

Brief summaries are offered for each output, including a summary infographic. The project activity reports are all appended as Annexures to this report for readers who wish to go into more detail. The Annexures are displayed in the same sequence.

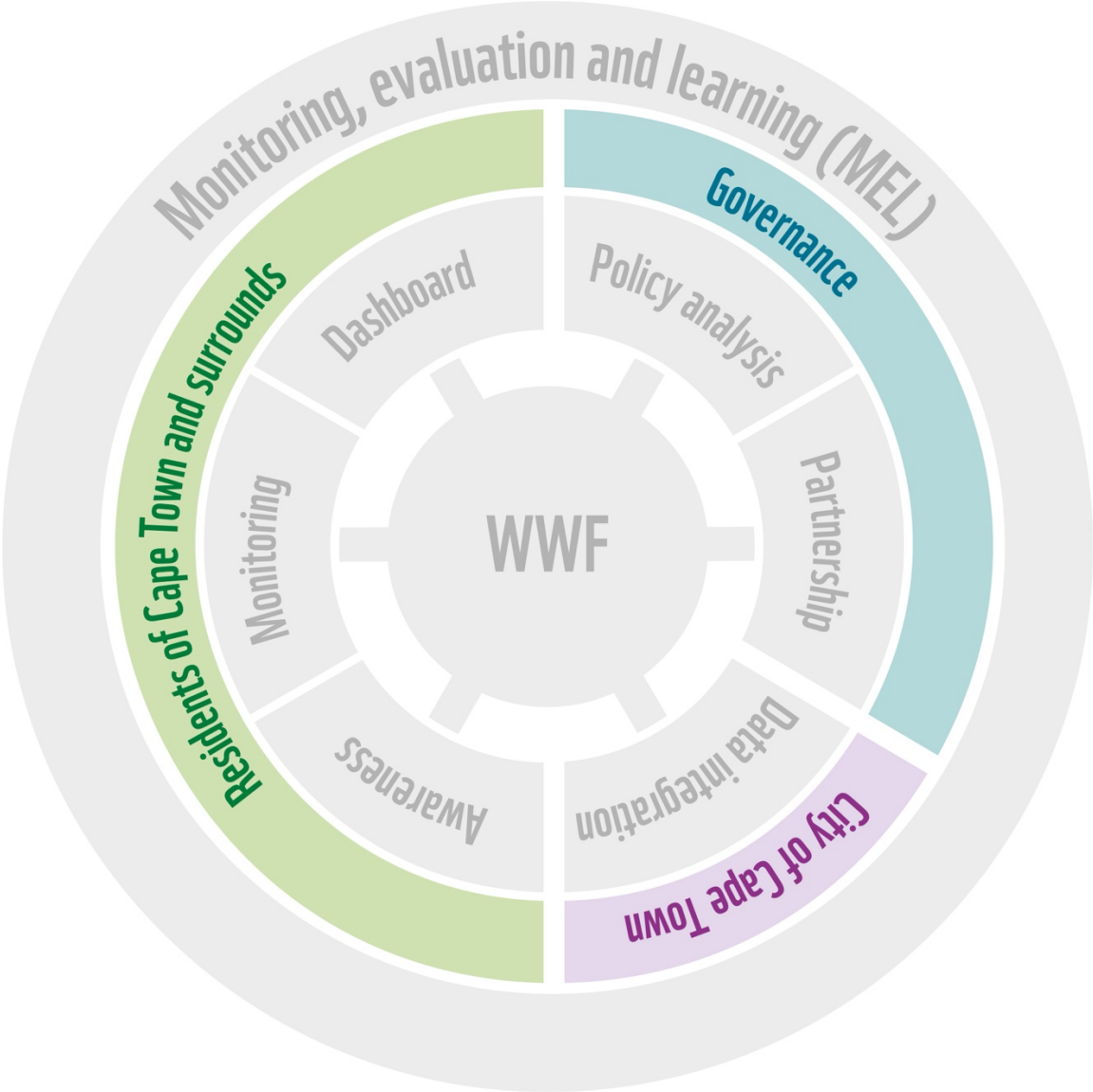


Figure 3: Depiction of each activity focus in terms of the level of audience

SECTION 2

OUTCOMES AND IMPACTS

The project successfully raised awareness of groundwater in faith and school communities and among the general public. The aims of expanding residential groundwater monitoring were met and a groundwater dashboard was developed. Learning exchange took place, groundwater policy was reviewed and a local groundwater partnership was formed. The project promoted internal focus on groundwater in institutions, and inspired the scale-up of groundwater ambitions.

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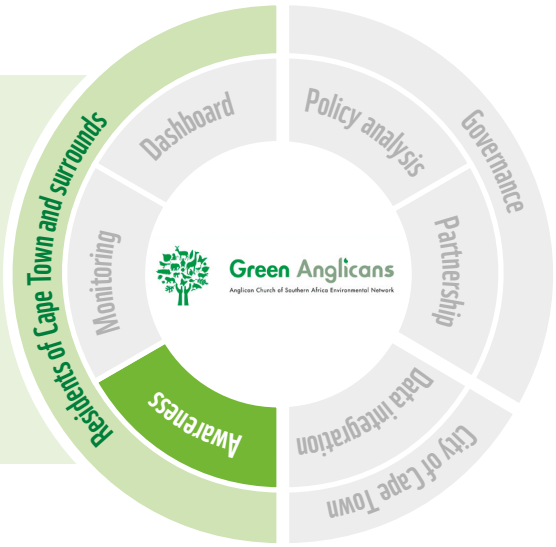
RAISING AWARENESS IN FAITH GROUPS

OUTPUT 4

The public is aware and understands the importance of groundwater and the need for its sustainable management

OUTPUT INDICATOR

Awareness materials are produced and distributed to public, **churches** and schools.



AIMS

Develop awareness materials for adults, young adults and children

Organise citizen awareness events linked to the environment and religious calendar

Expand the groundwater awareness to interfaith groups, other denominations and other awareness implementers

Participate in project evaluation, reporting and communication

WHAT WAS ACHIEVED?

Awareness materials
- 6 publications distributed to 36 000 mailing list
- Water Disciple education journey (13 graduated)

Citizen awareness events
- 7 youth events, 108 participants
- 3 children's events, 230 participants
- 6 clean-ups, 139 participants

Expanding groundwater awareness
- 3 international events
- 2 anti-development protest events in Cape Town
- Guests to the City of Cape Town Mayor's river paddle event

Project evaluation, reporting and communication
- World Water Day 2022: Liturgy emailed to 14 000 people
- Earth Day prayer: Facebook 50 000, Twitter 5 320

KEY WINS

- The Diocese of Cape Town passed a resolution on groundwater at the Synod (over 50 churches), encouraging pastoral charges to take action to save and protect groundwater.
- The World Council of Churches asked to use the Green Anglicans' resource materials about groundwater.
- The Anglican Church youth department sent out our Sunday School materials to their mailing list of 10 000 churchgoers.
- 13 Water Disciples were empowered through education on groundwater and faith.

FUTURE AMBITIONS

1. Groundwater activism will continue in Cape Town!
2. The Green Anglicans will always include groundwater now when we talk of rivers, oceans, lakes and dams.
3. We will liaise with the City of Cape Town to feed into their work on urban waterways.

RAISING AWARENESS

In three groundwater awareness projects, WWF partnered with the Green Anglicans, Greenpop and the Royal Danish Embassy to bring the concept of groundwater into the faith community, to learners and to the public at large through art.

RAISING AWARENESS THROUGH FAITH GROUPS
Partnering with the Green Anglicans

> *"At church you get filled by the rain, but under Covid you need to drink from your own well of sacred water within."*
>
> – Green Anglicans Water Disciple

The Green Anglicans' Water Disciples with the Rev. Rachel Mash on their hike to learn more about the springs on Table Mountain.

Water is often a politicised topic in South Africa and this also happened during the long drought period that brought about the term “Day Zero” in Cape Town. Water affects everybody, hence it was a deliberate decision on the part of the Table Mountain Water Source Partnership groundwater project to work with a faith group that could neutrally bring across the concept of the value of water beyond economic terms and nurture sustainable water use and stewardship in households from a wide variety of backgrounds.

The Green Anglicans is a movement started by the Anglican Church of Southern Africa, with a focus to empower, encourage and hold the church accountable for caring for the earth (and our water resources) that God has graciously placed us on.

In biblical terms, stewardship is defined as looking after something that you do not own. It is very easy to link that to the concept of looking after groundwater or any water through the process of water stewardship.

The Green Anglicans fulfil a very vocal activist and dedicated awareness-raising role in the faith community. Their work spans across denominations and interfaith groups. They had previously worked on water awareness projects funded by the WWF Nedbank Green Trust, but the funding from the Danish government for the Table Mountain Water Source Partnership project took their work to a new level. The aim was to strengthen the faith link to groundwater, seeing that it is often referenced in the Bible through springs and renewal.

The audience for this project spanned all ages. Sunday School materials were developed for primary school children (Annexure 1, Appendix A), a group of active young adults became “Water Disciples” to do an exploratory journey through the water cycle and its references in scripture (Annexure 1, Appendix B). Adults in the faith community had the opportunity to listen to two World Water Day sermons and participate in multiple online events. Various news publications on online platforms about the activities and events organised by the Green Anglicans as part of this project reflect the impact and appreciation of these efforts (Annexure 1).

The entire awareness-raising project took place during the Covid-19 pandemic. Of all the Partnership project activities, the faith awareness work was hit the hardest by the lockdown restrictions. Baptisms could not take place and hence awareness materials for this group could not be developed. The Water Disciples could see one another far less often than hoped. Very aptly, one of the participants explained: “*At church you get filled by the rain, but now under Covid you need to drink from your own well of sacred water within”* – indeed an appropriate analogy to the groundwater focus of this project.

Several activities originally planned with the Water Disciples had to be reworked to accommodate Covid-19 restrictions. The original aim was to allow the Water Disciples to “find their own Jordan River”, meaning that there would be an educational and immersive experience around the water cycle and the journey of water from the mountain tops to groundwater, springs, through rivers and wetlands and ultimately down to the sea. Only some of these educational events could actually take place. A lot more focus was thus placed on meeting in the residential areas where the Water Disciples lived and linking the risk of waste and pollution on land to water and groundwater pollution. Water quality is a prominent issue in Cape Town and a focus on this was suitable. One of the final outdoor events was a beach clean-up, to make the link between travelling water and travelling waste visible and understandable.

During the project, feedback meetings where all implementers engaged in discussions, it was clear that there were obvious linkages between the Green Anglicans and Greenpop, who did awareness-raising in primary schools. Unfortunately, Covid-19 restrictions made most of that type of networking and interlinking impossible, which was a loss for this project.

The really big wins for this awareness-raising activity were:

- Getting a groundwater resolution passed at the Anglican Synod, which was attended by 250 people. This meant over 50 churches around Cape Town were going to look at their own sustainable water and groundwater use on their church properties (see Annexure 1, Appendix C).
- The World Council of Churches asking to use the resource materials that had been produced as part of this project, meaning that the materials are now internationally available.
- Ensuring a particularly wide spread of the Sunday School materials because the Anglican Church youth department was willing to send out the materials to over 14 000 email addresses.
- The big disappointment of not being able to do a river paddle with the Water Disciples due to water-quality problems in the river was slightly remedied by an invitation to join the Mayor of Cape Town for a paddle on another river during a water-quality awareness drive in the City of Cape Town.

The enormous impact and future continuation of this awareness-raising project is acknowledged by this quote:

"Water is always one of our main focuses on the annual Green Anglicans' calendar, but we will always include groundwater now; when we talk of rivers, oceans, lakes, we will always keep raising awareness of groundwater. I think we have all internalised the idea of groundwater. The water cycle was 'factual knowledge' that we learned at school but now we feel and live it!"

- Rev. Rachel Mash, Green Anglicans

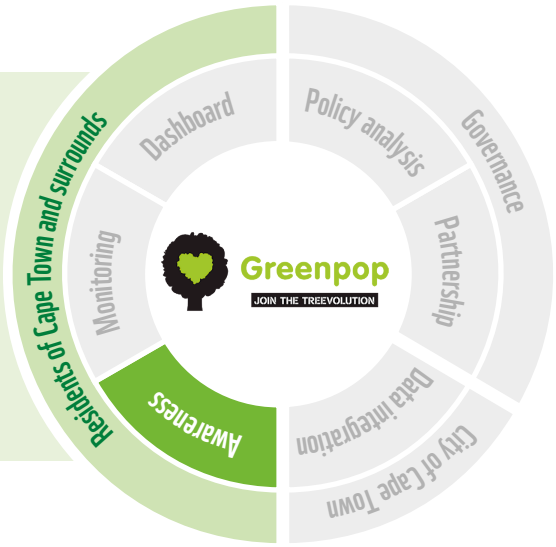
RAISING AWARENESS IN SCHOOLS

OUTPUT 4

The public is aware and understands the importance of groundwater and the need for its sustainable management.

OUTPUT INDICATOR

Awareness materials are produced and distributed to public, churches and **schools**.



AIMS

Run a groundwater awareness campaign in primary schools for Grade 4, 5 and 7

Life Orientation and Geography teachers present a tailor-made multimedia lesson during normal class time

Run an inter-school poster competition with sponsored prizes

Arrange a field trip and other prizes for learners submitting winning posters

WHAT WAS ACHIEVED?

Multimedia lessons
- Videos (3 languages – Afrikaans, English, isiXhosa)
- Curriculum lessons for Grade 4, 5 and 7 (English)
- Teacher information pack (English)
- Learner information pack (English)
- 14 schools participated

Poster competition (with prizes)
- 103 poster entries received
- 9 schools participated
- Winning poster – Kannemeyer Primary School, Grassy Park, Cape Town

Field trip to Greenpoint Park
- For top 30 winning-poster creators, with 30 learners attending
- Wetland and biodiversity links to groundwater were demonstrated and explained

Video billboards
- 2 video billboards at 33 locations across the Western Cape
- Billboard 1: 347 826 playouts in 2 months
- Billboard 2: 395 603 playouts in 2 months

KEY WINS

- Teachers and learners alike are excited about learning more about groundwater despite learning challenges during the Covid-19 pandemic.
- Talks with Water Research Commission to support the process to include groundwater lesson plans in school curriculum.

FUTURE AMBITIONS

1 Get groundwater information into the national curriculum.

RAISING AWARENESS IN SCHOOLS
Partnering with the Greenpop Foundation

"This project made groundwater a reality to my students, who didn't know anything about it before. Projects like these are important to the future of our environment."

– Claudia Cloete, Simon's Town Primary School

Learners visited the Greenpoint Urban Park in Cape Town with Damien Hewitt of Greenpop to experience how interdependent the components of the Web of Life – especially water – are.

"Greenpop is on a mission to plant trees, green communities and empower environmental stewards across sub-Saharan Africa."

www.greenpop.org

The Greenpop Foundation is a non-governmental organisation (NGO) focusing on environmental sustainability and education. This awareness-raising project gave them the opportunity to create groundwater awareness among learners through the development of school curriculum lessons and materials, as well as an exciting poster competition (Annexure 2, Appendix A).

Greenpop also designed accompanying learning materials for teachers and learners of grades 4, 5 and 7, together with short educational videos in three different languages (English, Afrikaans and Xhosa).

Covid-19 made it impossible to deliver and explain the materials face-to-face or for Greenpop to engage with the schools directly, so everything had to happen remotely. The school teaching staff were already severely stretched as they had to accommodate major changes in schools due to Covid-19. But some were open and eager to join the campaign. A total of 14 schools participated and 2 568 learners were reached.

But not all was “just another school day”. Apart from the lesson plans, a poster competition saw 103 entries from nine schools. Designing a poster proved to be challenge for the learners since they could not spend the usual time together at school for a group effort under Covid-19 regulations. Nonetheless, some really exciting entries were received and the sponsored prizes for learners and their school were definitely also a motivation. Greenpop set up clear, fair and comprehensive evaluation criteria and the posters were evaluated by a team consisting of Greenpop, WWF and the Royal Danish Embassy (Annexure 2, Appendix C). Lami-ah Solomons from Kannemeyer Primary School emerged as a clear winner. Her poster was celebrated on social media channels, in a local newspaper and at the official Table Mountain Water Source Partnership launch on 15 November 2021, together with the Royal Danish Embassy. The poster went on to inspire two video billboards for further groundwater awareness. The billboards ran for two months at 33 different locations across the Western Cape, being shown over 300 000 times each (Annexure 2, Appendix B).

To reward the learners for their hard work on the posters, a field trip was organised to Green Point Park for the top-performing learners from each school, along with their teachers (Annexure 2, Appendix B). The biodiversity gardens and wetland-walk areas within the park were the perfect setting for learners to position the topic of groundwater within the broad theme of biodiversity. The trip also gave learners the chance to gain a deeper appreciation for water as the central driving component of any ecosystem. The addition of the information boards and fun facts scattered around the park allowed for an even greater educational experience for the learners. The enthusiasm from the learners is a true testament to the power of education and the opportunity to foster and grow young custodians for our planet.

There were definite opportunities to engage with the Green Anglicans, who ran the faith-based awareness-raising project, but unfortunately Covid-19 made that link impossible. The ambition going forward is to get groundwater into the formal school curriculum, for grades 4, 5 and 7 as a start. Discussions are already under way and the idea enjoys the support of the Water Research Commission.

PUBLIC AWARENESS-RAISING
Reaching out through art

"May the artworks open the eyes of visitors to Cape Town to the link between climate change and water."

Flemming Møller Mortensen,

Danish Minister of Development Cooperation

Two murals, "Zipper"' by Eske Touborg (left) and "Camissa" by Nadia Nardstar, were unveiled at the V&A Waterfront to create awareness of the value of groundwater. © Klaudia Schachtschneider

Originally, the aim was to also produce a business awareness-raising output, but time constraints as well as Covid-19 made this delivery impossible. Instead, the Partnership project contributed technical input, organisation and networking, communication and funds to the Danish-South African public art collaboration at Makers Landing, V&A Waterfront, Cape Town.

The artwork consists of two public art murals with a groundwater focus, created by South African artist Nadia Nardstar and Danish artist Eske Touborg. The mural inauguration was held on 5 May 2022.

GROUNDWATER MONITORING

OUTPUT 3

An expanded citizen-science programme for groundwater monitoring is in place.

OUTPUT INDICATOR

Data collected by citizens in four more city areas over and above Newlands and Epping Industria, feeding into the database.

AIMS

Obtain current relevant groundwater data and information for the Table Mountain Strategic Water Source Area and select new areas

Develop and extend the monitoring network for residential and business groundwater use in Cape Town

Conduct a hydrocensus survey and expand the groundwater-monitoring network to four areas in Cape Town

Install six dataloggers in each area; download data quarterly for upload to the groundwater dashboard

WHAT WAS ACHIEVED?

Criteria for new areas

- Known borehole density
- Known groundwater use
- Potential points of concern
- Type of hydrogeology

Four suburbs to be monitored

- Brackenfell
- Constantia/Bergvliet
- Noordhoek
- Scarborough/Kommetjie

Hydrocensus

- 683 boreholes or wellpoints were counted
- Only 333 boreholes or wellpoints are registered on the City of Cape Town database

Dataloggers

- 17 residents/businesses across the four new areas in Cape Town agreed to datalogger installation

KEY WINS

- Hydrocensus was a door-to-door awareness campaign for residents and field training for students.
- Evidence was collected of borehole numbers and the vast number of water users who rely solely on groundwater for supply.
- Installed dataloggers will provide long-term data to groundwater dashboard.

FUTURE AMBITIONS

1. Extend the volunteer monitoring network to new areas.
2. Add water-quality components to the monitoring.
3. Meet residents' needs for more groundwater awareness communication.

MONITORING GROUNDWATER Partnering with GEOSS

The dramatic increase in the number of boreholes and wells that were drilled during the 2015 to 2018 drought made it imperative to start monitoring groundwater levels in Cape Town.

"It would be a bad idea to drive a car without a fuel gauge. Equally, it is a bad idea to use groundwater without monitoring how it is responding to abstraction. Groundwater levels over time provide you with a 'gauge' of aquifer health."

– Dale Barrow, GEOSS

GEOSS hydrogeologists with postgraduate students from the University of the Western Cape ready for their hydrocensus and door-to-door visits. © GEOSS

WWF South Africa appointed GEOSS South Africa (Pty) Ltd to start quantifying the number of groundwater users across Cape Town and the groundwater levels in different neighbourhoods. The brief was to establish a citizen-science groundwater-monitoring network throughout Cape Town, building on a previous project cycle funded by AB InBev. That pilot project started monitoring groundwater levels in residential and business areas, specifically in Newlands and Epping Industria.

For the Table Mountain Water Source Partnership groundwater project, the monitoring was extended to include four additional areas: Brackenfell, Constantia/Bergvliet, Noordhoek and Scarborough/Kommetjie (Annexure 3). These areas were carefully chosen based on known groundwater abstraction, the number of newly drilled boreholes as well as expressed concerns that groundwater levels were declining. Each area was carefully demarcated. Resident municipal councillors were contacted and informed and their cooperation was requested. Project information material was provided to give the councillors some background, and dates were set for a hydrocensus survey in each area.

A hydrocensus is a task that involves gathering information on water features, water supply sources (in this case groundwater) and sources of potential water pollution in a particular site or area. The focus of this hydrocensus was not on sources of potential pollution but rather on determining how many boreholes and wellpoints there were in an area, and how the groundwater was being utilised by the property owner. A total of 683 boreholes or wellpoints were counted, of which only 330 had been registered with the City of Cape Town. Boreholes suitable for datalogger installation at properties were identified and if the owner gave consent, a date was arranged to install the loggers.

The interaction with the residents was an opportunity for the GEOSS staff and the postgraduate students from the University of the Western Cape (who assisted with the survey) to create awareness of groundwater. Many of the residents engaged in a discussion and asked questions. The students gained valuable field experience through this project and therefore benefited from the project involvement. In order to adhere to Covid-19 regulations, the usual hand-out questionnaire to residents was replaced by an online form with a QR code attached to make it accessible to them. The hydrocensus team’s visits were announced via the most appropriate communication channel in each neighbourhood, often a neighbourhood WhatsApp group.

In each neighbourhood, at least four different volunteers were identified that were willing to have dataloggers installed in their boreholes. The loggers would regularly record the groundwater level and long-term monitoring would become possible. Each neighbourhood had a data feedback session where the data results were directly discussed with interested and affected parties.

Very similar to the previous findings in the Newlands and Epping Industria areas, this study indicated that most boreholes identified based on the available signage on the property, had not been captured in any official database that was publicly available. In this regard, the Table Mountain Water Source Partnership project has a very particular value and gap to fill. It would also be most valuable to broaden this type of monitoring across other areas of Cape Town to help Capetonians understand and manage their groundwater resources in future.

Going forward, the Table Mountain Water Source Partnership can play a valuable role in making groundwater data available, not only to inform how much groundwater can be used without depleting the resources, but also to monitor its quality.

The groundwater data collected with the electronic dataloggers gets uploaded regularly to the groundwater dashboard. That means that data on the dashboard is kept current and relevant, allowing residents to understand how the city's groundwater resources are coping under stresses like abstraction and droughts, and also how seasonal changes in rainfall affect the groundwater levels.

DEVELOPING A GROUNDWATER DATABASE AND DASHBOARD

OUTPUT 2

A sound knowledge base and database are in place for the Table Mountain SWSA.

OUTPUT INDICATOR

Operational groundwater database for the Cape Town area.

AIMS

Conduct a public opinion poll to determine what groundwater information and data would be of interest to Cape Town residents

Collect groundwater data from existing sources and new monitoring network

Design and test a tailored, easy-to-access groundwater dashboard for the Table Mountain SWSA

WHAT WAS ACHIEVED?

Public opinion poll

- Poll conducted by iComms prior to the Danish project and funded by AB InBev
- 74 replies
- Findings provided the foundation for data collection phase

Data collection

- 60 new boreholes added
- Approximately 500 000 water-level records from data loggers (hourly readings) and manual readings (monthly or quarterly) added
- Rainfall data for rainfall stations obtained, some for up to the past 10 years

Groundwater dashboard

- Based on database and website from previous work by the Water Resource Commission and Aquabase
- 12 stakeholders from various backgrounds tested the dashboard to reveal friction points, confusing experiences and bugs
- Groundwater dashboard launched on 24 March 2022: tablemountain.groundwaterinfo.africa

KEY WINS

- Front-end software allows the public to access, retrieve and visualise the groundwater data in the database: tablemountain.groundwaterinfo.africa
- Groundwater data can be visualised on simple maps with context information.
- The dashboard also acts as a public awareness tool, with various links to groundwater publications and a groundwater dictionary.
- The groundwater database is current with data regularly being updated.
- The partnership agreement enabled the contribution of data from the City of Cape Town and other institutions that had not previously been available.

FUTURE AMBITIONS

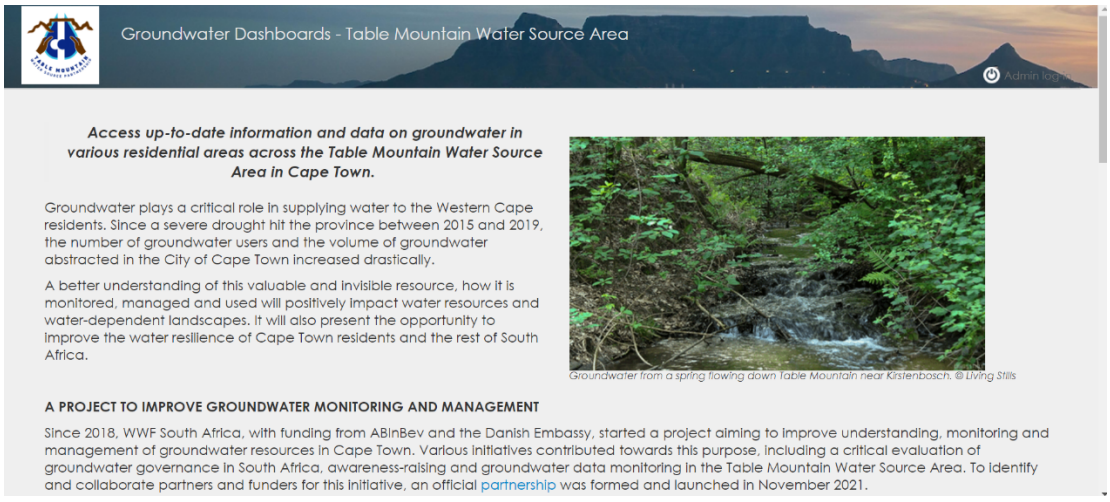
1 The dashboard is a live tool of the Table Mountain Water Source Partnership that will be regularly updated and improved.

DEVELOPING A GROUNDWATER DASHBOARD Partnering with Immo Blecher and iComms

Groundwater data can help scientists, decision-makers and residents make sense of groundwater, at different scales and in different places. But everyone might have different questions, so it makes sense to bring as much data together and to display it in various ways to make it easier to understand.

"I am over the moon with the dashboard. I have wanted to see this type of display for over 10 years and it shows more than I could have hoped for."

– Kevin Winter, UCT



The landing page of the groundwater dashboard website: tablemountain.groundwaterinfo.africa

Making groundwater information accessible to Cape Town residents was an idea that was sparked as far back as 2018. The project funded by AB InBev brought the idea to life as a pilot study. The first, and essential, step was to understand what residents wanted to know about groundwater before the actual dashboard and database could be designed.

WWF South Africa asked iComms, a specialist group at the University of Cape Town, to conduct a survey to ask residents what type of groundwater information would interest them (Annexure 4, Appendix A). The replies to four key questions guided the database structure:

1. What is the typical groundwater level in my area?
2. What is the typical groundwater quality in my area?
3. How many boreholes are in my area?
4. How much water is being abstracted in my area?

This information provided the ideal foundation for the Table Mountain Water Source Area groundwater project to design the database and a dashboard. But developing such a complex database is very time-consuming, and the project timeline did not allow for a completely new design. The solution was to contact Immo Blecher, the architect of Aquabase and a previous Water Research Commission database project, with the request to build on his existing comprehensive study, thus saving time and using previous projects constructively.

The aim was to build a database for groundwater in the Cape Town area using software into which data could easily be entered. It was also important that the information on the dashboard would be easy to visualise in the form of maps. In addition, the dashboard had to give the average resident solid but simply worded groundwater information. After months of improving and customising the existing database and front-end, the first round of database software and dashboard construction was ready for scrutiny, again through the iComms group of the University of Cape Town.

In a thorough dashboard review process, volunteers attended a one-hour session where they had to navigate the draft dashboard, locate basic groundwater information and give honest feedback on ease of use, logical build and display of the webpage. Based on the feedback of 14 participants, iComms provided a summary report with recommendations that formed the foundation for the database and dashboard architect to rework and reword the format. The reworking was done in very close cooperation with two WWF science communicators, who had the ability to translate some of the technical terms into text that is understandable by the average reader.

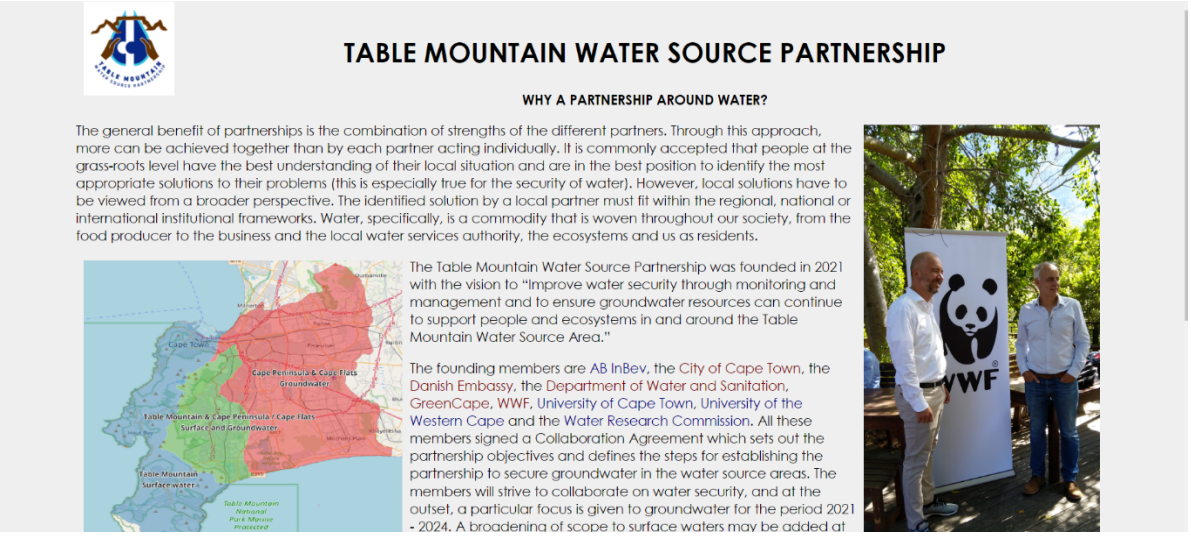
Based on one of the recommendations from the second iComms report (Annexure 4, Appendix B), the dashboard was adapted to allow for two different types of engagements: (1) a “Quick view” that is simple to navigate, straightforward in what one can see and perfectly suited to the average interested resident who wants to see what is going on in terms of groundwater in their neighbourhood; and (2) a “Deep dive” that holds far more technical and in-depth information that scientists, academics or anybody with a scientific background can query for research purposes.

The dashboard was officially launched on 24 March 2022 for World Water Day and tied in with its theme: “Groundwater, making the invisible visible”. The public webinar launch was attended by 47 guests who provided feedback and took part in the Q&A session.

The groundwater dashboard, as a platform for sharing data and information about groundwater in the Cape Town area, should support the recommendations in the policy and governance work in the bigger Table Mountain Water Source Partnership to improve groundwater governance and resource management for the benefit of residents and nature.

The next step in the dashboard journey is to secure funding to continue updating current data in the database and to keep it operational as a key output of the Table Mountain Water Source Partnership. This component of the Partnership project was affected very little by Covid-19 because it was mainly an online development process, even though some interactive workshop sessions with various stakeholders were envisaged at the start of the project.

A key challenge – not only for Cape Town, but for South Africa as a whole – remains the access to widely dispersed groundwater data, which is housed in many different locations. This challenge was acutely felt when the database and dashboard were constructed.



Information page about the Table Mountain Water Source Partnership on the dashboard website: tablemountain.groundwaterinfo.africa

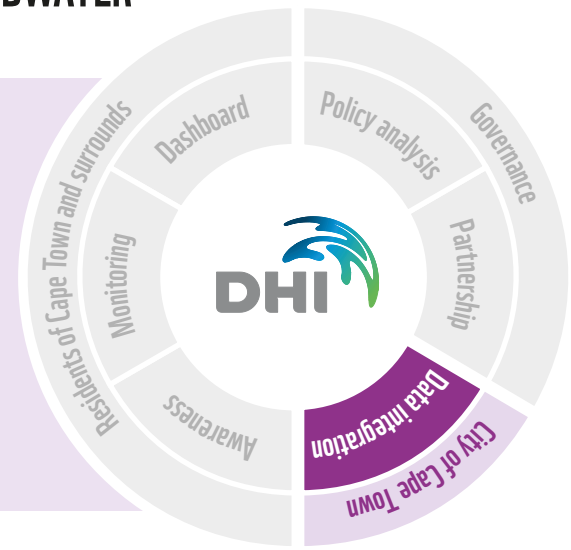
DATA INTEGRATION AND LEARNING EXCHANGE ON GROUNDWATER

OUTPUT 5

Table Mountain Water Source Area partners and national SWSA stakeholders have increased capacity through sharing of international best practices and Danish groundwater management expertise.

OUTPUT INDICATOR

Record of Danish and SWSA stakeholders engagement and lessons shared.



AIMS

Exchange technical knowledge and support to include groundwater data flow in the Bulk Water Decision Support System (BWDSS) of the City of Cape Town (CoCT)

Add identified groundwater observations stations to the BWDSS

Conduct coaching sessions with CoCT experts to operationalise developed groundwater models to the BWDSS and improve the performance of the current BWDSS

Design a roadmap showing how the BWDSS can be further improved

WHAT WAS ACHIEVED?

Participants in exchange project

- 2 from the City of Cape Town (Bulk Water Branch of CoCT)
- 3 from DHI Water & Environment, Denmark
- 2 from EkoSource (developer of the BWDSS)
- 2 from Umvoto groundwater-monitoring consultants for bulk groundwater supply

Events to exchange knowledge

- 4 inception workshop meetings
- 2 technical clarification meetings on FEFLOW models
- 3 training sessions with CoCT staff, Umvoto and EkoSource

KEY WINS

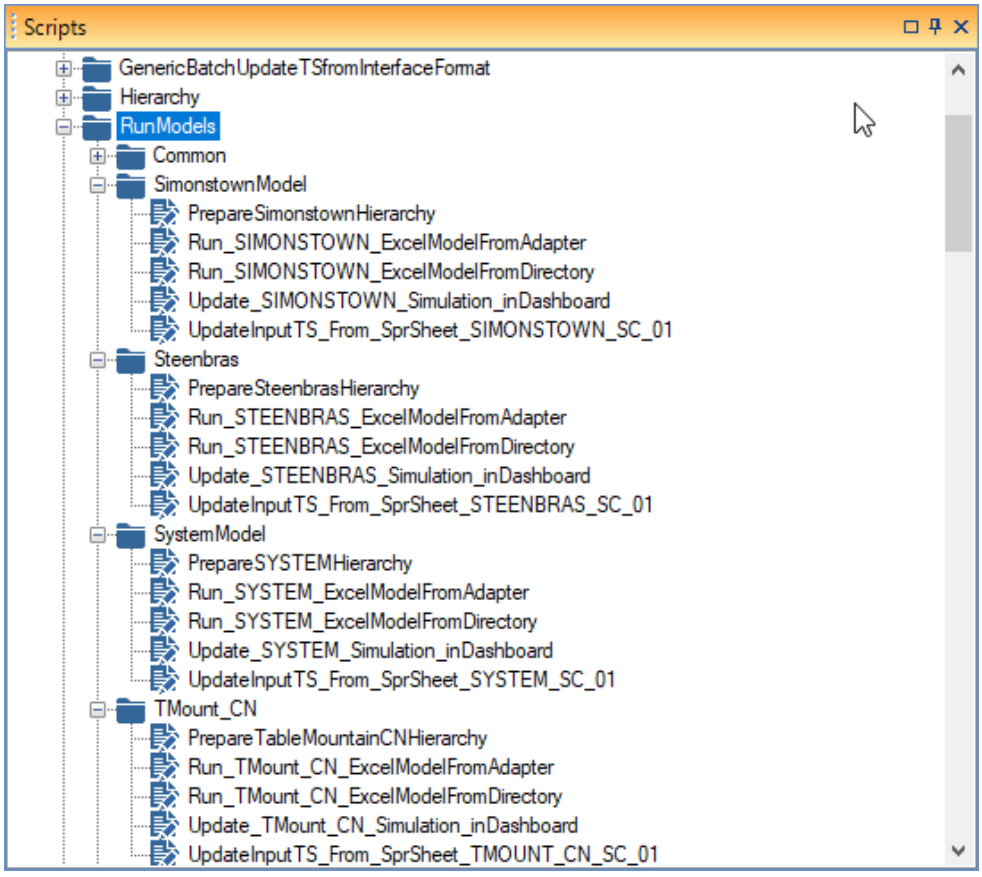
- The City of Cape Town has started with real-time monitoring of the groundwater levels in the Table Mountain Group aquifer, which contributes to the city's bulk water supply.
- Real-time measurements from seven boreholes are available for monitoring groundwater levels. Another 16 monitoring boreholes will potentially become available by June 2022 and will be added to the BWDSS.
- Thanks to the technology and knowledge transferred, the City of Cape Town will be able to monitor abstraction rates and aquifer replenishment more efficiently.
- The available data will make it possible to forecast changes in groundwater levels if groundwater is used to reduce water supply shortages.

FUTURE AMBITIONS

1. Include Cape Flats and Atlantis aquifer data in the BWDSS when it becomes available in August 2022.
2. City of Cape Town will keep monitoring the aquifers and changes in groundwater levels.
3. Use transferred technology and knowledge to forecast changes in groundwater levels.
4. Knowledge exchange and addition of monitoring data will ensure the proactive management of groundwater resources for future use.

LEARNING EXCHANGE
Partnering with DHI Water & Environment

To effectively and efficiently provide its residents with water, the City of Cape Town makes use of a Bulk Water Decision Support System. Groundwater data needs to be added to this system so that informed integrated water management decisions can be made for future water supply.



A page of script showing hard-coded function names.

Most of the City of Cape Town's (CoCT) drinking water is supplied by surface water stored in 14 dams in the Boland area. Due to water supply shortages, and especially after the major drought period in 2015 to 2018, the city is investigating the possibility of covering some of Cape Town's drinking water demand from available groundwater resources. The City of Cape Town plans to monitor and forecast the groundwater levels in the Atlantis, Cape Flats and Table Mountain Group aquifers and utilise these groundwater resources to reduce water supply shortages in case surface water does not suffice. The current Bulk Water Decision Support System (BWDSS) does not include groundwater observation data or groundwater models.

Therefore, DHI Water & Environment was contracted by WWF South Africa and the Table Mountain Water Source Partnership to improve and extend the existing BWDSS to support the city's plans to integrate available groundwater resources into its water supply. DHI Water & Environment is a Danish company of experts providing unique solutions for water resource management with modelling technologies and analytics (Annexure 5).

The main aims of this project were defined as follows:

- Add identified groundwater observations stations to the BWDSS
- Operationalise developed groundwater models to the BWDSS
- Improve the performance of the current BWDSS

The BWDSS is already in use by the City of Cape Town to manage surface water supply to the area. It consists of three applications:

- **MIKE Operations:** Desktop- and server-based software with centralised PostgreSQL database server. Application is hosted on a back-end server available only to a few CoCT staff (< 0) within CoCT's intranet.
- **WaterNet Advisor:** A web application used to run water allocation scenarios in near real time. Based on a bulk water model and near real-time data imported from the water supply network database, the application allows support of operational water allocation decisions in the bulk water system.
- **Bulk Water Web Dashboards and Data Capture (Web DSS):** This facilitates manual remote data collection and allows the presentation of data from the back-end databases via customised web-based dashboards.

As part of Cape Town's groundwater-monitoring plan, real-time measurements from approximately 400 boreholes were identified to include in the adapted BWDSS to accommodate groundwater. Various changes had to be made to the software scripts in order to accommodate the groundwater data.

Participants in this knowledge-exchange project include employees from the Bulk Water Branch at the City of Cape Town, experts from DHI Water & Environment, developers of the software and the consultant managing the real-time groundwater monitoring for the city.

Covid-19 restrictions affected this project too and in-person workshops planned for the end of 2021 could not be held. However, workshop sessions and technical meetings ensured that training for relevant stakeholder staff was completed.

BOX 2: THE WAY FORWARD

The City of Cape Town has already started with real-time monitoring of the groundwater levels in the Atlantis, Cape Flats and Table Mountain Group aquifers, which are targeted to contribute to bulk water supply for the city.

Thanks to this technology and knowledge transfer, Cape Town will be able to utilise these groundwater resources to reduce water supply shortages in future. Officials will also be able to forecast changes in the groundwater levels of the aquifers, taking into consideration abstraction rates and aquifer replenishment.

"We had a really excellent training session on Tuesday! It is really going to have a HUGE benefit for us as we implement what they [DHI and software developers] have developed."

Lloyd Fisher-Jeffes, City of Cape Town

ASSESSING GROUNDWATER POLICY AND GOVERNANCE IN SOUTH AFRICA

OUTPUT 1

Good governance, policy and regulation systems are in operation for the Table Mountain SWSA.

OUTPUT INDICATOR

Table Mountain Water Source Partnership terms of reference for partners, strategy and action plan.

AIM

Assess the current status of groundwater policy and governance in South Africa, with a focus on the role of local partners to support local groundwater resource management

WHAT WAS ACHIEVED?

Participating stakeholders

- City of Cape Town
  Resilience Department
  Bulk Water Supply
  Water and Wastewater Directorate
- National Department of Water and Sanitation
- AB InBev
- University of Cape Town
- SADC Groundwater Management Institute
- Stockholm International Water Institute (SIWI)

Outputs from various stakeholders

- Mapped relevant mandated institutions with respective functions/responsibilities
- Identified essential partners for a groundwater partnership in the Table Mountain Strategic Water Source Area (SWSA)
- Identified a framework to implement groundwater governance and groundwater resource management at local government level which the Table Mountain Water Source Partnership could take forward
- Provided recommendations to the Partnership regarding setup, solidification and growth

KEY WINS

- Initial integration discussions at City of Cape Town top management level, with defined next steps to better integrate groundwater into governance structures and project frameworks.
- Presentation of policy review report at World Water Day 2022 national event.

FUTURE AMBITIONS

1. Achieve effective groundwater management in the City of Cape Town, the local government institution with jurisdiction over the Table Mountain SWSA in terms of water resource management.
2. Evolve the current partnership model into a flexible but clearly mandated institutional arrangement.
3. Mandate WWF South Africa as the host institution and secretariat for the Table Mountain Water Source Partnership.
4. Empower the Partnership to mobilise inclusive, community-level engagement in the Table Mountain SWSA.
5. Through the host institution, pursue open and engaging communication with the relevant municipal departments and key players such as the provincial Department of Water and Sanitation.

POLICY AND GOVERNANCE
Partnering with OneWorld

The Table Mountain Water Source Partnership was used as a local partnership example to conduct a critical review of South Africa's groundwater-related policy, legal frameworks and strategies in the context of how they support the establishment of local groundwater partnerships.

POLICY REVIEW

"Given the severe impacts of previous drought events, and the significant risk that climate change poses to water resources and their management, projects such as these are timeous and important."

– Belynda Petrie from OneWorld

As drought events are predicted to become more common and intense because of climate change, groundwater can play an important role as part of the overall water resource for the City of Cape Town, which was severely impacted by drought between 2015 and 2018. Given the importance of groundwater and the widespread use of boreholes, it is key for water resource management to understand the potential of groundwater reserves and to strengthen and support groundwater governance in the Table Mountain Strategic Water Source Area (SWSA), to meet both current and future challenges.

OneWorld engaged stakeholders through interviews and meetings to map relevant mandated institutions together with their functions and responsibilities, and identify essential partners for a groundwater partnership. The project then aimed to find the most suitable frameworks currently in place to implement groundwater governance, providing international case study examples. Finally, mapping and frameworks were used to give recommendations to the existing Table Mountain Water Source Partnership that would assist in the critical review of its initial setup, and aid in further solidification and growth.

On World Water Day 2022, Belynda Petrie from OneWorld presented the report findings at the Danish Fellowship Centre's Water Engagement Day in Pretoria. © OneWorld

This project also embodies the principles of Integrated Water Resource Management (IWRM) and emphasises the need for effectual IWRM, with valuable stakeholder engagement and cross-cutting solutions.

The key audience for this project was a broad spectrum of stakeholders involved in groundwater resource management, planning, policy and regulations and water conservation, among others. This includes government officials involved in decision- and policy-making, local and regional institutes and organisations relevant to water and resource management, and academic institutions.

BOX 3: STAKEHOLDER ENGAGEMENT

The project had engagements with, and inputs from the following stakeholders:

- Resilience Department, City of Cape Town
- Bulk Water Supply, City of Cape Town
- Water Demand Management & Strategy, Water and Sanitation; Water and Wastewater Directorate, City of Cape Town
- Bulk Services, City of Cape Town
- National Department of Water and Sanitation
- SAB - AB InBev
- University of Cape Town
- SADC Groundwater Management Institute
- Stockholm International Water Institute (SIWI)

The activities carried out under this project were:

- A reconnaissance of existing groundwater-related policy, legal frameworks and strategies related to groundwater governance in South Africa. A summary was provided of their interlinkages, functions and responsibilities related to groundwater management. The mapping included the national, provincial as well as the SWSA-level in South Africa, with a specific focus on the Table Mountain SWSA.
- A summary of key challenges, gaps and any overlaps, with a particular lens on possible entry points for the proposed Table Mountain Water Source Area Partnership (Box 4).
- Identification of framework(s) to implement groundwater governance and groundwater resource management at a local government level which the Table Mountain Water Source Partnership could take forward.
- A summary was compiled of recommendations and a set of case studies of international examples.

Box 4: KEY CHALLENGES AND GAPS

Several gaps and challenges in the management and governance of water resources were identified, specifically relating to:

- **Effective groundwater management:** The City of Cape Town (CoCT), as the local government institution under whose jurisdiction the Table Mountain SWSA falls in terms of water resource management, is well positioned to play certain key roles in groundwater management (such as data management), but not others (such as mobilisation of local communities and catchment management forums, or financial management of resources dedicated to groundwater development and management). This necessitates cooperative governance both within and outside the CoCT.
- **Sustainable groundwater resources:** To achieve sustainable use, it is critical to build strategic partnerships and governance arrangements across mandated functions in relevant institutions. Empowered institutions and clear institutional arrangements attract predictable financial flows and critical resources.
- **Monitoring of groundwater resources:** This is needed across all levels of society and users. The data needs to be transparent and disseminated for education and awareness-building, and for a collective understanding of the pace of transformational change.
- **Partnership hosting:** This must be mandated to a credible and legitimate institution.
- **Community engagement:** Community-level engagement in groundwater resource development, management and monitoring is a critical success factor.
- **IAP management:** Management of invasive alien species (IAPs) is critical in conservation areas that are home to valuable groundwater resources.

The key learnings and outcomes were:

- The national Groundwater Management Strategy (2015) clearly devolves responsibility for groundwater management to local government.
- The functions of Catchment Management Agencies (CMAs) have not been fully delegated, thus limiting the contribution they can make to good water governance within the Water Management Areas (WMAs).
- Groundwater plays a vital role in public health and water security at household and domestic level.
- Groundwater management needs to cut across the mandates of water and environment departments in the City of Cape Town. The water department needs to consider the conjunctive use of ground- and surface water in water resource planning, while they are also responsible for water quality. The environment department is responsible for the conservation areas from which much of the Table Mountain SWSA groundwater originates. Urban planning is another critical function, given that the Table Mountain SWSA is located in an increasingly densifying urban area.

The recommendations based on the learnings and the gaps and challenges that were identified are:

- Adopt a set of defining principles for the Table Mountain Water Source Partnership and locate adaptive management – or learning-by-doing – as the pivotal principle.
- Agree to and adopt a definition of sustainable groundwater management for the Table Mountain SWSA.
- Consider establishing the Table Mountain Water Source Partnership as a Water User Association in the longer term, but only if considered necessary based on the learnings and outcomes of ongoing monitoring, evaluation and learning (MEL).
- Evolve the current Partnership model (as launched in November 2021) into a flexible but clearly mandated institutional arrangement.
- Ensure that the partnership structure embodies all the key functions the Table Mountain Water Source Partnership needs.
- Agree on a host institution for the Partnership.
- Consider establishing and mandating WWF South Africa, which has provided a strong facilitative role for the establishment and launch of the Partnership, as the host institution and secretariat.
- Empower the Partnership, through its host institution and as supported by other appropriate partners, to mobilise inclusive, community-level engagement in the Table Mountain SWSA.
- Through the host institution, pursue an open and engaging communication with the relevant municipal departments and the provincial Department of Water and Sanitation (DWS), among other key partners.

Belynda Petrie discussing the policy and governance review at the Table Mountain Water Source Partnership launch at Kirstenbosch Botanical Gardens on 15 November 2021. © WWF

BUILDING A GROUNDWATER PARTNERSHIP

OUTPUT 1

Good governance, policy and regulation systems are in operation for the Table Mountain SWSA.

OUTPUT INDICATOR

Table Mountain Water Source Partnership terms of reference for partners, strategy and action plan.

AIMS

Set up, formalise and launch the Table Mountain Water Source Partnership

Co-create key interventions of the Partnership with all partners based on the reviews of the institutional role of the Partnership, the partners, policy and best practices

WHAT WAS ACHIEVED?

Set up and formalise the Partnership

- 9 founding partners
- Partnership launched on 15 November 2021
- Basic structure defined: Secretariat and chair positions defined; monitoring, evaluation and learning role needed going forward
- Partner roles evolved and interests defined

Co-create key interventions

- Co-creating discussions held regarding partnership process and structure

KEY WINS

- The steering committee represents all levels of government, as well as the private, non-government and academic sectors.
- This project is a first for groundwater in South Africa, and representation at community level is actively pursued.

FUTURE AMBITIONS

1. Continue monitoring groundwater levels and maintain the dashboard in the long term.
2. Secure funds for the secretariat to keep the Table Mountain Water Source Partnership active.
3. Consider new project options to tackle priority problems, including more focus on water quality and groundwater/surface water interaction as identified during partner discussions.

PARTNERSHIP SETUP

"Improving water security through monitoring and management, to ensure that water resources can continue to support people and the ecosystem in and around the Table Mountain Strategic Water Source Area."

– Partnership Vision Statement

The Table Mountain Water Source Partnership was launched at Kirstenbosch Botanical Gardens on 15 November 2021. © Ruan Wolfaardt / WWF

A groundwater partnership in Cape Town was established and expedited for three reasons:

1. The Cape Town drought experience and the looming prospect of “Day Zero” created particular urgency to look at different water sources, and groundwater definitely shifted into focus. The impacts of the drought catalysed more serious attention on groundwater in the Table Mountain Strategic Water Source Area.
2. National policies recognise water source areas as critical for water security. Collaborative governance is a critical component to make this happen.
3. The groundwater strategy of South Africa specifically supports the idea of establishing local partnerships to govern groundwater.

At the end of the 2015 to 2018 drought, there were only a few players engaging with groundwater and yet pressure on the resource was increasing. The increased attention and policy recognition of the importance of water source areas and groundwater in particular provided good reasons to initiate local collaborative action.

In 2018, a groundwater pilot project was started by WWF and AB InBev. The key aims were to build groundwater-monitoring networks, to look at public data display and to start the Table Mountain Water Source Partnership. WWF South Africa facilitated the project process.

A first step was to identify and approach potential partners one by one, based on the experience of stakeholders: whether they were key players in the water sector in Cape Town or key governance bodies responsible for groundwater. Private-sector partners and funders with a specific focus on groundwater were also approached. By March 2020 the first meeting of founding members was held, coinciding with the onset of the Covid-19 pandemic. The founding members were considered to be the steering committee of the Table Mountain Water Source Partnership, who co-created its purpose and structure.

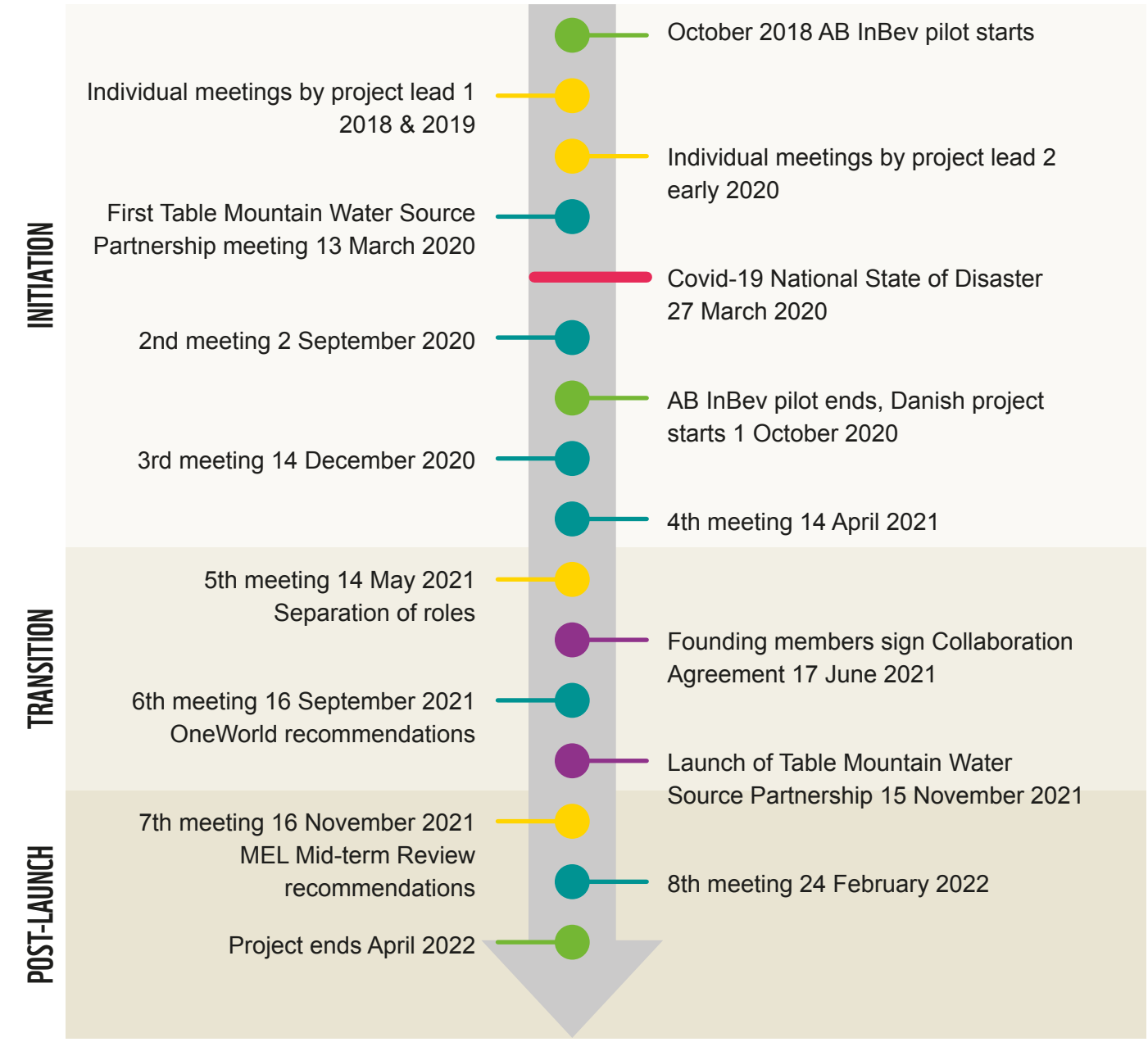
The Partnership’s joint vision is: “The Parties will collaborate and strive to attain water security. At the outset, particular focus is given to groundwater for the first three to four years. A broadening of scope to surface waters may be added at a later stage of the Partnership.”

The steering committee is representative of national, regional and local management and governance levels, as well as academia, the private sector and the non-governmental sector.

In October 2020, groundwater work and partnership building received a significant boost from the government of Denmark via funding from the Royal Danish Embassy, to implement a wide variety of groundwater activities and to further the partnership formation as a key output by April 2022.

Between March 2020 and April 2022, a total of eight steering committee meetings were held. With each meeting, the roles and responsibilities evolved. At first, WWF South Africa held most responsibility for facilitating the partnership growth process, but after a few meetings, enough growth had taken place to separate the role of the chairperson (now with the national Department of Water and Sanitation on a rotational basis) and the temporary secretariat (WWF).

PROJECT TIMELINE



FOUNDING MEMBERS

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

EMBASSY OF DENMARK

GreenCape
Supporting the business of green

SAB
The South African Breweries
A proud part of the ABInBev family

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

UNIVERSITY of the WESTERN CAPE

WATER RESEARCH COMMISSION

WWF

Pivotal to the negotiation of the growth and transition phases was an external monitoring, evaluation and learning (MEL) team. They kept a close eye on the aim of launching the Partnership and defining a strategy and action plan through observation and facilitation, giving feedback and making suggestions on the structure of the Partnership.

A contracted review by OneWorld of groundwater policy and governance in South Africa (Annexure 6) provided a valuable overview of the space in which the Partnership was being established. It also provided several recommendations on the process and structure of the Partnership to consider going forward.

A huge milestone was reached when finally, after all the months of Covid-19 isolation, the Partnership could be launched officially on 15 November 2021.

However, the journey of co-creating this unique Partnership has only just begun. To keep travelling on the partnership road ahead, several steps are essential:

- The Table Mountain Water Source Partnership requires top-level endorsement with key governance bodies.
- It needs a continuous funding stream, both from partners and from outside funders. This is to cover essential functions to service the Partnership (such as the secretariat), to keep it on track (through the support of external evaluators), to ensure ongoing priority groundwater activities under the Partnership banner (e.g. residential monitoring and maintaining the dashboard, as well as new projects that focus on groundwater and the groundwater/surface water interface).
- Most importantly, the internal enthusiasm needs to be nurtured, to further develop the Partnership and for the Partnership to actively support groundwater projects in order to make a meaningful contribution to groundwater governance in Cape Town.

The assembled Partnership logo at the official launch in Kirstenbosch Botanical Gardens on 15 November 2021 © Credit WWF

UPTAKE AND SCALE-UP

Apart from the key activity areas in which it has driven change, the Table Mountain Water Source Partnership project has also sparked internal institutional discussions on how to address groundwater going forward.

UPTAKE BY WWF

"What struck me the most was how ungoverned and unmanaged groundwater is in South Africa as a whole, and the complete over-emphasis on surface water. In a water-scarce country like ours, we cannot afford to be in this position and it is high time that groundwater comes into sharp focus by all relevant institutions. My eyes have been opened and I am taking a new awareness of groundwater into the water source areas and sectors in which I work."

– Sue Viljoen, Water Stewardship, Dairy Sector

The formation of the Table Mountain Water Source Partnership and this Danish-funded project have pushed groundwater to the foreground in WWF. Given the organisational focus on water source areas, and the fact that 37 water source areas are actually groundwater-focused, it was timeous to engage WWF's Freshwater team on the integration of groundwater in all work going forward (Annexure 9, Appendix A).

In February 2022, WWF South Africa's Freshwater team therefore met to learn more about groundwater policy and governance and groundwater tools such as the newly developed dashboard. The aim was to apply lessons from the creation of the Table Mountain Water Source Partnership to other priority areas and to understand where groundwater can easily be incorporated into water stewardship work. The first step was to map the water source areas in which WWF is already active and to overlay any groundwater source areas (Figure 4).

PRIORITISED STRATEGIC WATER SOURCE AREAS FOR SURFACE WATER THAT OVERLAP WITH THOSE OF GROUNDWATER

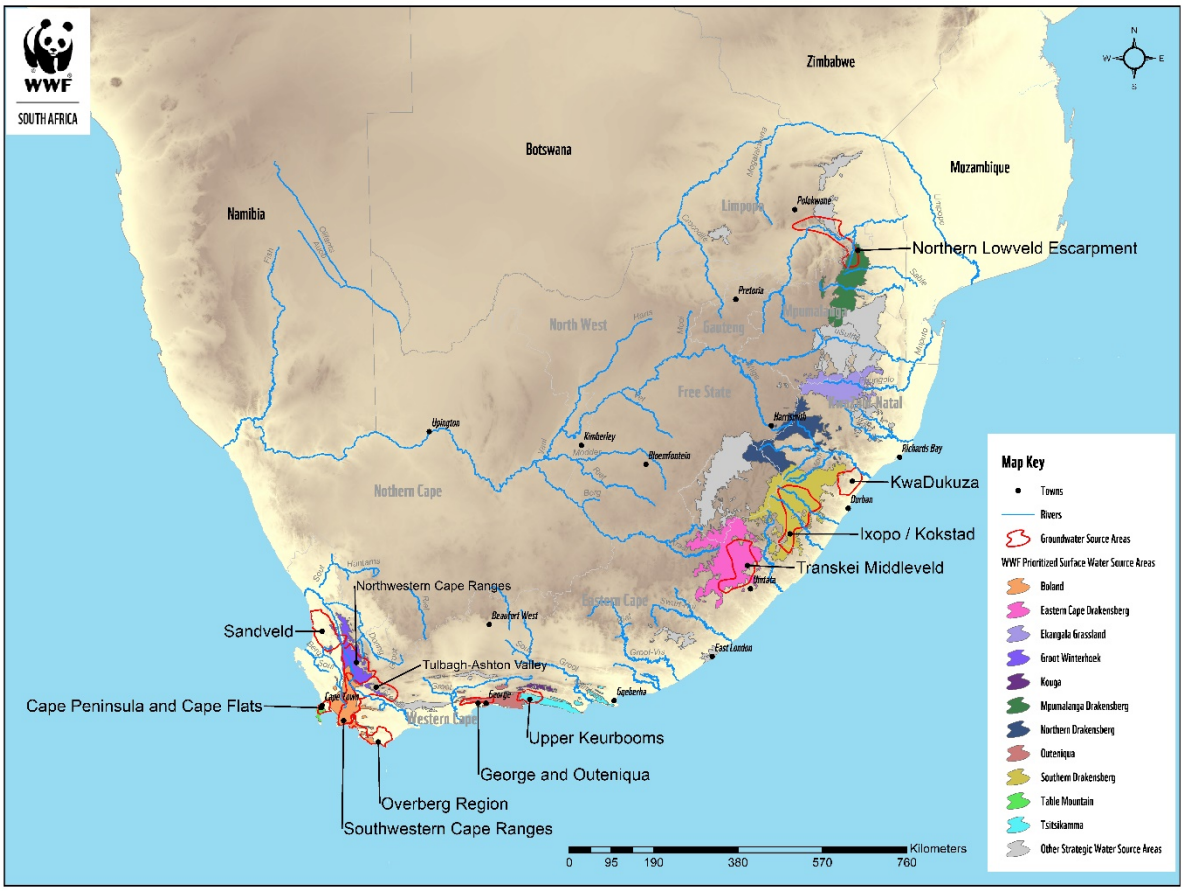


Figure 4: Prioritised strategic surface water source areas that also overlap with strategic groundwater source areas

The overlapping water source areas are the ones where it makes immediate sense for WWF to engage regarding groundwater.

Upon documenting existing groundwater work, it was found that there is an ongoing groundwater-monitoring project with farmers in the Groot Winterhoek Water Source Area, that there is spring protection work happening in the Eastern Drakensberg and that the uMhlathuze Water Stewardship Partnership is active in the Zululand Coast groundwater source area.

At the end of the session, team members provided feedback and identified potential roles for WWF in relevant partnerships and groundwater work. They also discussed a roadmap for greater groundwater inclusion in WWF Freshwater work in future.

More training on groundwater is envisaged going forward, and groundwater activities will be overtly pursued in the priority water source areas.

UPTAKE BY THE CITY OF CAPE TOWN

The City of Cape Town (CoCT) is a key partner for groundwater governance and use in the Table Mountain Strategic Water Source Area. Current legislation defines groundwater as a natural resource for management and regulation by the national Department of Water and Sanitation, which focuses on large water users. For this reason, the CoCT's institutional arrangements and governance have not specifically responded to the requirements of groundwater as an increasingly important resource. But this is changing. In addition to the requirement to register boreholes with the CoCT, the CoCT now manages wellfields used for bulk supply and has included groundwater protection zones in the District Plans and Biodiversity Network. While these activities are specific to groundwater, there are other mandates that intersect and affect groundwater management, such as environmental management; land-use planning; land-use management; water, sewage and solid-waste management; and parks and recreation.

Thanks to the driving of some CoCT staff members who also engage with the Table Mountain Water Source Partnership, a degree of initial integration of groundwater into governance has occurred. However, more focus is still needed to effect integrated water management at a catchment scale inclusive of surface and groundwater. Further and more regular internal communications inside the city structures is recommended to facilitate groundwater mainstreaming into governance and management, as per the National Groundwater Strategy, which firmly locates the responsibility for groundwater management at the local level.

"The two words 'information' and 'communication' are often used interchangeably, but they signify quite different things. Information is giving out; communication is getting through."

– S.J. Harris

Founding partners of the Table Mountain Water Source Partnership assembling the Partnership logo at the launch on 15 November 2021. © Roxanne Frizlar

Project communication was spearheaded by the WWF project managers, who also now form the Partnership secretariat. They coordinated all internal meetings of the steering committee and implementers, collaborated and attended external meetings organised by stakeholders, organised all overarching project events, and contributed to various of the learning and awareness-raising materials produced by the individual projects.

The WWF project members conducted various radio interviews, appeared in project videos and represented the Partnership at various stakeholder events and project activities. All communication outputs and media coverage links are listed in Annexure 9, Appendix B.

Communication took place through various channels and by means of different types of communication materials:

- Internally between work pieces, WWF, implementers, the steering committee and the monitoring, evaluation and learning (MEL) team
- From each work piece to external stakeholders (public, partners, etc.)
- From the overall project to external stakeholders and funders (project events, videos, final reporting, etc.)

The nature of a large component of this project, i.e. awareness-raising, meant that communication was critical to achieve related outcomes for the project. Due to the Covid-19 pandemic, the originally planned interactive activities had to be postponed or replaced with something different, so creative ways had to be found to still interact with various audiences. Although this made the interaction less personal, it reached a larger audience. An example is the liturgy, prepared by the Rev. Rachel Mash of the Green Anglicans, which was adopted by the World Council of Churches for their World Water Day service in March 2022 (Annexure 1, Appendix C). Instead of reaching the congregation of only one church, the materials were sent to a mailing list of 14 000 people and were used as far afield as Geneva, Switzerland.

The Mid-term Review produced by the MEL team (Annexure 8, Appendix B) confirmed that awareness-raising happened above and beyond the specific awareness-raising activities in faith groups, schools and public activities. It also happened in unexpected and complex ways at other scales, such as between partners and implementers. The active engagement of partners during steering committee meetings led to networking and cross-learning about other related projects and opportunities to provide inputs into other workshops, especially within the City of Cape Town. During feedback meetings with implementing teams, especially the in-person events, various ideas were shared for collaboration possibilities. Some of these fell flat due to Covid-19, but others will continue into the future.

The cross-pollination led to partners engaging colleagues in their own institutions and initiating groundwater discussions with water teams and top management. This was specifically the case for the City of Cape Town and WWF.

On a completely different and personal level, awareness-raising and learning was possible via door-to-door visits of students and GEOSS personnel during the hydrocensus process. And for anyone wanting to learn more about groundwater in their own time, the groundwater dashboard provides a wealth of information.

The launch of the Partnership at Kirstenbosch Gardens on 15 November 2021 was lauded as a networking opportunity. Partners and stakeholders got the opportunity to engage face-to-face for the first time since the inception of the project. Present at the launch were representatives of collaborating academic institutions and businesses, regional government institutions, the City of Cape Town and the schools that had submitted the winning posters. The event was covered by radio stations, newspapers and online news publications.

The feedback from all target audiences – learners, Water Disciples, teachers, church communities, policymakers, local residents and dashboard users – was very positive and reflects the impact that the communication endeavours had through materials, door-to-door visits, workshops, presentations and web interfaces.

PROJECT COMMUNICATION AND MEDIA

AIMS

1 Increase awareness and understanding of groundwater

2 "Make the invisible visible"

PROJECT COMMUNICATION

INTERNAL COMMUNICATION

FROM	CHANNEL	AUDIENCE
WWF project management MEL team Steering committee Implementers: Green Anglicans, Greenpop, GEOSS, Immo Blecher, DHI Water & Environment, City of Cape Town, OneWorld	Meetings: Implementers, steering committee (27 hours from September 2020 to April 2022), MEL, ad hoc meetings regarding projects or their overlap Minutes were taken and distributed to attendees	Internal stakeholders

EXTERNAL COMMUNICATION

FROM	CHANNEL	AUDIENCE
Green Anglicans	Public events (2), email, social media, webinars, church events, group events	Funder, launch, churchgoers of all ages, i.e. Water Disciples, residents, church administrators, religious councils, water and faith sector (even international)
Greenpop Foundation	Public events (2), videos (3), video billboards (2), blog (1), social media	Funder, launch, teachers, school children, residents
GEOSS hydrogeology consultants	Public events (2) Door-to-door hydrocensus, local WhatsApp groups	Funder, launch, residents
Immo Blecher	Public events (2), webinar (1)	Funder, launch, residents
DHI Water & Environment and City of Cape Town	Public event (1)	Funder, City of Cape Town
OneWorld	Public events (2)	SA water sector and funder

OVERALL COMMUNICATION

FROM	CHANNEL	AUDIENCE
WWF	Blogs (2), presentations (3), OpEd (1), launch event (1) Social media drive (#waterunderyourfeet)	WWF followers/residents, WWF Board, CoCT Section 80 committee, WWF International network, media
Table Mountain Water Source Partnership	Radio interviews (3), video (1), webinar (1), presentations (2), launch event (1)	Cape Town residents, Western Cape and national radio stations, Strategic Water Partners Network SA, funders, media

33 NEWS ARTICLES
Online and printed

3 RADIO INTERVIEWS
1 local
2 national

3 BLOGS
2 WWF
1 Greenpop

4 VIDEOS
1 WWF
3 Greenpop

2 VIDEO BILLBOARDS
at 33 locations

4 EVENTS
3 neighbourhood feedback sessions

Project initiation walk with implementers and funders

YOUTH-FOCUSED MATERIALS
Sunday School materials

School lesson plans (3 grades)

Groundwater information packs for teachers and learners

3 short “Introduction to groundwater” videos in 3 languages

2 WORLD WATER DAY 2022 EVENTS
Water Engagement Day, Royal Danish Embassy, 22 March 2022

Webinar launch of groundwater dashboard, 24 March 2022

THE TABLE MOUNTAIN WATER SOURCE PARTNERSHIP WAS OFFICIALLY LAUNCHED AT KIRSTENBOSCH BOTANICAL GARDENS, CAPE TOWN ON 15 NOVEMBER 2021.

MONITORING, EVALUATION AND LEARNING (MEL)

"The MEL process really gave me an appreciation for the magnitude of the task and how my component was a part (albeit a crucial part) of the entire project."

– Dale Barrow, GEOSS

This project had to be conceived and executed in an extremely short time and in a very turbulent era due to the Covid-19 pandemic. A MEL team was brought on board right from the outset to accompany the project through its progress in real time. It did so in various ways.

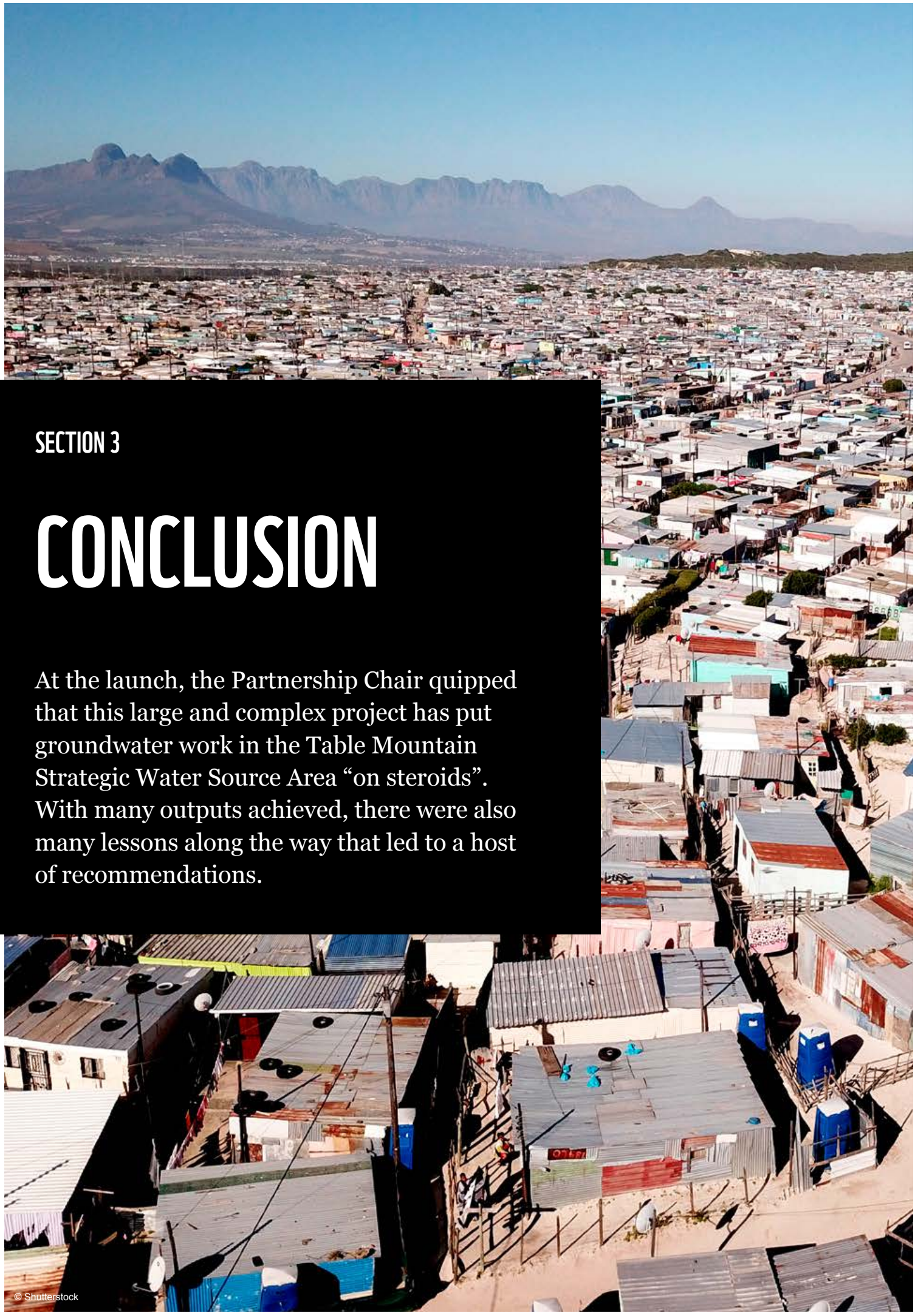
The first step was to generate a Theory of Change and to continue testing and reviewing project progress against this framework.

The MEL team met all project implementers right at the beginning at inception meetings, ensuring that outputs and deliverables were clearly planned and expressed from the outset. Every two months, this team facilitated a feedback session with all the implementers and the project management team. The meetings provided a space in which to report and track progress, voice challenges, overcome hurdles, build bridges between projects and allow for cross-learning.

To oversee the partnership formation process, the MEL team engaged with the project team and the Partnership's founding members at the steering committee meetings and during individual interviews. Here their role was to document progress in real time and to facilitate surface reflexive learning and dialogue.

Going forward, it is recommended that the Partnership's roadmap be accompanied by a MEL process to provide roadmap iterations at different time junctures. MEL forms part of the recommended motto for the Partnership, which is "Think big, start small and scale fast". MEL is the right tool to identify the timing and entry points for scaling-up activities. If, going forward, the capacity for effective MEL is not present, there is significant risk that the process could be hindered and lead to challenges that will derail project progression.

The MEL reports to date are given in Annexure 8.

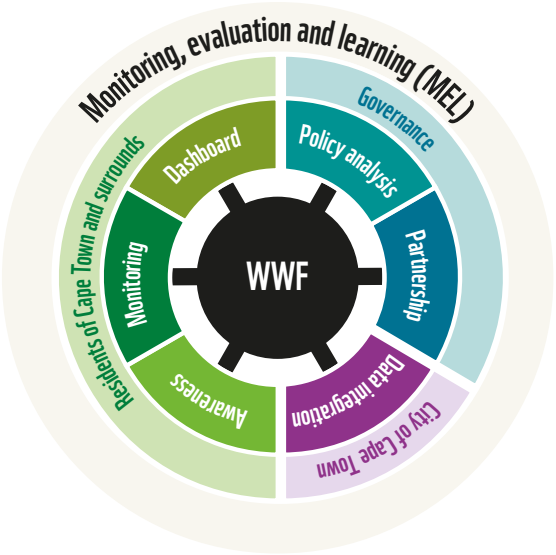


SECTION 3

CONCLUSION

At the launch, the Partnership Chair quipped that this large and complex project has put groundwater work in the Table Mountain Strategic Water Source Area “on steroids”. With many outputs achieved, there were also many lessons along the way that led to a host of recommendations.

PROJECT OVERVIEW



WWF PROJECT MANAGEMENT TEAM

The WWF project management team operated at three levels, directly facilitating the partnership formation, driving progress of each project component and "holding" the overall project.

AWARENESS

Faith groups

- Raised awareness that groundwater is sacred, not just an economic asset
- 6 publications reached over 36 000 people
- Uptake by International Council of Churches made material globally available
- 13 Water Disciples educated on ground-water and faith to work in local communities

Schools

- 2 000+ Grade 4, 5 and 7 learners reached
- Learner and teacher material on groundwater developed
- 130 pupils from 9 primary schools in Cape Town participated in a poster competition
- Winning poster (Kannemeyer Primary School) inspired 2 video posters, run at 33 Cape Town locations for 2 months.

Public

- 2 groundwater awareness murals unveiled on 5 May 2022 at the V&A Waterfront

DASHBOARD

- Groundwater dashboard for Cape Town was launched on 24 March 2022
- Publicly available at: tablemountain.groundwaterinfo.africa

MONITORING

- 4 new groundwater monitoring areas added: Brackenfell, Constantia/Bergvliet, Noordhoek and Scarborough/Kommetjie
- Hydrocensus counted 683 boreholes and wellpoints in the 4 new areas
- Dataloggers placed at 17 volunteer residents/ businesses and measurements placed onto groundwater dashboard

DATA INTEGRATION

- Learning exchange between DHI Water & Environment from Denmark and the City of Cape Town
- City groundwater data integrated into the Bulk Water Decision Support System
- Data integration makes better planning and management of future droughts possible

POLICY ANALYSIS

- Existing national and local groundwater-related policy, legal frameworks and governance strategies analysed
- Recommendations based on national Groundwater Management Strategy (2015):
  - Responsibility for groundwater management to be devolved to local government
  - Table Mountain Water Source Partnership to evolve into a flexible but clearly mandated institutional arrangement

PARTNERSHIP

- Table Mountain Water Source Partnership launched on 15 November 2021
- 9 founding members signed a Collaboration Agreement, supporting groundwater-related work in the Table Mountain Strategic Water Source Area
- Co-creating a partnership vision, structure and functions

MONITORING, EVALUATION AND LEARNING (MEL)

The MEL team ensured continuous checking, realignment, learning and documentation for the project management team of all project components, the overall project and the new partnership.

KEY LEARNINGS

Economic disparities and water quality

A fascinating learning coming out of the work with the Green Anglicans is that the economic disparity in South Africa and Cape Town also affects the type of groundwater issues that are most pressing to residents. Financial means are required to afford to drill a borehole and become the owner of groundwater infrastructure to tap into groundwater resources. Consequently, the topic of groundwater quantity, sustainable use and quality are of concern to borehole owners. The groundwater-monitoring project component directly related to this group of residents.

The Green Anglicans' awareness-raising work stretched across income disparities. Discussions with the young Water Disciples helped clarify that groundwater monitoring and sustainable use felt less tangible and relevant to non-borehole owners. The more pressing and tangible topic was water quality. The relationship between land use, waste management, pollutant infiltration into groundwater, its re-emergence in wetlands and surface water in the wet season and the associated health risks were far more concerning and relevant. This insight sensitised the team and the project narrative to the pressing groundwater issues in different communities. Future work of the Table Mountain Water Source Partnership will address water quality as a key topic and remain sensitive to the residential audience and their needs.

Covid-19 constraints

The key learning from the school awareness project was the difficult situation that teachers faced during Covid-19. At the same time, it was heartening how many teachers, despite the extra burden of Covid-19, were still willing to go the extra mile to participate in the groundwater awareness poster competition. The schools that were selected by Greenpop were government schools from less affluent areas, with the specific intention of giving children with limited exposure to additional education, and the opportunity of competing and winning prizes that would normally not be within their reach. Seeing the good turnout of the competition was particularly heartening.

Trust is vital

A key learning from the monitoring project was that residential engagement, through a hydrocensus and door-to-door visits, is best undertaken with support from trusted people in the neighbourhood. Given the vigilance about safety in Cape Town, trusted community members need to be on board to ensure the engagement of residents. The project approached local municipal councillors to gain permission for conducting the hydrocensus and gain on-the-ground support ahead of the neighbourhood visits. Communication of the planned visits worked best via trusted communication channels such as neighbourhood WhatsApp groups.

The local election in 2021 brought about a change in councillors in some neighbourhoods. This created additional footwork for the project, as a second set of councillors had to be engaged in all the areas that had been visited in the November to December 2021 period. The timing of such visits has to be clearly communicated and some branding for easy recognition helps to open doors and elicit conversations.

Strength of multi-skilled teams

A fascinating learning curve for the project team was to understand how many different skills were required to build the groundwater database and dashboard. Central to this process were the dashboard designer and the database architect. In addition, science communicators were pivotal to translating scientific geohydrological language into easily understandable terms. The input of iComms, with a keen eye on target audience interests, was a key development cornerstone for the project. They had the valuable assistance of the WWF Communications team. The dashboard testing process was equally eye-opening. The wide diversity of test subjects enriched the review process, making the dashboard what it is today.

Matching local needs with international expertise

For the project team, the most challenging activity to set up was the learning exchange. The team had to conduct regular in-depth interviews with partners in order to understand, identify and verbalise local learning needs that could indeed be addressed by Danish expertise. Brokering a project between the Danish company DHI Water & Environment and the City of Cape Town took an exceptionally long time. It also required the involvement of the Royal Danish Embassy, as they are more familiar with the technical groundwater skills on offer in Denmark. This restricted the actual engagement time between DHI Water & Environment and the City of Cape Town, which was exacerbated by Covid-19 travel restrictions and stay-at-home policies. Nonetheless, the output was completed, but could have had more depth had more time been available.

Complex groundwater policy environment

The most important lesson gained from the policy review was to appreciate the complexity of the groundwater space. Making groundwater “visible” from a governance perspective will be a true challenge going forward. While there seems to be general consensus that local governance structures for groundwater are ideal in theory, the Table Mountain Water Source Partnership or any other governance structure for groundwater will continue on their journey of co-creation with multiple stakeholders and partners.

Roles must be flexible

For WWF, the biggest lesson in the partnership development process was that an original facilitator like WWF needs to constantly navigate its role and remain flexible, and must be prepared to change roles when the time is right. A constant review of roles and the appropriateness of roles in a partnership process is a key learning that WWF will take forward into all other partnerships in which it might engage.

Timeline

A challenge for the project overall was the timeline. The Danish funding was generous, but the project had extremely rigorous timelines. Working with partnerships where the facilitator did not always have control over the speed at which partners moved made it difficult to negotiate such rigid timelines. Equally, having to navigate the restrictions of the Covid-19 pandemic required flexibility and constant adjustment in order to meet the tight deadlines. Future recipients of similar funding from Denmark will certainly benefit by reviewing the timelines.

Early engagement of the MEL team

An absolute strengthening factor for the project team has been the involvement of the monitoring, evaluation and learning (MEL) team right from the outset. The team ran the project planning and visioning processes and was able to view the entire unfolding of the project right from the beginning. The MEL team acted as a vital sounding board in many of the project processes, with specific focus on partnership building. Here the team was able to act as facilitators of processes when the time came for WWF to take on a different role. The neutral stance of the MEL team was highly valued by all participants and remains a key common recommendation going forward for the co-creation of the Table Mountain Water Source Partnership and, in fact, of any other partnerships in which WWF might engage.

RECOMMENDATIONS

This project solidified the Table Mountain Water Source Partnership. The internal structure of the Partnership shifted during the course of the project, from WWF as the sole driver, to the Chair position being taken up by the national Department of Water and Sanitation and WWF holding the secretariat. The steering committee members have been most engaging and are keen to grow the Partnership. Therefore, going forward, new groundwater-related projects should be jointly decided. A key first focus should be groundwater quality, seeing that there are real data gaps and because it is a topic that affects all residents across Cape Town.

Awareness-raising should remain a key focus for the Partnership, and new, innovative forms of education should remain a priority.

The recently developed and launched dashboard and established groundwater-monitoring network are tangible partnership assets that need to be kept alive once project funding has come to an end. Continued long-term funding for these two activities will be the pivotal initial focus for the members of the Table Mountain Water Source Partnership.

The funds from the Danish government have provided a superb blueprint for groundwater work that can be used as a guideline and for other projects and taken to other areas of South Africa. However, the differences between landscapes in terms of aspects such as land use, local stakeholders and social and economic conditions need to be acknowledged and incorporated into the partnership design process. The uptake in other Strategic Water Source Areas will not be the onus of the Table Mountain Water Source Partnership, but it can certainly be promoted by the Partnership's founding members with national reach, such as the Water Research Commission, WWF and the Royal Danish Embassy through its Water Sector Collaboration with the Department of Water and Sanitation.

As the Partnership continues to mature and co-create its own structures, the continued oversight of a MEL team is recommended to keep documenting and guiding the co-creation process and the learnings along the way.

A recommendation to funders is to consider accommodating the speed at which partnerships develop. These processes depend on a group dynamic, as well as environmental, economic and social climates that are often beyond the control of the implementing agent. A flexible timeline would offer the opportunity to deepen some of the implementation benefits and impacts that are otherwise cut short.

The learnings from this project should be written up in a manner that can contribute to critical literature and that can be presented at international forums, such as the Stockholm World Water Week.

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ANNEXURES

Annexures 1 to 9 are available at the following link: wwf.org.za/annexures/table_mountain_water_source_area_partnership

Annexure 1: Faith groups – Partnering with the Green Anglicans

Annexure 2: Schools – Partnering with the Greenpop Foundation

Annexure 3: Monitoring groundwater – Partnering with GEOSS

Annexure 4: Developing a groundwater dashboard – Partnering with Immo Blecher and iComms

Annexure 5: Learning exchange – Partnering with DHI Water & Environment

Annexure 6: Policy review – Partnering with OneWorld

Annexure 7: Partnership setup – Table Mountain Water Source Partnership

Annexure 8: Monitoring, Evaluation and Learning (MEL) reports

Annexure 9: Uptake, scale-up and project communication

Annexure 1: Faith groups – Partnering with the Green Anglicans

APPENDIX A

- World Water Day service 2021: What does water mean to you?
- Sunday School materials for children: Water is life!
- Sunday School materials for teachers: Water is life!
- Colouring activities

APPENDIX B

- Names of Water Disciples
- Participating churches in Cape Town
- 2022 Fast calendar

APPENDIX C

- Groundwater factsheet: Groundwater: The water we walk on
- Care for Creation manual
- Liturgy for World Water Day 2022
- Diocese of Cape Town resolution

APPENDIX D

- Spekboom donations
- Protest to protect the Black River

Annexure 2: Schools – Partnering with the Greenpop Foundation

APPENDIX A

- Grade 4 Groundwater Lesson: Aquifers
- Grade 5 Groundwater Lesson: Digging deep – Wells
- Grade 7 Groundwater Lesson: Protecting our precious resource
- WWF GAC 2021: Learner Information Pack (English)
- WWF GAC 2021: Teacher Information Pack (English)

APPENDIX B

- Blog: Learners at Greenpoint Urban Park
- Video billboards: Feedback summary

APPENDIX C

- Poster list and evaluation process
- School posters: Judging context

Annexure 3: Monitoring groundwater – Partnering with GEOSS

APPENDIX A

- Establishing a citizen-science groundwater monitoring network for Brackenfell, Western Cape

APPENDIX B

- Establishing a citizen-science groundwater monitoring network for Constantia & Bergvliet, Western Cape

APPENDIX C

Establishing a citizen-science groundwater monitoring network for Noordhoek, Western Cape

APPENDIX D

Establishing a citizen-science groundwater monitoring network for Scarborough & Kommetjie, Western Cape

Annexure 4: Developing a groundwater dashboard – Partnering with Immo Blecher and iComms

APPENDIX A

Thematic analysis results for the WWF citizen science groundwater project in Cape Town – iComms

APPENDIX B

WWF Groundwater platform: Usability Testing Report – iComms

Annexure 5: Learning exchange - Partnering with DHI Water & Environment

Technical Learning Exchange on groundwater data in decision support tools

Annexure 6: Policy review – Partnering with OneWorld

Current status of groundwater policy and governance in South Africa with a focus on the role of local partners to support local groundwater resource management

Annexure 7: Partnership setup – Table Mountain Water Source Partnership

Table Mountain Water Source Partnership – its setup and lessons

Annexure 8: Monitoring, Evaluation and Learning (MEL) reports

APPENDIX A

Approach, Processes and Methods: Monitoring, Evaluation and Learning (MEL) support to the Table Mountain Water Source Areas Partnership project

APPENDIX B

MEL Mid-term Review report for the Table Mountain Water Source Area Partnership project

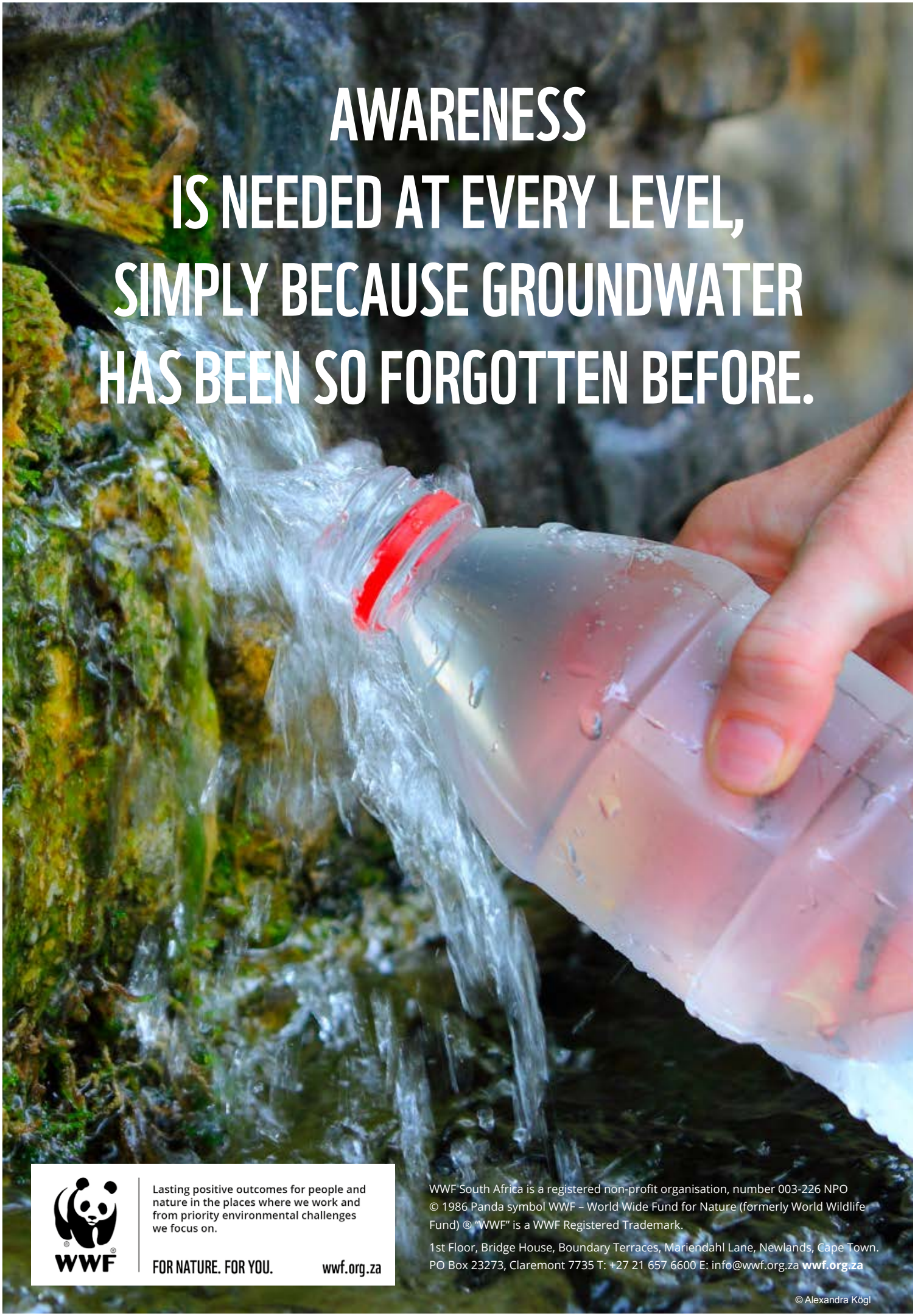
Annexure 9: Uptake, scale-up and project communication

APPENDIX A

Uptake by WWF: Policy insights from the WWF Freshwater team

APPENDIX B

Communication: List of publications and media



WWF

Lasting positive outcomes for people and nature in the places where we work and from priority environmental challenges we focus on.

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