

STRATEGIC GROUNDWATER SOURCE AREAS: STRENGTHENING NATURAL CAPITAL FOR WATER SECURITY AND CLIMATE RESILIENCE

National Natural Capital Accounting Forum 2026

Statistics South Africa (Stats SA) Pretoria Head Office, Rholihlahla Auditorium

Presented by: Dr Stanley Nzama
Designation: Scientist & Project Manager (SWSA-gw)
Chief Directorate: Water Ecosystems Management

Date: 14 September 2026

WATER IS LIFE - SANITATION IS DIGNITY



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA



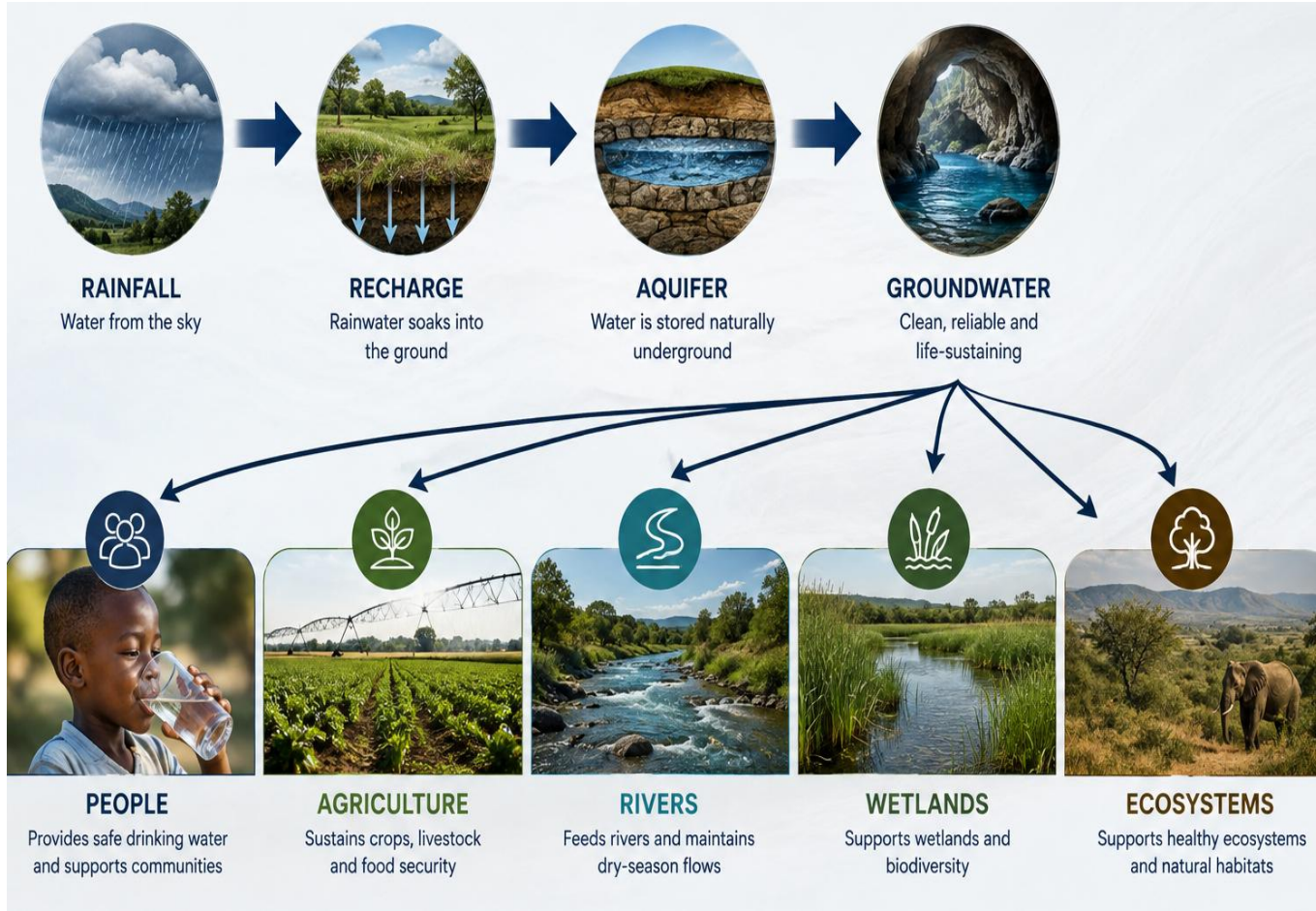
The Canadian wetland case as reflected in the social benefits of retaining wetlands demonstrates that the true economic value of natural assets extends beyond their immediate commercial use, (Millennium Ecosystem Assessment, 2005).

This principle is reflected in the evolution of Natural Capital thinking (Li et al., 2026).

1. Millennium Ecosystem Assessment, (2005). Ecosystems and Human Well-Being: Wetlands and Water Synthesis. World Resources Institute, Washington, DC.
<https://www.millenniumassessment.org/documents/document.358.aspx.pdf>
2. Li, C., Zhu, C., Wang, S., & Ouyang, Z., (2026). Natural capital accounting status and trends in China. Cell Reports Sustainability (3)5,100730.
<https://doi.org/10.1016/j.crsus.2026.100730>

GROUNDWATER: WHY IT MATTERS

Groundwater: An Invisible but Strategic Natural Asset



NW&SMP (2018):
Section 8.3.4 calls for protection of groundwater resources and aquifer-dependent ecosystems.

NGS (2017): Theme 4: Groundwater Resource Protection

NWRS 3 (2023):
Various sections citing groundwater as one of the key strategic water sources

FROM GROUNDWATER RESOURCE TO NATURAL CAPITAL

Changing the Perspective



ECOLOGICAL INFRASTRUCTURE: A FOUNDATION FOR WATER SECURITY

Water Security: Beyond Built Infrastructure



NWRS 3: Chapter 12 dedicated to Protection of Aquatic Ecosystems, Maintenance, and Restoration of Ecological Infrastructure

STRATEGIC WATER SOURCE AREAS

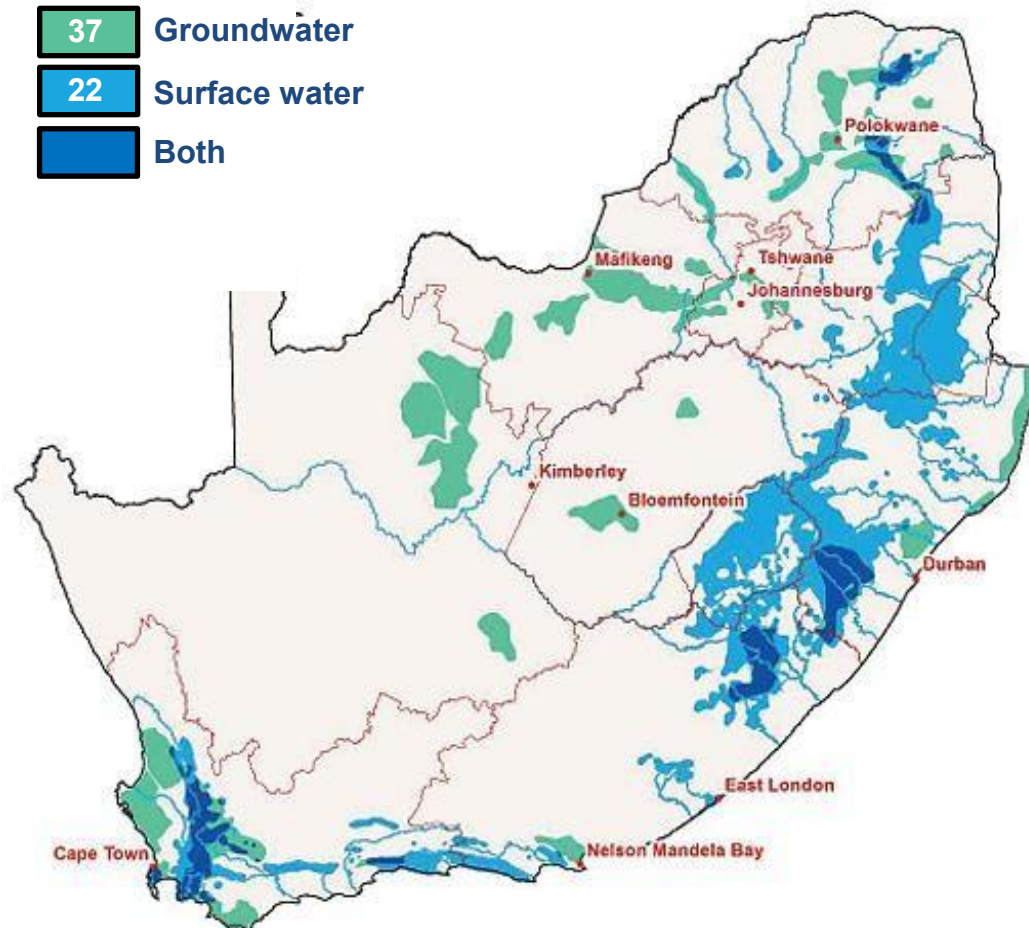
Not All Areas Have Equal Strategic Importance

SWSA-sw: Natural source areas that generate disproportionately large volumes of mean annual surface-water runoff relative to their size, making them strategically important for national water security.

SWSA-gw: Aquifers (geological bodies capable of holding and transmitting water) that can naturally supply disproportionately large volumes of groundwater per unit area and are considered of national strategic significance for water security, socio-economic development and sustainability.

STRATEGIC WATER SOURCE AREAS

Where Are South Africa's Strategic Water Source Areas?



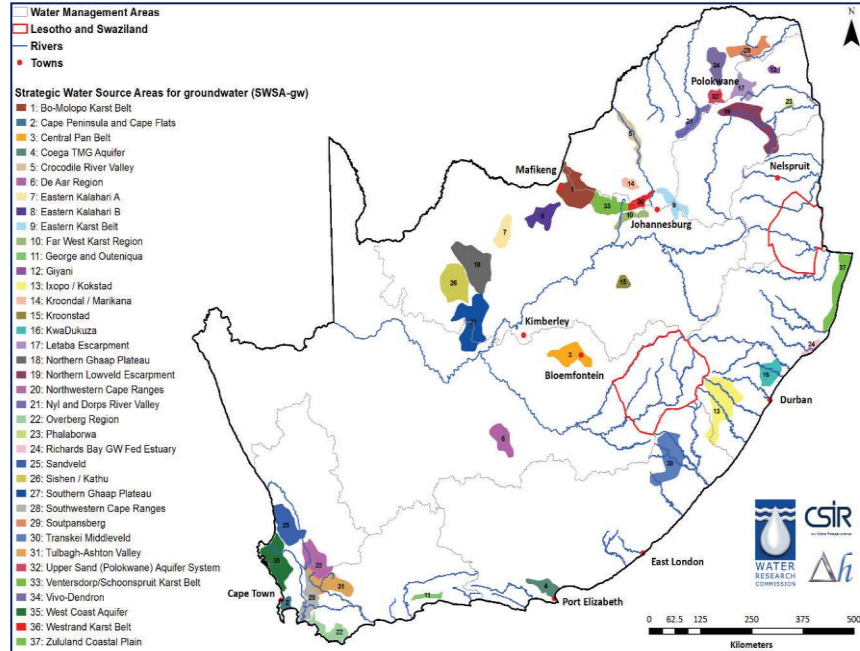
WHAT MAKES A GROUNDWATER AREA STRATEGIC?

Thinking Beyond “Where Is Groundwater?”

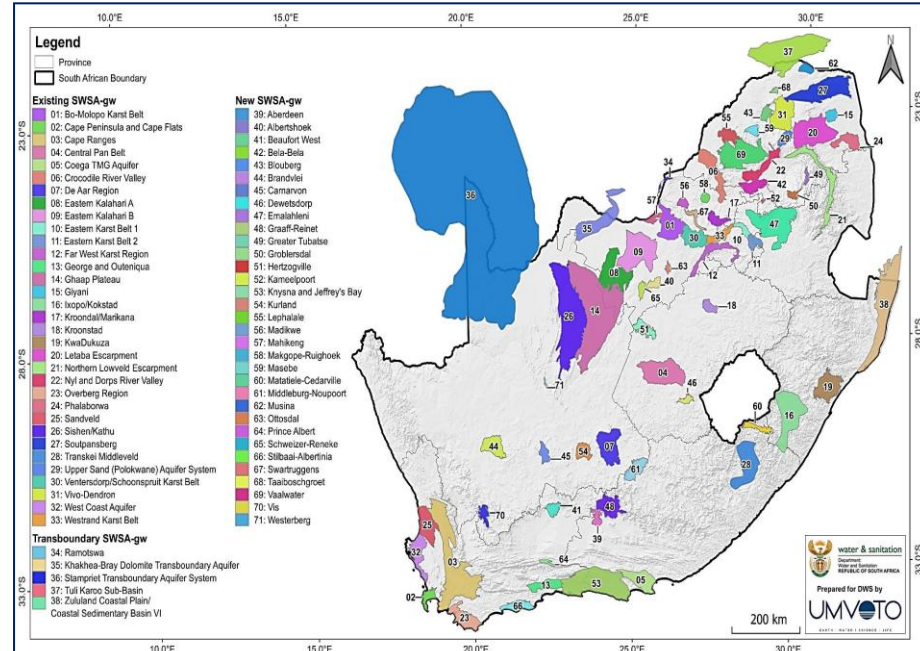
Groundwater Availability	Strategic Significance	Additional Considerations
Recharge	Current Demand	Groundwater Quality
Baseflow	Economic Significance	Future Developments
	Groundwater Reliance & Growth Pressure	
	Ecological Significance	
	Governance & Policy	

WHY REFINE THE SWSA-GW DELINEATION?

From National Baseline to Improved Spatial Understanding



Source: Le Maitre, et al., 2018

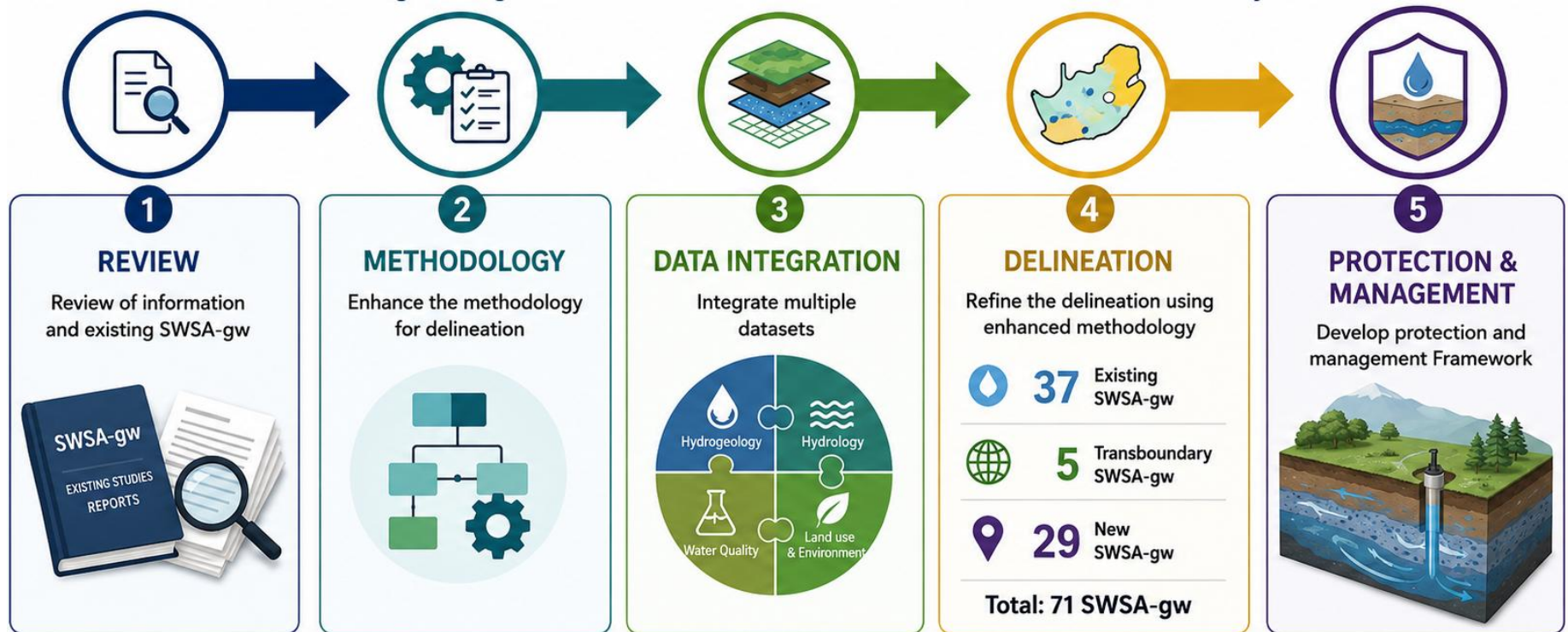


Source: DWS, 2026

1. Le Maitre, D.C., Seyler, H., Holland, M., Smith-Adao, L., Nel, J.L., Maherry, A. and Witthüser, K. (2018) Identification, Delineation and Importance of the Strategic Water Source Areas of South Africa, Lesotho and Swaziland for Surface Water and Groundwater. Report No. TT 743/1/18, Water Research Commission, Pretoria. South Africa
2. Department of Water and Sanitation (DWS) (2026). Refinement of Strategic Groundwater Source Areas of South Africa – Delineation of Strategic Groundwater Source Areas of South Africa Report: Volume 1. Chief Directorate: Water Ecosystems Management, Report No. 1047/3.3/5/2026. Private Bag X 313, Pretoria, South Africa

THE DWS REFINEMENT PROJECT

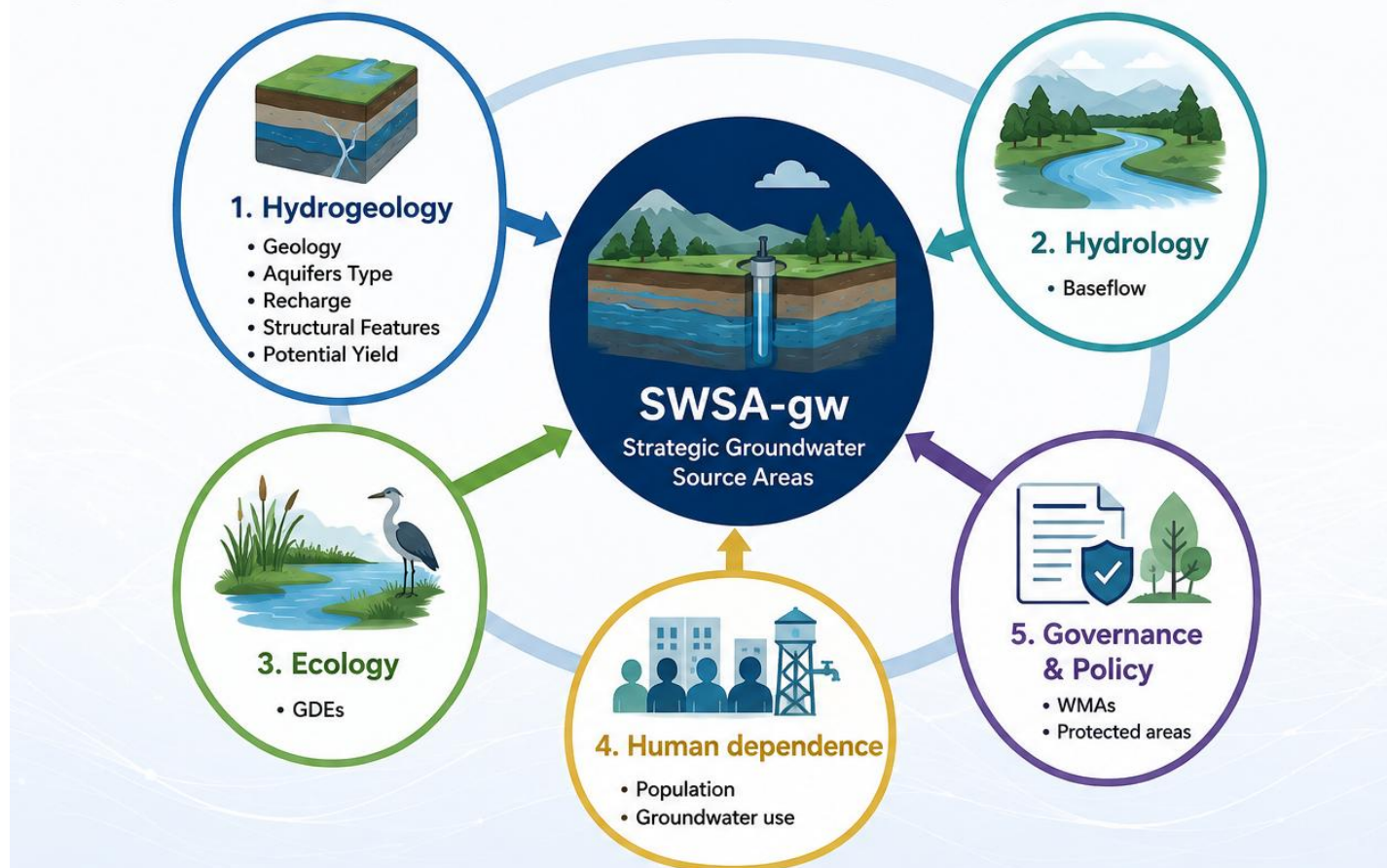
Refinement of Strategic Groundwater Source Areas of South Africa



WHAT INFORMATION INFORMS THE REFINEMENT?

An Integrated Evidence Base for SWSA-gw Delineation

Bringing together multiple lines of evidence to identify and manage Strategic Groundwater Source Areas



SWSA-GW AND NATURAL CAPITAL ACCOUNTING

From Spatial Information to Accounting

Refined SWSA-gw information can potentially support:

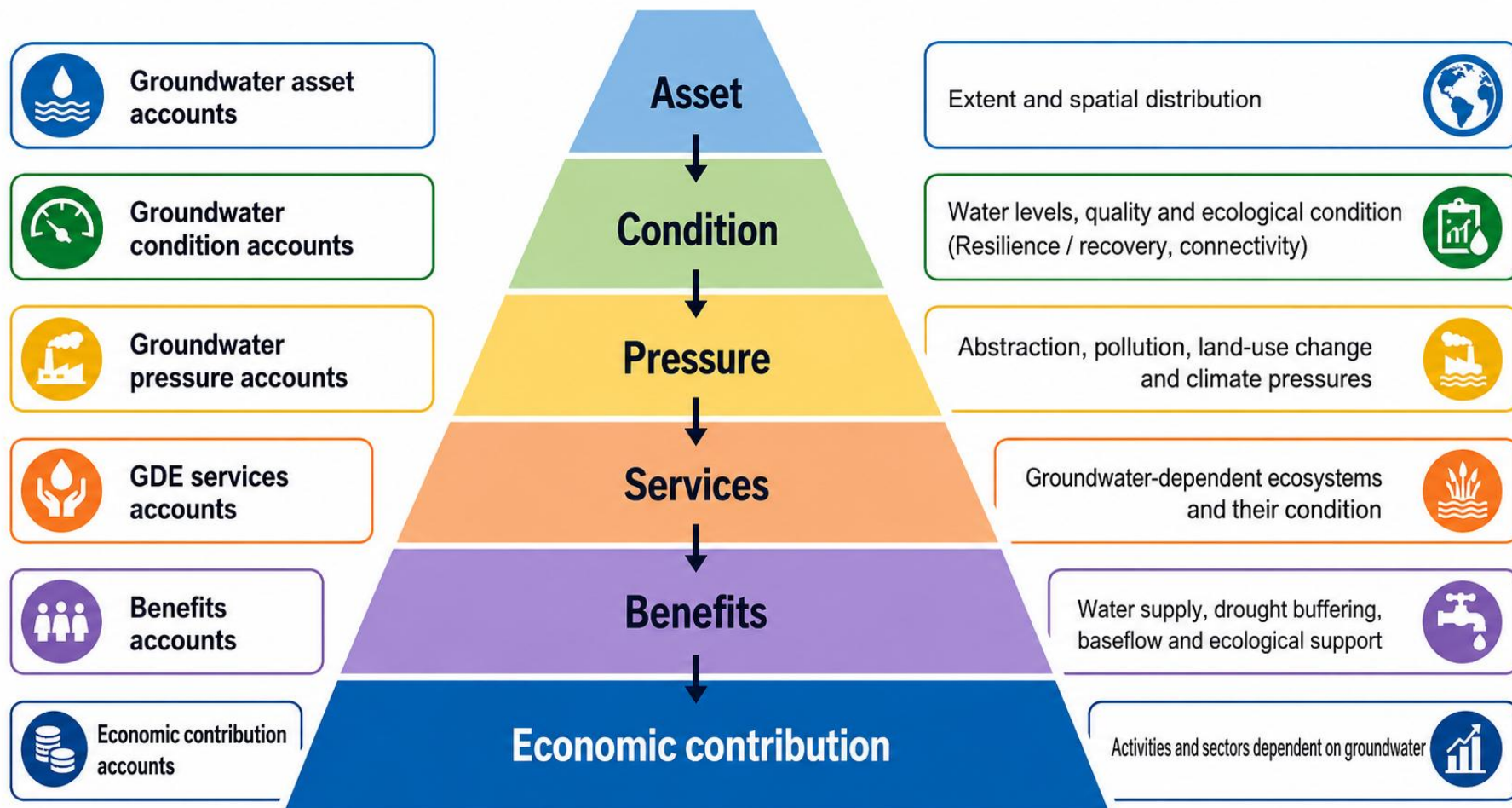
Extent	Where are the strategic groundwater assets?
Condition	What is their state?
Pressures	What is affecting them?
Services	What benefits do they provide?
Dependencies	Who and what depends on them?
Change	How are they changing?
Risk & Threats	Where are the strategic assets vulnerable?



Better information → Better accounting → Better decisions

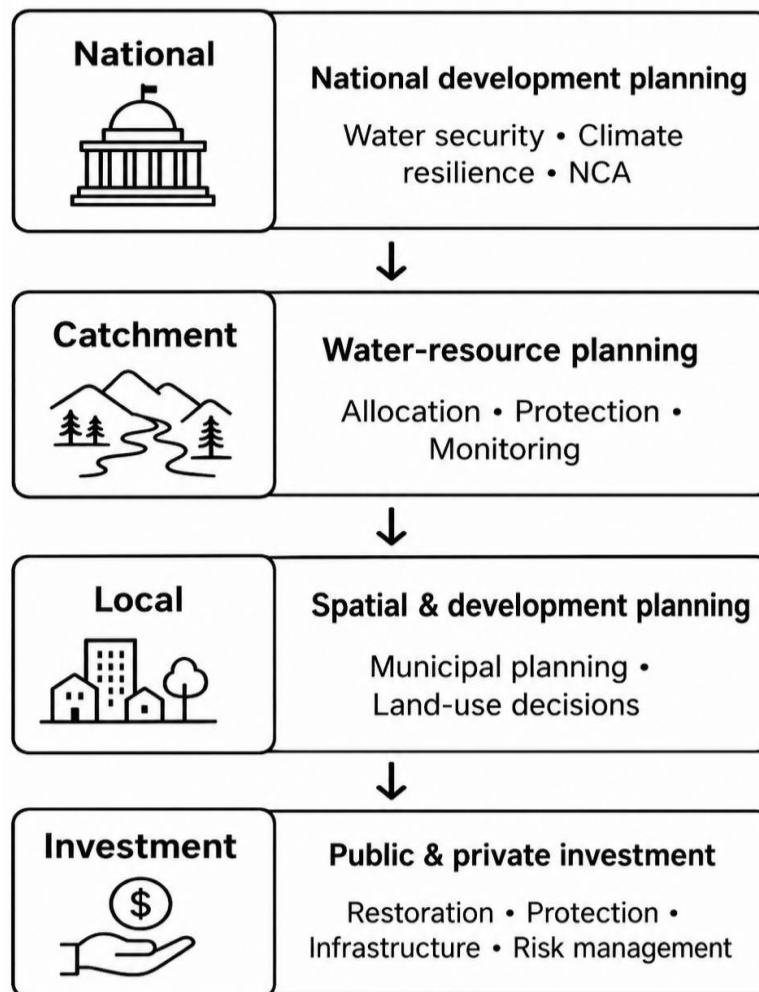
FUTURE GROUNDWATER ACCOUNTS

Envisioning the Future of Groundwater Accounting



FROM ACCOUNTING TO DECISION-MAKING

Making Natural Capital Information Useful



CONCLUSION

- **Groundwater is natural capital:** Aquifers provide storage, water and ecosystem supporting functions.
- **SWSA-gw identifies strategically important groundwater assets:** Refinement improves our spatial understanding and management basis.
- **Better groundwater information can strengthen NCA and water governance:** It can potentially support i) water security, ii) ecological infrastructure, iii) biodiversity, iv) climate resilience, and v) investment.

Protecting strategic groundwater source areas is an investment in South Africa's natural capital and long term water security!

This work provides bases for NCA updates for groundwater component.

THANK YOU

More information on the SWSA-gw project: <https://www.dws.gov.za/wem/sgsa.aspx>