Geodesy at the DSTI

National Geodesy Workshop

01 October 2025
Cape Town

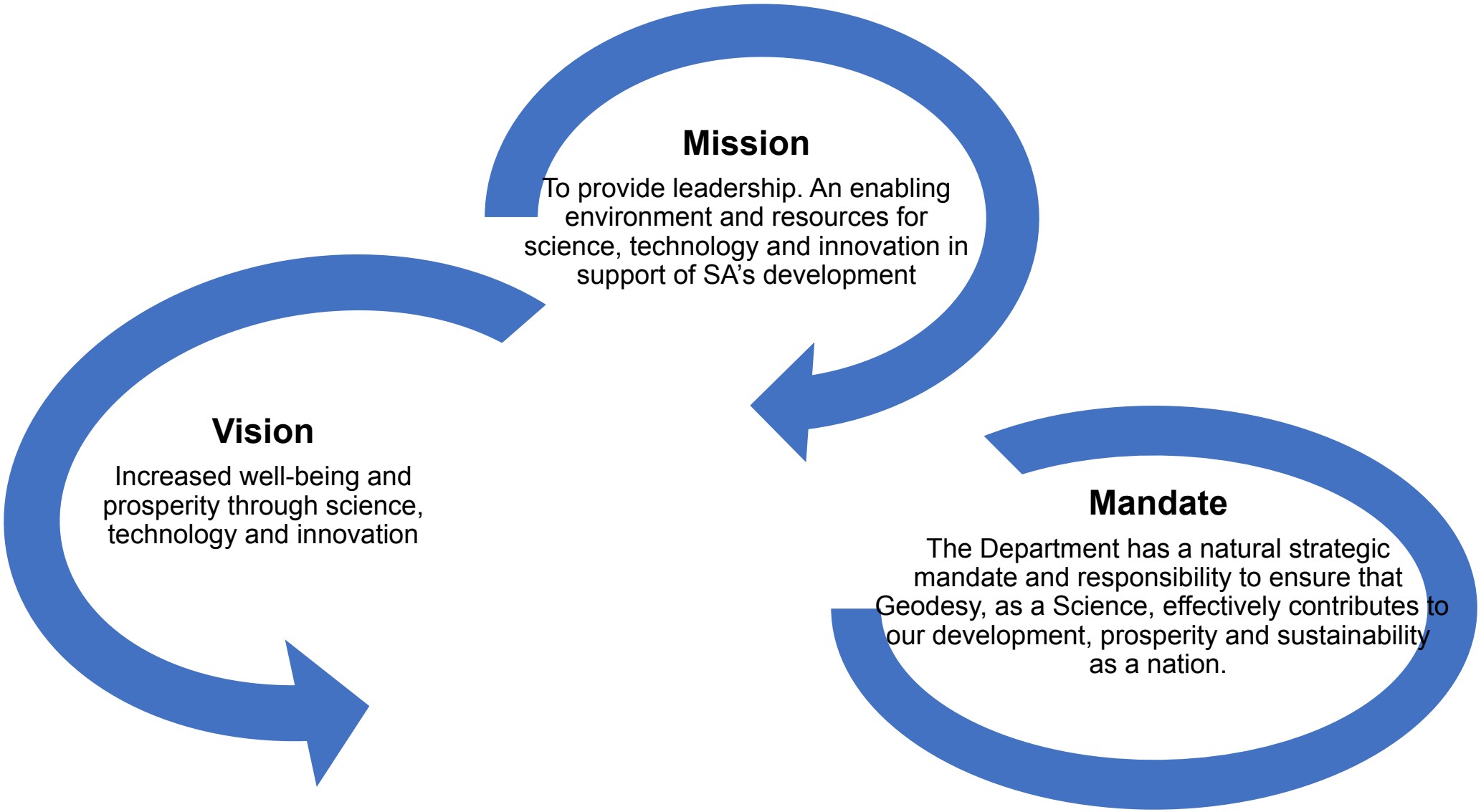
Making sure it's possible

science, technology & innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA

2030 NDP

The DSTI - Our Strategic Mandate



Policy Framework

The Decadal Plan:

- Calls for stronger institutions, better coordination, and inclusive innovation.
- Strategic focus areas:
  - **Addressing Societal Grand Challenges** (climate resilience, secure infrastructure, digital economy)
  - **Targeted R&D partnerships**
  - **Resource mobilisation**

Geadesy is firmly embedded in the Draft 2025 NSMWA:

- alignment with national and international scientific priorities;
- fostering collaboration across sectors (Astronomy, Space Science, terrestrial & Space Geodesy);
- ensuring consistent standards across sectors;
- Increased reliability and efficiency in the Geodetic supply chain network.

- Creating an enabling policy environment for the coordination and development of Geodetic activities in South Africa and beyond.

Geodesy and Astronomy in the DSTI

The South African Radio Astronomy Observatoty **(SARAO)**, a business unit of the NRF Manages two critical Astronomy and Geodetic facilities:

The MeerKAT Telescope

- A 64-antenna radio telescope;
- currently one of the best radio telescopes in the world

- completed and launched in 2018 (Currently being extended to 78 antennas)

- currently producing ground breaking
- science with scientific discoveries never seen before

- it will become part of the SKA Mid telescope once completed.

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Geodesy and Astronomy in the DSTI

The Hartebeesthoek Facility (hub for geodetic activities)

- Only “core” site in Africa integrating all space geodetic techniques (GNSS, VLBI, DORIS, and SLR).
- The 26-meter dish is the backbone of the national coordinate reference system as the official South African datum point.
- Higher radio frequency VLBI with the 26-Meter antenna enables precision and reliability of the celestial reference frame.

- The facility plays a critical role as the only fundamental/core geodetic station on the African continent, and one of only two in the Southern Hemisphere. The only station in Africa with geodetic VLBI capability.

Geodesy and Astronomy in the DSTI

- Geodesy and Astronomy sits in the Astronomy sub-programme.
- DSTI – funding, policy development and oversight; SARAO – Infrastructure management and operations;
- The link between Astronomy and geodesy dates back to the early days of Astronomy in South Africa – cataloguing of stars was done with arc measurements to determine Earth's shape and size – a core geodetic task
- Astronomy and geodesy intersect through shared radio telescope technologies and techniques, particularly VLBI *(Precise geodetic surveys are essential for SKA's baseline measurements)*
- SKA data could inversely refine geodetic models of Earth's interior

Geodesy in South Africa

- **DLRRD** manages South Africa's geodetic and cadastral reference system through TrigNet.

- **SANSA** conducts space science research, earth observations, and space weather monitoring activities (*relies on geodetic data and products from NGI and Hartebeesthoek)*

- **Higher Education Institutions** (UCT, UP, UKZN, Wits, Stellenbosch and CPUT) - drive scientific innovation through research in GNSS applications, space geodesy, reference frames, and geophysical modelling and human capital development.

- Current lack of strategic alignment, lack of synergy and the lack of a coordinated approach threaten the integrity of geodetic products due to inconsistent standards across sectors;

Coordinated Multi-Stakeholder Policy Approach

Policy Action 1 DSTI approved Geodesy Concet Note - coordinated approach to the development of Geodesy in South Africa and Africa

Policy Action 2 Stakeholder consultation and lobbying – leading to the National Geodesy Workshop

Policy Action 3 Establishment of the National Geodesy Working Group – accepted terms of reference

coordinated policy framework ensures efficiency, accuracy, and alignment with national and international priorities

Coordinated Multi-Stakeholder Policy Approach

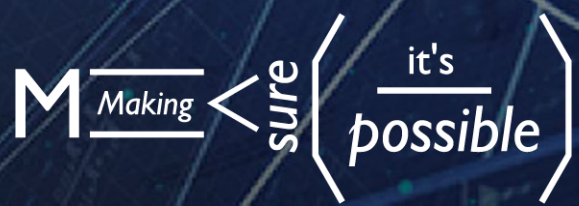
Policy Action 4 — Signing of the UN-GGCE multilateral MOA

Policy Action 5 — Development of a South African Geodesy Framework/Strategy

Policy Action 6 — Establishment of GGOS Africa and affiliation with GGOS.

coordinated policy framework ensures efficiency, accuracy, and alignment with national and international priorities

Dankie
Enkosi
Ha khensa
Re a leboga
Ro livhuwa
Siyabonga
Siyathokoza
Thank you



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