Africa Rising: Shaping our Common Future through Geodesy. Implementing UN General Assembly Resolution A/RES/69/266 "A Global Geodetic Reference Frame for Sustainable Development"

Meeting Summary

The United Nations General Assembly (UNGA) Science Summit has become an important forum for addressing global challenges through scientific collaboration and innovation. Bringing together world leaders, scientists, policymakers and various stakeholders, the Summit focuses on discussing and strategising solutions to critical global issues, particularly those outlined in the UN Sustainable Development Goals (SDGs). The Summit's roots can be traced back to the first Global Science Summit, held at the European Parliament in 2013, which was the largest event ever held there and a significant step forward in global science-policy discussions. Since then, the UNGA Science Summit has grown in influence and impact. A major achievement has been its role in bridging the gap between science and policy by providing a platform for direct engagement between scientists and decision-makers. This has helped to better integrate scientific evidence into global policymaking, resulting in more informed, evidence-based policies to address today's complex challenges. The Summit covers key topics such as climate action, One Health, biodiversity, food systems, artificial intelligence, science philanthropy, quality education, clean and affordable energy, indigenous knowledge and more. In 2024, the Science Summit coincided with the *UN Summit of the Future* and placed a special emphasis on the *Africa Science Leadership Coalition*, which was launched at the UN Civil Society Conference on May 9, 2024, to promote African leadership in science policy decision-making.

Aletha de Witt, Department of Science and Innovation (DSI), South Africa, opening Geodesy Day at UNGA79 Science Summit, photo L. Sánchez.

The Science Summit at the UN General Assembly 79 took place from 10 to 27 September 2024 as a hybrid meeting (online and face-to-face in New York City) and brought together a wide range of communities to discuss issues of utmost relevance today. The agenda covered a wide range of topics such as multilateral research cooperation, neuroscience and society, water research and innovation, strengthening the central role of science in society, resilient ecosystems and communities with science, transforming knowledge into practical services, and barriers to international science cooperation with a focus on data sharing and management. Africa-specific sessions were dedicated to highlighting the role of women in science and policymaking,

advancing sustainable development in Africa, indigenous knowledge for global health solutions, harnessing African leadership in artificial intelligence and policy development for equitable impact, collaborative solutions for food security and sustainable development, advancing health outcomes in Africa, scaling evidence-based and cost-effective innovations in Africa, and insights from Africa for research and innovation for the SDGs. Amidst all these exciting topics, the 2024 Science Summit hosted a *Geodesy Day* on 27 September. The one-day session was entitled **Africa Rising: Shaping our Common Future through Geodesy. Implementing UN General Assembly Resolution A/RES/69/266 "A Global Geodetic Reference Frame for Sustainable Development"**. The main objective of the event was to integrate the African perspective to address unique challenges and contributions by recognising the central role of the global geodesy supply chain in tackling global challenges such as climate change, urbanisation and sustainable resource management, as well as to align geodetic science with policymaking and to advance research through multidisciplinary cooperation within and between African countries. The event was attended by 209 participants and facilitated discussions between Member States, international organisations and geospatial experts.

The Geodesy Day was organised by *Aletha de Witt*, Director of Radio Astronomy Projects at the Department of Science and Innovation (DSI), South Africa, with support from *Nicholas Brown*, Head of Office, UN Global Geodetic Centre of Excellence (UN-GGCE), Germany, *Laura Sánchez*, President of the Global Geodetic Observing System (GGOS) and Research Associate at the Technical University of Munich, Deutsches Geodätisches Forschungsinstitut (DGFI-TUM), Germany, and *Anne Jørgensen*, Senior Communications Adviser, UN-GGCE and Norwegian Mapping Authority, Norway. The welcome address was given by *Eudy Mabuza*, Senior Science and Innovation Representative, Brussels, Department of Science and Innovation (DSI), South Africa, and the opening keynotes were delivered by *Richard Gross*, President of the International Association of Geodesy (IAG) and Senior Scientist at the NASA Jet Propulsion Laboratory, USA, and *Albert Momo*, Co-Chair of the International Advisory Committee (IAC) of the UN-GGCE and Founder and CEO of GeoDEV International, USA. *Richard Gross* highlighted the contribution of geodesy to sustainable development and how geodesy provides the essential reference layer for public infrastructure, while *Albert Momo* emphasised the hidden risks that threaten critical infrastructure and sustainable development, with a focus on Africa.

Richard Gross, President of the International Association of Geodesy, photo R. Botha.

Albert Momo, Co-Chair of the International Advisory Committee of the UN Global Geodetic Centre of Excellence, photo R. Botha.

Laura Sánchez, President of the Global Geodetic Observing System, photo A. de Witt.

Two panel discussions then extended and complemented the views presented in the keynote speeches. The first panel focused on *achievements and ongoing challenges since the adoption of the UN Resolution on the GGRF*. The session was moderated by *Nicholas Brown* (UN-GGCE) and the panellists were *Anne Jørgensen* (UN-GGCE), *Richard Gross* (IAG), *Laura Sánchez* (GGOS), *Aslam Parker*, Chief Director of the National Geospatial Information (NGI) at the Department of Agriculture, Land Reform and Rural Development, South Africa, and *Daniel Roman*, Senior Geodetic Advisor at the National Oceanic and Atmospheric Administration (NOAA) and International Federation of Surveyors (FIG), USA.

The second panel discussion focused on *African perspectives on the 1st Joint Development Plan for Global Geodesy to sustain the global geodesy supply chain*. It was moderated by *Laura Sánchez* (GGOS) and featured *Aslam Parker* (NGI, South Africa), *Roelf Botha*, Manager of the Geodesy Programme at the South African Radio Astronomy Observatory (SARAO), South Africa, *Rachael Umazi*, Principal Surveyor at the Regional Centre for Mapping of Resources for Development (RCMRD), Kenya, *Andre Nonguierma*, Head of the Geospatial Information Section at the UN Economic Commission for Africa (UNECA), Ethiopia, and *Fernand Eanes Bale*, Co-Chair of the UN Committee of Experts on Global Geospatial Information Management (UN-GGIM) and Director of the Ivorian National Mapping Agency (CIGN) at the Bureau National d'Études Techniques et de Développement (BNETD), Côte d'Ivoire.

Impressions from the first panel discussion: On-site panellists: Daniel Roman, Laura Sánchez, Richard Gross, online panellists: Anne Jørgensen, Aslam Parker and Nicholas Brown (moderator), photo M.V. Mackern.

In the afternoon, the workshop *Sustaining the Global Geodesy Supply Chain in Africa* provided further insights into the challenges and opportunities of a robust geodetic infrastructure in Africa. *Lorant Czaran*, UN SPIDER Programme Officer from the UN Office for Outer Space Affairs (UNOOSA), Austria, summarised the new strategy and relevance of UNOOSA to facilitate access to space technology for developing countries, with a focus on Africa. *Carla Mitchell*, Africa Programme Manager at the South African Radio Astronomy Observatory (SARAO), South Africa, presented high-level lessons and recommendations from the Square Kilometre Array (SKA) project, the world's largest radio telescope, and its implementation. *Francesco Petruccione*, Director of the National Institute for Theoretical and Computational Sciences (NITheCS), Professor of Quantum Computing at Stellenbosch University and Co-Chair of the Africa-Europe Cluster of Research Excellence in Addressing Global and African Challenges through Methods from Artificial Intelligence, Data Science and Theoretical and Computational Thinking (CoRE-AI), South Africa, highlighted the opportunities and challenges for Africa in advancing theoretical and computational sciences at the continental level. Finally, *Fernand Eanes Bale* (UN-GGIM) closed the workshop with reflections on lessons learnt and recommendations for effective governance and regional collaboration in sustaining the global geodetic supply chain in Africa.

At the end of the event, Albert Momo (IAC of the UN-GGCE) consolidated the session outcomes into recommendations for sustaining the global geodesy supply chain, key policy and implementation objectives for Africa-led geodesy capacity building, knowledge and data sharing,

investment requirements, and safeguarding development. The main opportunities may be summarised as follows:

- *Revitalisation of the African Geodetic Reference Frame (AFREF)*: Significant efforts are underway to develop a continent-wide geodetic reference network that promotes data consistency and facilitates geospatial applications.
- *Regional cooperation*: Initiatives such as the Regional Centre for Mapping of Resources for Development (RCMRD) in Nairobi, the Geospatial Information Section of the UN Economic Commission for Africa (UNECA) in Ethiopia, or the Africa Chapter of the UN Committee of Experts on Global Geospatial Information Management (UN-GGIM Africa) foster geodetic training and capacity building and provide a framework for cooperation at the continental level.
- *Increased participation in global geodetic organisations*: The interaction of African scientists and institutions in global communities such as the International Union of Geodesy and Geophysics (IUGG), the International Association of Geodesy (IAG) and the International Federation of Surveyors (FIG) facilitates participation in global initiatives that highlight the essential role of African geodesy in the global framework and promote collaborative projects of mutual benefit.
- *GGOS Africa*: The establishment of the GGOS Affiliate *GGOS Africa* will bring together regional scientists and technicians involved in the collection, analysis, management and use of geodetic data to facilitate greater collaboration across regions, communities and new technologies, and promote geodetic capacity building. This regional alliance will be a powerful tool to identify, enable and develop sustainable geodetic observations, products and services according to regional and national priorities, in line with global goals.

In summary, collaborative geodesy is essential to support sustainable development and effectively monitor the Earth's dynamics. Ongoing challenges and regional efforts, especially in Africa, highlight the need for continued international support and partnership to ensure that geodetic advances benefit all.

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