The Integrated and Multidisciplinary Geoscience Mapping Programme of the Council for Geoscience

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The integrated and multidisciplinary geoscience mapping programme (IMMP) was adopted as a strategy for the Council for Geoscience (CGS) in 2017/18 financial year. This strategy encourages the sustainability of the CGS in a changing state of ideologies, economy and technological landscape. It is intended to maintain an impactful delivery of the core mandate of the CGS and provides innovative and responsive geoscience solutions to support the National Development Plan 2030 and other government plans that addresses national developmental imperatives such as economic growth, poverty, inequality, unemployment, education, food security, optimal land use, environmental stewardship, clean water, energy security and safer communities, among others. To date, the Government of South Africa has supported the implementation of the IMMP, which resulted in the increased coverage of onshore geoscience maps from a meagre 4% to 10.7%. The integration of geoscience data and information from the IMMP is already yielding results that contribute to the various thematic areas as outlined. These include, albeit not limited to the expansion of the known pegmatite belt in the Northern Cape Province by more than 67%, which is highly prospective as a source of the much-needed intervention for the battery industry and renewable energy. Other notable outputs resulting from the IMMP include the completion of the Karoo Deep Drilling (KDD) Programme in the Beaufort West. The KDD Programme focused on the geo-environmental baseline assessment of the Karoo Supergroup to provide a scientific basis for Government to consider its options for shale gas exploration and exploitation in South Africa. At the CGS, we consider geoscience a fulcrum of human development and that geosciences provides the scientific evidence for policy development and national decision making. As part of South Africa's commitment to the international climate change protocol, carbon capture, utilisation and storage (CCUS) has been acknowledged as one of the scientific interventions for mitigating the emissions of carbon dioxide into the atmosphere. The CCUS is part of the national flagship projects of the CGS and forms part of the just transition to a future low-carbon energy economy. Understanding our water resources is critical because South Africa is a water-scarce country. The use of innovative machine learning techniques that integrates multidisciplinary geoscience datasets have already been tested for better understanding of the local and regional aquifer systems and for a more sustainable use of ground and surface water resources. To test these innovative techniques, CGS focused on Maluti-a-Phofung area in the Free State Province, and the drilling of a high-yielding well for the community was successful. The IMMP also aims to guide spatial planning, optimal land use and infrastructure development, District Development Model as well as geo-hazard risk modeling to safe-guard communities nationwide.

About the author:

Dr Nxumalo is a registered professional natural geoscientist with a PhD in Geology from the University of Johannesburg and an MSc in Geology from the University of the Witwatersrand. She matriculated from Soshangana High School in Bushbuckridge (Mpumalanga) in 2000, and started her career in 2007 as a junior exploration geologist at SRK Consulting, where she worked primarily on uranium exploration near Beaufort West (Western Cape).

Dr Nxumalo joined the Council for Geoscience (CGS) in November 2007 and worked on various commercial and statutory projects as a geoscientist, and then served in the Strategic Management Office (SMO). As the current manager of the SMO, Dr Nxumalo ensures, among others, that CGS executes its critical corporate responsibilities such as strategic and business planning, collation, evaluation, monitoring and reporting of the organisation's performance information and provides support for the CGS Board. Nature in all its forms is close to her heart and finds expression in her keen interest in photography and the exploration of human cultures.