
Contribution ID: **57** Type: **not specified**

# Developments in SADC Cyber-infrastructure for Open Data and Open Science: Opportunities in Space Sciences

*Wednesday 4 July 2018 11:00 (25 minutes)*

There are significant number of data (and compute) intensive projects and initiatives of National, regional and international consequence hosted or driven in Africa –including in the areas of earth and spaces sciences –for example, The Square Kilometre. In this area, Africa will host the largest high resolution radio telescope to do fundamental Astrophysiscs science as the continent has access to the Southern hemisphere skies, and quiet zones with respect to minimal radio frequency interference. For this reason - South Africa and SKA African partner countries are investing in space science and astronomy as building blocks for a knowledge economy through developing necessary supporting platforms. Data challenges for next generation telescopes including the SKA have been widely discussed and currently driving innovations in to meet envisaged computational, data storage, processing and high speed networking requirements

There are also significant projects in Earth observation, environment, climate and weather modelling and applications therein in early warning systems and applications including in agrometeorology and hydrometeorology. For example, the African Development Bank is resourcing a Southern Africa Development Community (SADC) Climare Center for a project that recognises the need to generate, disseminate and use reliable and high quality climate information to help decrease the negative impacts of extreme weather and climate related phenomena and risks in the Southern Africa Development Community (SADC) region.

Collectively, all these projects necessitate and facilitate the creation of requisite computational, network and data infrastructure through regional cyber-infrastructures; facilitate collaborative networks; stimulate discussions around data policy frameworks; address issues around data generation, data analysis, data sharing challenges and negotiating fairness in these domains.

Higher up the value chain, through these projects, it is envisaged they will provide necessary impetus in creating new cohorts of scientists, engineers, researchers and technicians ready to work on world-class projects. This will drive the human capital development programme including in transferable skills such as in data science and as consequence, contribute to stemming the historical brain drain away from the continent and spillovers into countries'economies.

As a result of all this activity, there is an increasing need for governments to put in place the necessary legislation, policies and governance structures to facilitate data sharing and its exploitation for research, innovation and for development. In addition to policy, there is awareness for the need of substantial investments in reliable ICT infrastructure that can sufficiently support data hosting, sharing and analysis. Furthermore, for researchers to generate, curate, manage and preserve and analyse data, they also need specialised skill sets and requisite training.

For the SKA readiness, the Southern African Development Community countries are developing a SADC Cyberinfrastructure and a HPC Ecosystem through a SADC Cyber-infrastructure Framework regional policy instrument.

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**Session Classification:** High Performance Computing