

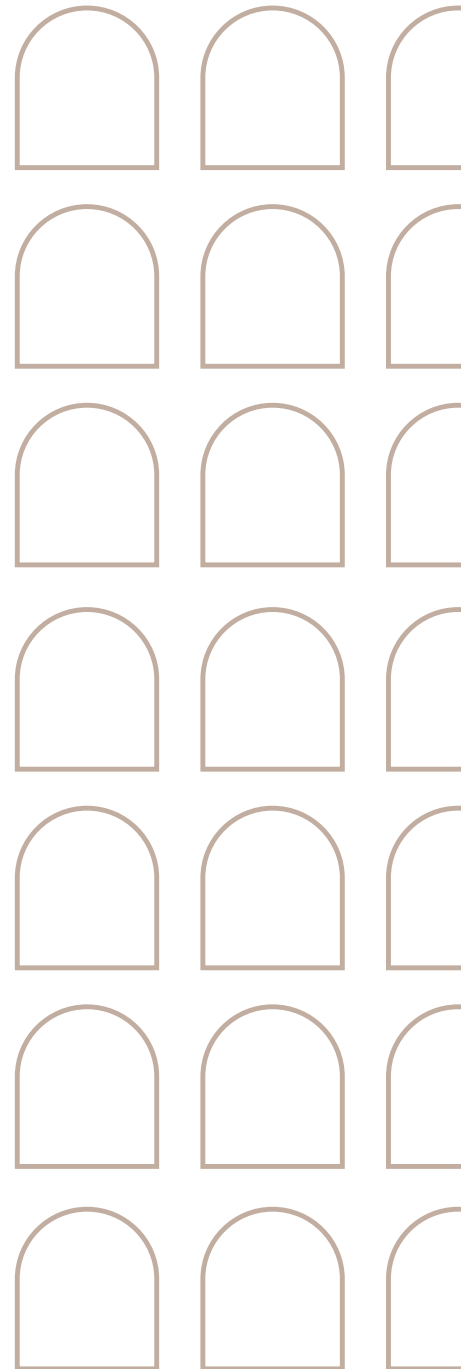
STG Policy Papers

POLICY BRIEF

NIGERIA-SOUTH AFRICA BI-NATIONAL COMMISSION: THE NEED TO INCLUDE COOPERATION IN OUTER SPACE ACTIVITIES

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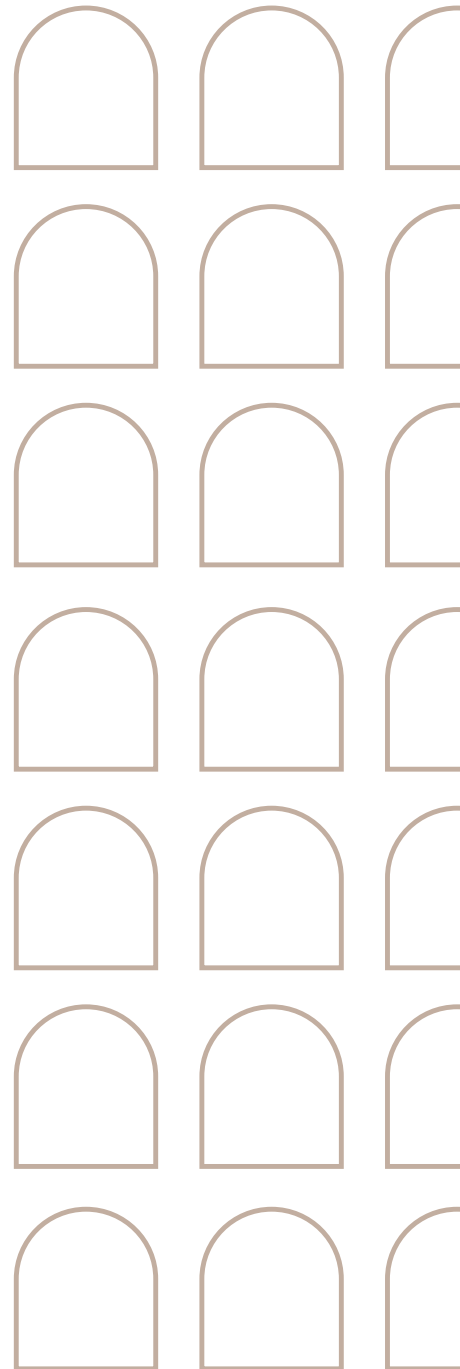
EXECUTIVE SUMMARY

Nigeria and South Africa renewed their commitment to each other during the 10th Bi-national Commission (BNC) that was held in November 2021. They signed new Memoranda of Understanding (MoUs) in youth development, women and child empowerment, and political consultation. They reviewed earlier MoUs in military cooperation, mining and processing, as well as oil and gas. They also established a Joint Ministerial Advisory Council (on trade, investment, and industry), and the South Africa-Nigeria Youth Dialogue. While this effort is commendable, one important but missing element is space cooperation, particularly in Earth Observation, Satellite Communication, Navigation and Positioning, as well as Space Science and Astronomy. Nigeria-South Africa space cooperation is not only beneficial to the space sectors of both countries, it is also a tool for attaining the goals of the BNC. To facilitate such cooperation, Nigeria and South Africa could strengthen their existing science cooperation; appoint science attachés in their respective embassies; establish a Space Forum within the framework of the BNC; and explore non-traditional mechanisms of science diplomacy. The bilateral space cooperation would also facilitate the implementation of the African Outer Space Programme – one of the flagship programmes of the African Union (AU) aimed at fostering Africa’s integration and socio-economic development.

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1. INTRODUCTION

In November 2021, the 10th Session of the Nigeria-South Africa Bi-national Commission (BNC) was held in Abuja, Nigeria, culminating in the official visit of President Cyril Ramaphosa of South Africa to Nigeria on 30th November 2021, amidst the COVID-19 pandemic. The BNC was established in 1999 to strengthen the relationship between Nigeria and South Africa on trade, economy, politics and governance. Through the BNC, representatives and leaders of Nigeria and South Africa – the leading economies in Africa – would have regular consultation and engagement for their mutual benefit as well as for Africa’s interest.

In 2001, science cooperation was included in the BNC cooperative framework; however, no activity emanated from the agreement until the framework became dormant. In August 2016, an effort was initiated to revive science-related activities, but it did not gain traction. ¹Following the spate of xenophobic attacks on foreigners in South Africa, particularly on Nigerians, the BNC was revived, and a fresh [agreement signed between both countries in October 2019](#).

During the aforementioned BNC Session, Nigeria and South Africa signed new Memoranda of Understanding (MoU) in youth development, women and child empowerment, and political consultation, adding to the 32 existing MoUs between them. They also reviewed earlier MoUs in military cooperation, mining and processing, as well as oil and gas. Two other major initiatives were launched, namely: a Joint Ministerial Advisory Council on trade, investment, and industry (to work on removing barriers to doing business between both countries), and a Youth Dialogue (for regular engagement among youths and building of trust).

2. A MISSING ELEMENT IN THE BNC: SPACE COOPERATION

The BNC is a laudable idea, but a missing element is cooperation in space activities. International cooperation is one of the practices of the space community, as countries reach

out to other countries within their geographic region, as well as overseas, to gain knowledge and technology, share costs, build trust and improve their relations.

Space cooperation between Nigeria and South Africa is not only beneficial for the space sectors of both countries, it is also a leverage for attaining other goals of the BNC. For example, it is a means of creating new job opportunities for both Nigerians and South Africans through joint research projects. In some of the projects, the participants do not need to leave their home countries as they could participate remotely from anywhere in the world; thus, the influx of young Nigerians into South Africa would reduce and a healthy relationship between Nigeria and South Africa would be maintained.

In addition to the mutual benefits to Nigeria and South Africa, cooperation between the two countries would advance the efforts towards the African Outer Space Programme, one of the priority areas of [Agenda 2063](#) – the Africa Union’s framework for integration and socio-economic development. The [African Space Policy](#) and [Strategy](#), which was adopted by African Heads of States and Governments in 2016, gives guidance to the implementation of the African Outer Space Programme. The African Space Agency (AfSA) was also established in 2018, to coordinate space activities in the continent. The successful implementation of the African Outer Space Programme is to some extent, dependent on cooperation between Nigeria and South Africa as they are the leading countries in the region in economy, science and space. Also, Nigeria and South Africa are strategically located in the continent and are endowed with necessary capabilities to catalyse space development in Africa.

3. POTENTIAL AREAS OF COOPERATION

The African Space Policy and Strategy could serve as a framework for identifying potential areas of cooperation between Nigeria and South Africa. The focus thematic areas of the

¹ The author participated in the meetings of South Africa’s Department of International Relations and Cooperation (DIRCO) and Department of Science and Innovation (DSI), with staff of Nigeria’s Permanent Mission to South Africa.

documents are Earth Observation, Satellite Communication, Navigation and Positioning, and Space Science and Astronomy.

3.1. Earth Observation

The entry point for several countries in the space enterprise is through Earth Observation, as it brings immediate tangible benefits. Earth Observation entails taking images of the Earth surface from an elevated platform; processing, analysing and interpreting the images; and using them for policymaking or taking decisions. High-altitude platforms that are used for taking the images include balloons, drones, aircrafts, and satellites, with satellites being the most stable of all the platforms. Earth Observation satellites are veritable tools for Nigeria and South Africa as both countries have a common interest in developing sectors such as agriculture, mining and natural resources, marine and ocean resources, as well as urban development.

Nigeria's Earth Observation satellites, namely NigeriaSat-1, NigeriaSat-2 and NigeriaSat-X, are polar-orbiting satellites, which are more useful to South Africa because it is closer to the Antarctic. On the other hand, economic challenges and the impact of the pandemic is hindering South Africa's efforts in the development of its Earth Observation satellite, called EOSat-1. Cooperation between Nigeria and South Africa would give South Africa access to images from Nigeria's satellites, while Nigeria could access South Africa's indigenous capability in processing, analysing and interpreting satellite data, as well as its 'big data' capabilities.

Furthermore, Nigeria and South Africa are parties to the data sharing agreement of the African Resource Management Constellation (ARMC). Initiated in 2007, the ARMC is an open regional cooperation whereby participating countries donate a satellite to the constellation, and then have access to data from other satellites. Algeria, Kenya, Nigeria and South Africa have indicated interest in participating in the initiative, but the required satellite infrastructure is not yet in place. Nigeria-South

Africa space cooperation could be a step towards reviving the initiative.

Also, Nigeria is part of the Disaster Monitoring Constellation (DMC), alongside Algeria, Turkey and the United Kingdom (UK), while South Africa is part of the BRICS² Remote Sensing Satellite Constellation. A working data access/sharing structure between Nigeria and South Africa, would give them access to wider pools of data. Moreover, a large portion of data from [Landsat](#) and [SPOT](#) constellations is publicly available, so there is no basis for a restriction of data sharing between Nigeria and South Africa.

3.2. Satellite communication

Communication satellites are used primarily for long-distance communication and for connecting remote parts of a country. In 2011, Nigeria procured a communication satellite, called Nigcomsat-1R. The objective of acquiring the communication satellite is to reduce the cost of communication, as well as to provide more connectivity to rural areas. South Africa is in the process of building its first communications satellite, but this is being hampered by funding challenges. Presently, satellite communication services in Nigeria and South Africa are mostly through non-indigent companies. Cooperation between Nigeria and South Africa would give Nigcomsat Limited (the company incorporated in Nigeria for marketing and sales of services from Nigcomsat satellite series) access to the South African market, while the cost of communication and connectivity services in South Africa would drop considerably.

Where patronage of foreign satellites is needed, Nigeria and South Africa can lead other African countries in reaching common positions and negotiate for more affordable satellite communication services. Common African positions are also essential for Africa's effective negotiations at international fora such as the World Radiocommunication Congress (WRC) and World Trade Organisation (WTO).

2 The geopolitical grouping of Brazil, Russia, India, China and South Africa.

3.3. Navigation and Positioning

The Global Navigation Satellite System (GNSS) is applied in precision agriculture, exact timing, and surveying, among others. The European Union (EU) has extended the operation of its Space-Based Augmentation System (SBAS) into Africa, by dividing the continent into segments, and offering [different services for the segments](#). China has also started advocating for the use of its [Beidou navigation system in Africa](#). With interoperability and compatibility of GNSS yet to be completely resolved, satellite navigation services in Africa may degrade. Hence, there is an urgent need for cooperation, coordination and harmonisation of satellite navigation services in Africa.

South Africa has developed a functioning SBAS system, but it needs a communication satellite in geostationary orbit for the system to give service. A cooperative agreement between Nigeria and South Africa could give South Africa access to the transponder on Nigcomsat-1R, while Nigeria could benefit from South Africa's SBAS. (The transponder is the main part of navigation and communication satellites that is used for position determination and navigation.) Nigeria would also benefit from the knowledgebase of South Africa and use it in developing its own planned augmentation system called the Nigerian Satellite Augmentation System (NSAS). When the two augmentation systems are functioning, they could be scaled up to cover the entire African continent, thus achieving one of the goals of the African Outer Space Programme.

3.4. Space Science and Astronomy

Astronomy deals with the study of objects and processes that occur outside the Earth's atmosphere. Its benefits are not immediately obvious, as it does not appear to have a direct link with problems on Earth. This is however changing as there are efforts for the promotion of astronomy education and research globally. New areas of application have been developed in education (such as the [Astronomy for Literacy](#)

[project](#) in Sierra Leone), health (such as the [Peek Vision project](#) in Kenya) and skills development (such as the [Madagascar Astronomy Python Workshop](#)).

South Africa has several astronomical facilities including the Hartebeesthoek Radio Astronomy Observatory (HartRAO), South African Large Telescope (SALT), South African Astronomical Observatory (SAAO) and the Hermanus Magnetic Observatory (HMO).³ In 2012, South Africa led a consortium of eight African countries (namely, Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia, and Zambia) to win the hosting of a major part of the Square Kilometre Array (SKA). The SKA when completed, will be the largest astronomy facility as its total collecting area will be approximately one square kilometre and it will operate over a wide range of frequencies.⁴ Nigeria can participate in a spin-off project called the African Very-Long-Baseline-Interferometry Network (AVN). The AVN involves converting redundant, large communication dishes into radio telescopes. Nigeria has several of such dishes that were used by the defunct national telecommunications carrier. These dishes, if converted into radio telescopes, could form a base for Nigeria's astronomy infrastructure. Nigeria could also benefit from the knowledge and technology of converting the dishes into radio telescopes.

Furthermore, SAAO has over the past few years upgraded all its optical telescopes at its Sutherland station into "an intelligent observatory." This means that the telescopes can be remotely operated from anywhere in the world via the Internet. Thus, astronomers in Nigeria may utilise the optically best African sky over Sutherland from their desktop computers. They only need to negotiate observing slots with SAAO. These developments have opened an opportunity for greater cooperation between astronomers in South Africa and Nigeria than ever before.

Also, there is increasing interest in Sun-Earth interaction as activities in the Sun affects the

³ The Hermanus Magnetic Observatory (HMO) has been absorbed into the structure of the South African Space Agency (SANSA) and is now called 'SANSA Space Science'.

⁴ After a global competition, South Africa and Australia won the bidding to host the SKA. While South Africa is hosting the mid and high frequencies, Australia is hosting the lower frequencies.

Earth and its environment. This phenomenon - referred to as Space Weather - can disrupt power supply, communication and satellite navigation services. It is therefore mutually beneficial for Nigeria and South Africa to cooperate in space weather and atmospheric research, for further understanding of the solar weather phenomenon, predict its occurrence and be prepared for it.

4. RECOMMENDATIONS

To facilitate space cooperation between Nigeria and South Africa, there are some immediate actions that both countries could consider. Some of these are discussed in the following sections.

4.1. Raise science in the BNC agenda

With the revival of the BNC, it is imperative to raise science in the agenda as it would in turn raise the profile of space. During President Ramaphosa's visit to Nigeria, President Buhari urged both countries to improve educational and scientific cooperation. This is a commendable proposal, as it will boost knowledge and skills in space science and technology. It will also contribute to the attainment of Sustainable Development Goals (SDGs) 4, 8, 9 and 10, on quality education; decent work and economic growth; industry, innovation and infrastructure; and reduced inequalities respectively.

4.2. Appoint science attachés

There needs to be a strong interface between Nigeria's Federal Ministry of Science, Technology and Innovation (FMSTI) with its Ministry of Foreign Affairs (MFA). Similarly, South Africa's Department of Science and Innovation (DSI) needs a stronger working relationship with the Department of International Relations and Cooperation (DIRCO) as well as the Department of Trade and Industry (DTI). Experts that are knowledgeable about space and experienced in diplomacy, could be appointed to serve as science attachés in the respective embassies of Nigeria and South Africa. Their roles would include, but not limited to scoping for potential areas, persons, institutions and mechanisms for collaboration, including funding sources.

The science attachés will also ensure speedy exchanges and necessary support for visiting professionals.

4.3. Establish Nigeria-South Africa Space Forum

A Nigeria-South Africa Space Forum could be created to serve as a platform for interaction and exchanges between professionals from both countries. Through the Forum, personal relationships could be built, which would eventually translate into institutional relationships. Potential collaborative, complimentary or joint projects and programmes would also be identified and initiated. The Forum may also advise on common positions for Africa, particularly as regards international policy issues such as long-term sustainability of outer space and spectrum management.

4.4. Utilise innovative approaches to bilateral cooperation

In addition to first-track diplomacy, there are other means to strengthen bilateral cooperation between Nigeria and South Africa including via space institutions, private companies, civil society and military. National space institutions should be empowered to enter long-term commitments and joint projects, with the active involvement of the respective ministries of foreign affairs. The cooperative agreement between Nigeria's National Space Research and Development Agency (NASRDA) and the South African National Space Agency (SANSA) should be strengthened and made functional. Also, the scope of the military cooperation agreement between Nigeria and South Africa could be enlarged to include space activities.

Policies should be enacted to allow private companies in both countries to have equal access to their respective markets. Professional organisations, such as the African Space Leadership Conference (ASLC) and the African Association for Remote Sensing of the Environment (AARSE) could serve as platforms for interaction between both countries, for forging common understanding between them, and for encouraging smooth and beneficial

exchanges. Other innovative approaches include cultural exchanges, engagement of chambers of commerce, collaboration in research and development, joint development of technology platforms, joint development of products and services, as well as infrastructure development and/or sharing.

4.5. Definitive strategy for human capital development

Cooperation cannot work effectively unless all parties contribute to the partnership. Knowledge and skills are the most important ingredients for a successful cooperation. Hence, Nigeria and South Africa need to develop a comprehensive strategy for knowledge and workforce development for the space sector. This includes a review of school curriculum for primary, secondary and tertiary levels, as well as review of training programmes of institutions dedicated to space education such as the African Regional Centre for Space Science and Technology Education in English (ARCSSTE-E) in Nigeria, and the Pan-African University Institute for Space Science (PAU-ISS) in South Africa.

5. CONCLUSION

Nigeria and South Africa stand to benefit in cooperative endeavours in outer space through sharing knowledge and facilities. The African Space Policy and Strategy provides a framework for cooperation through its four focal thematic areas, namely: Earth Observation, Satellite Communication, Navigation and Positioning, as well as Space Science and Astronomy. Nigeria and South Africa could harness opportunities for mutual space development, leverage on their strengths, and eliminate threats to space cooperation. Such bilateral space cooperation is not only mutually beneficial, it is equally necessary for the successful implementation of the African Outer Space Programme, which would in turn, strengthen Africa's integration and development.

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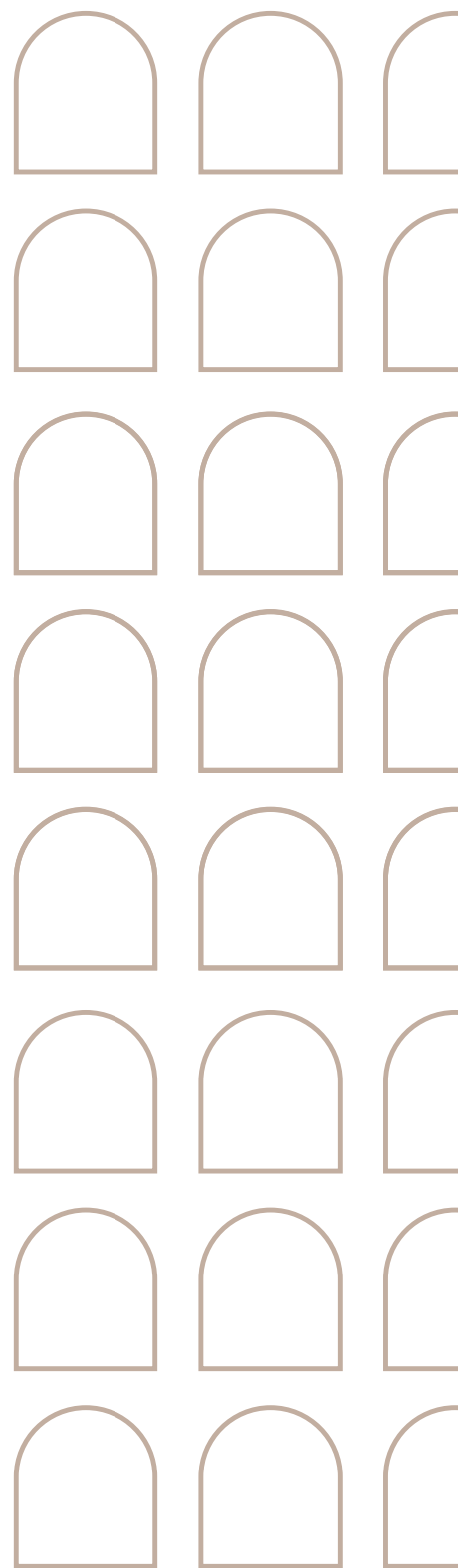
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