Peaceful Exploration and Use of Outer Space

ISSUES NOTE

BRICS 2025

1. Background Information

BRICS members have increasingly been recognized as a unique collective in shaping a new polycentric model of global governance. In terms of GDP and trade, the group represents an undeniable force on the international stage. However, the group's collective performance in science and technology, particularly in activities related to outer space, reveals notable disparities.

Among the expanded group, not all countries possess established space agencies, and many rely on international partnerships to access critical space technologies and expertise. In terms of innovation, BRICS members occupy markedly different positions, reflecting diverse capacities in research, technological advancement, and knowledge generation. Some members benefit from robust institutional frameworks, well-established research infrastructures, and a skilled base of specialized talent—factors that underpin their ability to design, launch, and operate space systems. Others, however, face constraints in fostering innovation ecosystems, securing adequate funding, and developing the requisite human capital.

Such asymmetry ultimately affects the group's potential to achieve significant progress in activities related to the peaceful exploration and use of outer space. Limited capacities in science and technology may restrict some members' ability to participate effectively in global space initiatives, reinforcing their reliance on other, more advanced nations and limiting their capacity to establish independent space programs.

These limitations reduce contributions to addressing global challenges, such as climate change monitoring, disaster response, deforestation, biodiversity loss, and space debris mitigation, thereby widening the technological and strategic gaps within the group. It is therefore desirable that BRICS member states adopt cooperative strategies to address these disparities by fostering mutual support and knowledge-sharing initiatives. By leveraging each other's scientific and technological potential, intra-group cooperation can be significantly strengthened.

The BRICS Remote Sensing Satellite Virtual Constellation (RSSC) is a noteworthy initiative in this regard. The successful implementation of pilot projects in 2023 and 2024 validated the constellation's data exchange mechanisms, marking a significant step forward. Operating within the governance structure established by the BRICS Space Agreement - including the Joint Committee and the Working Group - further efforts are crucial to ensuring the constellation's sustained success and evolution. Advancing such cooperation will involve building the competencies of various stakeholders to respond to emerging challenges and synergizing the strengths of each member country in satellite applications.

2. Priorities

2.1. Reducing Intra-BRICS Asymmetries in Space Cooperation through decentralized and open cooperation

While BRICS members possess diverse capacities and technological expertise, these differences represent not only a challenge but also an opportunity to establish a collaborative framework that transforms existing disparities into engines of innovation and progress.

To achieve this, reducing intra-BRICS asymmetries in space cooperation through capacity building and information exchange must become a cornerstone of these efforts. This requires a partnership model that is both decentralized and open—a network of distributed nodes capable of interacting horizontally and embracing a multistakeholder approach. In this context, space agencies, research centers, academic institutions and private sector companies may play integral roles in developing a platform that would serve as a decentralized, open-access hub for knowledge-sharing, technical training, and collaborative initiatives among BRICS members, where each member can contribute with its own capabilities.

2.2. Sustainability from space to earth and from earth to space

In 2024, several BRICS members faced a significant increase in wildfires, driven by record-high temperatures and exceptionally low humidity levels. In South Africa, devastating fires ravaged large areas. In India, regions such as Uttarakhand and Himachal Pradesh experienced severe wildfires, resulting in human casualties and substantial environmental damage. Meanwhile, Brazil endured flooding in its southern region, displacing hundreds of thousands of people and causing extensive economic losses.

These events underscore the frequency and severity of natural disasters, which are being amplified by human-induced climate change. According to the United Nations Environment Programme, the number of wildfires globally could rise by 50% by 2100 if decisive action is not taken. There is an urgent need to leverage every available tool to confront these challenges, and space-based technologies are playing a pivotal role in these efforts. These efforts align deeply with the priorities of the Paris Agreement, emphasizing the need to enhance adaptation strategies, build resilience, and address loss and damage as central elements of global climate action.

While leveraging space technologies to address Earth's sustainability challenges, BRICS countries must also prioritize the long-term sustainability of outer space activities. In this context, first and foremost is the issue of space debris mitigation. With the advent of mega-constellations, in the past few years there has been a huge increase in the number of satellites, especially in Low Earth Orbit (LEO). Key issues include:

- Ensuring that new satellites are removed at the end of their useful lives, through either passive decay or active de-orbiting.

- Equipping satellites with collision-avoidance capabilities, such as propulsion systems for corrective maneuvers, and ensuring effective, efficient, and timely traffic monitoring.

- Improving debris-tracking networks, potentially creating an integrated worldwide system capable of continuously monitoring even sub-10 cm debris, which often eludes detection but poses significant risks to manned and unmanned spacecraft.


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