Scientific Collaborations in BRICS

Mains: *GS II – International Relations*

Why in News?

The BRICS grouping—comprising Brazil, Russia, India, China, and South Africa, Conceived as a platform to promote a multipolar world order, has expanded its agenda beyond finance and macroeconomics to include Science, Technology, and Innovation (STI) as a key pillar of cooperation.

What is the evolving global STI landscape?

- **Role of BRICS in STI context** – Global scientific collaboration is increasingly influenced by strategic competition, sanctions, and export controls.
- In this context, BRICS provides:
  - A platform for coordinated research and innovation strategies
  - An avenue to reduce technological dependencies on Western nations
  - Institutional support through mechanisms like the New Development Bank
- The expansion into BRICS+, including countries such as Saudi Arabia, Egypt, UAE, Ethiopia, Indonesia, and Iran, reflects an effort to create a more inclusive and development-oriented scientific ecosystem.
- **Institutionalisation of STI cooperation –** STI cooperation within BRICS has evolved systematically:
  - **2011** – Formal recognition of STI collaboration.
  - **2015** – Memorandum of Understanding establishing STI as a strategic pillar.
- Creation of institutional frameworks for joint research and capacity-building
- The BRICS Science, Technology, Innovation and Entrepreneurship Partnership (STIEP) has played a central role in implementing collaborative programmes.
- In India, agencies such as the Council of Scientific and Industrial Research (CSIR) and the Department of Biotechnology (DBT) coordinate national participation.

What are the key initiatives and areas of collaboration?

- **Innovation and technology transfer**
  - Establishment of the *BRICS Technology Transfer Centre (TTC)*
  - Promotion of cross-border technology commercialisation
  - Initiatives like *iBRICS* to strengthen innovation ecosystems
- **Socially relevant research areas –** BRICS has gradually shifted from basic science to addressing developmental challenges, including:
  - Energy security

    - Water management
    - Public health
    - Environmental sustainability
    - The COVID-19 pandemic accelerated cooperation in, Vaccine development, Biosecurity and Digital health systems.
- **Frontier technologies –** Recent collaborations focus on:
    - Artificial Intelligence (AI)
    - High-Performance Computing (HPC)
    - Advanced materials
    - Information and Communication Technology (ICT)
    - Space research (boosted by the 2021 intergovernmental agreement)
- The 2025 AI Declaration marked a shift towards making AI a central pillar of BRICS cooperation, emphasising equitable and inclusive governance.
- **Progress and achievements**
    - Establishment of institutions such as the BRICS Institute of Future Networks.
    - Strengthening of ICT and HPC collaboration.
    - Expansion of joint research calls and thematic networks.
    - Increased emphasis on innovation-driven ecosystems.
    - These developments indicate a transition from theoretical collaboration to applied innovation frameworks.

What are the challenges and limitations?

- **Uneven innovation capacity –** Gross Domestic Expenditure on R&D (GERD) remains low across most BRICS nations, except China
- Significant gap compared to innovation leaders like South Korea
- **Heterogeneity among members –** Diverse economic and scientific capacities complicate consensus-building
- As noted by Irina Dezhina, aligning interests within BRICS+ is challenging
- **Limited funding and scale**
    - Research funding remains modest
    - Large-scale commercialisation of innovations is limited
- **Institutional constraints**
    - Absence of a permanent institutional mechanism
    - Rotational leadership model limits long-term continuity
- **Slow progress in certain domains**
    - Mega-science projects
    - Ocean and polar research
    - Infrastructure-intensive collaborations
- **limited research on STI cooperation**
    - Lack of systematic, data-driven evaluation frameworks
    - Insufficient academic focus on BRICS STI mechanisms
- **Significance for INDIA –** As a key member and 2026 Chair of BRICS+, India has a strategic opportunity to:
    - Strengthen its leadership in global science diplomacy
    - Promote South-South cooperation
    - Enhance domestic innovation capacity

- Address challenges like digital divide, public health, and climate resilience

What steps should be taken?

- **Establish a permanent institutional mechanism**
  - Creation of a BRICS STI Secretariat.
  - Modelled on frameworks like the EU's Horizon Programme.
  - Ensure continuity, monitoring, and evaluation.
- **Promote mega-science projects –** Joint long-term initiatives in:
  - Climate science.
  - Space exploration.
  - Biotechnology.
- **Strengthen innovation systems**
  - Increase investment in R&D.
  - Build capacity in new BRICS+ members.
  - Encourage public-private partnerships.
- **Foster targeted collaborations –** Develop "paired linkages" between countries with complementary strengths.
- **Expand scope to STI governance**
  - Research on ethical, regulatory, and societal impacts of emerging technologies.
  - Build capacity for international negotiations.
- **Enhance funding and scale**
  - Increase pooled funding mechanisms.
  - Support large-scale commercialisation of innovations.

What lies ahead?

- Scientific collaboration within BRICS has evolved significantly since 2015, transitioning from basic cooperation to a more structured and innovation-driven framework.
- However, challenges related to funding, institutional capacity, and coordination persist.
- As global scientific cooperation becomes increasingly fragmented, BRICS has the potential to emerge as a credible alternative platform for inclusive and equitable innovation.
- India, as the 2026 Chair, is well-positioned to lead reforms that make the framework more effective, agile, and impactful, thereby strengthening BRICS' role in shaping the global STI landscape.

Reference

[The Hindu| BRICS and Its Scientific Collaboration]