An Acad Bras Cienc (2024) 96(3): e20230942 DOI 10.1590/0001-3765202420230942
Anais da Academia Brasileira de Ciências | *Annals of the Brazilian Academy of Sciences*
Printed ISSN 0001-3765 I Online ISSN 1678-2690
www.scielo.br/aabc | www.fb.com/aabcjournal

SOCIAL SCIENCES

The South-South Dimension in International Research Collaboration

CONCEPTA MCMANUS, ABILIO A. BAETA NEVES, TIMOTHY JOSEPH FINAN, FELIPE PIMENTEL, DANIEL PIMENTEL & RAFAEL T. SCHLEICHER

Abstract: In this paper, we looked at the collaboration publishing patterns for groups of Global South countries (Latin America, Africa, ASEAN, Asian, BRICS), as well as publishing parameters. We looked at financing and the relationships between these groups and the Global North. Data from 2002 to 2021 was collected from InCites ® (Web of Science, Clarivate Analytics) and SciVal® (Scopus Elsevier). The impact was lower for BRICS, while Latin America and Asean countries tended to have a higher Field Weighted Citation Impact. Good Health and well-being (SDG 3) dominates South-South Collaborations. Asian countries showed a higher percentage of Affordable and Clean Energy (SDG7), while Africa and Latin America had a higher rate of Zero Hunger (SDG1). Each region shows different production profiles, but collaboration with the Global North is necessary for all regions. Intra-regional shows a lower impact than inter-regional financing, calling attention to the increasing influence of China in all regions, except for Latin America. The data analysed can be used for orienting South-South scientific Collaboration programs, focusing on pre-existent synergies and on where policy changes and results can be maximised.

Key words: International Cooperation, South-South Cooperation, Regionalization, Scientometrics, Sustainable Development Goals

INTRODUCTION

Internationalisation (Figure 1) carries multiple meanings. It can be understood as providing researchers with the opportunity to interact with global partners, enhancing the role of research institutions in addressing critical global issues, attracting outside researchers to collaborate with colleagues on matters of vital national and international interest, and effectively placing researchers in global research agendas, offering postgraduate students with international experiences through exchange programs with foreign academic and research institutions, and increasing the international components of postgraduate studies in the country. It also means avoiding academic and scientific isolation of institutions and researchers and using local comparative advantages. This vision of internationalisation implies the necessity to promote a culture of internationalism in which international networks, intercultural experiences, linguistic skills, and adherence to global standards of quality become accepted as part of the DNA/nature of the researcher, the students and training programs.

As the direct by-product of research and scholarly activity, knowledge is not limited by national boundaries. Most research problems are global. Consequently, the interests of any researcher are also not constrained by national borders either. In reality, the structure of research activity is built upon “research communities” and “research networks”, which

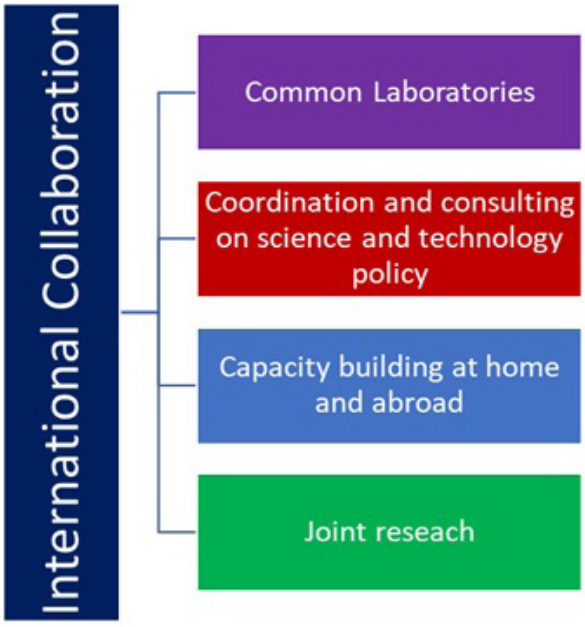

Figure 1. International Collaboration Scheme.

consist of informal institutionalised behaviour that is often international. In any field or discipline, multiple research communities have participants from numerous countries, as diversity is a cornerstone for developing new ideas. Furthermore, the dynamic interaction of research communities mediated by information technology is fed by the unique contribution of each participant. Knowledge expands when it is shared.

Thus, research ideas, methods, and techniques are internationally distributed. Each country and institution of higher education relies on different distributions of institutional resources to support research and the expansion of knowledge. Each participant country becomes a laboratory for research by bringing in unique social, cultural, political, and environmental characteristics. However, institutional research capacity is unequally distributed, and some countries and research institutions have enjoyed substantial support over time, resulting in the consolidation of long-lasting reputations and the development of unequal ranking practices.

Collaboration is best understood as a social activity within institutional contexts rather than a strategy to maximise productivity (Bozeman et al. 2001). Constituted by the collaboration among individuals, collaboration relies on interpersonal networks that can take many forms (Lewis et al. 2012). The ties between individual academics may be narrowly instrumental and purely as a means of doing research in the short term. Alternatively, friendships may be linked to long-term working relationships based on shared intellectual interests. In whatever form they take, academic networks can provide helpful information about the shape of research collaboration (Lewis 2010).

In academic networks, scientific achievements and developmental impacts directly derive from the quality and significance of the results in advancing the current state of knowledge in the field. Scientific results can typically be assessed using well-known, proven techniques and indicators such as peer review (proposal selection) and publication impact scoring (for retrospective assessment). For instance, developmental impacts may require additional time and action from stakeholders (non-scientists) to be detected. Strengthening scientific/non-scientific capacity is also crucial in international cooperation, resulting in an enhanced ability to conduct high-quality research, foresee global impacts, and consider future development goals.

Ideally, international collaboration among researchers and institutions should be an equitable partnership, with a balanced two-way flow of resources, efforts and benefits, while resulting in lasting positive results for all the parties. Idealised collaboration should also bring together partners with distinct but complementary strengths. Therefore, compiling and clearing an inventory of contributions that partners hope to make to the joint effort is

essential. Table I shows the definitions for many concepts discussed, focusing on South-South Collaborations.

The blending of science, technology, and international affairs is progressively becoming understood to tackle national and global challenges (Mauduit &Gual Soler 2020). According to Linkov et al. (2014), science is blending into international policy debates and becoming globally demanded, organising around scientific disciplines or problems such as the *Sustainable Development Goals* (SDGs) of the United Nations and other technological and economic competitiveness and overall societal development agendas. The rise in global environmental and technological threats implies that research and development centres worldwide have gained prominence. Research generated through small collaborative agreements rather than through large, centralised research organisations is also a growing trend in the internationalised scientific endeavour. As a result of the internationalisation of science, there is a growing need for an internationally knowledgeable workforce.

One characteristic of any scientific debate is the development of concepts to support the understanding of new phenomena. The discussions on the internationalisation of science are no different. The AAAS/ Royal Society (2010) and Romanova (2017) described three dimensions of the phenomenon:

- Science in Diplomacy: scientific experts join the diplomatic process, seeking to help identify and address national and global policy issues, using scientific knowledge in foreign policy decisions;
- Science for Diplomacy: scientific interaction and collaboration are tools to establish and build on relationships between nations; science is used to develop and improve state relations;

Diplomacy for science: diplomats work together to advance science and international collaborative science programs. In this case, there is an observable benefit from foreign science and technology capabilities to improve the national capacity. Any theorisation and concepts are subject to peer scrutiny and criticism in the scientific process. Although the three concepts mentioned above have become embedded in foreign policy debates and practice, there are alternative views in a field under constant development. For example, Echeverría et al. (2020) contend that a new and more specific phenomenon in science is named "science for sustainable development". In the same vein, countries use science diplomacy as an effective means of strategic development (Ezekiel 2020), advancing their foreign policy interests to meet the domestic demand for science and technology development.

Within this scenario, the Global South is defined as a block of countries in Asia, Latin America and Africa that share similar challenges, issues and resources. South-South Cooperation can be seen as an instrument to promote self-sufficiency and development in the countries of the South, defined as an exchange of experience between governments, organisations and individuals (King et al. 2020). Chaturvedi (2016) highlights that mutual gains govern this cooperation, together with collective growth and opportunities to strengthen human capital. South-South Cooperation is an essential expression of solidarity and unites expectations with principles and motivations (Vadell et al. 2020).

Most countries have a significant institutional capacity for research and the expansion of knowledge. Still, this capacity is unequally distributed across the system of institutions of higher education and all areas of learning and inquiry, which frequently result in an ambivalent

role for the country's internationalisation efforts (Schleicher & Barros-Platiau 2023). The sharing of knowledge among global research communities is an opportunity to expand institutional research capacity in-country and to support the growth of research capacity in countries with less developed institutions. If implemented equitably, international research cooperation benefits all participants in terms of knowledge-sharing. Bearing in mind that processes in international politics are subject to power relations and that South-South Cooperation is usually regarded as a horizontal form of collaboration, this paper mainly looks at scientific partnerships among the Global South regions, areas of cooperation and their impact, with a focus on Sustainable Development Goals in these collaborations.

MATERIALS AND METHODS

Data was collected from Incites ® (Clarivate Analytics, based on Web of Science) and Scival (Elsevier, based on Scopus) from 2012 to 2021. Five groups (Supplementary Material - Table SI) of Global South countries were formed (ASEAN[1], Asia, Africa, BRICS[2] and Latin America). The international scientific collaboration of these with other countries was formed. Other countries were formed into groups (Global North (N_) Asia, Europe, Middle East, North America and Oceania) and Global South (S_) Africa, ASEAN, Asia, Caribbean, Central America, Middle East, Oceania and South America – see Table SII). Only papers with international collaboration were considered. Data was considered by region and by Sustainable Development Goal (SDG).

Data[3] included % documents cited; % of documents in top 1% and 10% of citations (based on citations by category, year, and document type); citation impact (CI – number of citations per paper), % Hot papers - top 0.1% by citations for field and age; Impact Relative to the World (IRW - CI is divided by the CI of the Global baseline); Average Percentile (AP - percentile of a publication is determined by creating a citation frequency distribution for all publications in the same year, subject category, and document type (arranging papers by ascending citation count), and determining the percentage of papers at each level of citation); % documents in Q1, Q2, Q3 and Q4 journals; % industry collaborations; Category Normalized Citation Impact (CNCI-divide the actual count of citing items by the expected citation rate for documents with the same document type, year of publication and subject area); Journal Normalized Citation Impact (JNCI - normalize the citation rate for the journal in which the document is published); Brazilian author position in the paper (first, last or corresponding). Type of publication was defined depending on their Open Access (OA) classification as % Gold, % Gold-Hybrid, % Green, % Open Access (OA), %Free to Read, and % Not OA. Cluster analyses were grouped by indicator type (Open Access - % O.A. % Gold, % Green), Citations (% Top 1%, % Top 10%, CNCI, JNCI, IRW, AP), Journal Quartiles (Q1, Q2, Q3 and Q4), and Author Types (First, Last and Corresponding).

The data was analysed in SAS v9.4 (Statistical Analysis System Institute, Cary, North Carolina), and analyses included clustering (by author position, impact/citations, open access, journal

[1] Asean - Association of Southeast Asian Nations - International organization with ten member countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

[2] Although Russia is not a Global South country it is a developing country and so included here.

[3] https://incites.help.clarivate.com/Content/Indicators-Handbook/ih-about.htm.

quartile), principal components, and analysis of variance.

RESULTS

While Asia Pacific and ASEAN countries had higher percentages of publications in Engineering, computer science, and Physics (Figure 2), Africa and Latin America had higher percentages in Medicine and Agriculture-related subjects. The publication impact was generally lower for BRICS and Latin America (Table II), while ASEAN countries tended to have higher FWCI.

International Collaboration (Table III) has the highest impact in all cases. While Africa exhibited the highest percentage of international collaboration, Asia and the BRICS countries had the lowest percentages. Even with lower international collaboration, Asia and the BRICS show a higher impact than Latin America and Africa. Academic-cooperation collaboration also increased impact, with the highest percentage in ASEAN and Asian countries.

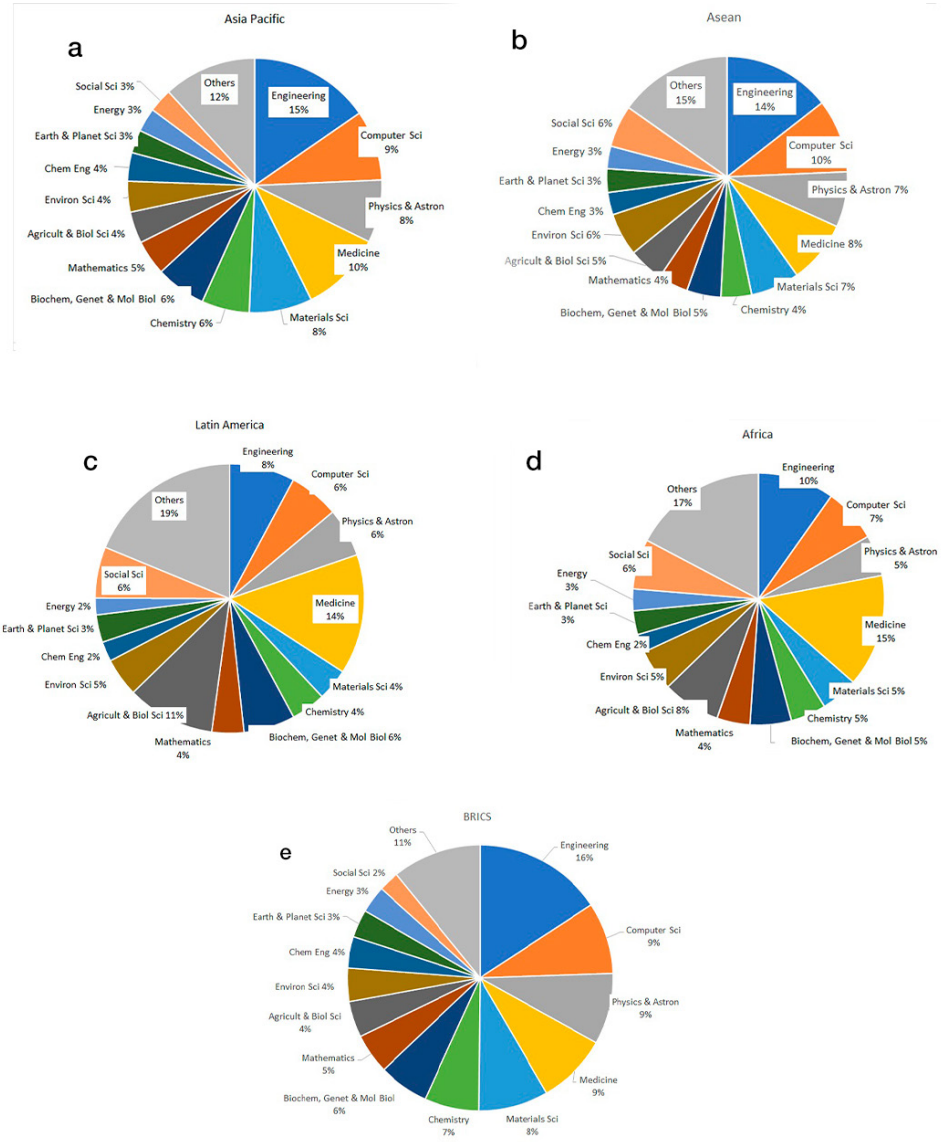

Figure 2. Areas of knowledge production in selected country groups a) Asia Pacific; b) Asean; c) Latin America; d) Africa; e) BRICS.

Asian countries had a higher percentage of papers in Q1 journals (Table IV and Table SIII), followed by the BRICS. In addition, Asia and the BRICS had a higher percentage of publications in top journal percentiles. Still, ASEAN had a higher percentage of outputs in top citation percentiles and Latin America had the lowest.

While Africa had low Academic-Corporate and International Cooperation, this tended to be good quality (Figure 3), with the BRICS and Latin America having the lowest impact. In recent years, ASEAN countries have had a lower percentage of Top Journal Citations, compared with higher levels for the BRICS countries.

Good Health and Wellbeing (SDG 3) dominates South-South Collaborations (Figure 4), with (16) Peace and Justice Strong Institutions, (08) Decent Work and Economic Growth, (10) Reduced Inequality and (01) No Poverty generally at less than 1% of the publications. Life below

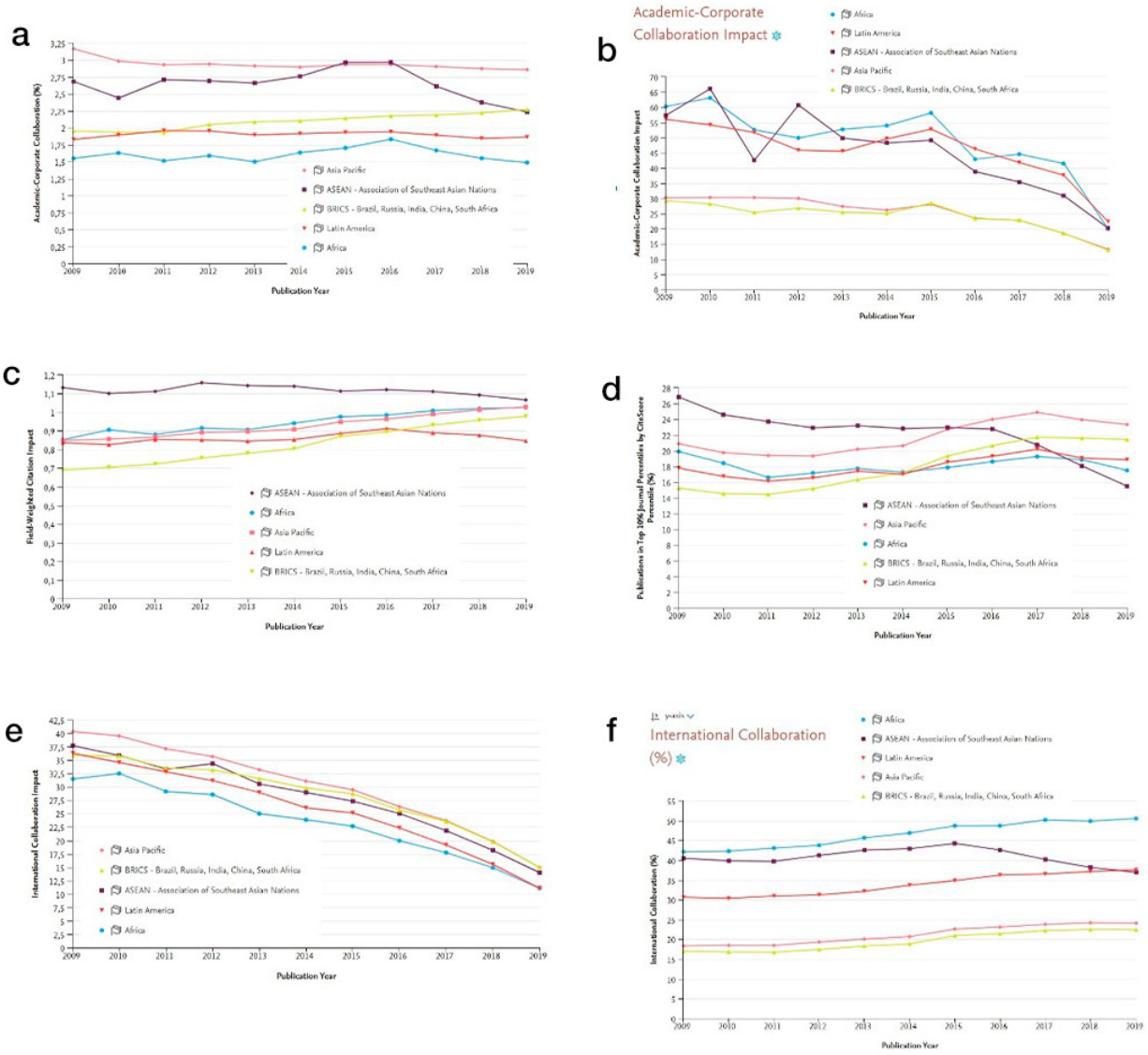

Figure 3. Trends in academic parameters for selected country groups (SciVal) : a) % Academic Corporate Collaboration, b) Academic Corporate Impact, c) Field Weighted Citation Impact, d) Publications in Top 10 % Journal Percentiles, e) International Collaboration Impact and f) % International Collaboration.

Water (14), Life on Land (15), Climate Action (13), Sustainable Cities and Communities (11) and Gender Equality (6) were generally between 5 and 10% of the publications. Asian and ASEAN countries showed a higher percentage of Affordable and Clean Energy (7), while Africa and Latin America had a higher rate of Zero Hunger (01).

Collaborations with Africa generally showed a high impact (Table Va and Tables SIV and SV) for all country groups but the lowest with the BRICS. Generally, these country groups exhibited a low impact compared to the aggregated international collaboration (world). Collaboration between Asia and ASEAN countries had a low impact, as did Latin America with the BRICS (SDGs 6 to 12, 16). The highest impact is seen for Gender Equality and Good Health. Lower % Open Access is seen in Latin America (Table Vb) and for SDGs 6 to 12. Latin America has a higher %OA overall.

Comparing inter-region and intra-region collaboration (Supplementary Figures S1 and S2), intra-region generally showed an increased impact except for collaboration with industry for the BRICS, Asia and World and % Open Access for ASEAN. Similarly, Principal Component analyses (Figure 5) revealed similar behaviour for all groups. Increasing authorship from a Global South author led to a reduction in the impact and a reduction in high-impact or industry publications, with more papers published in Q3 or Q4 journals.

The cluster analysis (Figure S3) shows similarities within the analysis parameters. Central and South America, the Caribbean and "Southern" Oceania states show different behaviours than other regions. Africa reveals a publishing behaviour more closely linked to the Global North. Even when the collaborations are South-South, the importance of North-South

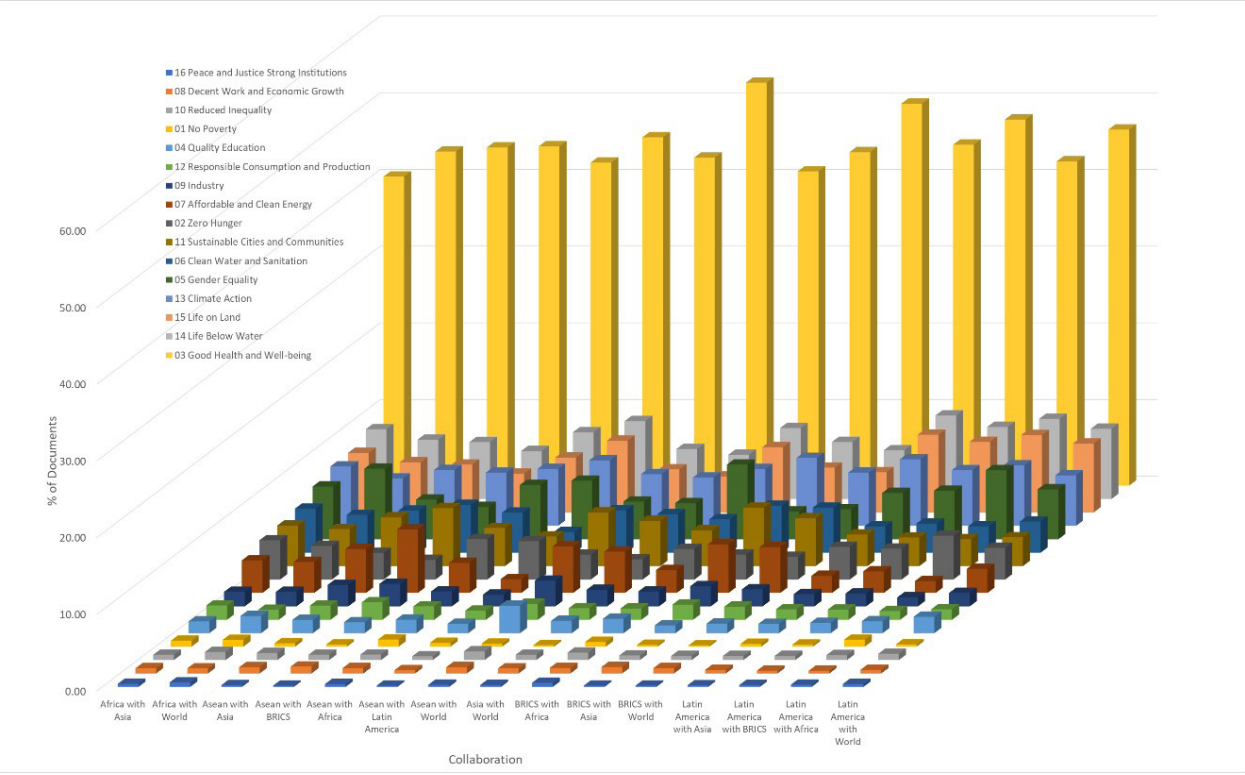

Figure 4. Percentage of documents in collaboration (Global South).

Collaboration is evident (Figure S4), especially with the United States.

Furthermore, The United States is a significant financial source for research worldwide (Figure 6), with increased flows in recent years for China, especially in the BRICS, Asia and ASEAN groups. Internal financing by the National Research Foundation of South Africa has increased above other regional financers. Africa has also seen a steady increase in international funding from Europe and the United States, with Chinese financing rising in the last ten years. Brazilian Agencies (CAPES, CNPq and FAPESP) dominate financing in Latin America.

The impact is generally higher (Figure 7) for non-local financing sources. For all regions, intra-regional collaboration had a lower impact than inter-regional.

Figure 5. Principal Components by Country Group a) Africa; b) Asean; c) Asia; d) BRICS; e) Latin America (Abbrevistions in Materials and Methods).

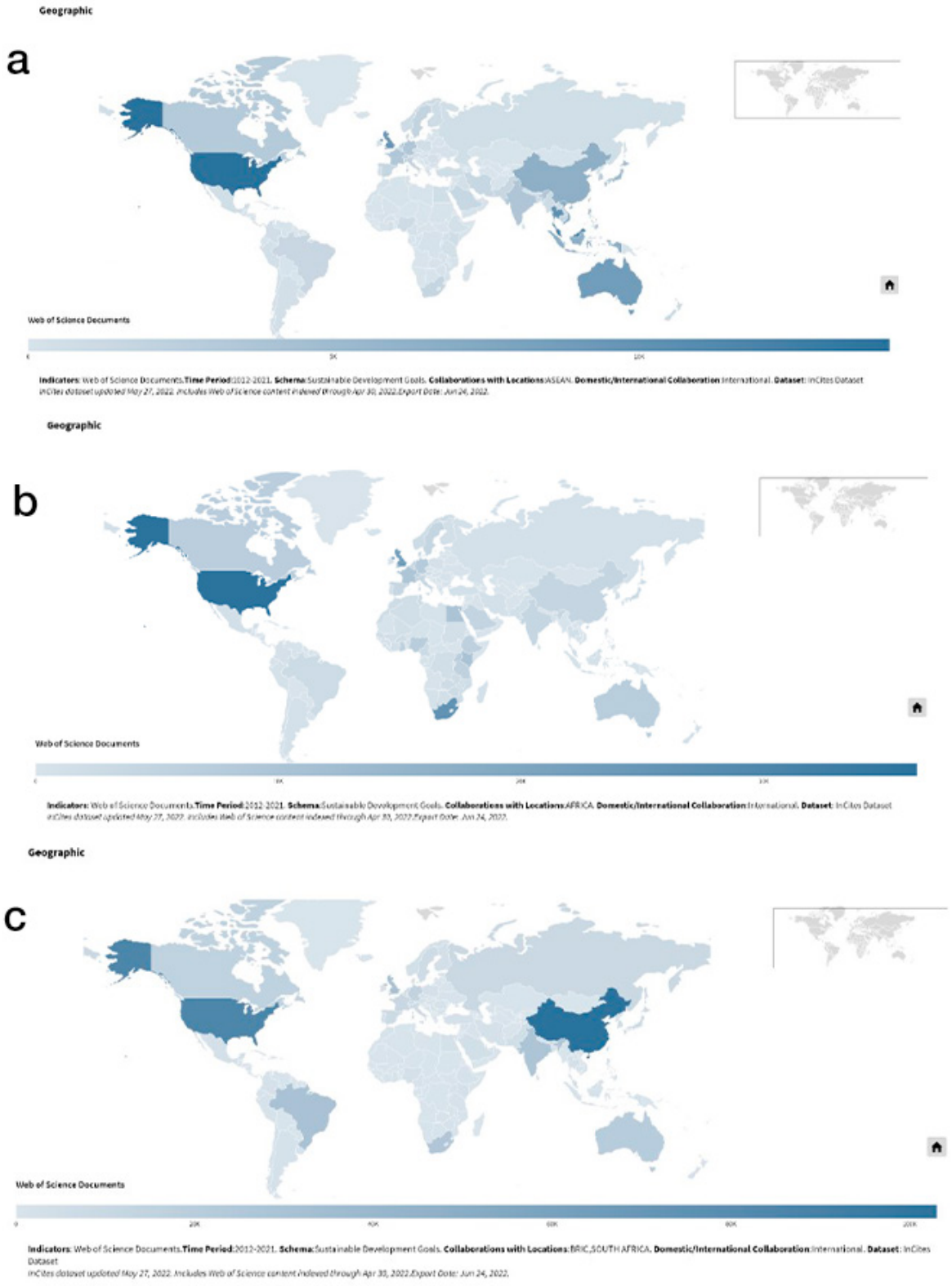

Figure 6. Publication Networks for South -South Collaborations (a) Asean, (b) Africa, (c) BRICS, (d) Asia, (e) Latin America.

Figure 6. Publication Networks for South -South Collaborations (a) Asean, (b) Africa, (c) BRICS, (d) Asia, (e) Latin America.

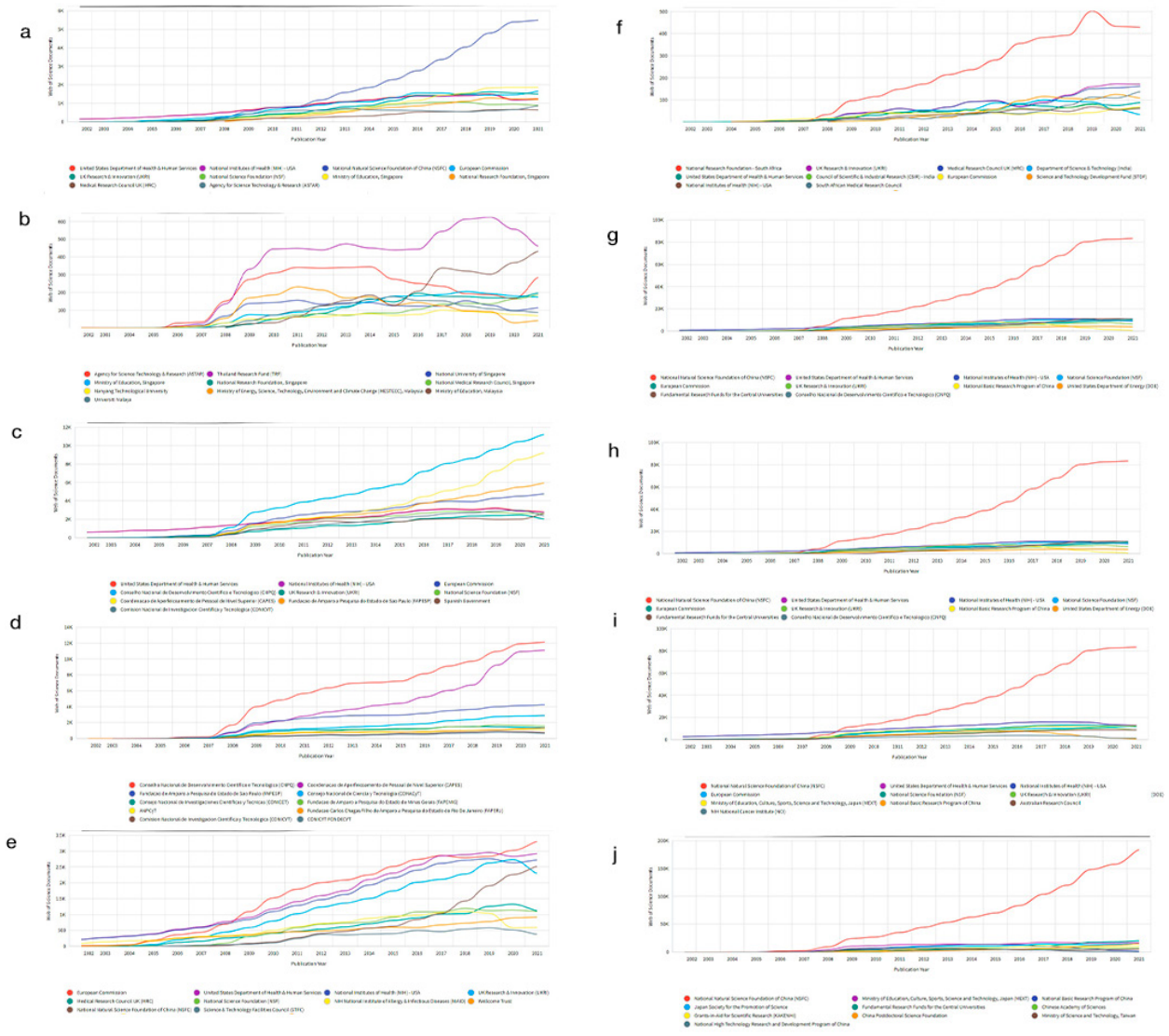

Figure 7. Financing South-South Collaboration Research. Left Column – inter-regional, right column – intra-regional. Lines – country groups.

DISCUSSION

In the construction of partnerships, where the necessary structural conditions for developing the proposed activities are not yet sufficient, it is a *sine qua non* trend to include national and international institutions that can share the costs of projects. Notwithstanding, developing countries tend to concentrate on a few specific science areas related to their national needs or priorities). Srivastava (2015) found that developing countries prefer collaborating with developed countries, even more so with countries sharing a common official language and colonial links. The present study corroborates Srivastava (2015), since collaboration with the Global North was prevalent.

Wagner & Leydesdorff (2005) mapped the networks created by international co-authorships for 1990 and 2000. They showed a pronounced expansion of the global network and the emergence of regional hubs, with large countries competing for developing partners.

This paper also found the same trend, particularly in building relationships with African countries.

Scientific and technical human capital is greater than the sum of a particular individual's scientific, technical and social knowledge, skills and resources (Bozeman et al. 2001). It includes human capital endowments, such as formal education and training, as well as social relations and network ties that bind scientists and science users together as a knowledge-value collective (Bozeman & Corley 2004). Therefore, financing international collaboration should also consider such intangible assets, whereby the appropriation of the collaboration should be part of any evaluation process (McManus et al. 2021).

According to Cooke (2005), open innovation on a global basis is a powerful tool to overcome inherent knowledge asymmetries and overturn the imbalance in an evolutionary process over time. Kim (2006) states that the symmetrical type of international research collaboration has intensified while the dominance of the asymmetrical collaboration has declined. This observation was based on the number of participating countries and revealed that papers written by multiple researchers from three or more countries have increased considerably during the last two decades.

The more people exchange ideas, the more a country benefits through increased mobility. The more open a country is for exchange and mobility programs, the more scientifically important and influential it becomes. Proximity means that groups share the same information within the inner circle and uniform ways of thinking, while external influences breed new ideas. This "rule of thumb" was also confirmed in the results reported in this paper, where collaborations between regionally closer groups tended to be of lower impact. This may reflect a similar behaviour or a "one size fits all" funding approach (Donovan 2005). Creating international research networks can spill over borders and supposedly open hermetically sealed institutional structures and rules. These networks can develop connections between disciplines, institutions and nations, mainly by producing links among people that initially had little or nothing to do with each other. Jeffrey (2003) argues that trends toward increasing interdisciplinary research reflect the complexity of modern problems and how funding bodies wish to see these problems tackled.

In the current study, each region shows tendencies towards different areas of research, which may be used to guide future collaboration efforts. Knowledge asymmetries can be flattened by tapping into the regional knowledge capabilities and systemic innovation strengths of accomplished regional and local clusters. These regional knowledge capabilities help metamorphose even macro-processes operating through globalisation (Cooke 2005). Luo et al. (2013) state that international partnerships often encounter barriers such as resource, capacity, and political and cultural differences, which affect the motivations, balance of benefits, regulation of research, and, ultimately, the outcomes of these programs.

While Africa has seen an increase in external funding for research, this is not evident in South America, where public Brazilian Agencies dominate the research financing. Among the countries in the Global South, there are distinct barriers against the full integration of international collaboration into institutional cultures, conceptual and structural deficiencies in the organisation of institutional internationalisation, overemphasis on human exchange initiatives, lack of cultural integration efforts, increased hidden agendas, and feelings of local neglect at the expense of global attention.

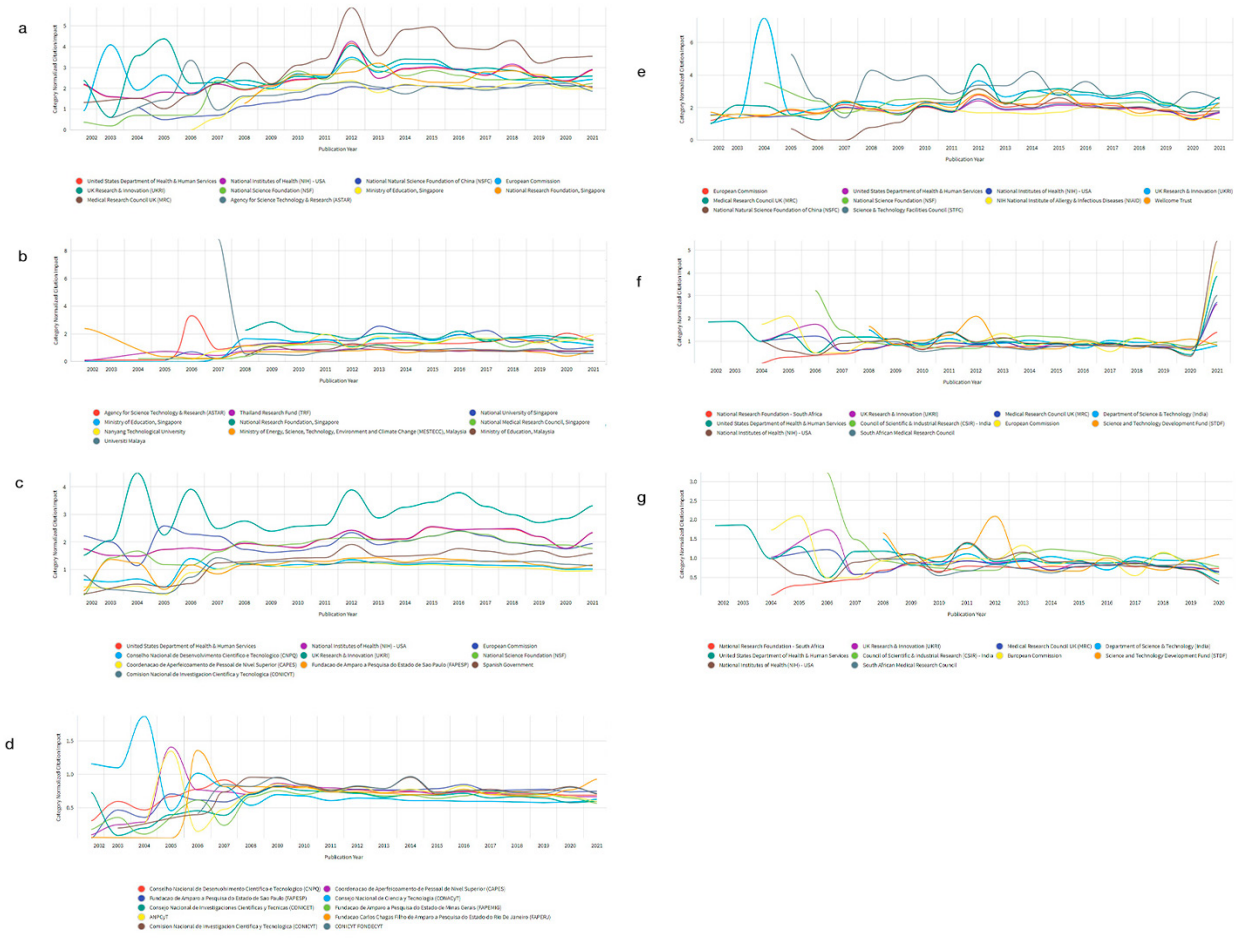

Figure 8. Impact of South-South Collaboration depending on Finance Source. Left Column – inter-regional, right column – intra-regional. Lines – country groups.

The influence of non-local financing agencies, as evidenced by the higher impact of African papers compared to the stagnated situation in Latin America between 2012 and 2021, is a significant variable in the research landscape. This variable, in part, may explain the differences in behaviours and policies within the regions. While ASEAN and Asian countries demonstrate a desire to enter the mainstream scientific community, Latin America is governed by a dichotomy of objectives: to follow internationalisation and become a significant player in the international research community while maintaining a discourse of solidarity, complementarity, and equality.

Internationalisation strategies must recognise important variability vectors that will affect any operational plans. First, it must be coherent with the reality of universities and research centres. Significant variability exists in the level of scientific excellence and the quality of postgraduate programs across higher education institutions. The second source of variability is found within any university or research institution where the professional faculty varies according to rank, experience, and scientific output. The third factor of variability is the nature of international partnerships that form the core of an internationalisation policy. The conventional distinction is between North-South partnerships in which institutions

collaborate with partners in North America, Europe, Japan, Korea, and Australia, which are regarded as having more well-endowed research institutions. The South-South partnerships tend to be among institutions in Latin America or with those located in Africa and specific parts of Asia.

Nevertheless, even among the South-South partnerships, there are those characterised more or less by equal levels of institutional capacity (e.g. Brazil-Argentina) and those where the institutional capacity is imbalanced (e.g. Brazil-Angola). These sources of variability must be addressed and incorporated into the operational plan of an internationalisation strategy. It should be recognised that most questions proposed in the current research agendas are transdisciplinary and should be treated as such.

According to the findings in this paper, the future points to an inevitable expansion in South-South international scientific cooperation. Current partnerships occur between countries with a similar institutional research capacity, and these relationships, in most cases, have very little inherited from collaboration with institutions from the U.S. and Europe. They tend to be based on equality and mutuality regarding costs and benefits. The goals are to enhance knowledge through exchange and collaborative research that derives full advantage of complementary levels of expertise.

However, South-South partnerships frequently involve cooperation between institutions with unbalanced levels of research capacity. There is a substantial distinction between scientific excellence and development goals. For example, most Lusophone African universities show that their research capacity is hindered by a lack of research infrastructure (labs, etc.), research funding, integration into broader research networks, organisation, and research experience. So, as partnerships are "tailored" to local contexts, many South-South scientific collaboration pose additional structural challenges, particularly in sub-Saharan Africa (South Africa excepted).

CONCLUSIONS

Inter-regional collaboration shows a higher impact than collaboration within a region. Each region displays different scientific production and impact profiles, with the Global North collaboration being necessary for all regions regarding results and financing. The data analysed can be used to orient South-South scientific collaboration programs, focusing on pre-existent synergies and where policy changes and results can be maximised.

Acknowledgments

Thanks are due to the Brazilian National Council for Scientific and Technological Development (CNPq) and the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) financing code 001 for financial support. The authors declare no conflict of interest.

REFERENCES

AAAS/ROYAL SOCIETY. 2010. New Frontiers in Science Diplomacy (London: Royal Society, 2010), https://royalsociety.org/~/media/Royal_Society_Content/policy/publications/2010/4294969468.pdf.

ABDENUR A & FONSECA J. 2013. The North's Growing Role in South-South Cooperation: keeping the foothold. Third World Quarterly 34: 1475-1491.

BEDWELL WL, WILDMAN JL, DIAZGRANADOS D, SALAZAR M, KRAMER WS & SALAS E. 2012. Collaboration at work: An integrative multilevel conceptualisation. Human Res Manag Rev 22(2): 128–145.

BOZEMAN B & CORLEY E. 2004. Scientists' collaboration strategies: implications for scientific and technical human capital. Res Pol 33(4):599-616.

BOZEMAN B ET AL. 2001. Scientific and technical human capital: An alternative model for research evaluation. Int J Tech Manag 22: 716-740.

CHATURVEDI S. 2016. The Development Compact: A Theoretical Construct for South-South Cooperation | Research and Information System For Developing Countries. New Delhi. Retrieved from https://www.ris.org.in/development-compact-theoretical-construct-south-southcooperation.

COOKE P. 2005. Regionally asymmetric knowledge capabilities and open innovation: Exploring' Globalisation 2'—A new model of industry organisation. Res Pol 34(8): 1128-1149.

DONOVAN C. 2005. The governance of social science and everyday epistemology. Public Admin 83: 597-615.

ECHEVERRÍA L, AQUINO K & WIDMAIER C. 2020. Science diplomacy and sustainable development goals: a latin american perspective. Sci Dip Rev 2(1): 3-13.

EZEKIEL IP. 2020. Engaging science diplomacy for nanotechnology development in Africa. In: IOP Conference Series: Materials Science and Engineering 805:012039. IOP Publishing.

FONSECA BPF, FERNANDES E & FONSECA MVA. 2016. Collaboration in science and technology organisations of the public sector: A network perspective. Sci Public Pol scw013. doi:10.1093/scipol/scw013.

GELFAND MJ, EREZ M & AYCAN Z. 2007. Cross-cultural organisational behavior. Annual Rev Psych 58: 479-514.

JEFFREY P. 2003. Smoothing the waters: Observations on the process of cross-disciplinary research collaboration. Social Stud Sci 33(4):539-562.

KIM KW. 2006. Measuring international research collaboration of peripheral countries: Taking the context into consideration. Scientometrics 66(2): 231-240.

KING LFE, VALLE KA & MULLER CW. 2020. Science diplomacy and South-South cooperation for emergency response: the case of COVID-19 pandemic in Latin America. Jurnal Sosial Politik 6(2): 167-181.

LEWIS JM. 2010. Connecting and cooperating: Social capital and public policy. Sydney: UNSW Press.

LEWIS JM, ROSS S & HOLDEN T. 2012. The how and why of academic collaboration: Disciplinary differences and policy implications. High Ed 64(5): 693-708.

LINKOV I, TRUMP B, TATHAM E, BASU S & ROCO MC. 2014. Diplomacy for science two generations later. Science & Dipl 3(1): 1-8.

LUO A, OMOLLO KL, DIANIS N & WOLBACH T. 2013. Collaboration between Developed and Developing Countries Offers Opportunities to Amplify Global Health Research. https://deepblue.lib.umich.edu/bitstream/handle/2027.42/102597/2013_Luo-et-al-SciTS_Cross-Cultural%20and%20International%20Team%20Science.pdf?sequence=2&isAllowed=y.

MAUDUIT JC & GUAL SOLER M. 2020. Building a science diplomacy curriculum. Front Ed 5: 138.

MCMANUS C & BAETA NEVES AA. 2021. Funding research in Brazil. Scientomet 126(1): 801-823.

McMANUS C, BAETA NEVES AA, DINIZ FILHO JA, MARANHAO AQ & SOUZA FILHO AG. 2021. Profiles not metrics: the case of Brazilian universities. An Acad Bras Cienc 93: e29290261. https://doi.org/10.1590/0001-3765202120200261.

MCMANUS C, BAETA NEVES AA, MARANHÃO AQ, SOUZA FILHO AG & SANTANA JM. 2020. International collaboration in Brazilian science: financing and impact. Scientomet 125(3): 2745-2772.

MCMANUS C, BAETA NEVES AA, OLIVEIRA CS & DE OLIVEIRA CASTRO HC. 2021. Postgraduate Internationalisation in Brazil. Int J Sci Res Manag 9: 1791-1805. 10.18535/ijsrm/v9i07.el02.

MEADOWS AJ. 1974. Communication in science. London: Butterworths.

MOLOSI-FRANCE K & MAKONI S. 2020. A partnership of unequals: global South–North research collaborations in higher education institutions. Modern Africa: Politics, History and Society 8(2): 9-24.

ROMANOVA M. 2017. Science Diplomacy: Dimensions and Practices, Sci Gov Scientom J 12(1): 38-52.

SALAZAR M & SALAS E. 2013. Reflections of cross-cultural collaboration science. J Organiz Beh 34(6): 910-917.

SCHLEICHER RT & BARROS-PLATIAU AF. 2023. The Brazilian international development cooperation: over-representation, ambivalence, decentralisation and instrumentalism. Rev Tempo Do Mundo. 31: 25-53. https://doi.org/10.38116/rtm31art1.

SHIBAYAMA S. 2015. Academic commercialisation and changing nature of academic cooperation. J Evol Econ 25: 513-532 https://doi.org/10.1007/s00191-014-0387-z.

SONNENWALD DH. 2007. Scientific Collaboration. Annual Rev Infor Sci Tech 41(1): 643-681. DOI: 10.1002/aris.2007.1440410121.

SRIVASTAVA R. 2015. Developing Countries and Scientific Collaboration in Pharmaceuticals. IATL Reinvention. Int J Undergrad Res 5: 1 https://warwick.ac.uk/fac/cross_fac/iatl/reinvention/archive/volume5issue1/srivastava/.

VADELL J, LO BRUTTO G & LEITE ACC. 2020. The Chinese south-south development cooperation: An assessment of its

structural transformation. Rev Brasil Pol Intern 63(2). https://doi.org/10.1590/0034-7329202000201.

WAGNER C & LEYDESDORFF L. 2005. Mapping the network of global science- comparing international co-authorships from 1990 to 2010. *Int J Tech Global* 1(2): 185-208.

How to cite
MCMANUS C, BAETA NEVES AA, FINAN TJ, PIMENTEL F, PIMENTEL D & SCHLEICHER RT. 2024. The South-South Dimension in International Research Collaboration. An Acad Bras Cienc 96: e20230942. DOI 10.1590/0001-3765202420230942.

Manuscript received on August 30, 2023;
accepted for publication on October 13, 2023

CONCEPTA MCMANUS[1]
https://orcid.org/0000-0002-1106-8962

ABILIO A. BAETA NEVES[2]
https://orcid.org/0000-0002-4684-2479

TIMOTHY JOSEPH FINAN[3]
https://orcid.org/000-0003-0172-6607

FELIPE PIMENTEL[4]
https://orcid.org/0000-0001-7016-5255

DANIEL PIMENTEL[1]
https://orcid.org/0000-0002-1105-4720

RAFAEL T. SCHLEICHER[5]
https://orcid.org/0000-0002-9737-7677

[1]Universidade de Brasília, Institute of Biological Sciences, Asa Norte, 70910-900 Brasília, DF, Brazil

[2]Pontifícia Universidade Católica do Rio Grande do Sul , Av. Ipiranga, 6681, Partenon, 90619-900 Porto Alegre, RS, Brazil

[3]University of Arizona, School of Anthropology, East South Campus Drive, P.O. Box 210030, 1009, 85721, Tucson, AZ, USA

[4]Universidade Anhembi Morumbi, Campus Paulista, Bela Vista, 01310-200 São Paulo, SP, Brazil

[5]Fiocruz Brasília, Avenida L3 Norte, s/n, Campus Universitário Darcy Ribeiro, Gleba A, Asa Norte, 70904-130 Brasília, DF, Brazil

Correspondence to: **Concepta McManus**
E-mail: concepta@unb.br

Author contributions

Concepta McManus, Conceptualization, Methodology, Validation, Writing - Original Draft, Writing - Review & Editing. Abilio Afonso Baeta Neves Conceptualization, Methodology, Validation, Writing - Original Draft, Writing - Review & Editing. Timothy Joseph Finan Investigation, Writing - Original Draft, Writing - Review & Editing. Felipe Pimentel, Formal analysis, Writing - Original Draft, Visualization. Daniel Pimentel, Formal analysis, Writing - Original Draft, Visualization. Rafael Tavares Schleicher Data Curation, Writing - Original Draft, Writing - Review & Editing.