International research collaboration among the G-20 countries

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G-20 refers to an organization of 20 member countries/units founded in 1999. Over the years, it has become an important political and economic platform to address various developmental concerns. The member countries collectively represent about 75% of global population, 85% of the global gross domestic product and 75% of the global trade. Given that the G-20 has 88.8% of the world's researchers and accounts for 93.2% of research spending and 90.6% of scientific publications at the global level, it would be interesting to analyse the international research collaboration patterns among the G-20 countries, including assessment of benefits and impact of such collaboration. The present study utilizes the publication data of these countries to estimate their collaborative research levels. A positive growth is observed in research collaboration along with a positive correlation with the national expenditure on R&D. Some countries (e.g. Saudi Arabia and South Africa) are found to have benefitted significantly from such collaborative research, as observed by a boost in productivity and citations. The results comprehensively account for international research collaboration among the G-20 countries.

Keywords: Citations, international research collaboration, member countries, publication data.

benefits of research collaboration in improving productivity and a strong correlation between collaboration, productivity and citations have been highlighted by several studies[4,10–13]. Some studies have also revealed that the greater the scientific wealth (publication and citation data), the greater the inequality of distribution[14].

The Group of Twenty (G-20) comprises 19 countries (Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Türkiye, United Kingdom and United States of America) and the European Union. The G-20 is an intergovernmental organization established in 1999 to address several global economic crises (https://www.g20.org/). Together, the G20 countries account for almost two-thirds of the global population, 75% of global trade and 85% of the world's GDP[15]. The G20 is also known to have about 88.8% of the world's researchers, and it accounts for 93.2% of research spending and 90.6% of scientific publications[16]. Thus, the G-20 countries command a substantial share of global resources and have mandated to work on global priority areas such as green development, climate finance, inclusive growth, digital economy, public infrastructure, technology transformation and reforms for women empowerment in socio-economic progress. In this context, exploring the level of scientific research collaboration among G-20 countries would [illegible]