Editorial Article

Advancing Global Research Equity: Strengthening Scientific Output in Middle-Income Economies

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The developments in science and technology have gone through several milestones in society and can be traced back to the 1700s: The first industrial revolution during which the biggest changes came in industries in the form of mechanization marked by inventions such as the steam engine; the second industrial revolution during which the emergence of new sources of energy—electricity, gas, and oil took place leading to inventions such as the internal combustion engine; the third industrial revolution which saw the rise in electronics, telecommunications and computers, opening the doors to space expeditions and research creating an era of a high level of automation and, the fourth industrial revolution, a phase that we are currently going through is an Internet-based world of virtual reality, in which the boundaries of the physical, digital and the biological worlds overlap. Our society has become a part of these evolutionary phases and as scientists, we have been sharing the advancement of knowledge during our formal teaching and creating new knowledge through research at universities and other research organizations. Along with teaching and research, stakeholder awareness as well as identification and implementation of appropriate policy changes in Science & Technology are key in contributing to economic and social progression.

The process of transforming scientific research outcomes into viable technologies and innovative solutions is complex and necessitates dedicated focus. Increasing sociopolitical pressure directs us to translate our research into products and services. However, it is well known that not all knowledge generated through research leads to innovations. Nevertheless, for the basis for innovations to be formed, a strong culture of research is required. Although our findings through applied research should be effectively translated and commercialized where possible, fundamental research should not be forgotten but encouraged. It is the quest to find the fundamental particles by scientists at CERN, that led Sir Tim Berners-Lee, to create the Internet-based World Wide Web for information sharing, considered to be one of the greatest inventions of all time. The development and deployment of the James Webb Space Telescope, designed to probe the origins and evolution of the universe, has catalyzed a multitude of groundbreaking innovations. This endeavor has not only advanced our knowledge in astrophysics but also yielded significant technological spillovers, including novel materials and cutting-edge technologies with broad applications beneficial to society at large.

The consistent dissemination of research findings in scholarly journals is an important aspect of a strong research culture. The research output of a country is often seen as an indicator of the economic advancement of a country. A study conducted recently by the National Center for Science and Engineering Statistics USA (https://ncses.nsf.gov), indicates a steady rise in the research output of every country, but a clear demarcation in the output levels between countries of high, middle and low-income economies as shown in the figure.

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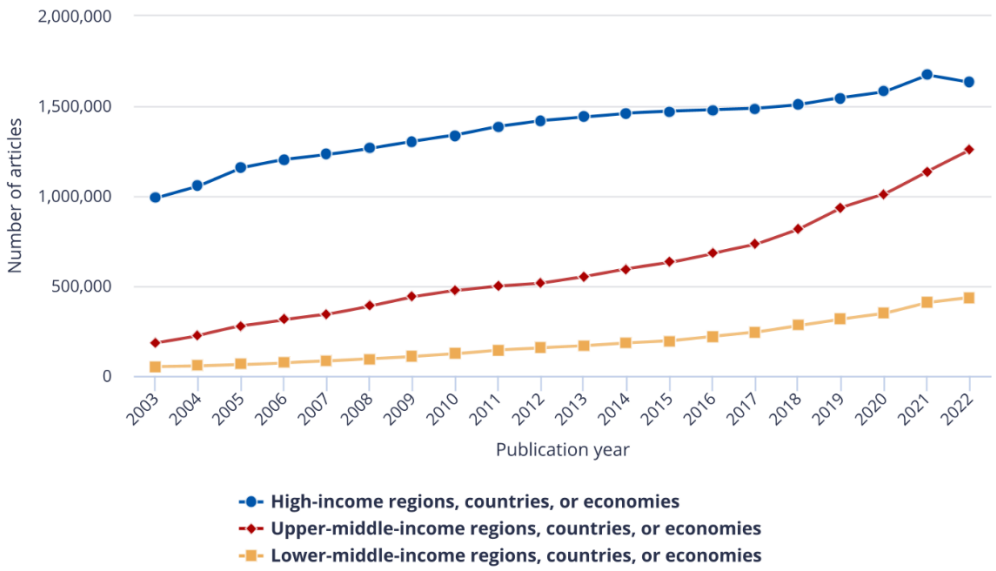

Figure: S&E publications, by income group: 2003–22. Source(s): National Center for Science and Engineering Statistics; Science-Metrix; Elsevier, Scopus abstract and citation database, accessed April 2023; World Bank Country and Lending Groups, accessed May 2023.

In 2022, the total worldwide science & engineering publication output has reached 3.3 million articles based on entries in the Scopus database. Approximately 86% of those publications have come from countries, or economies with high-income (blue) and upper-middle-income (orange) economies with the number of publications from upper-middle-income economies growing more rapidly than those from high-income economies during the more recent period between 2010 and 2022 (Figure 1). As scientists of Sri Lanka which has been re-classified as a lower-middle-income economy from its previous status of an upper-middle-income economy due to the recent economic crisis, our objective should be to elevate this status by improving our research output in order that it be visible globally. This can be achieved by publishing our research findings in internationally recognized journals while making efforts to elevate the standards of the other local journal for such recognition. The SCImago Journal ranking database, an established list of journals covering more than 30,000 peer-reviewed indexed journals provides a guide to publishing research findings in all disciplines including Social Science & Humanities and Accounting & Finances. Thus, it is clear that irrespective of the discipline, researchers have opportunities to publish their scientific contributions in a range of journals.

It is encouraging to note that this database includes the Journal of National Science Foundation, which serves as a platform to publish research findings of Sri Lankan scientists including the studies that are of national relevance, as well as those from overseas. It is time that we collectively make efforts to elevate the other peer-reviewed local journals for such recognition with the objective of strengthening the country's research culture. The need is to encourage local researchers to publish quality research work, be it of fundamental or applied interest, and to also invite international researchers to submit their research articles.

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