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Science Journalism in India: Strengths, Weaknesses, Opportunities, and Threats

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Abstract

Science journalism in India is need-based and happens only when the country is in crisis. There are many reasons to it including a lack of journalistic training in presenting science stories. While India has one of the largest newspaper markets in the world, its reach does not extend to one-third of its population. The vastness and vibrancy of the country, teeming millions in need of decent science stories in hundreds of different languages, and a large network of research institutions and think tanks offer enormous opportunities for the proliferation of science journalism. Journalists must tap these opportunities to promote this scientific stream.

Keywords

science and technology, science communication, mass communication, mass media, newspapers

Introduction

"By 2030 India will be among the top three countries in science and technology, and among the most attractive destinations for the best talent in the

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world.," said the Indian Prime Minister Narendra Damodar Modi while addressing the 104th annual meet of the Indian Science Congress in January 2017 at Tirupati, India (Pulakkat, 2017). The Prime Minister's statement fits well with the Vision 2030 declaration of the Government of India 2 years after which aims at the country's transformation into a modern, technology-driven, high-growth, equitable and transparent society (Press Information Bureau, 2019).

India is in action to achieve these envisioned objectives since then. There are myriad of activities running in parallel. It has also to train its 1.417 billion people (World Population Review, 2022) to orient them scientifically. The mass media needs to update society with the latest developments in science and technology. A knowledgeable nation signals greater human progress and inclusive economic growth (King, 2004), mandatory for a country's survival. This brings science journalism to the forefront.

But science journalism has a poor presence in communication outlets in India and seems to peak only when the country is in crisis. For example, during the past two waves of the coronavirus pandemic when about 520 Indian journalists, more than one-third of the 1,500 journalists who died globally due to COVID, lost their lives while reporting the disease (Reporters Without Borders, 2021). But India cannot endure such a tragedy just to proliferate science journalism!

Scholars have concluded that the distance between science and journalism has many political and economic implications, and a wide rift threatens a country's future in the long run (Hartz & Chappell, 1997; Peters, 2013). In an attempt to bridge this gap, the present commentary identifies some of the strengths (S), weaknesses (W), opportunities (O), and threats (T) (SWOT) of science journalism in India so that mitigation measures can be taken to promote the better scientific reporting throughout the country.

The SWOT Analysis

Strengths

India traditionally has been home to various forms of mass communication. Today, with a combined circulation of about 240 million copies of nearly 18,000 registered newspapers and more than 100,000 other periodicals, India remains one of the oldest and largest newspaper markets in the world (Registrar of Newspapers of India, 2018). Part of the reason for the wealth of media is India's vast expanse of 3,287,263 square kilometers (National Portal of India, 2022) with a staggering population of about 1.417 billion people.

Beyond print publications, All India Radio is the world's largest radio network serving about 420 stations located across the country. It covers about

92% of India's geographical area serving more than 99% of the country's population in 23 different languages and 146 dialects (Prasar Bharati, 2021). As of September 2021, the country had about 906 approved private satellite television channels (Telecom Regulatory Authority of India, 2022) besides having numerous regional channels. Out of about 300 million households with an average family size of 4.57 people (United Nations, 2008), 210 million households have access to television (*Business Standard*, 2021) resulting in a coverage of about 70% of India's population.

On the top of media's sphere of influence, there is no dearth of information being disseminated from various developmental sectors. For example, the Union Government has a huge network of 51 Ministries, 59 Departments, 26 Commissions/Committees/Missions, 545 statutory/autonomous bodies, 277 public sector undertakings/joint ventures/societies/ government-owned companies, 174 attached/subordinate offices, and 717 academies/institutions (National Portal of India, 2022). Activities of these agencies are intrinsically related to science and technology, such as in agriculture, water, health, space, information technology, telecommunication, and so on. For example, the largest research and development organization in India, Council of Scientific and Industrial Research (CSIR, 2021), has a dynamic network of 37 national laboratories, 39 outreach centers, 3 innovation complexes, and 5 units with a pan-India presence.

India consists of 28 States and eight union territories that also have their own setup for the development and promotion of science and technology (National Portal of India, 2022). In addition, many private companies have their own established laboratories and announce numerous breakthroughs on a regular basis to the public. Taken together, the broad spectrum and vastness of information make India one of the most information-rich countries in the world.

And then there is new media. Per statistics given by the Union Government in 2021, WhatsApp is the most used social media app with about 530 million users followed by YouTube with 448 million, Facebook with 410 million, Instagram with 210 million, Snapchat with 116 million, LinkedIn with 81 million, and Twitter with 78 million (Upadhyay, 2021). However, the latest data (The Global Statistics, 2022) far exceed these numbers. To complete the outreach picture, about 834 million people in India are internet users, which translates to about 60% of the population (Telecom Regulatory Authority of India, 2022).

Weaknesses

A study in 2015 reveals that science coverage was 3.4% in print media, 2.18% in television, and 5.84% in radio in India (Dayal & Monga, 2015). Experts opine that science coverage should make up at least 10% to 15% of the regular news items (Patairiya, 2016). Science content in the U.S.

newspapers in 2005, by contrast, made up about 12% to 18% of the daily media output (Russell, 2010).

In fact, Indian news media is addicted to stories related to protests, politics, and entertainment, perhaps more so than other developed nations (M. Kapoor & Ravi, 2021). Science news that has only political implications is able to find space on the front pages. Some experts call it "politicization of journalism" (Dutt & Garg, 2000). But even if science news cannot find a front slot, it still can draw the attention of the public if presented well. But the presentation itself is sometimes faulty and dry, lacking liveliness and lucidity (Patairiya, 2007). Lack of training as to how to write for the common man could be one of the reasons.

There are about 20 dedicated journalism schools in the country, but possibly only a few of them teach science journalism as a specialization. Science journalism as a Master's program is still a far-fetched agenda. Many leading science magazines that started with a promise have ceased publishing due to a lack of public demand. For example, the once-popular *Science Today*, *Science Age*, and Indian editions of few other magazines, such as *Scientific American*, are no longer being published. A few others, such as *The Science Reporter* and *Science Ki Dunia*, are still thriving because they have government sponsorship. So, running a business with general science communication magazines is a highly risky venture.

When considering scientific outreach, it is important to remember that India is a diversified country with about 19,569 mother tongues and 121 major languages spoken by more than 10,000 people each (Press Trust of India, 2018). The Constitution of India has allowed only 22 languages to be treated as official. But despite this, science publications are mostly found either in English or in Hindi, and large sections of society that are not very conversant with these languages do not have any access to much scientific information.

Then there is the bureaucratic aspect of dissemination. Most scientific research in India is carried out by the government sector, but agencies are very reluctant to part ways with their data due to fear of distortion and confidentiality (Goel & Chawla, 2022). Therefore, scientific information is limited mostly to the institutional level. While not all scientists are good communicators, junior-level scientists are prevented from speaking due to fear of misrepresentation. Since access to scientific data is limited, Indian journalists depend on sources from foreign countries for science communication.

Opportunities

The strengths of Indian science journalism are also its opportunities. Despite having the largest number of paid newspapers in the world (Tharoor, 2017) and a large circulation network, India has yet to reach out to about one-third

of its population, that is, about 470 million people. India's 509 think tanks, the highest in the world (McGann, 2019), are the sources of many revolutionary thoughts. These entities could be interrogated by journalists eager to write policy-oriented news which is the crux of science journalism. With the presence of hundreds of languages, a science story written in one language can be easily translated into other languages for a pan-India transmission.

Another strength of India lies in its strong network of educational systems. With about 490 million students, 301 million in secondary and tertiary level (United Nations Educational, Scientific and Cultural Organization, 2022) student population alone would constitute the third most populous country in the world (World Population Review, 2022). With such a huge network, the dissemination of science and technology should be an extremely easy task.

While India tops the user lists in most new media forums, it was ranked the second largest online market worldwide in 2019 (Ang, 2020). The annual growth rate of active social media and internet users in India stands at 4.2% (19 million) and 5.4% (34 million), respectively (The Global Statistics, 2022), with the number of internet users predicted to reach 1.532 billion in 2040 (Statista, 2022). New media touches almost every nook and corner of the country. Therefore, there are vast opportunities for communicating science through these new media forums.

Threats

James Hicky, the founder of *The Bengal Gazette*, was fined and sent to prison in 1782 as he reported corruption by the then Governor General of India, Warren Hastings (Otis, 2018). In 1975, Indira Gandhi, the then Prime Minister of India, gagged the press for 21 months, suspending all civil liberties (C. Kapoor, 2015). During the current pandemic of Covid-19, authoritarian leaders worldwide tried to control reporting by arresting journalists (Pullin, 2020). In India alone, 67 journalists were arrested and nearly 200 were physically attacked in 2020 (Biswas, 2021). Therefore, although freedom of press guarantees protection to journalists, there is no guarantee that criticism of the government on any science-related matter may not lead to censorship or libel accusations.

Journalism often demands creating attention, but with honesty. In many science stories, reporting numbers and presenting them in a way the public would appreciate is the key. But journalists with no science background are generally not good at statistics and it is doubtful as to how many of them would understand mathematics without adequate training in basic statistics and related tables and figures. There are chances that the data will be manipulated and embellished in an effort to make the story electrifying. Many scientists in the United States and Europe accuse reporters of inaccuracy,

sensationalism, and a host of other journalistic crimes and misdemeanors (Wilkes, 2002). India is not an exception (Rajgarhia, 2020).

The majority of Indians do not possess a scientific mindset. During the past two peak infection outbreaks of the coronavirus pandemic, people were more interested in media coverage because everybody's life was at stake. But in happy times, science journalism has not been popular. The possible reason could be the presentation style of the articles published. They simply are dull and dry. This again points toward a lack of adequate training for science communication in the country.

Science journalism has never been a lucrative profession in India (Mochahari, 2013). There is no guarantee that journalists can have a good living with solely reporting science unless the newspapers themselves open up jobs for them, employ science editors, and provide adequate compensation for the services rendered.

Conclusion

India was prominent in many spheres of science and technology until about the early medieval period (Mark, 2012). But soon after this, India's scientific spirit started disintegrating, possibly due to cultural and social changes the country went through because of several foreign invasions. Post-independence, India has been steadily on the rise again in science and technology. People have the perception that science is an overly complex subject. Therefore, demystification of science is necessary in easy-to-understand language. This can be achieved only through adequate training. All mass media institutions, therefore, should explore the possibility of opening new programs for science journalism or at least teach this subject as a major specialization.

The number of popular science journalists is very small in India while there is a greater need for science communication now than before as the country is facing serious environmental crises and climate change impacts. Working or retired scientists with limited training could possibly fulfill this gap. Studies in Israel show that scientists are better science communicators compared to journalists with no science background (David et al., 2020).

Blaming the government, media houses, or the journalists alone for lack of science journalism will not solve the problem. The public too is equally responsible. People should realize their right to information and value science in their lives. They must change their old-fashioned attitudes and develop a scientific spirit in themselves. Unless the people own responsibility for the spread of science journalism, India can never be a top-tier scientific nation and the vision for 2030, to see India as one of the foremost nations in the world in science output, will remain only a dream unrealized.

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References

Ang, C. (2020, August 17). *These are the countries where internet access is lowest*. World Economic Forum. https://www.weforum.org/agenda/2020/08/internet-users-usage-countries-change-demographics/

Biswas, S. (2021, February 4). Why journalists in India are under attack. *BBC News*. https://www.bbc.com/news/world-asia-india-55906345

Business Standard. (2021, April 15). TV-owning households in India grew 6.9% to 210 mln in two years: BARC. https://www.business-standard.com/article/current-affairs/tv-owning-households-in-india-grew-6-9-to-210-mln-in-two-years-barc-121041500923_1.html

Council of Scientific and Industrial Research. (2021). *About Council of Scientific and Industrial Research*. https://www.csir.res.in/about-us/about-csir

David, Y. B. B., Garty, E. S., & Baram-Tsabari, A. (2020). Can scientists fill the science journalism void? *PLOS ONE*, *15*, Article e0222250. https://doi.org/10.1371/journal.pone.0222250

Dayal, M., & Monga, P. (2015, June 29). Science coverage in leading English dailies. *Communication Today*. https://communicationtoday.net/2015/06/29/science-coverage-in-leading-english-dailies/

Dutt, B., & Garg, K. C. (2000). An overview of science and technology coverage in Indian English-language dailies. *Public Understanding of Science*, *9*, 123–140. https://iopscience.iop.org/article/10.1088/0963-6625/9/2/303/meta

The Global Statistics. (2022). *Social media statistics of India 2022*. https://www.theglobalstatistics.com/india-social-media-statistics/

Goel, A., & Chawla, R. (2022). *How can we address data bottlenecks in India?* World Economic Forum. https://www.weforum.org/agenda/2022/02/data-sharing-by-psus-crossing-the-last-mile/

Hartz, J., & Chappell, R. (1997). *Worlds apart: How the distance between science and journalism threatens America's future*. First Amendment Center. https://www.freedomforuminstitute.org/wp-content/uploads/2016/10/worldsapart.pdf

Kapoor, C. (2015). *The emergency: A personal history*. Penguin.

Kapoor, M., & Ravi, S. (2021). *Making waves in India: Media and the COVID-19 pandemic*. The Brookings Institution. https://www.brookings.edu/research/making-waves-in-india-media-and-the-covid-19-pandemic/#:~:text=This%20paper%20uses%20data%20from,March%202020%20to%20April%202021

King, D. A. (2004). The scientific impact of nations. *Nature*, *430*(6997), 311–316.

Mark, J. J. (2012). *Ancient India*. World History Encyclopedia. https://www.world-history.org/india/

McGann, J. G. (2019). *2018 global go to think tank index report* (TTCSP Global Go to Think Tank Index Reports, No. 16). University of Pennsylvania. https://repository.upenn.edu/think_tanks/16

Mochahari, M. (2013). Revisiting India's science communication and journalism: Issues and challenges. *Global Media Journal*, *4*(1), 1–9.

National Portal of India. (2022). *India at a glance*. https://www.india.gov.in/india-glance

Otis, A. (2018). *Hicky's Bengal gazette: The untold story of India's first newspaper*. Westland.

Patairiya, M. K. (2007). *Science journalism in India*. Pantaneto Press. http://pantaneto.co.uk/science-journalism-in-india-manoj-patairiya/

Patairiya, M. K. (2016). Science communication in India: An assessment. *International Journal of Deliberative Mechanisms in Science*, *4*(1), 22–64. https://doi.org/10.17583/demesci.2016.2182

Peters, H. P. (2013). Gap between science and media revisited: Scientists as public communicators. *Proceedings of the National Academy of Sciences of the United States of America*, *110*(Suppl. 3), 14102–14109.

Prasar Bharati. (2021). *Growth & development*. Ministry of Information and Broadcasting, Government of India. https://prasarbharati.gov.in/growth-development-air/

Press Information Bureau. (2019, February 1). *Government unveils vision for the next decade*. Ministry of Finance, Government of India. https://pib.gov.in/newsite/PrintRelease.aspx?relid=187925

Press Trust of India. (2018, July 1). More than 19,500 mother tongues spoken in India: Census. *The Indian Express*. https://indianexpress.com/article/india/more-than-19500-mother-tongues-spoken-in-india-census-5241056/

Pulakkat, H. (2017, January 10). Will India be among the top 3 nations in science output by 2030? *The Economics Times News*. https://economictimes.indiatimes.com/news/science/will-india-be-among-the-top-3-nations-in-science-output-by-2030/articleshow/56429161.cms

Pullin, R. (2020, December 15). Record number of journalists imprisoned in 2020—Report. *Reuters*. https://www.reuters.com/article/global-rights-journalists-int/record-number-of-journalists-imprisoned-in-2020-report-idUSKBN28P0DZ

Rajgarhia, S. (2020). *Media manipulation in the Indian context: An analysis of Kashmir-related discourse on Twitter* (M-RCBG Associate Working Paper Series No. 147). https://www.hks.harvard.edu/sites/default/files/centers/mrcbg/files/Final_AWP_147.pdf

Registrar of Newspapers of India. (2018). *The press in India 2017-18* [Report]. Ministry of Information and Broadcasting, Government of India, New Delhi. http://rni.nic.in/all_page/press_india.aspx

Reporters Without Borders. (2021, June 10). In rural India, journalists face choice between covering pandemic and survival. *RSF News*. https://rsf.org/en/news/rural-india-journalists-face-choice-between-covering-pandemic-and-survival

Russell, C. (2010). Covering controversial science: Improving reporting on science and public policy. In *Science and the media* (pp. 13–43). https://www.amacad.org/publication/science-and-media/section/5

Statista. (2022, March 15). *Number of internet users in India from 2010 to 2020, with estimates until 2040*. https://www.statista.com/statistics/255146/number-of-internet-users-in-india/

Telecom Regulatory Authority of India. (2022). *"Indian telecom services performance indicator report" for the quarter July-September, 2021* (Press Release No. 2/2022). Information Note to the Press. https://www.trai.gov.in/sites/default/files/PR_No.02of2022.pdf

Tharoor, S. (2017, May 24). *There's one country in the world where the newspaper industry is still thriving*. World Economic Forum. https://www.weforum.org/agenda/2017/05/despite-the-decline-of-printed-papers-theres-one-place-that-is-bucking-the-trend

United Nations. (2008). *Principles and recommendations for population and housing censuses* (Revision 2, Statistical Papers Series M No. 67/Rev.2). Department of Economic and Social Affairs Statistics Division.

United Nations Educational, Scientific and Cultural Organization. (2022). *Education and literacy*. http://uis.unesco.org/en/country/in

Upadhyay, H. (2021, February 25). Govt says WhatsApp has 530 Mn users in India. *Entrackr*. https://entrackr.com/2021/02/govt-says-whatsapp-has-530-mn-users-in-india/

Wilkes, J. (2002). Training scientists to be journalists. *EMBO Reports*, 3(11), 1005–1008. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1307590/

World Population Review. (2022). *Total population by country 2022*. https://worldpopulationreview.com/countries

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