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Comparative Study of Ethical Publication and Open Access Policies of Major research Funding agencies in India

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This study examines the ethical publication practices and open-access policies of major research funding agencies in India, basically focused on government sector agencies. The results analyse the top funding agencies for the year 2023-2024, revealing that the Indian Council of Agricultural Research (ICAR), Council of Scientific and Industrial Research (CSIR), and Department of Science and Technology (DST) are the leading agencies by funding allocation. The findings indicates that only 13% of the agencies adopted open access policies, and 6% mandating green open access. In addition to that, 70% of agencies allowed the uploading of funded research to institutional repositories, while only a few provide clear gold open-access options. The study also examines the ethical guidelines of these funding agencies. All agencies require acknowledgment of funding, and an emphasis on anti-plagiarism rules is noted among 80% of them. The results indicate a need for more uniform and robust ethical standards across funding agencies, particularly in comparison to international counterparts, to enhance research integrity and access to knowledge. This study offers information to scholars and organizations to raise the standard of research in India using open access and ethical standards.

Keywords: Ethical Publication, Funding Agencies, Open access, Open access Policies, Research.

1 Introduction

Funding is an essential and vital component of research. The funding of research is an extra measure to address the financial costs and expenses related to a project through several national and international funding bodies. Funding organizations are government and non-government entities that offer grants for scientific research fields, including science and technology, social sciences, and more. However, to receive this money, researchers must meet certain rules and conditions set by the funding agencies (Deori et al., 2023). In India, various major funding agencies provide grants for research in various fields. Funding agencies are Government and Non-Government bodies providing grants for scientific research areas such as science and technology, social sciences, etc. However, to receive this money, researchers must meet certain rules and conditions set by the funding agencies (Deori et al., 2023). India's total R&D spending is only 0.5% of GDP, which is significantly lower than global innovation leaders such as the United States over 2.5% GDP. Recently Government of India has initiated the One Nation One Subscription **(ONOS)** Policy, where a total of 6,000 crores will be utilized covering three years (2025-2027), which is aimed to provide nationwide access to scholarly research articles and journals. The funding will cover the subscription charges for all participating institutions across the three years (Press Information Bureau, 2025).

Open Access is a form of academic publishing that offers free, immediate, and online access to peer-reviewed scholarly material without restrictions (Muthuvennila & Thanuskodi, 2019). The Open Access movement has been steadily expanding for the last 20 years. Open Access is generally characterized as making research "digital, online, accessible at no cost, and devoid of most copyright and licensing limitations." Open access can typically be classified into various types: green, gold, hybrid, and diamond open access. In green open access, the author provides a free copy of their work to the public, usually through

an institutional repository or a disciplinary repository. Gold open access is typically attained at the journal level, meaning that all the content of a journal can be freely accessed by the public (Lange, 2016). Hybrid open access denotes a situation where certain articles within a subscription journal are available online for free, while the rest of the content is restricted to individuals and institutions that hold paid subscriptions. Diamond open access means that readers can access content for free while authors incur no costs.

Many research funding agencies in India mandate ethical publication and open access policies. Ethical publication is crucial for maintaining the credibility of research that is conducted and shared with integrity and accuracy. Ethical publication ensures high-quality research through proper acknowledgement of financial support, to avoid scientific misconduct and to remove duplicate publication in research. Funding agency also promotes open access policies to ensure the outcomes of the research are freely available for a wider audience.

The study focuses on examining the open access policies and ethical publication guidelines followed by major research funding agencies in India. It covers only Indian government agencies such as DST, DBT, ICAR, CSIR, and others. The study also focuses on the total research grant allocated by these agencies during the year 2023-2024. The study is conducted only on Indian funding agencies in the government sector and private funding agencies in India have been excluded. The study is significant as it focuses on examining how ethical practices and open access policies of major research funding agencies in India. It is very crucial to know that there are many unethical problems in academic publishing. The study also explores how research funding agencies mandate open access policies in research publications. By analyzing the approaches, this research would prove very helpful for researchers, institutions to improve the quality of research through ethical and open access publication in India

The study has been designed to meet the following objectives:

- To identify top government research funding agencies in India that allocated research funds during the year 2023-2024.
- To analyze the funding policies related to promoting open access.
- To analyze the funding policies regarding ethical research issues.

2 Review of Literature

Srinivasan et al. (2020) outline different funding organizations and provide general information regarding the type of assistance and financial resources available for health research in India. The research emphasizes numerous government and private entities that provide funding for health, including ICMR, DHR, and DBT. The research outlines the types of studies they endorse and the process for researchers to apply.

Morillo (2020) examines the value of open access publishing across various research areas by studying articles from two different disciplines. The findings suggest that funded and cooperative research receives more citations, particularly when released as open access OA. The research emphasizes that OA publication has been rising in the Science field due to EU funding, global collaboration, and citations. Green OA publications are the most connected to funding recognition, although Gold OA/Bronze OA articles in international partnerships also show significant ties to financing, while Hybrid OA receives the highest citation rates.

Nazim et al. (2022) explore the trends in open access publishing and associated policy viewpoints in India. They analyzed different factors such as the growth of OA journals, digital archives, the share of OA access to research literature, and the status of OA mandates and regulations. The results of the study shows that India ranks 15th in the world for Open Access journals and 17th for Open Access Publications, based on information from various sources such as DOAJ, open DOAR, SCImago, WOS, and others.

Deori (2022) examines research publications from India (2011-2022) to determine major funding sources. The research analyzed the funded publications of India and compared them with the patterns of several other countries, including the USA, China, Germany, Japan, and England. This research emphasized that the percentage of funded research publications in India varied from 49-58%, with an overall average of 54.79%. This level is significantly lower than that of other countries like China (86.48%), the US (68.01%), and others. Other funding organizations, such as DST, CSIR, UGC, SERB, and DBT, were recognized as the main supporters of scientific research in India.

Mirza et al. (2023) address the importance of ethical factors in research ethics. Ethical

considerations need to be considered in qualitative research. Ethics emphasizes the responsibilities of researchers towards their participants, their audience, society, and academic communities. Researchers need to refer to ethical guidelines to ensure they adhere to the principles of proper research methods. This article shows the ethical considerations that are generally expected to be maintained in qualitative research throughout data gathering and analysis. These include the principles of respect and conflict of interest, interactions with participants, securing informed consent, upholding confidentiality and anonymity, offering feedback to participants, ensuring research credibility, and tackling translation challenges.

Chari & Nagaiah (2023) described that the Government of India has issued a statement on one nation one subscription initiative where the academic community, research scholars, students, etc., can have open access to famous national and international journal articles, research, and other publications. The ONOS policy could enhance access to academic resources, influencing the sustainability of library consortia that promote resource availability for participating libraries. The policy may reduce the need for consortia, as some may prefer direct subscriptions. Nonetheless, government participation might also reduce subscription fees for consortia, improving their sustainability.

Lal and Sharma (2023) explain the concept of research integrity and ethics, and suggest that scientific misconduct is a critical issue that needs to be addressed. It discusses the impact of scientific misconduct on the scientific community, the reputation of researchers and institutions, and the public's trust in science. It also highlights the importance of promoting research integrity through clear guidelines, education, and fostering a culture of ethical conduct.

Tripathi and Chaturvedi (2023) explain that although ethical guidelines are in place for research, there exists a gap between these guidelines. The article seeks to pinpoint the ethical standards that have been adhered to in recent research endeavours, along with the challenges encountered, and the ethical practices documented, utilizing qualitative analysis of existing literature.

Singh et al. (2024) analyzed that India has taken several initiatives over the last two decades to promote OA to scientific research outcomes, including putting in place mandates that require all publicly funded research should be openly accessible. This article presents a qualitative analysis to understand how much of Indian research output from 2001 to 2020 is openly available, which in turn presents a reflection on the effectiveness of the various OA initiatives. The article shows which open access methods Indian researchers use most. It also looks at which subjects have more open-access papers. Then, it compares how many research papers are freely available when they are funded or not funded. The results show that open access is growing in India and most researchers prefer green and gold open access. The article ends with a brief discussion on the major patterns observed and their policy implications.

3 Ethical Publication and common issues in research publication

Precise and principled reporting is vital for upholding the integrity and excellence of scientific research. Ethical publishing practices aim to deter misconduct, such as plagiarism, data manipulation, falsification, and inequitable authorship practices. It is essential for everyone engaged in research to comply with the ethical guidelines that oversee their activities. Since 1999, the Committee on Publication Ethics (COPE) has offered guidelines for proper publication practices, with regular updates to align with current standards (Pan, 2020).

Some common ethical issues of research publications are-

- **Research Fraud and Data Manipulation:** The European code of conduct describes fabrication as "inventing results and documenting them as though they were genuine." Works that present findings and make conclusions based on data not produced by the research (fabrication) or obtained by altering the data (falsification) exemplify research misconduct. Manufacturing and distortion are serious types of scientific malpractice.
- **Plagiarism:** Plagiarism refers to using another author's previously published material without acknowledgment, misrepresenting it as one's own. This is the most common type of misconduct in manuscript writing and can be divided into two categories: Clear Plagiarism is the uncredited use of large segments of text or data. Minor Copying refers to the use of brief phrases without incorrectly attributing information. Self-plagiarism happens when an author utilizes their own written work in several publications without appropriate referencing. Authors must recognize prior work to frame their research appropriately. COPE offers

comprehensive instructions on the steps to take when plagiarism is identified during or after the review process.

- **Simultaneous Submission:** The practice of simultaneously submitting the same work to many publications at once is known as simultaneous submission. Authors are required by the majority of publications to attest that their work is unique and not being considered elsewhere. A paper may be accepted by several journals if this criterion is disregarded. Before looking at other venues, authors must submit to one journal and wait for a response.
- **Duplicate Publication:** The phrase "duplicate publication" pertains to the submission of a new paper by an author that includes identical hypotheses, facts, or conclusions as earlier published research. This resembles plagiarism, as it employs the same information rather than merely duplicating it. To manage duplicate publications, COPE categorizes them into major and minor offenses and provides guidelines for rejecting or retracting research
- **Self-citation:** Referencing one's own previously published works in papers that are unrelated to the topic under examination is known as self-citation. For senior scholars, a paper's number of citations may occasionally exceed its actual publication. Senior writers are encouraged to self-cite since total citations go toward metrics like the G and H index, which may be taken into account for academic promotion. Peers publicly despise it, and the majority of the scientific community views this as immoral. Some authors, however, may have produced a significant body of work in their field, and the following publication is a continuation of earlier research, necessitating self-references.
- **Conflicts of Interest:** Conflicts of interest, referred to as conflicting interests, are defined as financial, personal, social, or other interests that influence the author's behaviour regarding a specific manuscript, either directly or indirectly. Possessing conflicting interests in a product or device being studied is not deemed unethical; however, not revealing these hidden interests puts the integrity of the results at risk. (Nneoma et al., 2023)

4 Methodology

For the current study, a qualitative research approach has been adopted to analyze government research funding agencies in India, focusing on their funding policies related to open access publishing and ethical guidelines. For this study, the various Indian Government Research funding agencies such as DBT, DST, ICMR, CSIR etc. official websites were browsed and their various research project programs, official documents and annual reports of agencies were carefully reviewed and examined and identified. The publication mandates and the allocated research fund during years 2023-2024 were also reviewed. The gathered data were carefully reviewed and examined. The analysis of collected data has been tabulated and is shown in tabular forms. Microsoft Excel was used to organize the collected data and percentage technique was used to analyze and present the findings. Various Departments of Cotton University were also visited in person and an interaction was also conducted with the Professors who have conducted research under funding agencies to get a basic overview of how the research is done or how funding is obtain. The study adopted a qualitative content analysis approach to examine the collected data.

5 Data Analysis and Interpretation

5.1 List of Research Funding Agencies in India

Table 5.1 represents a brief overview of 30 numbers of Research Funding Agencies in India along with their established year and their affiliated ministry. The lists of agencies have been arranged based on the year of establishment. Indian Council of Agricultural Research (ICAR) is the oldest funding agency established in 1929 while Ministry of Ayush is the newest funding agency established in 2014. Indian Research Funding Agencies like AICTE, CIIL, ICPR, ICHR, ICSSR, NCERT and UGC all operate under the Ministry of Education. DBT, DST, CSIR, SERB are under the Ministry of Science and Technology. NIPCCD and NCW operate under Ministry of Women and Child Development.

5.2 Availability of Open Access Policies

Table 5.2 and 5.3 shows the insights into the adoption of open access policies among 30 research funding agencies. It reveals that 5 (13%) agencies have a strong mandate for Open Access Policy, while 25(83%) agencies do not mandate open access. 21 (70%) agencies have Institutional repositories, while 10(30%) agencies do not clearly mention publishing research in institutional repositories. Most of the funding agencies support green open access, which enables researchers to deposit their research for public

Table 5.1 — List of Research Funding Agencies in India

Sl No.	Name of Agencies	Year	Parent Ministry	Sl No.	Name of Agencies	Year	Parent Ministry
1	Indian Council of Agricultural Research (ICAR)	1929	Ministry of Agriculture and family Welfare	16	National Board for Higher Mathematics (NBHM)	1983	-
2	Council of Scientific and Industrial Research (CSIR)	1942	Ministry of Science and Technology	17	Ministry of Environment, Forest & Climate change (MoEF&CC)	1985	-
3	All India Council for Technical Education (AICTE)	1945	Ministry of Education	18	Council for Advancement of People's Action and Rural Technology (CAPART)	1986	Ministry of Rural Development
4	Department of Atomic Energy (DAE)	1954	-				
5	University Grants Commission (UGC)	1956	Ministry of Education	19	Department of Biotechnology (DBT)	1986	Ministry of Science and Technology
6	Defense Research and Development Organization (DRDO)	1958	Ministry of Defense	20	Indian Council of Forestry Research and Education (ICFRE)	1986	Ministry of Environment, Forest and Climate Change
				21	Ministry of Food Processing Industries (MoFPI)	1988	-
7	National Council of Education Research and Training (NCERT)	1961	Ministry of Education	22	National Academy of Agricultural Sciences (NAAS)	1990	-
8	National Institute of Cooperation and Child Development (NIPCCD)	1966	Ministry of Women and Child Development	23	Ministry of New and Renewable Energy (MNRE)	1992	-
9	Central Institute for Indian Language (CIIL)	1969	Ministry of Education	24	National Commission for Women (NCW)	1992	Ministry of Women and Child Development
10	Indian Council of Social Science Research (ICSSR)	1969	Ministry of Education	25	National Human Rights Commission (NHRC)	1993	Ministry of Home Affairs
11	Indian Space Research Organization (ISRO)	1969	Department of Space	26	Ministry of Statistics and Programme Implementation (MSPI)	1999	-
12	Department of Science and Technology (DST)	1971	Ministry of Science and Technology	27	Department of Health Research (DHR)	2007	Ministry of Health and Family Welfare
13	Indian Council of Historical Research (ICHR)	1972	Ministry of Education	28	Science and Engineering Research Board	2009	Ministry of Science and Technology
14	Indian Council for Philosophical Research (ICPR)	1977	Ministry of Education	29	Department of Electronics & Information Technology (DEITY)	2012	Ministry of Electronics and Information Technology
15	National Bank for Agriculture and Rural Development (NABARD)	1982	Ministry of Finance	30	Ministry of Ayush (MOA)	2014	-

Table 5.2 — Availability of Open Access Policies

Agency	OA policy mandate	IR	Optional APC	Green OA	Gold OA	Hybrid OA	Embargo Period
AICTE	NA	Yes	NA	NA	NA	NA	NA
CIIL	NA	Yes	NA	NA	NA	NA	NA
CAPART	NA	NA	NA	NA	NA	NA	NA
CSIR	Yes	Yes	NA	NA	NA	NA	6 months
DRDO	NA	Yes	NA	NA	NA	NA	6-12 months
DAE	NA	Yes	Yes	NA	Yes	NA	6-12 months
DBT	Yes	Yes	NA	Yes	NA	NA	6 -12 months
DEITY	NA	Yes	NA	NA	NA	NA	NA
DHR	Yes	Yes	Yes	NA	Yes	No	6-12 months
DST	Yes	Yes	NA	Yes	NA	No	6-12 months
ICPR	NA	NA	Yes	NA	NA	NA	NA
ICAR	Yes	Yes	NA	NA	NA	NA	12 months
ICFRE	NA	NA	NA	NA	NA	NA	NA

(*Contd*.)

Table 5.2 — Availability of Open Access Policies (*Contd*.)

Agency	OA policy mandate	IR	Optional APC	Green OA	Gold OA	Hybrid OA	Embargo Period
ICHR	NA	Yes	NA	NA	NA	NA	NA
ICSSR	NA	Yes	Yes	NA	No	NA	12 months
ISRO	NA	Yes	NA	NA	NA	NA	NA
MoA	NA	Yes	Yes	NA	Yes	NA	NA
MoEF&CC	NA	NA	NA	NA	NA	NA	NA
MoFPI	NA	NA	NA	NA	NA	NA	NA
MNRE	NA	Yes	NA	NA	NA	NA	NA
MSPI	NA	Yes	NA	NA	NA	NA	NA
NAAS	NA	NA	NA	NA	NA	NA	NA
NABARD	NA	NA	NA	NA	NA	NA	NA
NBHM	NA	Yes	NA	NA	NA	NA	NA
NCERT	NA	NA	NA	NA	NA	NA	NA
NCW	NA	NA	NA	NA	NA	NA	NA
NHRC	NA	Yes	NA	NA	NA	NA	NA
NIPCCD	NA	NA	NA	NA	NA	NA	NA
SERB	NA	Yes	NA	NA	NA	NA	NA
UGC	NA	Yes	NA	NA	NA	NA	12 months

Table 5.3 — Open Access Policies

Open Access Policy	Available Agencies	Percentage	Not Available Agencies	Percentage
OA Policy Mandate	5	13	25	83
OA IR	21	70	10	30
Article Processing Charges	5	20	25	83
Green OA	2	6	28	93
Gold OA	3	10	27	90
Hybrid OA	0	23	0	0
Embargo Period	9	30	21	70

Table 5.4 — Ethical Publication Policies and Mandates

Agency	Available Agencies	Percentage	Not available Agencies	Percentage
Acknowledgement to funding	30	100	0	0
Copyright	21	66	9	30
IPR	22	73	8	26
Patents	9	33	21	70
Anti plagiarism	24	80	6	20
Conflict of Interest	14	46	16	53
Proper citation	18	60	12	40
Prior Approval from PI	18	60	12	40
MoU with Institution	22	73	8	26

access. But only 2(6%) agencies mandated green open access policy, such as DBT, DST, which enable researchers to self-archive their work for public access. Only 3(10%) agencies support gold open access policy where research is made openly available through publishers, often involving 5(20%) agencies' article processing charges. Many funding agencies allow researchers after completion of the project to publish their work in high reputed journal of their choice. Sometimes it supports hybrid open access, but it is not clearly mentioned. Around 9 (30%) agencies allow an embargo period, which means research is freely available after a specific time period.

5.4 Ethical Publication Policies

Table 5.4 represents detailed information about the ethical publication policies adopted by 30 major research funding agencies in India. The policies are categorized into various parameters. Acknowledgement of funding provided by the agencies is mandated by all 30 agencies. This indicates that proper credit to the funding source is a mandatory ethical norm. Copyright is observed by

Table 5.5 — Submission of Final Project Completion Reports Guidelines

Agency	Total copies of final project completion	Submission time after completion of project	Agency	Total copies of final project completion	Submission time after completion of project
AICTE	NA	2 months	ISRO	2	12 months
CIIL	3	1 year	MoA	3	2 months
CAPART	NA	1 month	MoEF&CC	NA	NA
CSIR	NA	3 months	MoFPI	10	3 months
DRDO	5	2 months	MNRE	NA	3 months
DAE	5	3 months	MSPI	NA	NA
DBT	NA	1 month	NAAS	NA	3 months
DEITY	NA	within project time frame	NABARD	NA	6 months
DHR	10	3 months	NBHM	NA	1 month
DST	10	1 month	NCERT	NA	6 months
ICPR	NA	1 month	NCW	NA	3 months
ICAR	NA	3 months	NHRC	NA	3 months
ICFRE	3	3 months	NIPCCD	3	1-3 months
ICHR	NA	4 months	SERB	5	6 months
ICSSR	NA	1 month	UGC	NA	2 months

21 (70%) agencies, while 9 (30%) agencies do not mention anything about copyright. Intellectual Property Rights are addressed by 22 (73%) agencies, while 8 (26%) agencies do not have any mention of it. Patents are considered by 9 (33%) agencies, while 21(70%) agencies do not mention. 24 (80%) agencies clearly mentioned checking the plagiarism of the research. Conflict of interest is acknowledged by 14 (46%) agencies. Proper Citation is mandated by 18 (60 %) agencies. Prior Approval from the PI is required by 18 (60%). MoU with Institutions is required by 22 (73%) agencies.

5.5 Submission of Final Project Reports guidelines

Table 5.5 presents the time for the final project completion and the number of copies required to be submitted. Only 11(36%) out of 30 agencies specify how many are required, while 19 (63%) agencies have not mentioned, 11(36%) agencies accept soft copies and 19(63%) agencies do not require. 15(50%) funding agencies require hard copies from the funded projects, while 15(50%) agencies do not require. 27(90%) agencies clearly mention the timeline for submission of the project completion report, while 2 (10%) agencies do not provide such details. However, most agencies do mention the submission timeline, typically ranging from one to six months after project completion.

5.6. Duration of the research project

Table 5.6 represent 25(83%) agencies that provide details about the duration of each research projects, while 5(16%) agencies do not specify the information. For the extension of projects 21(70%) agencies allow extension while 9(30%) agencies do not mention anything about it. The minimum duration mentioned by the agencies is 5 years. Short-term research project duration typically lasts between 1 to 3 years, while long term duration of the projects generally ranges from 3 to 5 years. The extension time for the project does not exceed 2 years.

5.7. Research grant allocation during the last year 2023-24

Table 5.7 represents the total grant allocations by various Indian research funding agencies for the financial year 2023-24. The information was primarily gathered from the official annual reports of funding agencies. However, some agencies did not publish their official annual reports for the year. Therefore, their funding data could not be included in the analysis.

6 Findings

The analysis of official annual reports for the financial year 2023–2024 revealed that ICAR, CSIR, and DST were the top three government research funding agencies in India. ICAR reported the highest

Table 5.6 — Duration of Research Funding Project

Agency	Minimum Duration of project	Short term	Long term	Extension time
AICTE	2- 3 years	NA	NA	1 year 6 months
CIIL	3 years	6-12 months	3 years	1 year
CAPART	NA	6months- 1 year	NA	NA
CSIR	3 years	6 months- 1 year	3 to 5 years	3 years
DRDO	2 years	NA	NA	NA
DAE	3 years	NA	NA	NA
DBT	2-3 years	6 -12 months	3-5 years	1 year
DEITY	NA	NA	NA	NA
DHR	1-4 years	1-3 years	2-4 years	6 months
DST	3 years	1 to 3 years	5 years	6 months
ICPR	3 years	NA	NA	NA
ICAR	3 to 5 years	3 years	5 years	6 months 1 year
ICFRE	6 months to 1 year	3 years	5 years	1 year
ICHR	2 years	NA	NA	NA
ICSSR	NA	12 months	24 months	3 months
ISRO	1 -3 years	NA	NA	2 years
MoA	3 years	1-3 years	5 years	2 years
MoEF&CC	6 months -2years	6 months	6 months -1 year	NA
MoFPI	3 years	NA	NA	1 year
MNRE	3 years	NA	NA	NA
MSPI	1-2 year	NA	NA	2 years
NAAS	NA	NA	NA	NA
NABARD	3years	NA	NA	2 years
NBHM	3 years	NA	NA	1 year
NCERT	2 years	NA	NA	1 year
NCW	1 year	3- 6 months	6-1 years	2 years
NHRC	NA	3- 6 months	6-1 years	3 months
NIPCCD	5 years	NA	NA	2 months
SERB	3- 5 years	3 years	5 years	1 year
UGC	3 years	1-2 years	3- 5 Years	6 months
Available	25	13	14	21
NA	5	17	16	9
Total	30	30	30	30

Table 5.7 — Research Grant allocation during the last year 2023-24

Agency	Total grant allocated (crores)	Agency	Total grant allocated (crores)
AICTE	400	ICSSR	23.23
CAPART	NA	MEF&CC	25.23
CIIL	53.5	MFPI	NA
CSIR	6,141	MNRE	NA
DAE	7.15	MoA	NA
DBT	500	MSPI	NA
DEITY	NA	NAAS	NA
DHR	150	NABARD	50
DRDO	NA	NBHM	28.25
DST	1,463	NCERT	480
ICAR	8941.93	NCW	3.93
ICFRE	466.08	NHRC	63.65
ICHR	NA	SERB	NA
ICPR	NA	UGC	1758

allocation with a total fund of ₹8,941.93 crores, followed by CSIR with ₹6,141 crores, and DST ranking third with a total grant allocation of ₹1,463 crores. However, some agencies did not publish their official annual reports for the year, and therefore, their funding data could not be included in the analysis.

According to the study, 5 (13%) of the 30 agencies that were involved—DST, DBT, ICAR, CSIR, and DHR—had open access policy. Of them, the green open access policy is expressly required by DBT and DST. Approximately 21 (70%) agencies support repository-based publishing by permitting researchers to upload supported research articles to institutional repositories. Furthermore, three agencies, including DHR, Dae, and MoA, have specifically adopted gold open access policies and include Creative Commons licenses in their research papers. Many organizations

allow researchers to publish in reputable journals of their choosing after completing programs, often promoting hybrid open access, but without defined standards. A maximum of 6 to 12 months of embargo is advised by 9 agencies (30%), including DRDO, DHR, DST, DBT, ICAR, CSIR, ICSSR, DAE, and UGC. Following this, research findings are placed in repositories and made accessible to the public. In contrast to nations such as the United States, Canada, and Europe, Indian agencies continue to fall behind. For example, US institutions such as the National Institutes of Health and the National Science Foundation require peer-reviewed papers to be made open access within 12 months and placed in authorized archives such as PubMed Central. On the other hand, Indian authorities often don't impose such strict or well-defined open access standards.

The study also examined funding policies related to ethical research issues. All 30 agencies demand adequate acknowledgement of funding assistance in research papers. 24 agencies, or 80% of the total, have stringent anti-plagiarism policies that guarantee the integrity of research. About 22 agencies (73%) explicitly address intellectual property rights, 21 (70%) adhere to copyright regulations, and 9 (33%) demand patents. Moreover, 18 agencies (60%) stress that prior to publishing, the Project Investigator must provide an appropriate citation and approval. Only 14 organizations (46%) need conflict of interest disclosures, whereas 22 (73%) sign Memorandums of Understanding (MoUs) to define roles and guarantee proper use of funds. The ethical standards of certain agencies are more stringent than those of others, including SERB, DRDO, DHR, DST, DBT, CSIR, and ICSSR.

7 Conclusion

The overall conclusions of this study reflect both the strengths and limitations in India's research financing ecosystem. The main sources of research financing are a few important government organizations, including ICAR, CSIR, and DST, indicating the state's ongoing dedication to supporting scientific advancement. A thorough grasp of the national financial environment is hampered by the lack of accountability and openness demonstrated by the fact that a number of agencies failed to release their official reports for 2023–2024. The system's efficiency and credibility would be substantially increased if reports were published on time and funding data was accessible.

There has been progress in open access, since several agencies have implemented rules that encourage the broader distribution of research that is supported by the public. Researchers are encouraged to self-archive by organizations like DST, DBT, ICAR, and CSIR, which in some situations also need green or gold open access. Comparing this to overseas peers in the United States, Canada, and Europe, where robust, legally enforceable open access policies are the standard, the percentage of agencies implementing explicit requirements is still rather low. This suggests that in order to promote knowledge sharing, cooperation, and innovation, India must fortify its legislative framework and guarantee that taxpayer-funded research is made broadly available.

Ethical research practices are another area of concern. While most agencies recognize the importance of plagiarism checks, intellectual property rights, and acknowledgment of funding, there is still wide variation in how these policies are implemented. Very few agencies have extensive ethical rules or demand conflict of interest statements. While certain funding agencies, such SERB, DRDO, DHR, DST, DBT, CSIR, and ICSSR, have more sophisticated frameworks, overall consistency and clarity been still needed across all granting institutions. This would assist to improve research integrity, intellectual property protection, and the credibility of India's research output.

8 Disclosure statement

No potential conflict of interest was reported by the author(s).

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