Research Integrity in the Context of Responsible Research and Innovation Framework

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ABSTRACT

The responsible research and innovation (RRI) framework is a new set of globally accepted norms for ethically conducting academic and scientific research while at the same time producing socially-relevant research and innovation (R&I) outcomes. Recent internationally collaborative RRI projects in the country have attempted to promote the research integrity as a key facet in the framework. RRI-practice is one such collaborative research project conducted in India for documenting the opportunities and challenges in the RRI framework while establishing norms for academic and research integrity. Insights from and RRI-practice's 'Report from National Case Study: India - 2018', which highlighted the responsible research practices in academia and laboratories are presented. It describes the salient features of the recent national policy statements related to promotion of research integrity in the country, such as, the INSA 'Policy Statement on Dissemination and Evaluation of Research Output in India - 2018', and 'UGC (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulations - 2018'.

Keywords: Research integrity; Responsible research; Responsible innovation; Ethics; India

1. INTRODUCTION

India is one of the leading countries in the global south harnessing the pathways of responsible research and innovation (RRI) in its innovation and research (R&I) ecosystems. As pointed out by many of the scientometric studies, India is one of the top collaborative countries in the scientific research and development (R&D) arenas continuously engaged with the researchers in the Global North, i.e., economically advantaged countries. While the European Union is pitching in the RRI framework through their Horizon 2020 funding programmes for the research and innovation, India as a leading partner nation beyond the EU geographic boundaries takes a convincing role in the promotion of RRI framework in the country.

Working definition of RRI, as proposed by René von Schomberg in 2011, is widely accepted across the EU and beyond: "Responsible Research and Innovation is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)"[11].

RRI becomes a broad umbrella term connecting six different aspects of the relationship between R&I and society, namely, public engagement, open access, gender equality, science education, ethics, and governance. RRI is also considered as a cross-cutting issue in Horizon 2020 programme. Horizon 2020

is the EU programme for research and innovation during 2014-2020. The RRI framework includes five key, namely, public engagement, open access, gender equality, science education, and ethics, as described in Fig. 1. The 'Ethics' is one of the five key in the RRI Framework that focuses on (i) research integrity, and (ii) science and society. Research integrity facilitates the prevention of unacceptable research and research practices, while 'science and society' yield the ethical acceptability of scientific and technological developments.
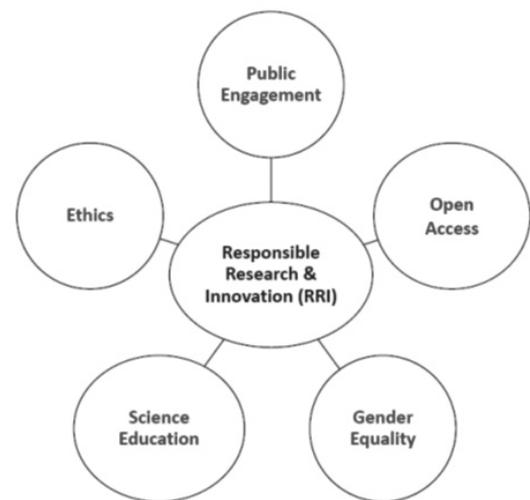

Figure 1. Five key in RRI framework as described in the RRI-practice national case study reports.

2. OBJECTIVES

This paper attempts to fulfill the following objectives:

- To highlight the RRI framework, and its sub-element research integrity
- To draw insights from the RRI practice documents on India, Brazil and China
- To understand the mechanism in implementing the academic and research Integrity in the higher education system and scientific research in the country
- To highlight the key policy statements in India for performing the academic and research Integrity in the higher education system and scientific research in the country.

3. METHODOLOGY

For this study, the author analyses the recently developed policy instruments and mechanism in addressing the issues of responsible research, research integrity, and plagiarism. He further examines the contents of recently launched reports and the policy instruments for deriving some insights from the thought contents of the said documents.

4. INSIGHTS FROM RRI PRACTICE RESEARCH PROJECT

In April 2017 the Research and Information System (RIS) for developing countries, in collaboration with the Department of Science and Technology, Government of India, organised a national consultation on responsible research and innovation (RRI). Five key issues aligning in the RRI framework were discussed in the meeting, which are namely public engagement, open access, gender equality, science education, and ethics. As pointed out by the expert panelists, the aspects of ethics in research and academia include the research integrity, minimisation of research misconduct and plagiarism, besides a few others.

In September 2018, EU-funded "RRI Practice" research project under Horizon 2020 released the RRI-Practice National Case Study Reports for 12 countries, namely, Australia, Brazil, Bulgaria, China, France, Germany, India, Italy, Norway, Netherlands, United Kingdom, and the USA. India, Brazil, and China represent the RRI-practice in the global south. They are also part of the group of BRICS nations – a grouping of the emerging economies in the Global South. Launched "RRI-Practice Report from National Case Study: India" extensively analysed the public policy instruments facilitating the governance of responsible research in India. The fundamental tenets of responsibility in research and innovation are to be based on the ideas of access, equity, and inclusion (AEI), as identified by the said country case study. RRI framework addresses many of

the critical issues related to SSR.

As the study area is the responsible research, RRI-Practice country case reports were expected to portray the challenges in the ethical aspects of RRI. After the content analysis of three national case study reports, some aspects related to research integrity are drawn upon and reported in Table 1 and Fig. 2.

Interestingly, India's case report is primarily concerned about plagiarism, followed by research integrity, and research misconduct[9]. Brazil's case report is primarily concerned about research integrity, followed by plagiarism[8]. China's case report is primarily concerned about research integrity, followed by research misconduct[12]. However, China is not concerned about plagiarism, whereas Brazil is not concerned about research misconduct. Table 1 and Fig. 2 also include the national policy briefs related to RRI Practice in these three countries.

Table 1 and Fig. 3 also describe the analysis of the keyword occurrences in the two policy documents from India, namely, (i) "A Policy Statement on Dissemination and Evaluation of

Table 1. Comparison of use of keywords in RRI practice documents on India, Brazil, and China

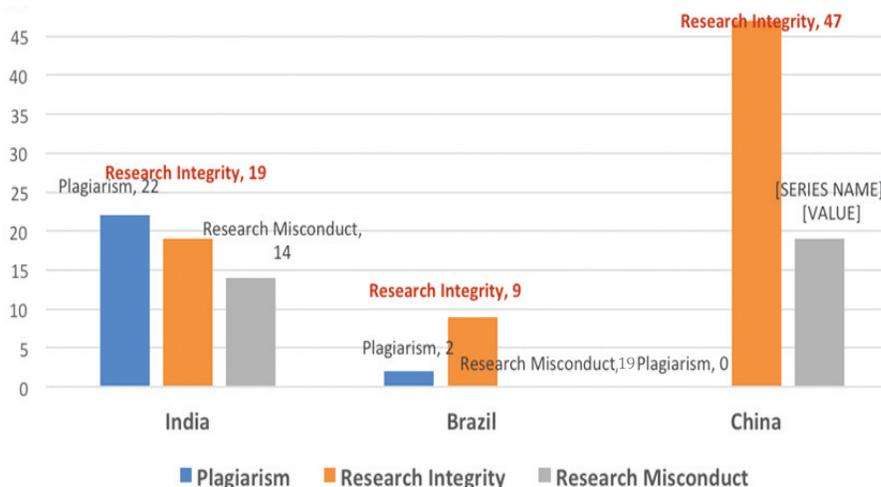| Name of the Document	Occurrence of Keywords (No. of times)		
	Plagiarism	Research integrity/ academic integrity	Research misconduct
India: *RRI-Practice National Case Study Report*	22	19	14
Brazil: *RRI-Practice National Case Study Report*	2	9	0
China: *RRI-Practice National Case Study Report*	0	47	19
INSA Policy Statement, 2018	4	0	0
UGC Regulations, 2018	49	17	2
eBook "Science and technology governance and ethics"	0	14	4

Figure 2. Occurrence of keywords in RRI-practice national case study reports.
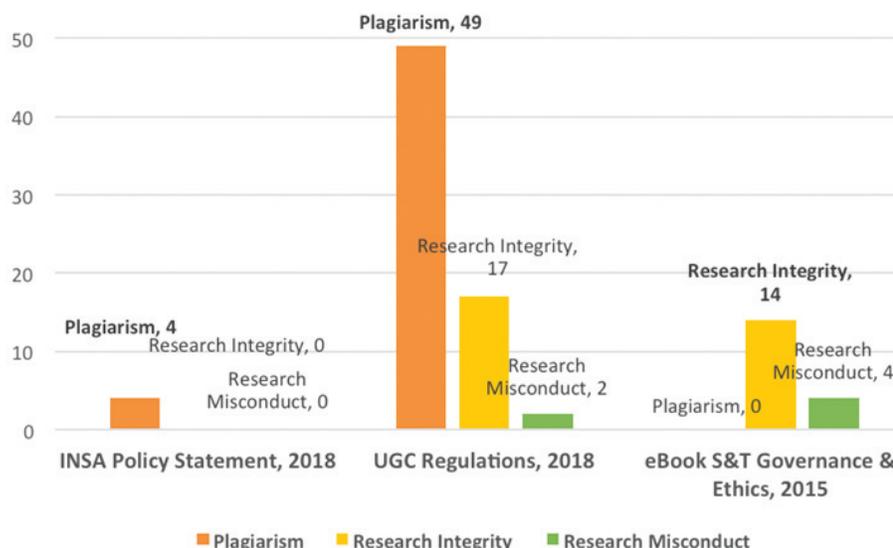
Figure 3. Occurrence of keywords in key policy documents of India.

Research Output in India" by the Indian National Science Academy (New Delhi)"; (ii) "UGC (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulations, 2018"; and one related (iii) eBook titled "Science and Technology Governance and Ethics: A Global Perspective from Europe, India and China", 2015[1,6,10]. Interestingly, the UGC Regulations is primarily concerned on plagiarism (occurred in 49 times), followed by research integrity (17 time), and research misconduct (2 time)[10]. However, INSA policy statement is primarily concerned about plagiarism, while the said eBook is concerned primarily about research integrity (14 time), followed by research misconduct (4 time)[1]. INSA policy statement is not concerned about research integrity or research misconduct, while the said eBook is not concerned about plagiarism as a problematic area for S&T governance and ethics in the studied countries[6].

5. **KEY POLICY STATEMENTS ON RESEARCH INTEGRITY IN INDIA**

Following three key policy statements and regulations, released during 2016-18 by India's apex bodies for the higher education system and scientific research, are dealing with the issues related to research integrity, research evaluation, and research misconduct.

• A Policy Statement on "Dissemination and Evaluation of Research Output in India" by the Indian National Science Academy (New Delhi) (May 2018). The Minutes of the general body meeting of the Indian National Science Academy held on 27 July 2017 had recorded the preparation of a policy document on "dissemination and evaluation of research output in India" by INSA Fellows Praveen Chaddah and S.C. Lakhotia. The draft report was sent to the members of the INSA Council for their opinion. After incorporating the opinion of the Council members, the updated report was sent to the entire fellowship of INSA. The final report was placed in the October meeting of the INSA Council. It was published in INSA's flagship journal the Proceedings of the Indian National Science Academy (PINSA) in May 2018.

• The UGC (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulations, 2018 (July 2018): India's University Grants Commission (UGC) had instituted a committee of experts to look into issues of plagiarism and recommend some institutional mechanisms to eliminate the scope of this malpractice in higher education system across the country. Consequently, the Committee released a set of draft regulations on "promotion of academic integrity and prevention of plagiarism in higher education institutions" was released on 01 September 2017, inviting the stakeholders for their observations, opinion, and suggestions. After incorporating the opinions of the stakeholders, the "UGC (promotion of academic integrity and prevention of plagiarism in higher educational institutions) regulations, 2018" was released on 31st July 2018 and published in The Gazette of India - Extraordinary. Many universities have reported adaptation of this set of regulations for achieving the research integrity in their research ecosystem. For example, Jawaharlal Nehru University has issued an ordinance related to promotion of academic integrity and prevention of plagiarism on 2nd November 2018.

• Department of Biotechnology (DBT) statement on the handling of allegations of research misconduct (2016). This is one of the key statements in India involving research in biomedical sciences. It was prepared in consultation with the Wellcome Trust/DBT India Alliance. The India Alliance was founded as a charitable trust in 2008 with a Vision of developing "An internationally competent research ecosystem in India" and a Mission "to enable biomedical research in India through funding and engagement". In 2018 the Alliance celebrates ten years of enabling biomedical research in India[7]. The Alliance becomes the early adopter of the said DBT Statement in India. DBT, under the Ministry of Science and Technology, Government of India, has expanded its outreach with sustained efforts of advocacy and awareness-raising across the country on the issues related to research integrity and handling of research. DBT is also one of institutional signatories from India of the San Francisco Declaration on Research Assessment (DORA). This DBT Statement complements the DORA declaration and many of the beneficiary institutions have now adopted this guideline in their intuitional research management strategies.

6. **INSA'S POLICY STATEMENT ON "DISSEMINATION AND EVALUATION OF RESEARCH OUTPUT IN INDIA".**

INSA Policy Statement is an attempt to make use of the global best practices for Indian scientists and researchers in

India since the Declaration on Research Assessment (DORA), and "Leiden Manifesto for Research Metrics" came in existence[5]. The Policy Statement was published online first on 22 May 2018 in the PINSA. PINSA has been publishing since 1935, thus, have global circulation and reputation. INSA's Policy Statement appearing on PINSA is expected to reach to the INSA Fellows, Fellows of all other science academies in India, research team members of these Fellows, editorial board members of Indian scientific journals as well the other academic communities in South Asia.

INSA is also the founding member of the "Inter-Academy Panel on Ethics in Science", while the Panel was constituted jointly by three science academies, namely, INSA, Indian Academy of Sciences (IASc), and National Academy of Sciences India (NASI), in 2015. In the first meeting of this Panel, held on 18th September 2015 at IASc Bengaluru, the Panel was entrusted "to develop guidelines for ethical conduct of science, which will be adopted by all the Academies and other academic and research institutions across the country. Any complaint received by the Academies on ethical issues are to be referred to this Panel"[1]. Thus, INSA's Policy Statement would be used as a tool for this Inter-Academy Panel in achieving its overarching goals. The INSA's Policy Statement will have much higher acceptance in India if the Inter-Academy Panel endorses the same and becomes the de-facto standard for all three science academies in the near future.

Figure 4 indicates the tipping points and corresponding key recommendations of the INSA Policy Statement. The INSA statement contains a set of four recommendations. These statement resonates the Leiden Manifesto's Ten Principles as well as the DORA statement. A recent debate on predatory and questionable scientific journals publishing from India and other neighbouring countries had a bearing in the INSA policy statement, which contains a set of six recommendations. Statement draws action points for minimising predatory journals and predatory conferences in the country, circumventing
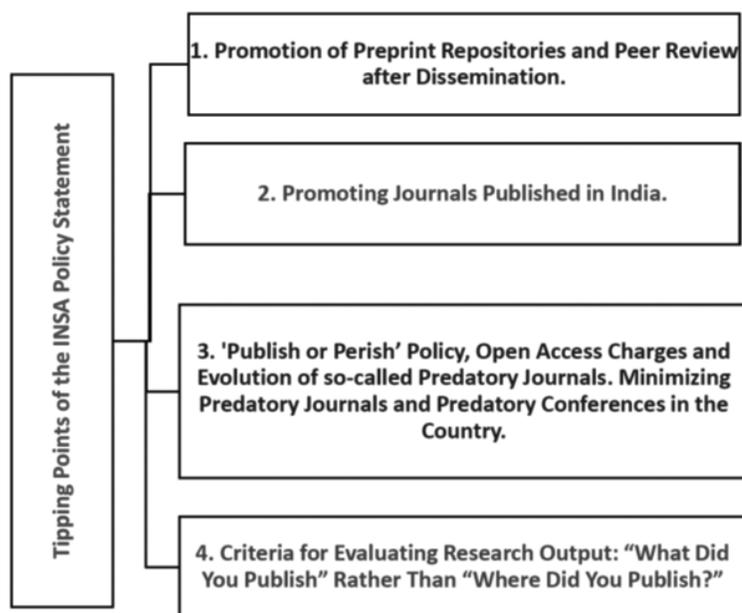
'publish or perish' policy in the academia and laboratories, and significantly reducing open access charges for publishing in gold open access.

The INSA statement also recommends the self-declaration of 'best five papers' by the candidate or the nominator. Those declared papers should have identified and categorised as 'confirmatory', 'incremental advance' or 'path-breaking advance' (Fig. 5). The candidate needs to further justify the 'path-breaking advance' paper by providing either explicit citations from non-overlapping authors (i.e., excluding the citations by the co-authors), or (b) brief statement as to why the applicant/nominator considers the given work as 'path-breaking'. Thus, the researchers, submitting their applications for the research grants or career promotion in the future, need to engage with their downstream research activities as well as the researchers in the common domains to document their real impact on the scientific society.
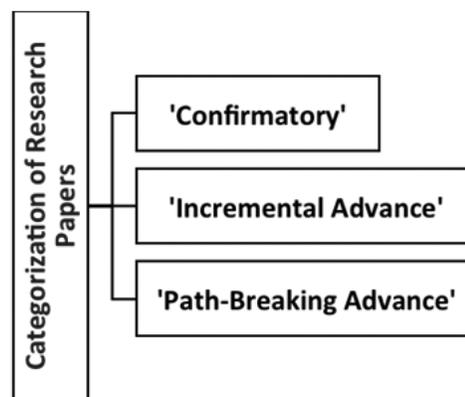
Figure 5: **Categorisation of research papers as suggested in the INSA policy statement.**

7. CONCLUSIONS

The research and innovation (R&I) activities across the world are gradually adopting the principles of responsible research and innovation (RRI), where research integrity is positioned very distinctly[2]. The frameworks of research integrity in the formal R&D activities in the universities and public-funded research institutions also have emerged since the conceptual framework for RRI came into existence. Indian universities and public-funded research institutions are now being engaged with the collaborative global research, where RRI has become the de-facto standard for academic and scientific research. Now, it is the right time for the Indian universities and public-funded research institutions to adopt the recommendations as described in the related Statements confirming the principles of RRI. They also conform to the research integrity pledges taken by the international scientific communities. All forms of plagiarism and scientific misconducts need to be minimised through early adaptation of the relevant guidelines, regulations, and statements that include the RRI framework of the European Union. We also need to sensitise the affiliated scientists, faculty members, and scholars and advocate the principles of RRI and research integrity. Some training modules for educating and sensitising on the principles of

Figure 4: INSA policy statement and its tipping points.

RRI in the higher education institutions (HEIs) were prepared in the HEIRRI Project during 2017-18, under auspices of EU Horizon 2020 programme. These modules were tested globally, including in two HEIs in India[3].

Similarly, UNESCO open access curricula for researchers and librarians, launched in 2015, have become very popular across the world[4]. These toolkits might be used broadly for sensitising the doctoral students, researchers, and scientists across India. However, we need to create some training modules on India's newly introduced policy instruments and institutional mechanisms in achieving the overarching goals of the research integrity in the country.

The INSA Policy Statement (2018), the UGC Regulations (2018), and the DBT Statement (2016) are complementing each other, but require more synergy in their implementation strategies at the institutional and funders' level. Every research establishment and every research funder in the country need to unveiling their respective institutional mechanism and an appropriate research communications strategy for promoting responsible research. India should play a leadership role for creating sustainable knowledge societies in the Global South embracing responsible research and innovation practices.

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