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DEEPSTRAT
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FEASIBILITY OF OPEN ACCESS & SINGLE SUBSCRIPTION POLICY UNDER STIP 2020

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ABOUT THE ORGANISATIONS

The Dialogue™
INFORM ENGAGE IDEATE

The Dialogue is a research and public-policy think-tank with a vision to drive a progressive narrative in India's policy discourse. In 2021, The Dialogue was recognised as one of the top 10 think tanks to be watched out for by the University of Pennsylvania. Our primary focus is on technology being a key driver of change in the 21st century.

The nature of our work lies in driving informed advocacy on technology policy issues with the objective of enhancing the level of discourse and making a case for reforms as and when needed. We adopt a four-pronged approach that will be based on the pillars of research, public discourse and government engagement, capacity building initiatives and media engagement.

The Dialogue will deliver on the output using the strength of our team, which consists of full time researchers and consultants, as well as the networks and expertise provided by our senior advisors.

DEEPSTRAT
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Deepstrat, a research and public policy group, has been started by a group that has decades of experience working in the top echelons of the Indian government, media, law and public policy. Deepstrat's vision is to combine research that is cutting-edge and relevant to the Indian context, which serves as the basis for all policy formulation and implementation.

Between them, the founders have nearly 200 years' experience in diverse areas such as intelligence, security, diplomacy, military, media, law and public policy spanning across South Asia. DeepStrat facilitates different stakeholders from the government, the private sector, academia and civil society to work together and resolve challenging issues backed by cutting-edge data and research.

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DECLARATION

This study focusses on Para 1.4. Open Access and Para 1.5. One Nation One Subscription under the STIP Policy 2020. Analysis of relevant aspects of the STIP policy is a continued endeavour and we shall be sharing our analysis of other relevant aspects of the policy as well in due course.

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KEY CHALLENGES WITH THE DRAFT SCIENCE TECHNOLOGY AND INNOVATION POLICY (STIP) 2020:

- The mandatory immediate posting online on a government repository of peer-reviewed research papers is likely to lead to major disruption of the research ecosystem and could also adversely impact Prime Minister Narendra Modi's call for "atma nirbharta" which seeks promotion and global recognition of indigenous research and self-reliance in technologies.

- Publishers provide a host of services that enhance the quality of research and facilitate global research cooperation. Our assessment is that publishers, particularly due to financial sustainability issues, may no longer wish to edit and publish India-originating research papers if the government requires papers to be made immediately and freely available online.

- If India loses access to large parts of the international publishing system it may lose access to the peer review capacities that are organised by publishers. These reviews enhance the global acceptance of research papers and can contribute significantly to the success of STIP 2020. If access to this process is lost, this could lead to a setback to the commendable aims of STIP 2020 to increase the quality and impact of India's research.

- If internationally acclaimed publishers are disincentivised from publishing research from India, Indian scholars may lose access to global platforms and opportunities. This will result in less focus and visibility of Indian research globally and could cause harm to the intended aims of STIP 2020.

- Research can be competitive with significant stakes at the national level, as witnessed during the race to produce vaccines against the COVID-19 pandemic. The lack of publication of peer-reviewed research from India in respected international research journals could significantly jeopardise India's capabilities to not only showcase, but also lose its competitive edge in the international research community.

- Research and innovation in a globalised world needs a lot of collaboration between researchers. Research publications offer a neutral platform to not only showcase quality research, but also engineer global cooperation between peers. This is a significant outcome and lies at the heart of STIP 2020's stated intentions. Therefore, the policy could limit international collaboration opportunities, as India's researchers would become less visible to researchers in other countries.

- India could build its own publishing infrastructure to replace the access it may lose to international publishing platforms, but it will require significant money, effort and time for these to be built and accepted globally. Therefore, it is most cost-efficient with high returns to ensure high quality Indian research can still be published in reputed international research journals and not be restricted by the new Open Access policy.

- The existence of diverse business models of publishers may make it difficult to arrive at a centrally negotiated payment system, as envisaged under the One Nation, One Subscription proposals.

INTRODUCTION

ABOUT THE INITIATIVE

This study is a product of the collaborative efforts of The Dialogue, one of India's leading tech policy think tanks and Deepstrat, a research and public policy group initiated by a group with decades of experience in the top echelons of governance and policy making. The objective of this research is to analyse the nuances of STIP, 2020 with a sharp focus on the Open Access and Singular Subscription provisions. The researchers aim to analyse these provisions in light of their impact on India's research ecosystem and propose evidence-based recommendations in consonance with the international standards to ensure a seamless fulfilment of the core objectives of STIP, 2020.

BACKGROUND

A vibrant science, technology and innovation ecosystem presents significant benefits, including promotion of ground-breaking evidence-based research, novel solutions to societal problems and economic growth of the country. With an objective to realise these benefits, the Draft 'Science, Technology, Innovation Policy' (STIP), 2020 was released in December 2020. The purpose of the policy is to reorient science, technology and innovation in terms of priorities, sectoral focus and strategies. At the outset, it can be observed that the policy is created in continuation of the Hon'ble Prime Minister Narendra Modi's government's

ambition to create an 'Atmanirbhar Bharat'. The government is aiming to incorporate self-reliance in the policy goals pertaining to technology, innovation and economy. With the STIP 2020, the government is continuing its commitment to the goal of achieving a welfare state through the use of scientific knowledge, an objective that has consistently been present in previous STIPs of 1983[1], 2003[2] and 2013[3]. Past policies have been guided by objectives of promoting scientific temper, increasing investment in research and development and positioning India as a global scientific power. The 2020 policy, keeping in mind the aforementioned objectives, additionally looks at establishing an inclusive, bottom-up approach by keeping socio-economic considerations in mind.

A priority area of the policy is to promote open science, i.e., enhance the accessibility of research outputs, including but not limited to publications, research data and resources. While the goal is laudatory, there are certain areas wherein significant improvements are required.

[1]Kaushik, Aditya et al. 2020. 'Science Technology and Innovation (STI) Policies in India: a Flashback', 2 January 2020. IndiaBioscience. (https://indiabioscience.org/columns/indian-scenario-science-technology-and-innovation-sti-policies-in-india-a-flashback#:~:text=The%20primary%20feature%20of%20TPS,(human%20and%20material)%20resources) (accessed on 1 February 2022).

[2]Science and Technology Policy, 2003. IndiaBioscience. https://indiabioscience.org/media/articles/STP-2003.pdf

[3]Sheikh, Faya Ahmad. 2014. 'Science, Technology, Innovation Policy 2003 of India and informal sector innovations'. Current Science 106 (1): 21-23. (https://www.jstor.org/stable/24099855) (accessed on 1 February 2022).

ANALYSING KEY POLICY AREAS

To promote science and innovation, the policy aims to establish firstly open access and secondly one nation, one subscription. The policy delineates these in the following manner:

Para 1.4. Open Access

Full text of final accepted author versions of manuscripts (postprints and optionally preprints) along with supplementary materials, which are the result of public funding or performed in publicly funded institutions, or were performed using infrastructure built with the support of public funds will be deposited, immediately upon acceptance, to an institutional repository or central repository.

Para 1.5. One Nation, One Subscription

The Government of India will negotiate with journal publishers for a "one nation, one subscription" policy whereby, in return for one centrally- negotiated payment, all individuals in India will have access to journal articles. This will replace individual institutional journal subscriptions."

These objectives are in consonance with the broader intent of the policy to facilitate wider access and robust research and are highly laudable. However; the delineated approach poses concerns regarding the successful fulfilment of the envisioned objectives. These approaches are likely to have implications for researchers, publishers, institutions and other relevant stakeholders in the research ecosystem. Towards this, we are highlighting herewith some of the most glaring policy questions requiring greater discourse and deliberation:

FINANCIAL SUSTAINABILITY OF THE RESEARCH ECOSYSTEM

Research publications take place through interactions between various stakeholders in the publishing ecosystem. These interactions are often commercial and allow the ecosystem to financially sustain itself. The publishing ecosystem involves various aspects, including research and discovery, authoring and research output, peer review, publication and distribution and post-publication. These include the involvement of various stakeholders including researchers, institutions, publishers and editors; who have relevant transactions, investments and rewards[4]. For instance, a publisher spends a significant amount of money to review, edit and disseminate a research publication that it often retrieves from readers.

Researchers participate in this system because they want their research papers to be validated, promoted and made visible to the wider national and international research community. The increased visibility of the research papers creates lots of opportunities for researchers, including invitations to conferences, new research collaborations and access to funding for projects.

A policy that mandates immediate posting online in a government repository of peer-reviewed research papers, may invite difficulties to loss of access to rewards for researchers because of the way it may undermine the financial viability of publishing those papers. Subsequently, this could adversely impact Prime Minister Narendra Modi's vision for an "atma nirbhar bharat" which encourages indigenous Indian research and self-reliance in technology that can be recognized at a global stage.

The financial sustainability of research publishers is especially critical to the research ecosystem. Publishers provide a host of services that help enhance the quality of research and global cooperation. These include but are not limited to

[4]Scientific Publishing Ecosystem, 2019, Copyright Clearance Centre, https://www.copyright.com/wp-content/uploads/2019/12/ScientificPublishingEcosystem-1.jpg (accessed on 1 February 2022)

hosting events and paper presentations as well as disseminating research. There are many labour-intensive steps that underpin the academic publishing process that have been built to support researchers. These include: tools and-technologies to track submissions, identify funders, manage peer review, format and tag content, publish research, track readership and impact, and detect plagiarism. In addition, publishers recruit and train tens of thousands of editors globally, set and enforce editorial policy, index journals, register articles, set layouts and illustrations, promote research, resolve queries, protect researchers' rights, investigate ethics cases, and manage journals.

Publishers' management of the peer review process typically includes providing tools and information to editors to find the most relevant reviewers. Editors also have a role in the peer review process to examine, interrogate and critique researchers' analysis, methods, results, conclusions and statistical analysis, as well as review any research data accompanying the original submission. Publishers also invest in a range of tools to ensure the integrity of the research findings that they publish. Examples include systematic approaches to duplication and plagiarism detection wherein they collaborate with other publishers through common technologies to detect plagiarism before publication and have ongoing programmes to detect other publication infringements, such as citation pushing, fake article detection from paper mills, or image manipulation. Business models of publishers may be disrupted who may struggle to recover their investments where free versions of works they have invested in are available online, as proposed by the open access policy, Further, ramifications for the publisher's commercial relationships and internal mechanisms may also be witnessed. For instance, strategic partnerships between publishers and other stakeholders including government agencies and industry players may require substantial changes. In this context, it is important to stress on the need to:

Firstly, engage in more extensive consultations with various stakeholders in the industry; including publishers and

Secondly, consider alternative approaches through evidence-based research that can sustainably enhance accessibility.

Various options to increase accessibility while protecting the interests of the stakeholders in the ecosystem exist. A few of these include:

i) Embargos: Researchers could be required to post peer-reviewed papers to a government repository after a reasonable 'embargo' period which the Government could negotiate with publishers. The embargo period could be relatively short but long enough to allow publishers to fund their investments in the papers through subscriptions.

ii) Pay to publish: Immediate open access to peer-reviewed articles authored by Indian researchers could be delivered via an upfront fee with that payment funded by the Government.

iii) Immediate open access to unreviewed articles (so called 'preprints') authored by Indian researchers could be delivered via a requirement being placed on researchers to make sure their unreviewed articles are made publicly available.

It is crucial that the government considers the pros and cons of various approaches in the Indian context and arrives at a nuanced strategy that protects the interests of every stakeholder.

DIFFICULTIES PERTAINING TO A CENTRALLY NEGOTIATED PAYMENT

The manner in which publishers generate revenue can differ across the ecosystem. Various publishers follow a 'customer pays' model where the reader is charged for access to the research publications. Publishers often provide an option to buy individual papers or take long term subscriptions. Additionally, they may have different criterias to determine charges while providing institutional subscriptions to stakeholders like academic institutions and research

centers[5]. At the same time, in order to promote open access, various publishers also rely on charging authors instead of customers for publishing costs and often depend on grants, endowments or external funding. Additionally, revenue can often be generated by providing publishing services to other presses or institutions or by selling print copies in addition to digital versions[6].

In this context, one can observe that publishers may have diverse sources of revenue, criterias for determining costs, and relationships that assist them in saving costs. Therefore, for the government to negotiate subscriptions with different publishers may prove to be challenging. It will need to keep in mind the nuanced differences in the business models of publishers and their costs. In addition, they may need to provide further clarity on prices that are paid to the publishers, for instance, to ensure that similarly placed competitors in the market are not disadvantaged due to opaque, vague and unequal payment standards.

DISINCENTIVISE PEER REVIEW OF RESEARCH AND OUTCOMES

The peer-review process is crucial to the publication process. Among other things, it determines whether the thesis in a research paper has been clearly formulated and a suitable approach to address the research question has been taken. Establishing a policy that would actively push submissions of India research articles away from reputed national and international academic publications respected by Indian researchers and instead redirecting them to lower quality publications, such as predatory journals, which would be inconsistent with the core objectives of STIP 2020. This could affect the quality of research produced, directly impact the acceptance of Indian research in international

[5]Chapter: 4 Publication Business Models and Revenue, 2020 The National Academic Press, https://www.nap.edu/read/10983/chapter/5#29 (last accessed 5 February 2022).

[6]Speicher L., et al, 2018, July 30, OPERAS Open Access Business Models White Paper, Zenodo. http://doi.org/10.5281/zenodo.1323708 (last accessed 17 February 2022).

circles, and undermine the commendable objectives of the STIP 2020.
As noted in more detail above, publishers' management of the peer review process is labour-intensive and typically includes providing tools and information to editors to find the most relevant reviewers, investing in a range of tools to ensure the integrity of the research findings that they publish, as well as recruiting and training editors globally to support the peer-review process. If international publishers are no longer able to peer review India's research papers it would be highly challenging for India to build from scratch a government run peer-review process as a replacement.

DEPRIVES INDIAN SCHOLARS ACCESS TO GLOBAL PLATFORMS & REDUCE COMPETITIVE EDGE OF INDIAN RESEARCH

Interaction in the global research community through publications in reputed journals, paper presentations and networking events and access to global literature benefits researchers and their home country. The former gains access to multiple perspectives, global dissemination platforms and research opportunities. The country benefits by enhancing its repute on the global stage, recognition of indigenous research and increase in funding opportunities for domestic scholars. Publishers have an important role to play in this as they provide access to global knowledge and international colleagues.

Most publishers have invested in 'recommenders' on their platforms. Recommenders are technologies designed to make suggestions to help researchers find what they need, such as relevant articles or researchers with whom they might collaborate. These have value when there is an overload of information and is similar to walking into a library and not knowing exactly what you want to read. As with recommendations on platforms such as Netflix and Spotify, publishers' recommendations are based on user activity, similarity and connections between objects (e.g. academic papers and researchers). The publishing indus

try estimates that over 3 million articles are published a year with output typically growing by 2-3% each year so researchers increasingly need technologies to help them find the information they need in a vast sea of potentially relevant content.

Switching publication to a central repository, as required by the proposed policy may deprive Indian scholars of the opportunity to publish on international platforms and hamper these potential benefits. This may lead to decreasing the visibility and impact of Indian research globally and undermining the core objectives of the STIP policy.

Moreover, research also entails a competitive aspect wherein nations strive to better their research outputs on international platforms. The lack of publication of quality research with peer-review from India in authoritative international journals may reduce the competitive edge of our researchers and also impact our abilities to showcase our research prowess globally.

UNDERMINES COLLABORATION BETWEEN RESEARCHERS

Producing quality research in a globalised world requires extensive collaboration and cooperation between researchers. Research publications offer an opportunity to not only present meaningful research but also to garner support and cooperation from peers globally. Such cooperation is crucial to enhance the quality and impact of research and lies at the core of the actual success of the STIP policy. The approach to open access being proposed in the 'Open Access' policy could limit the scope of such collaborations. Depriving Indian scholars of the opportunity to publish on global platforms and disincentivising internationally acclaimed publishers to publish research by Indian scholars can limit the dissemination of our research globally. This may also impact the collaboration opportunities as reduced visibility would mean lesser chances of the study being noted by foreign researchers.

INCREASED RESPONSIBILITY OF INDIAN PUBLISHERS

While India is currently the third largest producer of scientific articles and journals in the world, the impact of this research is limited. The H Index is based on the number of times a paper has been cited and published to provide an estimate of the importance and impact of the cumulative research contributions[7]. India currently ranks 21 on this index, falling behind countries like the United States, China and the United Kingdom[8]. In this context, international publishers play an important role in increasing the dissemination of Indian research and consequently increasing its impact. Showcasing Indian research at a global level requires credible and well-established platforms that existing internationally-accepted journals offer.

The vision in the Open Access policy of building an alternative national publishing platform (i.e. a national repository) seeks to establish capacities that are comparable with existing commercial publishing platforms. It will require a significant amount of money, effort and time to build platforms in India of similar complexity and functionality to those available from publishers like Springer and Cambridge. Furthermore a new national platform will need to not just exist with equal capabilities, but also be accepted and used by Indian researchers and the global research community, a prospect which currently has limited feasibility. Therefore, it is most cost-efficient with high returns to ensure high quality Indian research can be published in reputed international research journals and not be restricted by the Open Access policy to a national platform, as is currently envisioned by the proposals.

[7]Tools for Authors: What is the h index?, Bernard Becker Medical Library, https://beckerguides.wustl.edu/authors/hindex last accessed 17 February 2022.

[8]Scimago Country Rankings, last accessed 28 March 2022

WAY FORWARD: ENVISIONING A MORE SUSTAINABLE MODEL

In order to ensure that the objectives of increasing access to research is achieved in a sustainable and collaborative manner, changes to the approach will be required. It will be crucial to:

firstly, conduct careful and contextualised analyses, based on anecdotal and empirical data, of the advantages and disadvantages of various models,

secondly, analyse the drawbacks of the current policy, ***and***

thirdly, engage with various stakeholders in the ecosystem, including publishers, researchers and institutions.

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