

This is a not peer-reviewed preprint to an article submitted to *Science of the Total Environment*

## **Comments on “Factors affecting global flow of scientific knowledge in environmental sciences” by Sonne et al. (2020)**

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## **Abstract**

There are major challenges that need to be addressed in the world of scholarly communication, especially in the field of environmental studies and in the context of the United Nations Sustainable Development Goals. Recently, Sonne et al. (2020) published an article in *Science of the Total Environment* discussing some of these challenges. However, many of the arguments put forward by these authors are lacking precision and are based on an incomplete understanding of Open Access (OA), Plan S, and broader issues in scholarly publishing. In our response, we focus on addressing key elements of their discussion on (i) OA and Plan S, as well as (ii) Open Access Predatory Journals (OAPJ). The authors mischaracterise OA and Plan S as restricting author choice, especially regarding the payment of article-processing charges. The reality is that ‘green OA’ self-archiving options alleviate all of the risks they mention, and are even the preferred ‘routes’ to OA as stated by their own institutional and national policies in Denmark. In alignment with this, Plan S is also taking a progressive stance on reforming research evaluation. The assumptions these authors make about OA in the “global south” are also incorrect, and fail to acknowledge some of the progressive work being done in regions like Indonesia and Latin America. Finally, Sonne et al. (2020) highlight the threat that OAPJs face to our scholarly knowledge production system. While we agree generally that OAPJs are problematic, the authors simultaneously fail to mention many of the excellent initiatives helping to combat this threat (e.g., the Directory of Open Access Journals). We call for researchers to more effectively equip themselves with sufficient prior knowledge of relevant systems before making public statements about them, in order to prevent misinformation from polluting the debate about the future of scholarly communication.

## **Introduction**

We agree Sonne et al. (2020) that there are major challenges that need to be addressed in the world of scholarly communication, especially in the field of environmental studies. However, many of the arguments they put forward are misleading, or based on incomplete information. In these comments, we will focus on responding to their discussion on (i) Open Access (OA) and Plan S, as well as (ii) Open Access Predatory Journals (OAPJ). We also note that many of these incorrect arguments were also previously published by the same authors as a Nature Correspondence piece (Sonne et al., 2019) that similarly lacked precision in their apparent understanding of how OA works.

### **(i) Open Access (OA) and Plan S**

Our primary concern is that Sonne et al. (2020) seem to critically misunderstand the diversity of the OA landscape, as well as the guidelines associated with Plan S. Too often OA gets conflated with just one way to achieve it (Tennant et al., 2019): the author-facing Article Processing Charge (APC) business model, whereby authors (or their respective institutions or research funders, on their behalf) pay an APC to cover publishing costs. Yet, there are a number of ‘routes’ to achieve OA. These are usually identified by ‘gold’, ‘bronze’, ‘green’, or ‘diamond’; the latter two explicitly having no APCs. Green OA refers to author self-archiving of a near-final and peer reviewed version of their work (usually the accepted manuscript or ‘postprint’, prior to any typesetting or copy-editing by the publisher) on a personal website or general-purpose or institutional repository (IR), in parallel with publishing in a subscription journal. Publishing in an IR is usually preferable due to better long-term preservation. Diamond (or sometimes ‘platinum’) OA refers to the free

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article availability on a journal website without payment of any APCs; costs are usually covered by external means. Gold OA often requires payment of additional APCs for immediate access upon publication (i.e., all APC-based OA is gold OA, but not all Gold OA is APC-based). Bronze OA refers to articles made free-to-read on the publisher website, but without any explicit open license (e.g., CC BY), which potentially inhibits their future re-use. Indeed, according to the Directory of Open Access Journals (DOAJ; <https://doaj.org/>), around 71% of fully OA journals do not levy APCs; however, perhaps counter-intuitively, most articles published OA are published in journals with APCs (Crawford, 2018). The highest APCs are typically those leveraged by the large commercial publishing houses (e.g., in palaeontology journals; Tennant and Lomax, 2019), but are not broadly representative of the wider system of scholarly publishing in different research sectors (e.g., in geochemistry; Pourret et al., 2019). Moreover, Indonesia is one of the countries in the “global south” which has more than 1500 OA journals (second rank after UK in DOAJ database), in which most of them are locally published and funded by universities and research institutions. More than 70% of them are APC-free (Irawan et al., 2018). The remaining 30% charge a very low to moderate APC (usually under USD \$350). The 1571 journals listed in the DOAJ, which are mostly publishing English-language articles, is only around one-sixth of the OA Indonesian journals listed in the national database, GARUDA (<http://garuda.ristekdikti.go.id/>). Interestingly, the journals which charge a moderate APC (for Indonesia’s income level) are mostly the ones that have been indexed by “western” indexing services (e.g., Scopus). The regulation of Indonesia’s higher education system gives a higher score to articles published in journals listed in Scopus, which are now only 47 journals. Those journals are now considered to be the elite journals in Indonesia. This means that, in the future, we might see the start of a correlation between APC and scientific scoring system in Indonesia, and possibly other countries in SE Asia should they follow

This is a not peer-reviewed preprint to an article submitted to *Science of the Total Environment* suit. Eventually, worldwide, only 27 environmental sciences journals are referenced by DOAJ, among them none are well-respected high impact journals (like *Science of the Total Environment*). Indeed, historical, more traditional journals are mostly hybrid with APC between US\$1000-5000 and green color in the SHERPA-RoMEO database.

In Denmark, where Sonne and colleagues are based, there is a ‘green’ Open Access policy (Ministry of Higher Education and Science Denmark, 2018); it has existed since 2016, meaning that Sonne et al. (2020) should have had ample time to become aware of it. This policy means that, to the largest possible extent, researchers and their institutes ensure that a peer reviewed copy of a manuscript accepted for publication is uploaded to the appropriate institutional repositories whenever legally and technically possible (i.e., the green route). As such, this does not constrain researchers in their choice of publishing channel, as virtually all journals, including Nature, Science, Cell, and all major environmental sciences journals allow this or even deposit articles automatically after an embargo period, often on behalf of authors in repositories like PubMed Central (e.g., *Proceedings of the National Academy of Sciences*). At the moment approximately 45 percent of the Danish annual research production is being uploaded into the universities’ repositories (<https://www.oaindikator.dk/en/>). Furthermore, some research libraries in Denmark have allocated specific funds for paying of APCs, albeit requiring that the corresponding manuscripts are made available through institutional repositories as well, in order to count as green Open Access in the sense of the national policy. It seems strange that the authors would not be aware of their own national OA policy and the options that it affords to them in this regard. Furthermore, Aarhus University, where the authors are based, has an institutional policy (<https://medarbejdere.au.dk/en/open-access/open-access-policy/>) that is clearly aligned with the

This is a not peer-reviewed preprint to an article submitted to *Science of the Total Environment* national policy, and even has additional library support for helping researchers with the associated practical elements of making their work OA. Knowledge of these policies that directly affect Sonne et al. (2020) should address most of the core issues that they raised. As if to emphasise this, *Science of the Total Environment* is a ‘Green’ journal according to SHERPA/RoMEO (<http://sherpa.ac.uk/romeo/search.php?issn=0048-9697>), with authors freely available to upload a copy of their preprint whenever they wish, or of their postprint to their personal website upon article acceptance. Now, nearly two months after being published online, we can find no trace of Sonne et al. (2020) in relevant repositories or using Unpaywall or the CORE Discovery plugin; this could be due to the fact that the authors seem to be unaware of the OA policies of journals they publish in.

In the context of the rapid evolution of scientific publishing models, it seems necessary to draw attention to the situation of hybrid journals, which include the majority of traditional historical journals from major publishers. Plan S (<https://www.coalition-s.org/>) recommends supporting fully open access publications and, therefore, excludes hybrid journals. It formally discourages researchers and institutions from having to pay additional fees in a subscription-based journal and asks us not to support a model that introduces ‘double-dipping’. As recalled by Pourret et al. (2019), it is indeed possible to publish in a hybrid journal without paying an APC and to disseminate any manuscript in open archives in a repository. On the website of the journal, the article will be accessible only to subscribers, and it will be accessible to all on the open archive (the green route).

Regarding Plan S, there are a number of confusing statements made by Sonne et al. (2020) that require clarification. First of all, the Wellcome Trust is based in London in the UK not in Seattle, USA. Coalition S are also behind Plan S, representing an initial consortium of thirteen national

This is a not peer-reviewed preprint to an article submitted to *Science of the Total Environment* research funders from Europe. The authors fall into the easy trap of conflating Plan S and OA with an APC-only model, implying that they will only be able to publish in low-ranked journals. Such a statement or proposal has never been made public or implied by any of those behind Plan S. As such, this is a common and unfounded misconception, as we have detailed above. Indeed, through Plan S there are currently nine different routes for authors to achieve compliance (Bosman and Kramer, 2019), only some of which have author-facing costs. The funders behind Plan S will allocate additional funding to researchers to cover associated costs from APCs, and there should be no increased financial burden on authors. If authors are not funded by Coalition S, then they have nothing to worry about as they will not be forced to comply with a policy that does not concern them. If anything, we should be concerned that Plan S seems to be directly financially biased towards covering APCs, based on ongoing trends around “transformative agreements”, rather than the other potentially more sustainable and fair methods of achieving OA, as we have briefly discussed.

Part of Plan S also involves reforming the evaluation system, particularly by encouraging the wider adoption of the San Francisco Declaration On Research Assessment and Leiden Manifesto (sfDORA, 2012; de Rijcke, 2014). Neither of these initiatives, or many of the others spearheading the movement towards responsible research evaluation are mentioned, and it does not seem that either of the authors are among the 15,000+ individual signatories of sfDORA. Furthermore, Sonne et al. (2020) use statistics to support their arguments incorrectly. There are not 2.5 million OA articles published per year; the STM report 2018 indicates that in total, there are around 3 million articles published per year in English-language STM journals (Johnson et al., 2018). This is not the same thing. The quote of €1-8 billion is also mis-used, and again the STM Report 2018 estimates that the total revenue for the English-language STM market is around \$10 billion per

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year, as of 2017. There is substantial scope to reinvest these funds, and make dramatic savings to researchers and library budgets, with a system-wide ‘transformative’ flip to OA; something which is slowly and incrementally happening at the present, and particularly in Europe (Schimmer et al., 2015). Many of the ‘negative’ consequences they propose as a result of OA and Plan S are thus incorrect. Virtually each one they mention is already a symptom of the present subscription-dominated system, and the authors do not seem to have grasped a full understanding of the systemic socio-economic problems and injustices that this system has already been imposing for decades now. The authors call for a cross-stakeholder dialogue on the future of scholarly publishing. Yet, they seem to be unaware that such has been happening now, around the world, for around two decades, and even earlier in some cases with the launch of arXiv in 1991. Indeed, the authors only seem to emphasise this by their often incorrect understanding of the realities associated with scholarly publishing. In particular, in Denmark, there has been a strong cross-stakeholder dialogue for some time now at the institutional and national level about the future of scholarly communication, leading, for example, to the development of a national OA policy in 2018, with developments for this dating as far back as 2014.

One other point that Sonne et al. (2020) attempt to address is the impact of OA and Plan S on nations in the ‘global south’; an issue also discussed in the response to their article by Hedding (2020). As part of their argumentation, they seem to forget that the present subscription-based model already systematically discriminates against researchers, particularly from lower income countries. We also need to look at journal management in general in the southern part of the globe, where most of the journals are OA with no fee for the authors (i.e., follow the ‘diamond’ model; DOAJ). The operation of the journals is still built upon the scientific community with low to moderate size institutional funding, e.g., Latin America, SE Asia (Van Noorden, 2019). Ironically,



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scientists from those two regions commonly think that the western OA (with high APC) model is the best in the world, as it is associated with higher ‘prestige’. Most of them also believe that such a model should also be applied to their countries as well, although Suber (2012) and some other international and local OA leaders have continuously mentioned that OA should not be associated with the APC model. Indeed, initiatives such as SciELO (<https://scielo.org/>) and REDALYC (<https://www.redalyc.org/>) in Latin America already provide cross-national non-profit infrastructural support to research communities and journals at a massive scale, and we believe demonstrate a far superior model of publishing to that which dominates western scholarly discourses. These initiatives recently coalesced around AmeliCA (<http://amelica.org>), which is the Latin American counterpart to Plan S, and in our view far more effective and sustainable in both theory and practice.

## **(ii) Open Access Predatory Journals**

Finally, we are also concerned with the arguments that Sonne et al. (2020) propose against OAPJs. First of all, we should note that the problems surrounding OAPJs are largely over-emphasised, and especially with respect to the enormous issues that the large commercial publishing houses continue to impose on the scholarly communication system (Tennant et al., 2019). The definitions of ‘predatory’, ‘deceptive’, or ‘questionable’ publishers/journals are often vague, opaque, and confusing, and can also include fully legitimate journals, such as those indexed by PubMed Central. In this sense, Grudniewicz et al. (2019) recently proposed a definition that needs to be shared: *“Predatory journals and publishers are entities that prioritize self-interest at the expense of scholarship and are characterized by false or misleading information, deviation from best editorial and publication practices, a lack of transparency, and/or the use of aggressive and indiscriminate solicitation practices.”* Note that this definition was published after the article by

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Sonne et al. (2020). In a recent paper, Eve and Priego (2017) queried who is actually harmed by “predatory publishers”, and concluded that any harm is negligible to virtually all stakeholder groups, including researchers. However, they also noted that “established publishers have a strong motivation to hype claims of predation as damaging to the scholarly and scientific endeavour while noting that, in fact, systems of peer review are themselves already acknowledged as deeply flawed”. As researchers, it is our duty to remain critical and not fall for such misleading messaging, and focus on the real problems at hand.

Publishers have always been in the lucrative business of making money off of researchers, and the largest publishing houses are among the most profitable companies in the world, often at the expense of vast amounts of taxpayer funds. Predatory publishers are no worse in this regard than any other commercial publishing house, except that the scale of their threat is relatively minute. However, the problem of predatory publishers can be easily alleviated with a little knowledge and training. One simple rule for researchers is that if you do not recognise a journal, invoke some scholarly intellect and act sensibly and do not publish with them. There now exist a number of alternatives to the defamed “Beall’s List”, including Cabell’s Whitelist and Blacklist (commercial), as well as the DOAJ. Web of Science and Scopus also offer whitelists of a sort, and a tool dedicated to this specific problem, Think Check Submit, is freely available. None of these are mentioned by Sonne et al. (2020). The authors, in their analysis of detection of emails from predatory publishers, seem to do more than a satisfactory job of identifying those with questionable practices, and thus cannot be much of an issue; that is, unless they then were to go on to submit a paper to a journal, knowingly that it was an OAPJ.

These tools and services will not stop the ‘pollution’ of the scholarly record. With or without OA journals and OAPJs, there has always been harmful research published in journals. One of the most

This is a not peer-reviewed preprint to an article submitted to *Science of the Total Environment* harmful papers ever published, associating vaccines with autism, was published in the ‘top’ journal, *Science*, retracted finally 12 years after publication. and continues to create major global health problems to this day (Godlee et al., 2011). There is absolutely no evidence to support the assertion that OAPJs lead to a decline in the public trust in science; and indeed, with more open research practices, public trust in science is actually on the rise (Iyengar and Massey, 2019; Harris, 2019). In terms of the ‘fight’ against questionable publishing, many organisations, groups, and individuals have already in part taken on this burden (e.g., COPE, <https://publicationethics.org/>, DOAJ). At an institutional level in Denmark, France and many other countries, it is now commonly a requirement for students at different levels to pass a responsible research course of some sort, including ethical research conduct, plagiarism, and identification of predatory journals. We do not believe that judges are required to fix this problem, but that training, support, and education can help. If we want to almost completely solve the problem at its source, the solution is easy: require all journals to publish their review reports alongside articles, and thus prove that they operate a rigorous peer review procedure.

There is a clear imperative here for those behind Plan S to be absolutely clear about the different pathways to compliance, and any associated author-facing costs with them. There are many different ways to achieving OA, many of which are both cost- and risk-free for authors, depending on the options available to them. It is our collective responsibility as members of the international research community to ensure that we have accurate information and understanding of the scholarly publishing landscape, and communicate this wisely and carefully. We feel that graduate schools and training programs have a greater responsibility to uphold here, by training researchers on ethical and responsible research conduct, including elements of scholarly publishing and communication. This statement by Sonne et al. (2020) is not the only one of its kind to recently

This is a not peer-reviewed preprint to an article submitted to *Science of the Total Environment* make erroneous statements about Open Access and scholarly communication. We are deeply concerned that false arguments are being allowed to make it into the published scholarly record within reputable journals like *Science of the Total Environment*, and defame progress towards an OA future. Especially in the context of environmental science, where there has never been a greater imperative for accurate information and practices regarding open science than now, in the context of the United Nations Sustainable Development Goals (<https://sustainabledevelopment.un.org/>), in which the environment features prominently.

### **CRedit authorship contribution statement**

Olivier Pourret, Dasapta Erwin Irawan, Jonathan P. Tennant: Conceptualization, Writing - original draft, Writing - review & editing. Charlotte Wien and Bertil F. Dorch: Writing - review & editing.

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