

# Can I Afford to Publish? A Dilemma for African Scholars

Addisu Mekonnen<sup>1</sup>, Colleen Downs<sup>2</sup>, Edu Effiom<sup>3</sup>, Mohamed Kibaja<sup>4</sup>, Michael Lawes<sup>2</sup>, Patrick Omeja<sup>5</sup>, Fanomezana Ratsoavina<sup>6</sup>, Onja Razafindratsima<sup>7</sup>, Dipto Sarkar<sup>8</sup>, Nils Stenseth<sup>9</sup>, and Colin Chapman<sup>10</sup>

<sup>1</sup>Bahir Dar University

<sup>2</sup>University of KwaZulu-Natal

<sup>3</sup>Cross River State Forestry Commission

<sup>4</sup>University of Dar es Salaam

<sup>5</sup>Makerere University Biological Field Station

<sup>6</sup>Université d'Antananarivo

<sup>7</sup>University of California Berkeley

<sup>8</sup>Carleton University

<sup>9</sup>University of Oslo

<sup>10</sup>Wilson Center

March 07, 2024

## Abstract

Open-access publishing involves a business model where authors pay article processing charges, and subsequently, the article is freely available online. For African researchers, the shift to open access publishing flips the business model from a pay-wall model, where accessing literature is difficult, to a pay-to-play one, where it is difficult to publish. We explore costs of publishing in the 40 top ecology journals and the ability of African scholars to pay for open access. Three quarters of journals required payment for open-access publishing and the average cost was \$3,150. Paying such fees would be a hardship for African scholars as grant funding is not available. Furthermore, it is not feasible for Africa scholars to pay the fees themselves as salaries are low. We encourage funders and publishers to facilitate a more equitable publishing realm where African scholars can see their research made available through open-access.

## Viewpoint

### Can I Afford to Publish? A Dilemma for African Scholars

Addisu Mekonnen<sup>1,2,3\*</sup>, Colleen Downs<sup>4</sup>, Edu O. Effiom<sup>5</sup>, Mohamed Kibaja<sup>6</sup>, Michael J. Lawes<sup>4</sup>, Patrick Omeja<sup>7</sup>, Fanomezana M. Ratsoavina<sup>8</sup>, Onja Razafindratsima<sup>9</sup>, Dipto Sarkar<sup>10</sup>, Nils Chr. Stenseth<sup>3,11</sup>, Colin A. Chapman<sup>12,13,14,15</sup>

<sup>1</sup>Department of Wildlife and Ecotourism Management, Bahir Dar University, Bahir Dar, Ethiopia

<sup>2</sup>Department of Anthropology and Archaeology, University of Calgary, Calgary, Alberta, Canada

<sup>3</sup>Centre for Ecological and Evolutionary Synthesis (CEES), Department of Biosciences, University of Oslo, Oslo, Norway

<sup>4</sup>School of Life Sciences, University of KwaZulu-Natal, Scottsville, Pietermaritzburg, South Africa,

<sup>5</sup>Cross River State Forestry Commission, Calabar, Nigeria

<sup>6</sup>Department of Zoology and Wildlife Conservation, University of Dar Essalam, Dar Essalam, Tanzania

<sup>7</sup>Makerere University Biological Field Station, Fort Portal, Uganda

<sup>8</sup>Zoologie et Biodiversité Animale, Université d'Antananarivo, BP 906, Antananarivo, 101 Madagascar

<sup>9</sup>University of California, Berkeley, Department of Integrative Biology, Berkeley, USA 94720-3140

<sup>10</sup>Department of Geography and Environmental Studies, Carleton University, Ottawa, Canada

<sup>11</sup>Department of Zoological Sciences, Addis Ababa University, Addis Ababa, Ethiopia

<sup>12</sup>Wilson Center, 1300 Pennsylvania Avenue NW, Washington, DC 20004,

<sup>13</sup>Department of Anthropology, The George Washington University, Washington DC, USA, 20037,

<sup>14</sup>School of Life Sciences, University of KwaZulu-Natal, Scottsville, Pietermaritzburg, South Africa,

<sup>15</sup>Shaanxi Key Laboratory for Animal Conservation, Northwest University, Xi'an, China

Email: Addisu Mekonnen - [addisumekonnen@gmail.com](mailto:addisumekonnen@gmail.com), Colleen Downs - [Downs@ukzn.ac.za](mailto:Downs@ukzn.ac.za), Edu O. Effiom - [edu.efiom@gmail.com](mailto:edu.efiom@gmail.com), Mohamed Kibaja - [mkibaja@gmail.com](mailto:mkibaja@gmail.com), Michael J. Lawes - [Michael-Lawes62@gmail.com](mailto:Michael-Lawes62@gmail.com), Patrick Omeja - [Omejap@yahoo.com](mailto:Omejap@yahoo.com), Fanomezana M. Ratsoavina - [fanomezanarts@gmail.com](mailto:fanomezanarts@gmail.com), Onja Razafindratsima - [onja@berkeley.edu](mailto:onja@berkeley.edu), Dipto Sarkar - [dipto.sarkar@carleton.ca](mailto:dipto.sarkar@carleton.ca), Nils Chr. Stenseth - [n.c.stenseth@mn.uio.no](mailto:n.c.stenseth@mn.uio.no), Colin A. Chapman - [colin.chapman.research@gmail.com](mailto:colin.chapman.research@gmail.com)

Running title: Can I afford to Publish

## **AUTHORSHIP STATEMENT**

AM and CAC conceived of the project and wrote the first draft. All authors contributed data and helped with the writing.

## **DATA AVAILABILITY STATEMENT**

All data is open access and is available from the journals indicated in the supplementary data. The data will be publically available in Dryad and the data DOI will be included at the end of the article.

## **KEYWORDS**

Open access publishing, pay wall, pay to pay, scientific publishing, scientific journals

Manuscript details

Words in Abstract = 145

Words in Main text = 1913

Number of References = 20

Number of figures, tables, and text boxes = 0

\* Corresponding author: Addisu Mekonnen, Department of Wildlife and Ecotourism Management, Bahir Dar University, Bahir Dar, Ethiopia. Email: [addisumekonnen@gmail.com](mailto:addisumekonnen@gmail.com)

Contact person:

Colin Chapman, Wilson Center, 1300 Pennsylvania Avenue NW, Washington, DC 20004 – (202) 880-9708

## **Abstract**

Open-access publishing involves a business model where authors pay article processing charges, and subsequently, the article is freely available online. For African researchers, the shift to open access publishing flips the business model from a pay-wall model, where accessing literature is difficult, to a pay-to-play one,

where it is difficult to publish. We explore costs of publishing in the 40 top ecology journals and the ability of African scholars to pay for open access. Three quarters of journals required payment for open-access publishing and the average cost was \$3,150. Paying such fees would be a hardship for African scholars as grant funding is not available. Furthermore, it is not feasible for Africa scholars to pay the fees themselves as salaries are low. We encourage funders and publishers to facilitate a more equitable publishing realm where African scholars can see their research made available through open-access.

Humanity is facing unprecedented environmental challenges, and nowhere will these challenges be greater than in Africa. Over the next century, Africa's population is projected to quadruple (UN 2015), the impact of climate change will be severe (Niang *et al.* 2014), and environmental conflict is projected to rise sharply (Laurance *et al.* 2014). It is widely recognized that grappling with these challenges will require substantial investment in the continent's research capacity (Atickem *et al.* 2019). Yet, African scholars are disadvantaged by their inability to access scientific information (pay to access journal articles) and pay to publish their research in the best journals. Most African Universities cannot afford institutional journal fees; thus, their faculty have limited access to the latest published research. Such disadvantages have been recognized for some time (Solomon & Björk 2012a; Björk 2017) and strategies to mitigate them have been put in place. Governments, funders, and publishers responded to this with strategies to facilitate faculty access to literature. For example, Research4Life, working with WHO, FAO, UNEP, and 180 international publishers, provides institutions in low-and middle-income countries with online access to 111,255 books and 28,920 journals in health, agriculture, the environment and other life, physical and social sciences. But the publishing world is rapidly changing, and the academic community must adapt.

One way the academic landscape is changing deals with open access. The push to open access publishing began in 2000 (Solomon & Björk 2016) and is seen as an excellent way of providing access for everyone to journal articles. However, open-access publishing is a business model where authors or their institutions pay article processing charges prior to publication, and subsequently, the article is freely available online to all. At this time these processing charges are beyond the reach of most African academics and their institutions, with the consequence that African research is underrepresented by the open access model. This is a concern as the number of open access publications funded by article processing charges is increasing exponentially (Solomon & Björk 2016). Open access is likely to continue to increase as a group of European science funders and international foundations launched Plan S 20 in 2018, which requires a commitment to open-access publishing to receive funding (Rabesandratana 2018; Else 2021). The plan prohibits researchers who receive funding from the 11 agencies involved (that together grant over 8.8 US\$ billion) from publishing in non-open access journals, which include 85% of all journals and influential journals such as Nature and Science (Else 2018) ((but see recent changes Else 2021)). Additionally, open access publishing will increase in ecology because it confers a citation advantage that is independent of the economic status of the author's country (Tang *et al.* 2017). As researchers are increasingly evaluated for promotion and grants by the number of citations and their h-index (Chapman *et al.* 2019), there is considerable pressure to pay article processing charges. However, open access is expensive, even by wealthy country standards: a 2019 evaluation of open access publishing for Biology found that the cost per article was \$3,769 USD. For most African scholars, moving to open access publishing is not within reach. The shift to an open access publishing model could simply flip the business model from a pay-wall model, where accessing literature is difficult, to a pay-to-play or 'play-wall' one, where it is difficult to have your research published (Green 2019). As open access publishing becomes the norm, it will be increasingly difficult for African Scholars to fully engage in the scientific process.

In this commentary, we explore the costs of publishing in the top-ranked ecology journals. We review what steps journals have taken to accommodate low-income country authors. We provide information on the availability of research funds from our home countries, illustrating the ability to pay article processing charges from in-country sources, the salaries of professors at Universities in Africa, illustrating the ability of individuals to pay), and the cost of student tuition and research, showing what the gains would be if funds for publishing were used for training.

We evaluated information on open access publishing for the top-ranked 40 ecology journals listed in the Journal Citation Reports from ISI Web of Knowledge (Table S1). For each journal, we reviewed information on open access, the article processing charges, and waivers for low-income countries. In many instances, it was not clear when article processing charges would be levied; thus, we wrote to all editors for clarification and all responded. It became apparent that publishers granted the journal and the editors flexibility in how article processing charges were levied, so different journals associated with the same large publishers (e.g., Elsevier, Springer, and Wiley) have different policies. This would appear to allow journals to respond to the research community they serve in an adaptive manner, which we view as a very positive approach.

Two of the top 40 journals were fully open access and for each of these journals there was no waiver option available for African scholars. Two of the journals were invitation only and were not considered further. Two journals did not have the open access option. Excluding the two journals that were invitation only ( $n=38$ ), most (24, 63.2%) were hybrid journals that did not offer waivers for open access publishing, but it was possible to publish for free under the subscription model with the article being available behind a paywall. Nine journals (23.7%) provided a full open access waiver for African scholars. Four of the journals (10.5%) did not offer a waiver for African scholars for either open access or the subscription model and an author would have to pay. One journal did not have a waiver for open access, but provided a waiver for paying under the subscription model. For those journals with article processing charges, the average cost was \$3,150. Editors and journal websites referred readers to Research4Life to indicate if the author's country was eligible for a waiver. However, Research4Life indicated that if an author from a low-income had co-authors from high income countries, they are ineligible for a waiver. However, upon inquiry with the editors, this requirement does not seem to be enforced, and as long as the corresponding author is from a low-income country the waiver was granted and the African researcher would not have to turn to his high-income country scholars to ask for support to publish. There was only one journal that levied the full-page charges if there were co-authors from high income countries. We would like to point out that if discount is only available when all authors are from Africa, it puts the African scholar in the inappropriate situation where they must repeatedly ask their international collaborators to pay to publish the research they lead.

Only 7.9% of journals asked low-income scholars to pay to publish. However, of those that were not invitation only and offered open access, three quarters of journals ask for payment for publishing open-access research. Open access publishing provides a citation advantage (Tang *et al.* 2017) and the open access model will likely increasingly dominate academic publishing leaving African scholars and their research findings disadvantaged, unless actions are taken to make the situation equitable.

Paying article processing fees of around \$3000 is a hardship for African scholars, as most African countries do not have grant programs that cover publication costs. In general, sub-Saharan African countries invest only 1.3% of what North American and Western European countries spend on research and development – thus, for every \$100 spent on research in North America and Western Europe, African governments spend on average \$1.30 (Purchase Power Parity expenditures (UNESCO 2021)). Consequently, grant funding is simply not available to pay article processing fees. There are no national grant funds available in Ethiopia, Madagascar, or Uganda to pay publication related expenses. In Nigeria the Tertiary Education Trust Fund (TETFUND) provides supplementary support for the general improvement of tertiary education. One of the key areas supported by the fund is research and publication, however these grants are highly competitive, few lecturers obtain funding, and the grants allow only \$300 to cover publishing. South Africa is not considered a low-income country and is not eligible for waivers to publish or access literature through groups such as Research4Life. South Africa's National Research Foundation (NRF) was established in 1999 to support research and innovation. Some universities in South Africa (e.g., University of KwaZulu-Natal) do offer some internal support to cover page charges in the top ecology journals.

Only 10% of researchers in ecology, botany, and zoology in North America and Europe always or often have access to funds for paying article processing fees (Cookson 2012). Thus, researchers often pay the fees to publish personally. It is simply not feasible for Africa scholars to pay the fees themselves as salaries are relatively low (e.g., the monthly salary for a starting professor in Uganda is \$2,300, in Tanzania it is \$2027,

in South Africa it is \$1250, in Madagascar it is \$531, and in Ethiopia it is \$365). As grant money is typically very difficult to obtain for African scholars, if they do use grant money to pay the article processing charges, it would mean they may have to forego research or student support. This would be a shame as grant money can go a long way to helping graduate training. For example, in Uganda paying the article processing fee for two articles is the equivalent of funding the tuition and field expenses for a Masters student. In Madagascar, paying the article processing charges for one paper would cover the expenses of a typical Masters student. In Ethiopia, the article processing fee for one article would cover the tuition and field expenses for nearly two Masters students and in Nigeria it would cover the expenses for three Masters students. In South Africa paying for four papers equals the costs of a Masters student.

In recent decades, there has been a rapid shift to open access publishing and there is every indication that this trend will grow. This is a very positive development for African scholars because with reliable internet it is possible to keep up to date on international research. However, conversely, African scholars currently cannot afford to publish in some of the best journals. As a result, we are encouraged to see deliberations on how to make the business model used in academic publishing more globally equitable (Solomon & Björk 2012b, a; Green 2019; Björk 2021). Academics should keep in mind that journals are, for the most part, for-profit businesses with profit margins reaching as high as 40% (Buranyi 2017). In fact, in 2017 the global revenues from scientific publishing were estimated to be US\$24 billion, and in 2010 the profit margins were higher than Apple, Google, or Amazon (Buranyi 2017). However, publication charges account for only a tiny fraction of the global research and development budget (Else 2018), thus exploring creative ways to maintain equity and diversity in research publishing, such as Research4Life, should be encouraged.

Having research articles available to African researchers through open publishing business models would advance science on this continent and we applaud the efforts of those funders and publishers who are promoting the accessibility of research to all and creating a more equitable publishing realm. Strategies to make research truly open access, with no pay walls or article processing charges, should be explored (Beall 2013; Teschke 2018). Such advances will promote African research and training and will be needed if we are to grapple with the environmental challenges that Africa is going to face in the coming years.

## ACKNOWLEDGEMENTS

CC was supported by the Wilson Center while working on this project. We thank Claire Hemingway for helpful ideas and comment on this project.

## AUTHORSHIP STATEMENT

AM and CAC conceived of the project and wrote the first draft. All authors contributed data and helped with the writing.

## PEER REVIEW

The peer review history of this article is available at *To Be Provided Later*

## DATA AVAILABILITY STATEMENT

All data is available from the journals indicated in the supplementary data. The data will be publically available in Dryad and the data DOI will be included at the end of the article.

## ORCID

Addisu Mekonnen - 0000-0001-8403-1071, Colleen Downs - 0000-0001-8334-1510, Mohamed Kibaja - 0000-0002-9437-7380, Michael J. Lawes - 0000-0002-2381-6147, Fanomezana M. Ratsoavina - 0000-0003-1661-1669, Onja Razafindratsima - 0000-0003-1655-6647, Dipto Sarkar - 0000-0003-2254-049X, Nils Chr. Stenseth - 0000-0002-1591-5399, Colin A. Chapman - 0000-0002-8827-8140

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