

**Submission to CBD**  
**By the DSI Scientific Network**  
September 2021

In line with the outcomes of the first part of the third meeting of the Open-Ended Working Group on the Post-2020 Global Biodiversity Framework, the DSI Scientific Network is pleased to submit its views on how to address digital sequence information on genetic resources under the Convention on Biological Diversity and the Nagoya Protocol. The DSI Scientific Network is composed of researchers with in-depth experience in the use and storage of DSI, who are contributing to biodiversity conservation, and who are committed to enabling informed decision-making on access and benefit-sharing considerations at the global level, taking into account the immense importance of open access and the urgent need for a solution that allows for fair and equitable benefit-sharing, including monetary benefits (further information on the Network can be found below). The Network comprises 43 experts in 18 countries, representing Africa, Asia, Latin America and the Caribbean, Europe, North America, and Oceania, and disciplines as diverse as microbiology, medicine, plant genomics, taxonomy, and many others.

The use of digital sequence information has radically changed nearly all aspects of the Life Sciences and spurred ground-breaking advances in recent years. It underpins current research in fields as diverse as ecosystem management and restoration, medicine, food security, sustainable production and consumption, taxonomy, biodiversity conservation, human, plant, and animal health, and many other fields. Without widespread use of, and easy access to DSI it will not be possible to achieve the UN Sustainable Development Goals or to implement the Post-2020 Global Framework for Biodiversity. It is crucial that any future policy approach to governing this information makes it freely accessible, and represents a workable and realistic solution that enables fair and equitable benefit-sharing without hindering the research necessary to meet our global environmental and development objectives.

With that in mind, the DSI Scientific Network would like to express its concern at the lack of representation of the scientific community among the members of the recently established Informal Co-Chairs Advisory Group on DSI. Subsequently, we would like to encourage all stakeholders in the discussions to keep in mind the following key considerations:

**A bilateral system for benefit-sharing will fundamentally impede researchers' ability to access sequence information, and is not compatible with the use of DSI in the service of scientific progress and the achievement of the SDGs.**

- Proposals have been made to establish an access and benefit-sharing mechanism for DSI along the same lines as those used for genetic resources under the Nagoya Protocol, or similar bilateral arrangements using mutually agreed terms such as standardized licenses. There are several fundamental and disruptive constraints to this model based on the way DSI is used to promote scientific discoveries and progress.
- One of the most consequential of these is the complexity and scale of current DSI infrastructures and their use. Publicly accessible databases contain hundreds of millions of

annotated sequences<sup>1</sup>, accessed by tens of millions of unique users<sup>2</sup>, and cited by hundreds of thousands of publications (each of which on average makes use of several dozen DSI sequences). Agreeing on, tracking and enforcing mutually agreed terms would be extremely complicated and costly. Technical attempts to bypass these difficulties, such as through the use of a blockchain-based solution or other tracking technology, would be expensive to develop and maintain, would have a substantial environmental footprint, and would raise significant privacy concerns.

- As sequences are identified through comparison with those already catalogued, the value of DSI is in direct proportion to the size of the collections that researchers are able to access. A bilateral approach would lead to greater partitioning of information (e.g., separating sequences into subset of those with and without ABS restrictions), with imminent and detrimental consequences for database linkages and interoperability<sup>3</sup>. This would significantly hamper access to sequence data across a wide range of sources, creating obstacles to scientific research and knowledge generation. Open access to sequences enables independent verification, replication, and peer review of findings, which are cornerstones of scientific integrity, reproducibility, and, ultimately, progress.
- Bilateral systems that “tag” individual sequences risk disincentivising the use of these particular data if the costs of compliance are substantial, thereby encouraging DSI “forum shopping”, where potential users gravitate towards DSI from countries with few or no mechanisms in place to track and enforce benefit-sharing. This would place countries that do regulate DSI access, as well as their researchers, at a clear disadvantage, while having a negative effect on global efforts towards biodiversity documentation, observation and collaboration. Few users means that few benefits will be generated, while imposing substantial costs on research<sup>4</sup>.

#### **A multilateral system could preserve open access to DSI and benefit users and providers alike.**

- A multilateral system would sidestep many of the problems associated with bilateral systems, reduce transaction costs and other inefficiencies, standardise compliance requirements, and enable predictable and near-term benefit-sharing in accordance with the way that DSI is used today.
- A simple multilateral system preserving open access will remain effective and efficient, even as global collections and applications of DSI continue to expand exponentially. Simplicity will also help ensure that the requirements of such a system can be more easily harmonized with or adapted to those of other international treaties governing related topics, contributing towards more universal DSI solutions and the prevention of “forum shopping” between treaties.

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<sup>1</sup> National Center for Biotechnology Information, GenBank and WGS statistics, doi: <https://www.ncbi.nlm.nih.gov/genbank/statistics/>

<sup>2</sup> F. Rohden, S. Huang, G. Dröge, A. Scholz, Combined study on digital sequence information (DSI) in public and private databases and traceability. Secretariat of the Convention on Biological Diversity (2020), doi: <https://www.cbd.int/doc/c/1f8f/d793/57cb114ca40cb6468f479584/dsi-ahteg-2020-01-04-en.pdf>

<sup>3</sup> C. Alves, J. A. Castro, C. Ribeiro, J. P. Honrado, A. Lomba, Research data management in the field of Ecology: an overview. Proceedings of the International Conference on Dublin Core and Metadata Applications. 2018 Sept., 87–94.

<sup>4</sup> K. D. Prathapan, R. Pethiyagoda, K. S. Bawa, P. H. Raven, P. D. Rajan, When the cure kills—CBD limits biodiversity research. *Science*. 360, 1405–1406 (2018). doi: 10.1126/science.aat9844

- Such a system could encompass indirect micro-levies or de-coupled (from access to DSI) annual payments for a global sequence dataset, which would feed into a trust used to finance e.g., biodiversity conservation activities, among other approaches.

#### **A multilateral system could enhance capacity-building and reduce scientific inequalities**

- Researchers in low-, middle-, and high-income countries all make extensive use of DSI. However, those of us in lower-income countries routinely face greater barriers related to institutional, technological, and infrastructural capacities, including costly equipment and molecular reagents, poor internet access, limited opportunities for training and professional development, and a lack of research funding.
- This means that we rely to a *greater degree* on the free and open access to data, and preserving such access will facilitate our research disproportionately more than our high-income research counterparts, and grow the bioeconomy in our countries .
- A multilateral system will avoid the need for the creation and enforcement of individual bilateral regulatory frameworks, which would require significant outlays on capacity-building, particularly for states which are not members of the Nagoya Protocol where little ABS regulatory infrastructure exists, and thus may lack experience in designing and enforcing such frameworks. This would disproportionately affect scientists in less well-resourced settings, further accentuating inequalities in research. These funds (if not needed for establishing a tracking and tracing bureaucracy) could instead be directed towards researchers' current capacity-building needs, reinforcing critical scientific capacity in environmental conservation and related fields in targeted regions.

#### **Access and Benefit Sharing from DSI cannot fulfil the resource mobilisation needs required to support biodiversity conservation.**

- The resources needed to reverse current declines in biodiversity and successfully implement the Post-2020 Global Biodiversity Framework will be substantial, with preliminary estimates running to several hundred billion US dollars.<sup>5</sup>
- Based on previous experiences with the Nagoya Protocol and current patterns of DSI use, any monetary benefit-sharing from DSI under a bilateral or multilateral system would add up to a tiny fraction of that amount.
- Therefore, regardless of the approach adopted, DSI benefit-sharing cannot be expected to play a significant role in financing the transformative changes needed to protect the environment.

**The DSI Scientific Network** was created in 2020 to engage in international debates on DSI. The Network's mission is to contribute to policymakers' and other stakeholders' understanding of DSI, its applications and contributions to research supporting biodiversity conservation and public health, as well as the global benefits of open access to DSI databases.

All Network members are researchers with experience in scientific research using DSI and are committed to supporting informed decision-making on future access and benefit-sharing framework(s) for DSI. Members recognise that finding a solution, which balances the value of open

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<sup>5</sup> Estimation of resources needed for implementing the Post-2020 Global Biodiversity Framework. *Secretariat of the Convention on Biological Diversity* (2020): <https://www.cbd.int/doc/c/c3f7/163d/b1f2c136506037842cebc521/sbi-03-05-add2-en.pdf>

access for researchers with the importance of benefit sharing, including monetary benefits, is essential to deliver a Global Biodiversity Framework that meets the priorities of different stakeholders and contributes to the Sustainable Development Goals. Members serve in their individual expert capacity, not on behalf of their organisations or institutions. For more information please visit: <https://www.dsmz.de/collection/nagoya-protocol/digital-sequence-information/dsi-scientific-network>

Members of the DSI Scientific Network (Members serve in their individual expert capacity, not on behalf of their organisations or institutions):

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