COOP4CBD

coop4cbd.eu @coop4cbd.eu CO-OP4CBD

DSI AND THE CALI FUND

Editorial lead: Camille Guibal, Pierre Spielewoy.

Contributors: Liliana Ballesteros-Mejia, Laureen Calcat, Edouard Champaud, Martine Hossaert, Bob Kreiken, Constance Laureau, Thomas Legoupil, Manon Lemaire, Anca Leroy.

Key messages

- There is no internationally agreed definition of DSI, which remains an undefined notion to be understood from an operational and legal point of view.
- Within the CBD context, DSI is being structured by COP decisions with a lot still to be decided.
- DSI are usually produced in order to answer a scientific question and test scientific hypothesis. Benefits arising from this use can be monetary (on a voluntary basis as there is no legal obligation for States to force users to do so).
- The vast majority of benefits being shared today are in the form of non-monetary benefits.
- COP17 will make recommendations on rates and thresholds for private sector contributions to the Cali Fund and adopt a methodology to assess the effectiveness of the mechanism. It will also make recommendations on how the CBD's multilateral mechanism should facilitate greater sharing of non-monetary benefits as well as capacity building as an essential component of the mechanism.
- The BBNJ treaty offers a legally binding framework for DSI, which differs from the CBD COP decisions that offer incentives to contribute to the Cali Fund. While BBNJ builds on the CBD's work, it may also provide input back into the CBD. There remains a need for clarification on whether the Cali Fund can be used for DSI from areas beyond national jurisdiction (ABNJ), as this is legally complex, though not entirely excluded.
- The voluntary mechanism of the Cali Fund, established by a COP decision, cannot be an obligation at the international or national level unless Parties themselves legislate on the matter and turn it into an obligation at the national level.
- To ensure legal certainty for users, the public and private sectors need clarity on the scope of application regarding DSI, the types of use targeted by the CBD, what qualifies as indirect and direct use, legal certainty regarding double payments and modalities for taking into account sectoral realities and existing value chains.

Funded by the European Union

1. What is Digital Sequence Information (DSI)?

DSI refers to ''digital sequence information'' and is a political term. It is understood to include DNA, but also its derivatives (messenger RNA) and potentially its translators that transform them into proteins or metabolites. "Digital" refers to data stored electronically, such as on a computer or in data storage and not on paper; "Sequence" may refer to the order of nucleotides in nucleic acids or amino acids in proteins, although it is unclear if three-dimensional molecular structures are included under this terminology; "Information" that is obtained by processing data, such as cleaned DNA data from raw sequence data.

There is no legal international definition of DSI – the term is therefore not operational.

Initially unregulated, the regime for access and benefit-sharing arising from the utilisation of genetic resources and traditional knowledge under the CBD was built in response to North/South asymmetries on the conservation and sustainable use of biodiversity, and innovations building on traditional knowledge. In its Article 15, the CBD recalls the sovereign right of States over their natural resources and recognizes their authority to determine access to their genetic resources. To address historical imbalances, Article 16 of the Convention provides for technology transfer while Article 8(j) recognizes the knowledge, innovations, and practices of Indigenous peoples and local communities encouraging equitable sharing of the benefits arising from their use. **The Nagoya Protocol puts this article and Objective 3 of the CBD into practice by establishing a system for sharing benefits arising from the use of genetic resources**. However, rapid technological developments have made it possible to access genetic data at a more precise level, often known as Digital Sequence Information (DSI).

Over two billion genetic sequences are deposited into databases annually and this number keeps growing exponentially. The use of DSI varies by sector: while some sectors rely on it for the synthetic recreation of genetic resources (Scholz et al., 2023), others use it as reference to evaluate their own genetic resources (Aubry, 2019). However, the possibility to exploit biological characteristics *in silico* without ever physically accessing the original tangible resource presents a fundamental policy dilemma.

DSI users can be found in every country. DSI is extremely difficult to track geographically and it is impossible to distinguish between user and provider countries, as is the case in the bilateral system under the Nagoya Protocol. For this reason, a bilateral approach would be highly impractical for regulating access to DSI. Some countries, however, have adopted bilateral regulation for DSI in order to maintain the sovereign rights over genetic resources provided for in 1992. Additionally, a multilateral approach allows for open access to DSI, which is essential to the work of scientists and follows the FAIR principles.

Where is DSI stored?

Public research is a major user of DSI (about two thirds), and the private sector accounts for another third. Scientists are required to deposit DSI in open access databases. There are at least three large global databases: one in the United States (GenBank), one in Europe (European Nucleotide Archive, or ENA), and one in Japan (DNA Data Bank of Japan, DDBJ). These three databases collaborate within the International Nucleotide Sequence Database Collaboration (INSDC). But based on information from the DSI network, actually more than 3,000 databases exist. There are about 10 to 15 million users of these open access databases. How might a bilateral solution work in this case? And running them (for GenBank) costs about US$50 million a year.

2. Recent developments on DSI in the CBD context

COP15 2022

Decision to create a multilateral benefit-sharing mechanism for DSI, backed by principles and reinforcing existing databases.

COP16 2024

Establishment of the Cali Fund and its modalities for monetary and non-monetary benefit-sharing and data governance.

COP17 2026 IN FOCUS

- Pending decision on rates and thresholds for private-sector contributions.
- Methodology to assess the effectiveness of the mechanism.
- Definition of the funding allocation formula.
- Tools and platforms (such as databases) to make DSI available, and other modalities for fair and equitable sharing.

COP18 2028

Will review the effectiveness of the mechanism and adjust it accordingly.

The adoption of the multilateral mechanism at COP15 was a major development. Some actors regard access to public databases and shared publications already as a part of non-monetary sharing, but this is a disputed point of view considering the need to strengthen the capacities of developing countries, and the fact that open access data do not guarantee the fair and equitable sharing of benefits and can render associated knowledge (especially traditional knowledge) invisible (around 80% of DSI have no identified geographical origins in databases). Following article 10 of COP Decision 16/2, the managers of these public databases reinforce the requirement for the provision of information on the country of origin of the genetic resources from which digital sequence information was derived.

The COP16 decision stipulates that the resources of the Cali fund must be allocated to developing countries and at least 50% of the resources must go towards self-identified needs of Indigenous peoples and local communities (from developing and developed countries), including women and youth within those communities.

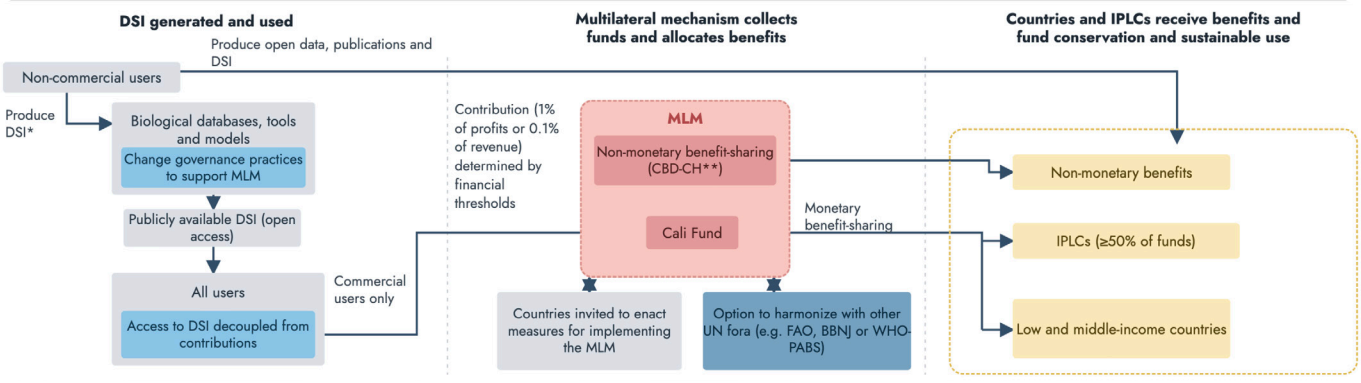
The current thresholds for private sector contributions are very high as they aim to meet large companies and not burden small and medium-sized companies, particularly in developing countries.

Despite ongoing discussions, the articulation between this multilateral mechanism and national legislations that already exist in some countries, as well as with other multilateral mechanisms aiming to deal with DSI (future BBNJ DSI system, WHO, FAO…) remains to be clarified.

What will happen at SBI-7 and COP17?

To prepare for COP17, SBI-7 scheduled for August 2026 in Nairobi will consider the study on making DSI public and accessible in a transparent and accountable manner. Two other studies will later be examined directly by COP17:

- one on existing standards for small, medium and large enterprises and
- the other on contribution rates to the Cali fund.



The DSI multilateral mechanism. Orozco, P., Scholz, A.H. The Cali Fund promises conservation benefits, but only if countries and businesses take action. Nat. Rev. Biodivers. 1, 276–278 (2025)

SBI-7 is also expected to consider a synthesis by the CBD Secretariat on possible additional modalities of the multilateral mechanism that take into account products and services. Parties will explore new tools and models such as databases to improve accessibility and transparency, as well as develop a methodology for review of effectiveness of the multilateral mechanism.

The issue at stake is not only that of **leveraging funds but also of ensuring stable funding**. This development is part of a broader transformation of international law from obligations to a more and more voluntary and flexible system, and puts the ability of international law to maintain the original aim of the benefit-sharing regime into question.

3. DSI in the context of the BBNJ treaty

It is important to distinguish the aspect of the overall decision-making framework of COPs from the BBNJ treaty obligations, which have legal value. The negotiation of the Nagoya Protocol is a treaty implementing the CBD and does not at any time refer to DSI in its scope. Therefore, the voluntary mechanism of the Cali Fund, established by a COP decision, cannot be an obligation at the international or national level unless Parties themselves legislate on the matter and turn it into an obligation at the national level.

The BBNJ agreement (adopted in June 2023 and entered into force in January 2026) contains legal obligations regarding DSI without defining the term. It established a legal framework in which marine genetic resources in areas beyond national jurisdiction (the high seas) and the ''Area'' are subject to a notification and reporting system with mandatory monetary benefit-sharing.

This implementing agreement of the Law of the Sea Convention will have an impact on all processes currently being negotiated because it is the first treaty making a clear obligation for States to share benefits from the use of DSI. The BBNJ agreement uses the CBD's definition of genetic resource by adding only the term "marine" as well as the term of "utilisation" from the Nagoya Protocol to ensure legal security and consistency in implementation.

The question of whether it is possible to use the Cali fund for this purpose has yet to be answered as the CBD and BBNJ are two legally distinct instruments. The BBNJ treaty would need an institutional link to use another treaty's (the CBD in this instance) financial instrument. Concretely, this would mean inviting users of the BBNJ treaty to contribute financially to the Cali Fund. The CBD only incentivizes contributions whereas under BBNJ there is a legal obligation to share benefits on DSI.

Alternatively, discussions have also focused on establishing a special fund under the BBNJ framework and COP1 of BBNJ should decide on its establishment. In any case, a dialogue between the CBD and the Cali fund will be needed. After its establishment by COP, during four years, the BBNJ special fund will be fed by the State Parties' mandatory financial contributions. States will have to report to COP on commercialization of products and benefits. Once effective financial benefits from the sales of products are real, the COP will oversee changing monetary benefit-sharing modalities and replace the public financing of the fund with private sector funds.

4. The importance of DSI for scientific research

DSI are an essential resource for researchers. When used in the context of biodiversity characterisation, DSI facilitates the monitoring of ecosystem functioning and evolution as well as the tracking of biodiversity dynamics. Furthermore, the mandatory deposit of sequences in databases – now a pre-requisite before publication – ensures that this data remains a shared global resource. Within this context, DSI contributes to the production of scientific knowledge in several areas, including:

- Species identification: DSI enables the identification of organisms using genetic data, notably through DNA barcoding (identification of a species from a fragment of DNA) or metabarcoding (identification of several species from a sample). Once identified, species can be mapped geographically, recognized in biodiversity inventories and determine its evolutionary relationships with other taxa.

- Biodiversity inventory and monitoring: Molecular approaches expand environmental monitoring by increasing detection capacity. By combining field sampling with high throughput sequencing systems, DSI allows to detect more species, providing insights into their temporal and spatial dynamics.

The knowledge derived from DSI – for example, in detecting invasive alien species or monitoring environmental changes – provides the empirical evidence needed to guide public decision making in the conservation of Biodiversity. It can inform policies related to biodiversity conservation, public health, and sustainable management of ecosystems.

GenRef is a French initiative launched in December 2024 aiming to build a public national registry of genetic sequences. Its objective is to provide access to high-quality DNA sequences to support the identification of all species present in mainland France and overseas territories. GenRef is built in connection with TaxRef, which is the national nomenclatural and taxonomic registry. It integrates genetic sequence data and associated metadata from international databases while facilitating collaboration with researchers in French institutions and taxonomic experts. GenRef is not a database and is not intended to store genetic sequences, nor to replace existing genetic or genomic repositories. Instead, it aggregates, validates, and qualifies data from these sources to provide users with an informed view of available and reliable genetic resources (Ballesteros-Mejia et al., 2026).

5. DSI and benefit-sharing in the private sector: example of the cosmetics industry

The EU Access and benefit-sharing Regulation (2014) establishes mandatory due diligence for users to comply with the ABS laws of supplier countries, but **DSI is not included in its scope**. In European Member States, the private sector must comply with national ABS laws and the EU ABS Regulation but do not have any legal obligations to share benefits related to DSI. If a Member State decides to regulate DSI, it would require changes to national legislation, which would go beyond the current provisions of the Nagoya Protocol and the EU ABS Regulation.

The sectors covered by COP Decision 16/2 are:

- Pharmaceuticals,
- Nutraceuticals (food and health supplements),
- Cosmetics,
- Animal and plant breeding,
- Biotechnology,
- Laboratory equipment associated with the sequencing and use of DSI on genetic resources, including reagents and supplies,
- Information, scientific and technical services related to DSI on genetic resources, including artificial intelligence.

Within the CBD context, in the cosmetics sector, value creation is based on the desirability of products and brand reputations, formulatory and sensory know-how, and structured supply chains, integrating natural ingredients from agricultural or harvesting sectors.

The sector's interactions with biodiversity are mainly based on access to physical biological resources that are part of the traditional access and benefit-sharing regime under the Nagoya Protocol or ethical biotrade guidelines. Hence DSI is not the main mode of interaction with biodiversity.

The cosmetics value chain is extremely long and fragmented. Each step can involve many different businesses in several countries, which raises practical questions:

- Attribution: if DSI is used in the value chain, it is difficult to identify to which actor it should be attached;
- Proportionality: DSI use can be very central or on the contrary very indirect in the value creation. The sectors concerned and the associated level of exposure can vary greatly, so the mechanism should be coherent and proportional with the effective use of DSI (which is however very difficult to assess);
- The articulation of regulatory frameworks and the risk of double-payment: companies are subject to obligations related to access and benefit-sharing. It is important to avoid several mechanisms being applied successively along the value chain.

If DSI were to be defined in the broadest terms — extending to molecular structures irrespective of species or use context — the underlying logic targeting the cosmetics industry would become even more questionable. Indeed, a wide range of sectors could have also been included but weren't.

For effective implementation of the mechanism, it is essential to specify:

- The scope of the information covered by DSI (i.e. a definition of DSI)
- Identification of use cases (direct / indirect uses)
- Taking into account sectoral realities and existing value chains

Pierre Fabre (a French company) uses a type of seaweed from Brittany that is considered a wild species. The company has carried out R&D work to improve the properties of an extract produced by a third-party supplier in a cosmetic formulation. In complying with the French regulations, Pierre Fabre has worked with the French authorities and the Proches platform (dedicated to collaborative research) to identify a research project to support. The selected project will be led by the Marine Environmental Sciences Lab (LEMAR, UMR 6539), in collaboration with Océanopolis, with €10,000 of funding per year. The potential extension of this specific example to DSI depends on whether DNA/RNA is being used, or an extension to proteins and metabolites. In any case, needs have been expressed in terms of harmonization at the EU level, particularly on the reporting regime in the R&D phase.

References

Aubry, S. (2019). The future of digital sequence information for plant genetic resources for food and agriculture. Frontiers in Plant Science, 10. https://doi.org/10.3389/fpls.2019.01046`Ballesteros Mejia L, Seon-Massin N, Olivier G, Lacoeuilhe A, Rougerie R (2026) Towards Building a National Genetic Reference Library for Species Identification in Support of Biodiversity Research and Public Policies in France. Biodiversity Information Science and Standards 10: e184100. https://doi.org/10.3897/biss.10.184100

https://www.cbd.int/doc/c/fef9/2f90/70f037ccc5da885dfb293e88/dsi-ahteg-2020-01-03-en.pdf

https://www.cbd.int/doc/decisions/cop-16/cop-16-dec-02-en.pdf

https://www.ccsd.cnrs.fr/en/fair-guidelines/

https://www.dsiscientificnetwork.org/wp-content/uploads/2024/12/DSI-Database-landscape_WEB.pdf

dsi-ahteg-2020-01-04-en-1.pdf

https://www.dsiscientificnetwork.org/wp-content/uploads/2026/02/DSI-Scientific-Network-Supporting-the-generation-and-sharing-of-non-monetary-benefits-What-should-be-done-under-the-Convention-on-Biological-Diversitys-Multilateral-Mechanism-for-DSI-2026.pdf

https://www.ncbi.nlm.nih.gov/genbank/statistics/

Orozco, P., Scholz, A.H. The Cali Fund promises conservation benefits, but only if countries and businesses take action. Nat. Rev. Biodivers. 1, 276–278 (2025).

Scholz et al. 2022. Multilateral benefit-sharing from digital sequence information will support both science and biodiversity conservation. https://doi.org/10.1038/s41467-022-28594-0.

Scholz, A. H., Nunez-Vega, G., Weissgold, L., & Wussmann, K. (2023). The future of access and benefit-sharing: What next after the adoption of the Global Biodiversity Framework and decision on digital sequence information?. Diversity, 16(1), 27.