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# Despite negotiations in 2024, disagreements over DSI persist

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Publié le 07/03/2025, modifié le 09/03/2026

In 2024, digital sequence information (DSI) derived from genetic resources was at the heart of international negotiations. Discussions focused mainly on the sharing of the benefits generated by the industrial and commercial use of this DSI, and the mechanisms required to implement it. These developments could redefine governance and influence the future regulation of DSI, but persistent differences between countries are holding back progress.




The crucial issue of DSIs linked to genetic resources was addressed at two meetings in 2024: in September in Rome, as part of the working group on improving the multilateral system of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA or Treaty), and then in November in Cali, during COP16 of the Convention on Biological Diversity (CBD).

The Tirpaa applies the CBD to crops, as the CBD was initially unable to regulate the majority of plant genetic resources already held in the collections of former colonial powers and the Consultative Group on International Agricultural Research (CGIAR), often without traceability of their origin. Although the ITPGRFA and the CBD deal with DSI under different legal frameworks, their implications in terms of conservation, access, use and benefit-sharing remain intertwined. Solutions to the problem of DSI were proposed at these meetings, but disagreements, including semantic disagreements, remain.

## DSI, an undefined concept

No officially agreed definition of DSI has yet been adopted. Some consider that DSI is limited to the digital representation of raw sequences (of DNA, RNA, etc.), while others also include information on the proteins linked to these sequences and their functions, their molecular structures and ecological metadata (contextual information describing the environmental characteristics associated with the biological data)[i]. Biological samples and certain functions or traits of selected and identified organisms (plants, animals, etc.) ("*traditional"* knowledge), mostly from farmers, have been collected for many years. They are then entered into databases along with certain traits. The concept of DSI is based on the separation between the biological sample and the digital sequence, considering that the DSI results from the creative interpretation of the researcher through his computer. This is incorrect.

Although DSI are not formally considered to be physical genetic resources, notably by the CBD [i], they are nevertheless treated as derivatives requiring benefit sharing, particularly when they are exploited for commercial purposes. This interpretation has given rise to heated debate. On the one hand, there are the countries of the Global South and farmers, the main providers of genetic resources, who argue that DSI should be considered as genetic resources subject to the obligations of the Treaty. On the other hand, the countries of the Global North believe that DSI are the products of research and therefore not subject to these obligations.

To make matters more complex, another acronym, GSD (genetic sequence data), was used in 2017 by the United States at the FAO. The US argued that "*GSD is neither genetic material nor a genetic resource, and that a conceptual and definitional distinction should be maintained between the genetic material itself and the data describing that material*". However, as some, such as Guy Kastler of the European Coordination Via Campesina( ECVC), assert, "*DSI and GSD refer to the same reality*"[iii]. This lack of consensus on the precise meaning of the term DSI is holding back the development of legal mechanisms for regulation, access to DSI and the sharing of the benefits arising from their use. However, in 2024, the ITPGRFA and the CBD continued their separate negotiations in an attempt to find solutions.

## ITPGRFA : DSI at the heart of negotiations

At the ITPGRFA meeting in Rome in September 2024, discussions again focused on the integration of DSI into the Multilateral System of access and benefit-sharing (ABS)[iv]. The working group emphasised the growing role of DSI in agricultural research and development and examined the ways in which they could be taken into account in the context of benefit sharing.

A major point of discussion was the possibility of introducing two options for benefit sharing: an annual payment option and a deferred payment option. In the first case, known as "*subscription*", a sum would be paid each year from the year following the first accession to a plant genetic resource in the Multilateral System (MLS). In the second case, known as "*single access*", this sum would be paid when the product developed from this accession is marketed. The working group has included

DSI in the deferred payment option, which is simply a continuation of the current benefit-sharing mechanism, which is totally flawed because industry rarely declares the origin of the resources it uses. This circumvention will be further facilitated by the free access on the Internet to multiple DSI databases, which exempt the industry from signing all its commitments resulting from the signing of "*material transfer agreements*" each time it accesses physical seed samples from the MLS. The working group also examined how the mechanism for subscribing to the MLS could better meet expectations in terms of sharing the monetary benefits arising from DSI. For the majority of countries in the "*South*", this should be the only possible option. This "*subscription*", consists of a company paying each year a share of its sales turnover to a benefit-sharing fund managed under the responsibility of the Treaty in exchange for unlimited access to all the plant genetic resources of the MLS. This percentage would then be much lower than the percentage paid for single access. The working group's discussions on these two mechanisms must continue, with the aim of reaching a consensus at the next meeting of the Treaty's governing body, which will take place from 13 to 15 December 2025.

The working group also stressed the need to coordinate the proposals with the mechanisms developed under the Convention on Biological Diversity (CBD) in order to avoid redundant payments. The group also encouraged the contracting parties, the co-chairs and the secretariat to raise awareness among delegations and stakeholders of the importance of the multilateral system and the prospects for strengthening it.

## COP16: between progress and uncertainty

COP16 in Cali focused on DSI governance[v]. It started from a mixed assessment of COP15 (2022) on the financing of projects and the sharing of benefits from genetic resources[vi]. The compromise reached in Montreal in December 2022 only laid down general principles, including the creation of a multilateral mechanism for sharing the benefits arising from the use of DSI[vii].

COP16 aimed to implement this multilateral mechanism and create a global fund. The objective was also to determine the purposes for which the benefits from DSI will be distributed, in order to meet the global challenges of biodiversity and equity. While the scope of the multilateral mechanism was broadly defined, no definition of DSI was established due to the deep disagreements over this major issue. This point is due to be discussed again at a follow-up conference to COP16, to be held from 25 to 27 February in Rome[viii].

A decision has nevertheless been taken with the creation of the Cali Fund, which aims to ensure "*an equitable sharing of the benefits arising from the use of DSI*". Under this fund, users of DSI (pharmaceutical, biotechnology, cosmetics, plant and animal breeding, etc.) are required to contribute 0.1% of their turnover or 1% of their profits each year. The funds collected will in theory be earmarked for conservation programmes and the collection of new biological resources, with priority given to the main supplier countries, involving indigenous peoples or local communities legally recognised for their role in conserving biodiversity. Whether corporate contributions to the Cali Fund should be mandatory or voluntary remains open to debate, but the question seems almost ironic, given the substantial benefits they derive from DSI. The actual implementation of the multilateral mechanism also remains uncertain: it is crucial to succeed in guaranteeing the active participation of the companies concerned, and to put in place precise monitoring systems to identify DSI users who should contribute to the fund. The lack of a definition of DSI further complicates the implementation of the fund.

The issue of the governance of the Cali Fund also requires particular attention to ensure that funds are distributed transparently and equitably, particularly in terms of how they are paid out to

indigenous peoples and local communities. The experience of the Treaty's Benefit Sharing Fund shows us that these funds are never allocated directly to indigenous peoples and local communities, but are always channelled through gene banks, NGOs, researchers, natural parks, etc., which are responsible for facilitating the *ex situ* collection and conservation of new resources and associated knowledge, the first foodstuffs for the artificial '*intelligence*' responsible for identifying DSI. The success of this mechanism will depend on the ability of the stakeholders to overcome these obstacles and establish effective operational structures before COP17, scheduled to take place in Armenia in October 2026.

## What are the prospects for balanced governance?

DSI facilitate access to genomes and the identification of plant traits, thereby encouraging the sharing of information without requiring access to physical biological organisms. This raises the question of the fairness of benefit sharing, particularly in the absence of a clear legal framework. It does away with the free, prior and informed consent of the CBD, which makes any access to genetic resources conditional on the beneficiary's not claiming intellectual property rights over these resources, their genetic parts and/or components, and the Treaty's formal prohibition on claiming such intellectual property rights. This effectively legalises the tools of biopiracy, which are now dematerialised. This also explains the differences in the legal status of DSI, with countries in the global North considering them to be patentable products of research, while countries in the global South regard them as genetic components of unpatentable physical organisms, blurring the obligations of consent and benefit sharing[ix].

The use of DSI is closely linked to the new genomic modification techniques (NGT), which make it possible to use DSI to modify genomes while claiming not to introduce foreign genetic material. This approach, which is widely used by multinational seed companies, increases the risks of biopiracy [x], as NGTs enable genetic diversity to be exploited without recognising the rights of the countries of origin of the resources or those of indigenous peoples and local farming communities. This situation therefore primarily benefits economic players in the Global North to the detriment of countries in the Global South, which are the main suppliers of genetic resources and sources of DSI.

These "*innovations*" are also widening inequalities of access, with some countries lacking the infrastructure and technical capacity to make full use of DSI, particularly IT resources. In the absence of appropriate legal tools, these technologies reinforce the control of living organisms by a few multinationals and weaken existing frameworks for the protection of genetic resources and traditional knowledge.

The future of DSI governance is now in the hands of international bodies that claim to want to reconcile "*innovation*", equity and the preservation of biodiversity. The effective implementation of the Cali Fund, the clarification of companies' obligations and the link between equitable access and patents, the main tool used to enhance the value of DSI-derived "*innovation"*, are major challenges. Similarly, the balance between open access, the prohibition on claiming intellectual property rights and benefit sharing under the ITPGRFA will require adjustments to ensure fair recognition of the providers of genetic resources and their knowledge relating to these resources.

i Brink M., "Practical consequences of digital sequence information (DSI) definitions and access and benefit-sharing scenarios from a plant genebank's perspective", 2 May 2021.

ii Convention on Biological Diversity, "Decision 16/2 - Digital sequencing information", 1st November 2024.

iii Guy Kastler, "DSI: dematerialised biopiracy", *Inf'OGM, le journal*, n°176, July/September 2024.

iv FAO, Tirpaa, "Twelfth meeting of the ad hoc open-ended working group to enhance the functioning of the multilateral system", 16 to 19 September 2024.

v Convention on Biological Diversity, "Conference of the Parties to the Convention on Biological Diversity - Sixteenth meeting, Cali - Digital sequence information on genetic resources", 1 November 2024.

vi Denis Meshaka, "COP16 : les pays se réunissent pour « *protéger la biodiversité* »"', *Inf'OGM*, 25 October 2024 (in french).

vii Denis Meshaka, "COP 15: accord a minima sur les ressources génétiques", *Inf'OGM*, 22 December 2022 (in french).

viii Convention on Biological Diversity, "Countries to Resume Crucial Biodiversity Discussions in Rome, 25-27 February 2025", 27 November 2024.

ix Denis Meshaka, "COP 15: accord a minima sur les ressources génétiques", *Inf'OGM*, 22 December 2022 (in french).

x Guy Kastler, "DSI: dematerialised biopiracy", *Inf'OGM, le journal*, n°176, July/September 2024.

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