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Biodiversity COP15: what future for digital sequencing information?

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Considered one of the most controversial issues during the negotiations of the 15th Conference of the Parties to the Convention on Biological Diversity held in December 2022 in Montreal, digital sequencing information (DSI) was seen by some States as a sine qua non condition for the adoption of a post-2020 global biodiversity framework. In fact, a compromise on this technical subject was finally adopted, but it simply sets out general principles, the implementation of which will have to be negotiated in the coming years. Between now and COP16 in 2024, Parties will have to set up a multilateral mechanism and determine for what purposes the benefits of DSI will be distributed in order to meet both the global challenges of biodiversity and equity, and the national needs for sustainable development

Digital Sequencing Information (DSI), i.e. genetic sequences of biodiversity stored in databases, is a major issue in international negotiations. In search of equity and legal security, the majority of States want an equitable sharing of

the benefits, both monetary and non-monetary, arising from the use of ISN on genetic resources derived from biodiversity (for example, in the case of vaccines, medicines, hybrid seeds, cosmetics, etc.). Far from agreeing on how this sharing should be done, Parties to the Convention on Biological Diversity (CBD) have been debating different policy options for the future of ISN for several years. The much-anticipated decision of COP15 will have implications for the treatment of ISN in other international arenas, including the FAO and the negotiations for a treaty on high seas biodiversity.

A threat to the Nagoya Protocol?

The Nagoya Protocol, which was adopted in 2010 and entered into force in 2014, complements the CBD in its third objective: the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. In order to achieve equitable relations between user countries (mostly in the North) and genetic resource provider countries (mostly in the South), the protocol created the Access and Benefit Sharing (ABS) mechanism. Under this mechanism, access to genetic resources and associated traditional knowledge is subject to the prior informed consent of the provider and the conclusion of a benefit-sharing contract between providers and users. The idea behind the ABS mechanism is that the exploitation of genetic resources by research, whether private or public, should result in benefits, monetary or non-monetary, for all parties as well as benefits for biodiversity conservation. Twelve years after the adoption of the Nagoya Protocol, however, the ABS mechanism has not been as successful as expected[1] . The adoption of national ABS legislation is still relatively low and ABS contracts are mostly non-commercial, which does not generate significant monetary benefits to be allocated to biodiversity conservation.

In this context, the development of genetic or biological sequencing technologies and big data has added new difficulties to a fragile mechanism. Genetic resources are now sequenced and stored in public or private databases, very often in open access (the most important is the International Nucleotide Sequence Database Collaboration). Thanks to *in silico* research, access to physical genetic resources is less and less necessary to exploit these resources. By no longer going to the places of origin of biodiversity, users of genetic resources thus escape the application of the Nagoya Protocol and the ABS mechanism by using ISN in open access without compensation. In light of this situation, the CBD States Parties are considering the merits of extending the ABS mechanism to dematerialized genetic resources, known as Digital Sequence Information (DSI).

A multilateral mechanism to frame DSI

Since COP14 in 2018, the issue of benefit sharing from the use of DSI on genetic resources has been at the heart of international negotiations. Views on this subject diverge and schematically oppose the countries of the South with a rich biodiversity, but a low technological capacity, who plead for the application of ABS to DSI, to the countries of the North whose situation is quite the opposite and who are reluctant to such an extension. The scientific community is mobilized to defend the principle of free and open access to digital data.

Several policy options were under discussion in Montreal, ranging from maintaining the bilateral ABS system to establishing a multilateral or hybrid mechanism. Among other things, the chosen solution had to meet the following criteria:

(a) be efficient, feasible and practical;

(b) create more benefits, including monetary and non-monetary benefits, than costs;

(c) be effective;

(d) provide legal certainty and transparency for providers and users of DSI on genetic resources

e) not hinder research and innovation;

(f) be consistent with open access to data;

(g) not be contrary to international legal obligations;

(h) be mutually supportive of other access and benefit-sharing instruments;

(i) take into account the rights of Indigenous peoples and local communities, including with respect to traditional knowledge associated with genetic resources held by them.

In the final decision adopted at COP15, Parties finally found common ground on the establishment of a multilateral mechanism and a global fund for the sharing of benefits arising from the use of DSI. Although this decision avoided a blockage in the adoption of the global framework, the discussion on the subject is far from being settled and only marks the starting point for new international negotiations, planned for COP16, to implement this mechanism.

Two sub-options are currently under consideration.

- A payment or contribution to the multilateral fund for access to the genetic sequences themselves. This could take the form of a fee to access the databases or a minimal payment for each DSI. It could also be free access to the sequences in exchange for a fee to access associated data such as protein function or gene association. However, these options may conflict with the principle of free access to data for research.
- A contribution to the independent DSI Multilateral Fund. In this case, services related to DSI (storage, processing, expertise, sequence analysis) could be charged. It is also proposed to impose a micro-tax on laboratory equipment or on computer space rented in the cloud to store and process sequences. The fund could also be financed by bond financing or labels linked to voluntary contributions.

It should be noted that the establishment of a bilateral ABS system as a complement to the multilateral mechanism is not ruled out at this stage of the negotiations. Indeed, the decision adopted provides that exceptions to the multilateral approach could be identified. In this case, a hybrid mechanism such as the one proposed by the African Group is possible. Under this proposal, the multilateral mechanism would only work in cases where the ABS system would not be feasible, for example where the DSI has no identified country of origin or comes from several known countries. The multilateral fund could then be financed by a 1% tax on all retail sales of products resulting from the utilization of genetic resources. This approach, while still vague, may seem promising for funding the multilateral fund. However, given the small share of commercial utilization of genetic resources, the ability of such a mechanism to generate significant monetary benefits is questionable. Furthermore, combining it with a bilateral system would lead to the need to trace the origin and use of ISN, which is currently recognized as being financially and technically very difficult.

The variety of solutions proposed shows the complexity of the work to be done before such a multilateral instrument can be truly effective. This ultimately depends on funding issues. Furthermore, the success of an open and multilateral solution requires responsible data management to ensure fairness and equity.

The operation of the global fund to be further investigated

Parties to the CBD recognize that the establishment of a mechanism for sharing the benefits of the use of DSI is an important tool for mobilizing financial resources for the conservation and sustainable use of biodiversity. However, in

addition to the creation of a multilateral mechanism to feed this fund, many aspects related to the functioning of this global fund remain to be clarified. In particular, the question of whether the fund dedicated to the implementation of the global biodiversity framework under the Global Environment Facility is the appropriate entity to manage the revenues from DSI. In addition, should the benefits from the use of DSI be shared among countries or on a project-based approach to biodiversity conservation and sustainable use? While the latter option seems to be favored by many countries, including those in the African Group, it raises the question of financial and human needs, but also the risk of creating situations where countries in the North sell their expertise to countries in the South to set up biodiversity conservation and sustainable use projects. Many answers are thus highly expected at COP16 to clarify the future of DSI.

1 https://sfecologie.org/regard/r102-mars-2022-aubertin-et-pham-apa/

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