



Digital Sequence Information (DSI) on Genetic Resources

A Guide for Financial Institutions in the Context
of the Cali Fund

October 2026

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Executive Summary

Context and Purpose

This FfB Foundation guidance on Digital Sequence Information (DSI) on genetic resources aims to help investors assess portfolio exposure, identify relevant companies and engage with them on DSI and the fair and equitable sharing of benefits arising from the utilisation of genetic resources. It constitutes a first step towards raising awareness of the macro-trends linked to the emergence of DSI, especially in the key economic sectors of pharmaceuticals and biotechnology, and the development of multilateral benefit-sharing agreements.

This guidance has been developed in the context of the [Cali Fund](#), the financial engine of the Multilateral Mechanism for the Fair and Equitable Sharing of Benefits from the Use of Digital Sequence Information on Genetic Resources (MLM), developed by the Convention on Biological Diversity (CBD). It calls for increased transparency from DSI users globally and presents a set of recommendations to policymakers in their efforts to provide legal certainty on benefit-sharing in the digital era.

Why DSI Matters for Investors

For investors, the significance of DSI lies not only in specific products or individual patents, but also in its ability to improve research productivity, accelerate innovation cycles and support the development of new products, services and business models. As sequencing technologies, computational tools and artificial intelligence continue to advance, DSI is likely to become an increasingly important component of innovation and competitiveness across a growing number of industries.

The difficulties of ensuring the fair and equitable sharing of benefits from genetic resources in the digital era are a source of emerging legal risks for companies and investors. In this context, a Multilateral Mechanism can help preserve innovation and societal progress arising from DSI use, notably for human health and for sustainability, while safeguarding open access to data and enabling fair and equitable benefit-sharing with countries, Indigenous Peoples and local communities. The goal is to support biodiversity conservation and provide regulatory stability for DSI users.

Our Guidance in the Context of the Cali Fund

This report contains four main sections. The first section focuses on understanding the commercial relevance of DSI. It presents the applications of DSI as a research enabler, explaining what it is and how it is used, including its innovation potential for human health and sustainability. The second section aims to help investors anticipate the regulatory risks linked to DSI. The third section provides a snapshot of how investors can start to assess and engage with companies. Finally, the fourth section presents a set of next steps for investors and key recommendations for policymakers to mobilise private sector contributions to the Cali Fund.

Applications and Use

This report provides financial institutions with the knowledge and practical tools needed to start integrating benefit-sharing from the use of DSI into their engagement activities and broader biodiversity finance strategies in support of biodiversity conservation. It calls for increased transparency from DSI users globally and presents a set of recommendations to policymakers in their efforts to provide legal certainty on benefit-sharing in the digital era.

The third section is intended to guide interested investors in putting into practice the insights gathered on DSI in the previous sections, starting with an assessment of exposure and then moving to potential company engagement. It focuses on company identification and maturity, available tools and data, and early-stage questions for company engagement. The aim is not yet to build the materiality case for DSI, but to help investors develop their own assessment of the importance of this input for research and innovation across economic sectors and in the context of biodiversity finance. It will enable them to use available information on DSI and investigate further according to their individual portfolios and priorities.

The third section includes an 'Engagement Starter Rationale' which is illustrated as follows:

Digital Sequence Information

Engagement starter rationale for investors

Mainstream economic opportunity

DSI use accelerates research by enabling genetic information to be screened and analysed digitally before laboratory testing.

Implications across a wide range of economic sectors (i.e. Pharma, Biotech, Plant Breeding, AI).

Cost of genome sequencing: around US\$ 500 per genome.

Positive Impacts

Innovations for Health & Sustainability

Negative Impacts

Energy use for computing power and data architecture

Dependencies

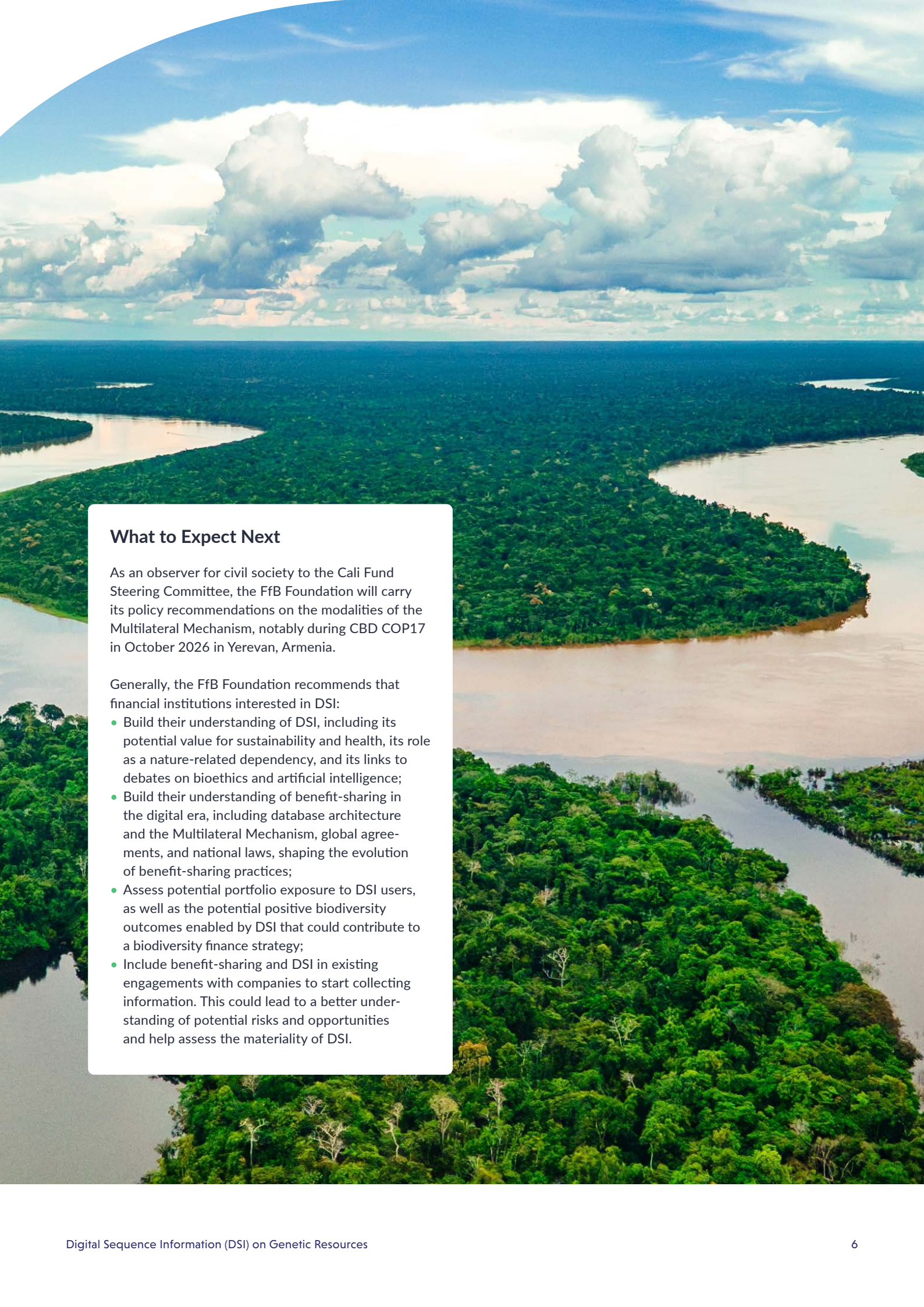
Open Access to DSI public databases
Genetic diversity

Emerging legal and transition risks

Growing scrutiny on bioethics and benefit-sharing compliance. DSI reshapes expectations on a global scale.

International agreements include: Cali Fund & CBD Multilateral Mechanism, High Seas Treaty (BBNJ), Plant Treaty, Pandemic Agreement.

Links to the GBF: Goal C, Target 13, Target 15c, and Target 19d.



What to Expect Next

As an observer for civil society to the Cali Fund Steering Committee, the FfB Foundation will carry its policy recommendations on the modalities of the Multilateral Mechanism, notably during CBD COP17 in October 2026 in Yerevan, Armenia.

Generally, the FfB Foundation recommends that financial institutions interested in DSI:

- Build their understanding of DSI, including its potential value for sustainability and health, its role as a nature-related dependency, and its links to debates on bioethics and artificial intelligence;
- Build their understanding of benefit-sharing in the digital era, including database architecture and the Multilateral Mechanism, global agreements, and national laws, shaping the evolution of benefit-sharing practices;
- Assess potential portfolio exposure to DSI users, as well as the potential positive biodiversity outcomes enabled by DSI that could contribute to a biodiversity finance strategy;
- Include benefit-sharing and DSI in existing engagements with companies to start collecting information. This could lead to a better understanding of potential risks and opportunities and help assess the materiality of DSI.

Foreword

The Cali Fund and the Multilateral Mechanism on DSI provide an innovative, global solution to the challenges of benefit-sharing in the digital era. Together, they have the potential to ensure fairness for biodiversity guardians as well as stability for the users of digital sequence information (DSI).

The use of DSI can be understood as the digitalisation of genetic information. It is driving transformations similar to those previously witnessed in the audiovisual industries. It is affecting operations in a number of economic sectors, particularly pharmaceuticals & biotechnology. It also holds potential for innovation in sustainability and for human, plant and animal health.

As with many innovative processes, the use of DSI and its surrounding environment bring inherent complexities. How can we measure its relevance in business models? How can we anticipate its effects on society? How can we efficiently manage open-source data on a global scale? How can we ensure fair and equitable benefit-sharing with countries, Indigenous Peoples, and local communities in the context of rapid technological evolution?

The Cali Fund is the financial arm of the global Multilateral Mechanism for benefit-sharing from the use of DSI. It illustrates the benefits of global governance, even if challenges remain in making it fully operational. In this process, as many stakeholders as possible should be engaged to ensure fairness and success.

Building capacity is essential to ensure a better understanding of the issues surrounding DSI use, including the growing importance of genetic data in research and innovation.

However, transparency around DSI use remains limited, and awareness of the Cali Fund is still low.

Investors have an important role to play in communicating their expectations to companies and encouraging greater ambition. Their perspectives can also provide valuable insights to policymakers as the Cali Fund becomes operational.

To develop effective policies and engagement strategies, investors need to understand the materiality and relevance of DSI to their portfolios. This publication aims to build that understanding by providing knowledge and insights into the growing significance of DSI across economic sectors and business models.

It represents a starting point for engaging the financial sector as a key stakeholder in the ongoing operationalisation of the Cali Fund and the broader Multilateral Mechanism for benefit-sharing from the use of DSI.

Overview

At a Glance

This FfB Foundation guidance on Digital Sequence Information (DSI) on genetic resources aims to help investors assess portfolio exposure, identify relevant companies and engage with them on DSI and the fair and equitable sharing of benefits arising from the utilisation of genetic resources. This guidance has been developed in the context of the [Cali Fund](#), the financial engine of the Multilateral Mechanism for the Fair and Equitable Sharing of Benefits from the Use of Digital Sequence Information on Genetic Resources (MLM), developed by the Convention on Biological Diversity (CBD). It constitutes a first step towards raising awareness of the macro-trends linked to the emergence of DSI, especially in the key economic sectors of pharmaceuticals and biotechnology, and the development of multilateral benefit-sharing agreements. It provides financial institutions with the knowledge and practical tools needed to start integrating benefit-sharing from the use of DSI into their engagement activities and broader biodiversity finance strategies in support of biodiversity conservation. It calls for increased transparency from DSI users globally and presents a set of recommendations to policymakers in their efforts to provide legal certainty on benefit-sharing in the digital era.

How the Report has been Structured

This report contains four main sections:

- The **first section** focuses on understanding the commercial relevance of DSI. It presents the applications of DSI as a research enabler, explaining what it is and how it is used, including its innovation potential for human health and sustainability. It then explores the role and impact of DSI use across business models and economic sectors, with a deep dive into DSI-using patents and products, as well as concrete examples from mainstream companies. This section concludes by highlighting the emerging trends and open debates on DSI and biotechnology, with a focus on bioethical risks and data management considerations.
- The **second section** aims to help investors anticipate the regulatory risks linked to DSI. It describes benefit-sharing as an essential dimension of global biodiversity goals, including those set out in the [Global Biodiversity Framework](#). It also explains why a Multilateral Mechanism is needed to ensure fair and equitable benefit-sharing in the digital era and draws on this explanation to present the reasons for, and remaining challenges associated with, company contributions.

- The **third section** provides a snapshot of how investors can start to assess and engage with companies. It includes an assessment of market maturity on the topic as well as an 'Engagement Starter Rationale', which makes the case as to why companies need to engage in this in the first place, and then proposes a process for company identification. It also includes recommended company actions and engagement questions.
- Finally, the **fourth section** presents a set of next steps for investors and key recommendations for policymakers to mobilise private sector contributions to the Cali Fund – notably in relation to discussions on the modalities of the Multilateral Mechanism at the CBD COP17, taking place in October 2026 in Armenia – and sets out a pathway for further investor mobilisation.

A **glossary** of key terms, including scientific terminology related to DSI, can be found at the end of this document.

Project Background and Process

Since 2025, the FfB Foundation has participated in the structuring of the Cali Fund, through the appointment of [Anita de Horde](#), the Foundation's Executive Director, as an observer to the Steering Committee for civil society. In parallel, the Foundation mobilised its investor community to build an understanding of DSI and benefit-sharing, and of the role investors can play by engaging with portfolio companies and raising these issues with their management teams. To support this work, the FfB Foundation established a DSI Investor Group in 2026 to exchange knowledge on benefit-sharing, DSI and the Cali Fund. Despite limited information from companies on their use of DSI, participating financial institutions demonstrated a strong appetite to learn more about DSI-related technological and regulatory developments. A key message from the group was the need for greater transparency and better information to assess the materiality of DSI-related issues. Members also expressed interest in collaborative engagement with companies to obtain this information and in exploring the broader role of DSI within biodiversity finance strategies, including capital allocation to solutions and the use of biomonitoring to assess and manage biodiversity impacts.

Chapter 1

Understanding DSI and its Commercial Relevance

Digital sequence information (DSI) is the digital representation of the information contained in genetic resources. Accessing information from biological material enables researchers and companies to store, share, compare and analyse genetic material at scale. The use of DSI can support research and innovation, including through data analysis and artificial intelligence, and can create potential value across a range of business models and economic sectors, in particular in pharmaceuticals, biotechnology, agriculture, and other emerging bioeconomy sectors.

The use of DSI offers significant potential and opportunities, but it also creates nature-related dependencies for companies on genetic diversity and open access to data. It also generates risks and uncertainties as debates remain open around governance, bioethics and benefit-sharing in the digital era. These issues are increasingly relevant to understanding the commercial relevance and potential financial and environmental materiality of DSI.

As an introduction to DSI, this section examines its commercial relevance by presenting key technological concepts and its potential for economic application. The section also takes a forward-looking approach by examining emerging trends and signals that may shape the future development and use of DSI. It considers what this might mean for markets and investors, including its potential for disruption and its environmental and financial materiality. It aims to reinforce investors' understanding of DSI as a source of value creation that ultimately relies on biological diversity.

1.1 The Applications of DSI as a Research Enabler

This section introduces the scientific concepts and terminology needed to understand how DSI is generated and used as a research input. It then uses practical examples to show how DSI can support research and innovation and also considers the evolving scope of DSI, recognising that aspects of its definition remain subject to scientific and policy debate.

1.1.1 What DSI Is and How It Is Used

The acronym DSI emerged from discussions among governments under the [UN Convention on Biological Diversity \(CBD\)](#), during negotiations alongside the development of the [Global Biodiversity Framework \(GBF\)](#) – the international agreement setting out an ambitious pathway towards the global vision of a world living in harmony with nature by 2050. The term has guided the development of the [Cali Fund](#), which is the enabling financial engine of the

Multilateral Mechanism (MLM) for the Fair and Equitable Sharing of Benefits from the Use of Digital Sequence Information on Genetic Resources.

In the [Cali Fund Guide for Businesses](#), the working definition of DSI is presented as: “the digital representation of genetic material, including DNA and RNA sequences and potentially other related biological information.” For the purposes of this guide, this definition provides a practical starting point for understanding DSI and its applications. It can be understood as a specific type of data that enables research and innovation by allowing genetic information to be stored, shared, analysed and applied at scale. It can support the study of biological diversity, as DNA contains the genetic “code” or “construction plan” within the cells of living organisms. The information it contains can be interpreted by being retrieved, read and analysed as a sequence. See Box 1 for a reminder of key DNA-related terminology.

BOX 1

REMINDER OF KEY DNA-RELATED TERMINOLOGY

DNA (Deoxyribonucleic Acid) is the fundamental molecule that carries the genetic instructions or blueprint used in the growth, development and functioning of all known living organisms. It is an acidic substance found in the nucleus, or “brain”, of a cell. DNA resembles a twisted ladder, known as a double helix. The sides of the ladder are made of sugar and phosphate molecules, while the rungs are formed by pairs of four chemical nucleotide bases: Adenine (A), Thymine (T), Guanine (G) and Cytosine (C). Certain sequences of these chemical letters make up genes, which carry the specific code for producing proteins by specifying the order of amino acids. RNA (Ribonucleic Acid) acts as the molecular messenger and template used to translate this blueprint into functional proteins.

Gene sequencing is a method used to determine the exact order of chemical building blocks in a DNA strand, while whole genome sequencing reads an organism's entire genetic blueprint. This laboratory process was developed in the 1970s and became known as the [Sanger sequencing method](#). It uses radioactive isotopes to tag DNA fragments, which is then injected into a gel and separated using an electrical current. As smaller fragments move faster, they can be separated cleanly by size. By placing a sheet of X-ray film over the gel, scientists could scan the radiation spots, identify the dark bands and manually record the associated letters (A, T, C, and G).

Sequencing methods evolved over time, using chemical markers or lasers. Then, a major technological shift came with the development of Next-Generation Sequencing (NGS) in 2008. While the underlying biochemical processes remain physical, detection and analysis have become

increasingly digital. More recently, third-generation sequencing, such as [Oxford Nanopore](#), can read DNA directly as it passes through a microscopic protein pore. With each generation, data output per run has increased substantially, while the cost of genetic sequencing has fallen.

This increasing digitisation of sequencing and analysis means that genetic information can be stored, analysed, and shared in a digital format. To illustrate this, the DNA sequence of *Bemisia tabaci* (whitefly) is presented in Figure 1 below. The figure shows a sequence of 750 base pairs, composed of the bases A, T, C, and G. *Bemisia tabaci* is a relevant example because genetic sequencing can support research into this agriculturally important species, including its biology, adaptation and resistance, and thereby contribute to research and innovation in areas such as agriculture and crop protection.

Figure 1: DNA Sequence, *Bemisia tabaci*

Source: European Nucleotide Archive (ENA), n.d. To note: the DNA sequence is read left to right, line after line.



Overall, technological advances in gene and genome sequencing, combined with the availability of genetic information in digital form, mean that researchers may no longer need physical access to a living organism or its genetic material in order to study the information encoded in its genes. This shift challenges established global benefit-sharing mechanisms such as the [Nagoya Protocol](#) (see Section 2), and raises questions around bioethics and data governance.

It is important to note that while the description above provides a useful understanding of what DSI is, some sources emphasise that DSI is a “placeholder term” ([Horton and Lee, 2024](#)). This is also reflected in the CBD COP decisions. There is “no agreed definition” of DSI, as “differences in terminology in scientific circles reflect differences in the material referred to” ([FAO, 2026](#)). This debate includes whether the scope of DSI extends beyond genetic sequences to other biological information, such as cellular proteins and their metabolites, which are substances produced by cells as they break down nutrients. This creates uncertainty around the scope of DSI and associated benefit-sharing practices. To improve investors’ understanding of these questions and companies’ potential exposure to DSI, it is useful to become familiar with the range of scientific terms associated with the concept. To that end, a glossary of key terms can be found in Annex 1.

1.1.2 Innovation Potential for Human Health and Sustainability

Beyond definitional and scope debates, DSI use offers significant potential for biodiversity-based research and innovation. The Cali Fund Guide for Businesses lists potential applications of DSI including “drug discovery and the development of therapies, biotechnology and synthetic biology, agriculture and animal and plant breeding, cosmetics and nutraceuticals, conservation research, and artificial-intelligence and data-based scientific services.”

Progress at the intersection of life sciences and data analysis can support research and innovation in numerous sectors and provide significant benefits to society, including for human health. Box 2 below provides examples of genetic data used in practice in the pharmaceutical sector.

Such progress could also contribute to the sustainable transition of the economy, which corresponds to the evolution of economic activities in line with the goals and targets of the Global Biodiversity Framework and in accordance with the Paris Agreement to limit climate change. Genetic research could support adaptation, for example through innovation in crop resilience, or support advancements in the field of energy efficiency, for example through enzymes that reduce the need to heat water in

BOX 2

EXAMPLES OF DIGITAL GENETIC INFORMATION USED IN PRACTICE IN THE PHARMACEUTICAL SECTOR, IDENTIFIED BY [ISS STOXX \(2025\)](#)

COVID-19: In early January 2020, Chinese scientists, alongside international colleagues, made the genomic sequence of SARS-CoV-2 publicly available. Pharmaceutical companies worldwide used this data to develop a variety of vaccines that saved millions of lives and generated significant commercial revenues. The data also enabled governments and public health agencies to track mutations and emerging variants, supporting rapid public health responses.

Ebola: During the 2014-2016 Ebola outbreak in West Africa, researchers sequenced the virus to better understand its evolution and transmission. The sequence was made [publicly available on the GenBank database](#) and was subsequently leveraged by a pharmaceutical company to develop an antibody-based therapy that provides [effective treatment](#) for a disease with an estimated [mortality rate of approximately 50%](#).

GLP-1 Drugs: GLP-1 agonist drugs have transformed the treatment of type 2 diabetes and obesity. One estimate suggests that sales of these drugs could [reach US\\$111 billion](#) by 2033 across major markets, including the United States and Japan. Their development was partly informed by genomic studies and digital genetic information, including studies of the [Gila monster](#) (*Heloderma suspectum*), a venomous lizard species classified by the IUCN as near threatened. Its [saliva contains ‘exendin-4’](#), a molecule with similarities to the human GLP-1 hormone, which helps regulate blood sugar levels and appetite.



certain industrial processes. Box 3 presents an inspiring innovative example by the company, Novonesis, aimed at improving the sustainability of industrial processes and made possible by a better understanding of genetic information.

It is important to note that these examples only illustrate the growing importance of genetic data in innovation. They do not establish that this data falls under the definition of DSI, that it was publicly available data, or that the process is under the scope of the Multilateral Mechanism on benefit-sharing from DSI.

Understanding the potential applications of DSI demonstrates its importance as an emerging input for research, especially for human health and environmental resilience, while also highlighting the extent to which innovation can depend on genetic diversity. For example, an estimated [70%](#) of current antibiotics and cancer treatments are derived from natural organisms, such as plants, sea snakes, or sponges, illustrating the extent to which innovation pipelines continue to depend on biological diversity and associated genetic information.

Meanwhile, academic research estimates that some 86% of existing species on Earth and 91% of species in the ocean still await description (Mora *et al.*, 2011) and scientists wonder whether they will be able to name Earth's species

before they go extinct (Costello *et al.*, 2013). The loss of these species, beyond the loss of their intrinsic value, would also mean losing access to and understanding of genetic information and properties that may hold future scientific or commercial value. In that sense, the emergence of DSI use can be assessed by investors as reinforcing a potential nature-related dependency for companies in relevant fields and economic sectors.

While terminology and scope remain subject to debate, the importance of DSI for innovation and society at large is already clear. The next section will further explore the economic implications of the use of DSI across business models and economic sectors, with particular attention to companies' dependence on genetic biodiversity.

1.2 The Role and Impact of DSI use across Business Models and Economic Sectors

Understanding the potential of a technological development is only a first step towards assessing its financial materiality and commercial relevance. This section will examine sectoral exposure, the role of DSI in products and patents, and its place within innovation supply chains and processes. It will also provide real-world company examples. The aim is to identify sectoral exposure to the disruptive potential of DSI emergence.

BOX 3

EXAMPLE OF BIOLOGY-BASED INNOVATION BY NOVONESIS

In an [interview](#) for the International Institute for Management Development ([IMD](#)), Novonesis' CEO, Ester Baiget, presents the "recipe for success" for unlocking the potential of the company's biological library, which includes 10,000 patents and a catalogue of over 100,000 microbial strains. This combines artificial intelligence (AI), [CRISPR](#) technology (Clustered Regularly Interspaced Short Palindromic Repeats), and advanced bioengineering with a world-class R&D team skilled in biotechnology and data analytics.

She points out that the global biosolutions market could generate €877 billion in economic value by 2035, according to a [report](#) produced by the Amsterdam Data Collective. Biosolutions are described as sustainable, biology-based technologies that harness nature's tools — such as enzymes, microbes, fermentation and biorefinement — to tackle environmental, agricultural, industrial and food system challenges.

Novonesis aims to be a key player in this transformation. The company reports on the environmental impacts of its products, including up to 30% lower surfactant (chemical) use in a standard detergent using its biosolutions, and annual savings of more than 60 million tonnes of CO₂e in the global transport sector through biofuel production. Furthermore, one key application of Novonesis enzymes is in the production of ultrapure water product, a critical resource in semiconductor manufacturing.

1.2.1 Economic Sectors with Potential DSI Exposure

In [Decision 16/2](#) establishing the Cali Fund, the following indicative sectors have been identified as likely to be significantly benefiting commercially from the use of digital sequence information:

- Pharmaceuticals and biotechnology;
- Nutraceuticals;
- Cosmetics;
- Animal and plant breeding;
- Laboratory equipment, reagents and sequencing services; and
- Scientific, technical, information and AI-enabled services connected to DSI.

In the recent study entitled [“From global biodiversity commitments to local action: revenue potential and allocation dynamics of the Cali Fund”](#) (Makowska-Curran, 2026), an analysis was conducted to estimate the number of companies that might be expected to make a contribution to the Cali Fund. The resulting estimates are presented in Table 1 below. These companies are large in terms of revenue, assets, or turnover.

These results do not provide information on companies' actual use of DSI. However, they do give a sense of potential market depth for investors, as they identify almost

22,000 eligible companies, with a median revenue of US\$95 million. The sectors of 'Information and AI', 'Animal and Plant Breeding', 'Biotechnology' and 'Pharmaceuticals' contain the largest numbers of these companies. There are still open questions about which economic sectors are currently, or may become, exposed to DSI. However, the importance of DSI to pharmaceuticals and biotechnology is already widely recognised by informed stakeholders.

1.2.2 Products, Applications and Patents

In the video [“DSI – Simply Explained”](#) the association ABS BioTrade, presents a list of “possibilities” enabled by DSI use, as shown in Figure 2 below. Among them, “fighting illegal trade” is particularly interesting, as it depicts DSI as a tool for biodiversity conservation and the protection of threatened or protected species. For instance, if a fish product is suspected to be mislabelled, it is now possible to take a sample, sequence its DNA, and identify whether the species has been correctly labelled. These possibilities illustrate a wide range of applications and potential impacts associated with the use of DSI. However, they represent only a subset of possible applications, which are likely to expand as research and technology continue to develop.

Another way to better understand the potential uses and materiality of DSI is to examine patent development. Pat-

Develop vaccines	DSI	Replacing natural ingredients
Synthesizing biology	Regulating invasive species	Fighting illegal trade
Ecosystem research	Breed improved plants and animals	Identifying organisms
Identifying plant pests	Repair gene defects	Create drugs

Figure 2: DSI-linked products and activities, from ABS BioTrade

Source: Adapted from the video [“DSI – Simply Explained”](#) by ABS BioTrade.

Sector	n	Med. rev. (\$mn)	Revenue IQR (P25–P75, \$mn)	Med. assets (\$mn)	Med. profit (\$mn)	Med. margin	Margin IQR (P25–P75)
Information and AI	5,217	96	58–202	95	6.4	6.0%	1.4%–15.7%
Animal & plant breeding	4,256	83	47–170	97	4.6	5.2%	0.5%–17.8%
Biotechnology	3,709	96	56–217	120	5.7	5.9%	0.9%–15.4%
Pharmaceuticals	3,401	105	59–246	165	10.2	10.4%	3.6%–21.2%
Laboratory equipment	2,846	93	57–179	114	7.4	7.9%	2.8%–16.9%
Nutraceuticals	1,513	104	64–218	191	5.0	4.2%	1.1%–10.1%
Cosmetics	748	100	66–214	97	7.4	6.0%	2.6%–12.4%
All sectors	21,690	95	57–202	111	6.5	6.6%	1.5%–16.7%

Table 1: Cali Fund eligible entity characteristics by economic sector

Source: Makowska-Curran, 2026. Note: All figures in nominal USD millions, reference year 2023.

ent searches can provide useful indications of technological activity and trends, although they should not be interpreted as a direct measure of DSI use. Patent activity associated with genetic information, sequencing and related technologies appears substantial and growing, suggesting increasing commercial relevance across a range of sectors.

Inspired by the [Cali Fund Index](#), we propose to look for insights by exploring [The Lens](#); a professional search, analysis and management platform for worldwide patent and scholarly data. It provides access to global patent and research information as a public good to support science and technology-enabled problem-solving. It should be noted that various possible sources and different keywords can be used for such purposes, as explored further in Section 3.

As of September 2026, a search for “[Genetic Sequence Data](#)” returned 817,599 patent records, of which 518,581 were identified as originating from the United States and 1,701 from China. Figure 3 below provides an extract from

the search results and shows that leading applicants include universities such as Harvard and the Massachusetts Institute of Technology (MIT), large companies such as Monsanto, and biotechnology companies such as Genentech ([Roche Group](#)). It also indicates that annual patent publications have doubled from around 20,000 per year in 2005 to more than 40,000 per year in 2025. While this search provides only an indicative picture, it suggests growing patent activity in DSI-related fields, involving major universities and large companies.

Overall, knowledge of DSI-related products and technologies is growing and will continue to evolve as new applications emerge. It is useful to look at both product and patent trends to build a more complete picture of these developments, especially as it remains difficult to establish direct links between the two sources of information through company reporting and broader market assessments.

Applicant Name Exact



Publication Date

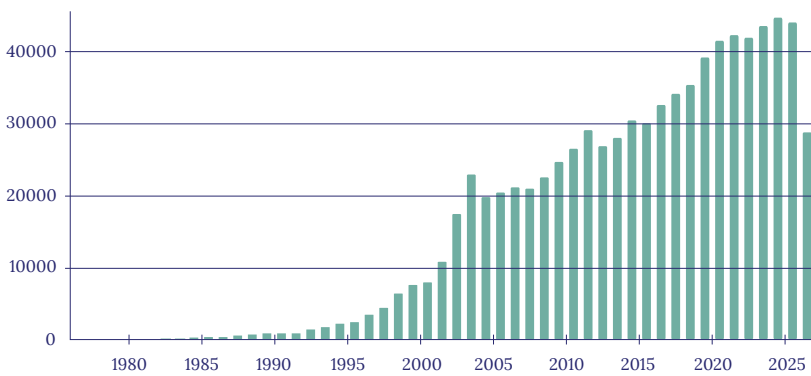


Figure 3: Applicant names and publications dates of patents including the term “Genetic Sequence Data”

Source: Extract from [The Lens](#) website, Patent Search [Results](#) for “Genetic Sequence Data” .

1.2.3 Insights into Innovation Processes: Company Examples

Through direct conversations with industry representatives, the members of FfB's DSI Investor Group learned that the use of DSI appears early on in innovation processes. It is particularly useful in accelerating research, because it can be used to identify potential properties or reactions before they are tested in real-time settings. The digital format reduces the need to travel or source genetic material from different parts of the world.

As a reminder, there is no agreed definition of the term DSI. In addition, the Multilateral Mechanism only covers publicly available data. Therefore, this section does not provide examples of DSI use, and does not set out expectations regarding benefit-sharing. It instead highlights the growing relationship between life and data sciences and illustrates how artificial intelligence and large-scale data analysis of genetic information are reshaping innovation processes.

In March 2026, L'Oréal announced the integration of the [NVIDIA ALCHEMI](#) machine learning framework directly into its research and development (R&D) ecosystem. The expansion of this AI partnership aims to accelerate beauty innovation through computational chemistry. The announced outcome is a more agile innovation process, with discovery becoming up to 100 times faster than with traditional methods, helping to shorten the transition from laboratory concepts to finished products.

In August 2026, the [Financial Times](#) reported that [Stanford University](#) researchers developed a generative AI programme,

called Evo 2, that writes new genomes. For the first time, artificial intelligence was used to create viruses unknown in nature. It designed synthetic phages, small viruses that can kill disease-causing bacteria. This milestone in synthetic biology promises advances in healthcare but also raises important biosafety and biosecurity concerns.

In September 2026, [Anthropic](#) introduced a new life sciences research group. It will focus on fundamental biology research using Claude: exploring datasets of DNA to identify uncharacterised protein families, generating hypotheses at scale, and testing them through experiments in the lab. This announcement also presents early results in which Claude discovered a novel enzyme system, with only high-level direction from scientists.

In 2024, Google DeepMind's [AlphaFold](#) contributed to the work recognised by the Nobel Prize in Chemistry for protein structure prediction. Box 4 below explains the relevance of this achievement and details some potential applications of this innovation.

From existing research and a growing body of concrete examples, it is becoming clear that DSI use is increasingly serving as a resource that accelerates research, which in turn can support innovation and value creation across multiple sectors. While pharmaceuticals and biotechnology remain the most visible examples, similar dynamics are emerging in agriculture, industrial biotechnology, biomaterials, environmental services and other sectors associated with the growing bioeconomy.

BOX 4

EXAMPLE OF AI-ENABLED INNOVATION IN THE LIFE SCIENCES BY [GOOGLE DEEPMIND ALPHA FOLD](#)

Made from long chains of amino acids, each protein has a unique, complex 3D structure. Determining just one of these structures could take several years and hundreds of thousands of dollars. In 2020, AlphaFold helped address this challenge by enabling researchers to predict protein structures in minutes with a remarkable degree of accuracy.

AlphaFold was recognised as a solution to the 50-year "protein-folding problem" and is helping scientists understand how life's molecules interact. AlphaFold has predicted over 200 million protein structures — nearly all the catalogued proteins known to science. The [AlphaFold Protein Structure Database](#) makes this data freely available. To date, it has had over three million users from more than 190 countries. That means it may have already saved millions of dollars and hundreds of millions of years in research time. The [AlphaFold Server](#) predicts how proteins may interact with a broad spectrum of biomolecules, accelerating new research.

Scientists are using AlphaFold to accelerate research in nearly every field of biology, including areas such as malaria, climate-resilient crops, osteoporosis, heart disease and honeybee health.

For investors, the significance of DSI lies not only in specific products or individual patents, but also in its ability to improve research productivity, accelerate innovation cycles and support the development of new products, services and business models. As sequencing technologies, computational tools and artificial intelligence continue to advance, DSI is likely to become an increasingly important component of innovation and competitiveness across a growing number of industries. The next section will take a forward-looking approach to explore the macro trends linked to the use of DSI, especially in the transformation of medicine, as well as implications for data management and potential bioethical risks.

1.3 Emerging Trends and Open Debates on DSI and Biotechnology

Innovation is about developing possibilities that align with market needs. It requires alignment between supply and demand, efficient marketing, and in some cases, political support. Anticipating the effects of a technology can draw on futures thinking, using methods such as horizon scanning, for example, to help identify emerging signals and trend analysis to understand patterns of change.

This section explores the transformations that DSI could enable in the medical field. It also explores open debates, risks, and implications arising from the use of DSI, both as part of broader 'big data' dynamics and through the way genetic technologies and their potential risks are already being reflected in popular culture and debates on bioethics. These two complementary discussions help illustrate the same point: that DSI is not a marginal development, but part of a potentially significant technological shift.

1.3.1 Genome Sequencing and the Future of Medicine

Technological progress is increasing our capacity to understand, map, and study genetic materials, which is helping to shape the future of medicine by redefining approaches to diagnosis and drug design. This section explores how the falling cost of sequencing, coupled with evolving techniques, is generating a growing interest in the use of these technologies to support human health.

An important caveat to note is that the UN CBD has no mandate over human genetic materials. Therefore, this section focuses on highlighting the importance of DSI and genetic material in mainstream medical research and practice, but is not directly related to benefit-sharing considerations under Decision 16/2 establishing the Cali Fund.

The landmark global scientific effort that aimed to generate the first sequence of the human genome, known as the [Human Genome Project](#), started in 1990. The project cost US\$2.7 billion, took twenty years to complete, and the genome mapping itself spanned more than [two years](#). Nowadays, the record for rapid sequencing is [five hours](#). DataHub shows, as presented in Figure 4, that the fall in the cost of sequencing a human genome from almost US\$100 million to around US\$500 represents an 181,000-fold decrease.

This rapid technological development of sequencing holds significant potential for the future of medicine. In the paper, "[Big Data: Astronomical or Genomical?](#)", the authors suggest that there is a "very reasonable possibility" that a significant fraction of the world's human population will have their genomes sequenced, as genomic medicine has the potential

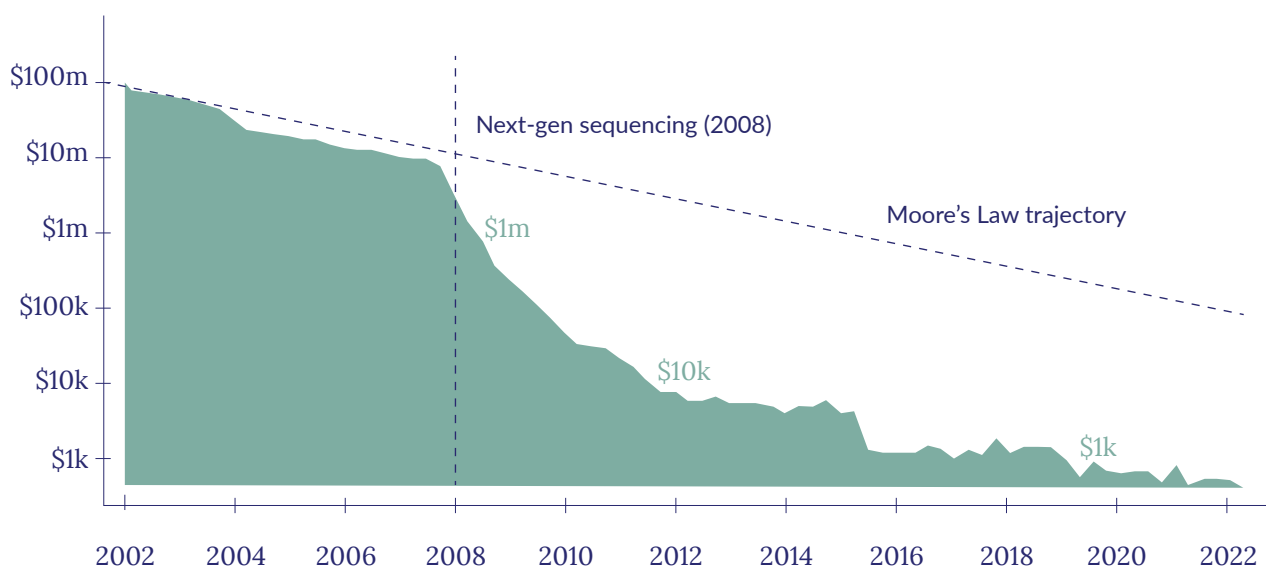


Figure 4: Falling cost of whole human genome sequencing

Source: [DataHub.io](#), n.d.

to transform the diagnosis and treatment of disease. Some countries are already considering, or indeed have started to pursue, the sequencing of large portions of their populations, with plans announced by England, Saudi Arabia, and Iceland. This ambition is also reflected in the European Commission's initiative "[1+ Million Genome](#)", which aims to improve disease prevention, enable more personalised treatments and support groundbreaking research.

A potential counterpoint to this view of the importance of genomic health is the idea that synthetic biology may represent the future of medicine, as scientists can design medicines at the molecular level, directly in the laboratory. Such approaches have already demonstrated efficiency, scalability, and safety. Historic examples include the development of aspirin by Felix Hoffmann at Bayer in 1897, which is synthesised from salicylic acid, and the large-scale production of penicillin and the subsequent development of semi-synthetic and synthetic antibiotics, illustrating the longstanding role of chemical synthesis in medicine.

However, this development of synthetic biology does not reduce the importance of DSI use. On the contrary, the two approaches can reinforce one another. Genetic sequencing can be used to better diagnose diseases, more precisely define therapeutic targets for drug development, and test biological responses. In gene editing, the company [Illumina](#) explains that "integrating CRISPR technology (Clustered Regularly Interspaced Short Palindromic Repeats) with the informational power of Next Generation Sequencing (NGS) enables researchers to have complete control throughout their editing experiment, resulting in a better understanding of the biological systems they are modifying". Overall, as synthetic biology and genomic medicine continue to evolve, DSI is likely to remain an integral part of these developments.

1.3.2 Data implications and Ethical Risks of DSI Use

In the paper "[Big Data: Astronomical or Genomical?](#)", the authors explain that genetic sequencing requires substantial data storage and computational power, potentially exceeding that required for video streaming or astronomical data. They anticipated growth that could lead to one zettabase — one trillion billion bases — of sequencing data per year.

This anticipation was based on historical growth rates and key announcements, such as plans by the [BGI Group](#), a Chinese genomics organisation, and the Chinese Academy of Agricultural Science to sequence one million plant and animal genomes, as well as the [Smithsonian Institute's](#) ambition to "capture and catalog all the DNA from the world's flora and fauna".

In 2026, there is no evidence that DSI use has yet reached this projected scale of data generation and computing demand. However, the idea that digital infrastructure is an essential dimension of the future of medicine is increasingly being recognised. According to a [blog post](#) in *Frontline Genomics*, "with billions of data points being produced in shorter time scales, robust infrastructure is key, alongside responsible data protection principles." A similar message comes from the [2025 McKinsey report](#) on boosting biopharma R&D performance with a next-generation technology stack. With three billion bases making up each "human puzzle", genomic information is "[Big Data among Big Data](#)". Databases of the size being forecast will require significant infrastructure to support them. These demands will need to be considered alongside broader debates around the future of artificial intelligence, which will also compete for digital infrastructure.

The use of DSI for gene editing is also part of wider debates around Genetically Modified Organisms (GMO). While offering potential benefits for agricultural productivity and resilience, GMOs still raise concerns around health impacts and broader unintended consequences on the environment. NGOs have also called for more independent, long-term research into potential impacts. Public perceptions of biotechnology are also reflected in popular culture. Numerous cultural references portray genetic technologies through dystopian or disaster scenarios, such as *Jurassic Park* or *I Am Legend*. These references illustrate how bioethics and genetic manipulation have become part of wider public and societal debate.

This first section has set out what DSI is and how it can be used. It has highlighted the growing role of DSI in healthcare, biotechnology, agriculture and sustainability-related applications, while also demonstrating how advances in sequencing, data analytics and artificial intelligence are accelerating scientific discovery. It has shown how research and innovation can depend on genetic diversity, reinforcing the importance of biodiversity protection. As the use of DSI expands, questions relating to governance, data stewardship, transparency and benefit-sharing are becoming increasingly important. These developments provide a natural foundation for understanding the regulatory and policy considerations discussed in the next section, including benefit-sharing frameworks and the Cali Fund.

Chapter 2

Anticipating the Regulatory Risks Linked to DSI

This section builds on the previous section's analysis of the commercial relevance of DSI to further explore its position within mechanisms designed to support the fair and equitable sharing of benefits derived from the use of biodiversity and genetic resources. It starts by highlighting the importance of benefit-sharing as a key objective of the UN CBD and then outlines the existing frameworks provided by the Nagoya Protocol and the Global Biodiversity Framework. It explains why the digitisation and open sharing of genetic information creates challenges for existing approaches to fair and equitable benefit-sharing, and why a multilateral mechanism was developed in response.

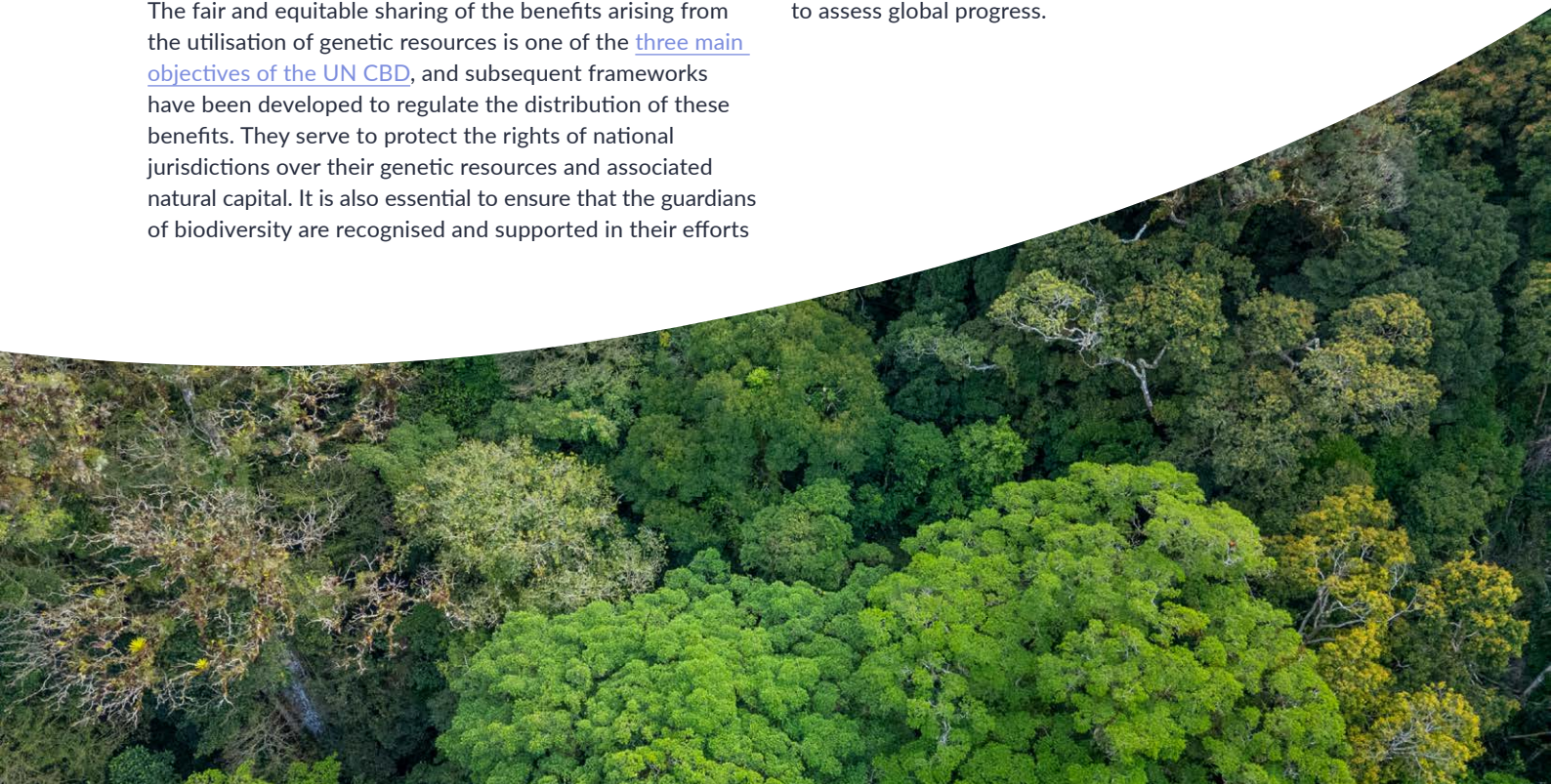
The section then introduces the Cali Fund under the Multilateral Mechanism for the Fair and Equitable Sharing of Benefits from the Use of Digital Sequence Information on Genetic Resources, explaining their objectives and current modalities. From there, it considers the reasons why companies may contribute to the Fund, as well as the challenges they may face in considering to do so, providing initial insights to inform investor engagement with companies and policymakers.

2.1 Benefit-sharing as an Essential Dimension of the Global Biodiversity Goals

The fair and equitable sharing of the benefits arising from the utilisation of genetic resources is one of the [three main objectives of the UN CBD](#), and subsequent frameworks have been developed to regulate the distribution of these benefits. They serve to protect the rights of national jurisdictions over their genetic resources and associated natural capital. It is also essential to ensure that the guardians of biodiversity are recognised and supported in their efforts

to conserve and protect genetic diversity, recognising the importance of ancestral knowledge passed down over generations. Effective benefit-sharing, therefore, helps to ensure that conservation and sustainable use, the other two core UN CBD objectives, are upheld over the long term.

This section provides a brief overview of the history of access and benefit-sharing (ABS) under the UN CBD over the past 25 years, including how the Nagoya Protocol operates, recent progress on its implementation, and opportunities to strengthen current ABS mechanisms. It then examines how ABS is integrated into the GBF and its targets, drawing on the draft [Global Report](#) of June 2026 to assess global progress.



2.1.1 Access and Benefit-sharing under the UN CBD and the Nagoya Protocol

The fair and equitable sharing of benefits is one of the fundamental objectives of the CBD, set out in Article 1 of the [Convention](#), with a further framework for its implementation set out in Article 15. The [Nagoya Protocol](#) on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation was developed between 2005 and 2010, adopted at the CBD COP10 and officially entered into force in 2014. The aim of the Nagoya Protocol is to create greater legal certainty and transparency for both providers and users of genetic resources and to create incentives to conserve and sustainably use genetic resources, enhancing the contribution of biodiversity to development and human wellbeing. More detailed information on how it operates in practice is provided in Box 5 below.

The Nagoya Protocol also creates a legal framework to combat biopiracy, which can occur when biological resources are used without official authorisation and without appropriate recognition of, or benefit-sharing with, the communities and lands from which they originate. Biopiracy undermines the sovereign rights of States over their natural resources and can also affect the traditional knowledge relating to biodiversity held by Indigenous Peoples and local communities.

As of 2026, the Nagoya Protocol has 142 Parties. Of these, 110 Parties have national requirements in place, including legislative, administrative and policy measures relating to access and benefit-sharing. A 2026 [legal-industry review](#) of the first full round of national ABS reports found that only 22 of the 103 reporting countries had received any benefit-sharing revenue, with a combined total of only around US\$54 million collected across all Parties since 2014. That is negligible next to Target 19 of the Global Biodiversity Framework, under which governments agreed in 2022 to mobilise at least US\$200 billion per year for biodiversity by 2030.

This section has highlighted the importance of benefit-sharing as an essential objective of the UN CBD, delivered through the Nagoya Protocol as a means of creating economic incentives for the protection of biodiversity. It has also explored the implementation and the outcomes of the Protocol. The next section will focus on how ABS elements are integrated in the goals and targets of the GBF.

BOX 5

HOW DOES THE NAGOYA PROTOCOL OPERATE IN PRACTICE?

The Nagoya Protocol is implemented in each individual country according to national ABS regulations, where such regulations have been established, although this is not mandatory. The [protocol](#) applies to genetic resources that are covered by the CBD, and to the benefits arising from their utilisation. It includes, on the one hand, the provider-country rules on access, prior informed consent, and, on the other, benefit-sharing from user-country compliance measures applicable to persons or companies within the user's jurisdiction. The Nagoya Protocol also covers traditional knowledge associated with genetic resources that are covered by the CBD and the benefits arising from its utilisation.

As an example, anyone seeking to access genetic resources from Kenya must obtain a permit from the National Environment Management Authority (NEMA). This permit outlines the terms and conditions for access. Users of genetic resources or traditional knowledge must negotiate Benefit-Sharing Agreements (BSAs) with providers. These agreements define how benefits will be shared, which may include financial benefits, technology transfer, and capacity-building. Users must also obtain Prior Informed Consent from the provider community or individual before accessing genetic resources or traditional knowledge.

2.1.2 Benefit-sharing Goals and Target in the Global Biodiversity Framework

Access and benefit-sharing from the utilisation of genetic resources, associated traditional knowledge and digital sequence information, is a core part of the Global Biodiversity Framework. It is mentioned in Goal C of the Framework, which expresses the aim of ensuring fair and equitable sharing of monetary and non-monetary benefits from the use of genetic resources and traditional knowledge. They are also reflected in Target 13, Target 15c and Target 19d. See Box 6 below for information taken from the GBF these targets and the integration of ABS wording.

It is important to note that scientists have reported that several CBD Parties explicitly stated that international benefit-sharing from DSI was a precondition for reaching political consensus on the Global Biodiversity Framework (Scholz *et. al*, 2022).

The CBD draft [Global Report](#) on Collective Progress provides an overview of progress in implementing the GBF. However, progress is still off track to meet the full ambition of its goals and targets. For Target 13, the majority of Parties (75%) are assessed as making mid-level progress, with many

in the early stages of implementation. Most Parties have a significant shortfall in the scope of the national targets compared with the ambitions set out in Target 15. In particular, only 19% of reporting Parties addressed the element of Target 15c on access and benefit-sharing regulations and measures. Target 19 fares worse, with insufficient progress and a high likelihood that the 2025 finance milestone will not be achieved. Only 34% of reporting Parties addressed Target 19d, which relates to stimulating innovative schemes including through benefit-sharing mechanisms.

This section has highlighted the importance of fair and equitable benefit-sharing under the CBD and GBF and has explored how ABS has been incorporated into global governance frameworks and systems. But does this system continue to operate and remain fit for purpose in the digital era?

The next section will examine more closely how ABS mechanisms are being challenged and reshaped in the era of digitisation and open access to data, with a focus on specific mechanisms – including the Cali Fund – designed to support this transition.

BOX 6

MENTIONS OF BENEFIT-SHARING IN THE GBF

Goal C: The monetary and non-monetary benefits from the utilisation of genetic resources and digital sequence information on genetic resources, and of traditional knowledge associated with genetic resources, as applicable, are shared fairly and equitably, including, as appropriate with Indigenous Peoples and local communities, and substantially increased by 2050, while ensuring traditional knowledge associated with genetic resources is appropriately protected, thereby contributing to the conservation and sustainable use of biodiversity, in accordance with internationally agreed access and benefit-sharing instruments.

Target 13: Take effective legal, policy, administrative and capacity-building measures at all levels, as appropriate, to ensure the fair and equitable sharing of benefits that arise from the utilisation of genetic resources and from digital sequence information on genetic resources, as well as traditional knowledge associated with genetic resources, and facilitating appropriate access to genetic resources, and by 2030, facilitating a significant increase of the benefits shared, in accordance with applicable international access and benefit-sharing instruments.

Target 15c: Take legal, administrative or policy measures to encourage and enable business, and in particular to ensure that large and transnational companies and financial institutions report on compliance with access and benefit-sharing regulations and measures, as applicable.

Target 19d: [“Substantially and progressively increase the level of financial resources from all sources by]. Stimulating innovative schemes such as payment for ecosystem services, green bonds, biodiversity offsets and credits, benefit-sharing mechanisms, with environmental and social safeguards.

2.2 Benefit-sharing in the Digital Era: Why the Multilateral Mechanism is Needed

This section will explain the difficulties that followed the emergence of DSI, and the digitisation and widespread sharing of genetic information, and why the Cali Fund, under a Multilateral Mechanism, was developed in response. It will start by exploring the architecture of public databases as the backbone of the open access system, which supports innovation by making data widely accessible but also creates challenges for traceability and benefit-sharing.

Building on the information presented in Section 2.1, this section will present the Cali Fund's objectives and key modalities as a response to these identified challenges. This will provide the basis for the following section's analysis of the reasons for, and potential challenges associated with, company contributions to the Fund.

2.2.1 DSI Public Databases Architecture and Open Access System

The [combined study on DSI in public and private databases and traceability](#), mandated by the CBD in 2018, is a key source for understanding the architecture of DSI data systems and some of the traceability and benefit-sharing challenges that later informed the development of the

Multilateral Mechanism and the Cali Fund. The study explains how three public databases – the National Center for Biotechnology Information ([NCBI](#)) in the US, the European Bioinformatics Institute ([EMBL-EBI](#)), and the DNA Data Bank of Japan ([DDBJ](#)) – constitute the International Nucleotide Sequence Database Collaboration ([INSDC](#)), forming a connected and open network of archives, search tools, workspaces, external sources and analysis tools. This is illustrated in Figure 5 below.

At the time of the study, 1,600 biological public databases were categorised and summarised in the [Nucleic Acids Research](#) (NAR) database issue. Among them, 743 are qualified Nucleotide Sequence Data (NSD) databases, of which 95% directly link to or download NSD from the INSDC. In 2018, the CBD study did not identify private commercial databases, only private databases for internal use, notably within companies. The lack of commercial databases was attributed, as one possible explanation, to an unprofitable business model. In 2026, an emerging development is the growth of “AI Labs”, such as [Biohub](#), [Basecamp](#), [Evo2](#), [XetaBase](#), and [Isomorphic Labs](#), suggesting that value may lie not only in access to data itself, but also in the computational power and data intelligence used to analyse it.

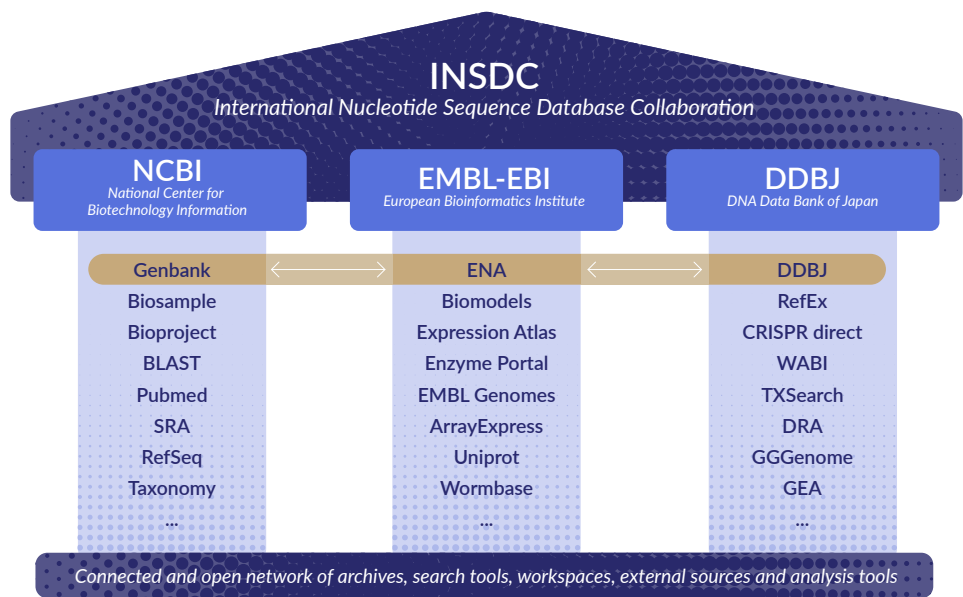


Figure 5: International DSI public databases architecture
Source: Rohden et. al. (2020)

The study explains the open-source model of the INSDC, ensuring that access to these databases is free, unrestricted, and permanent. The INSDC 2016 policy notes that “the core of the INSDC policy is maintaining public access to the global archives of nucleotide data generated in publicly funded experiments. A key instrument for this is submission as a pre-requisite for publication in scholarly journals, (...)”. Moreover, access to these databases does not usually require an account or registration to view or download information. The study notes that the availability of nucleotide sequence data (NSD) to the broader public, with an estimated 10-15 million users, has been unconditionally free.

There is limited visibility into who accesses DSI databases and for what purpose. There is also limited information on the country of origin of the available genetic material. In 2018, over 40% of submitted entries included a country of origin. This proportion was expected to increase, according to the authors of the CBD study, particularly following the introduction of country of origin as a required field in 2011. The study explains that this is a matter of training scientists and stronger enforcement of this requirement by database operators.

The architecture of public DSI databases, therefore, helps explain both the need for a new benefit-sharing system for the digital era and the importance of preserving open access to data. For governments, the challenge is to strengthen traceability and benefit-sharing; for companies, a multilater-

al system can help maintain the stability and accessibility of the existing data infrastructure, while providing a predictable, transparent and practical mechanism for benefit-sharing. The question of how DSI databases evolve is a key part of the Cali Fund development process, and several options are being explored by the CBD Secretariat and the Global Biodiversity Information Facility (GBIF), as detailed in Box 7 below.

The FfB DSI Investor Group learned that products and patents resulting from DSI use may draw on genetic information from multiple sources and countries, adding a further layer of complexity for traceability and benefit-sharing. Value from DSI use often arises from screening and comparing large datasets, applying computational methods and validating selected findings using physical material. This is why open access matters so much and why a bilateral tracking model could be difficult to apply to modern DSI-based research. Even where provenance metadata exists, it may be impracticable to attribute the value of a product to every sequence or provider country involved.

Despite these difficulties, there is a consensus among stakeholders — scientists, companies, policymakers and medical professionals — that open access to DSI is a common good that should be preserved. In this context, the Multilateral Mechanism aims to both to preserve free and open access to DSI and to ensure fair and equitable benefit-sharing.

BOX 7

DEVELOPMENTS REGARDING THE EVOLUTION OF DSI PUBLIC DATABASES

The evolution of the current database architecture to improve transparency, traceability, and benefit-sharing, could be shaped in part by the following developments:

- **From the CBD Secretariat:** In Decision 16/2 on the adoption of the Cali Fund, Parties decided to further explore possible new tools and models, such as databases, for making digital sequence information on genetic resources publicly available and accessible in a transparent and accountable manner to all Parties. A public consultation was launched by the CBD Secretariat on the topic in 2025, to inform discussions at the upcoming COP17.
- **From the Global Biodiversity Information Facility (GBIF):** In August 2026, the GBIF [announced](#) the availability of nucleotide sequence search on its platform, giving users a sequence-based way to access GBIF’s data. Using the ‘sequence similarity’ filter in the occurrence search tool, users can search for nucleotide sequences of up to 2,048 base pairs to explore spatial diversity patterns. This functionality can be combined with additional filters such as target gene and sequence length.

2.2.2 The Cali Fund and the Multilateral Mechanism on Benefit-sharing

This section provides an overview of both the Multilateral Mechanism on benefit-sharing (MLM) and the Cali Fund, which were developed to address the difficulties arising from the emergence of DSI as part of the digitalisation of genetic information. It explains how the Cali Fund acts as the financial engine of the Multilateral Mechanism and presents their modalities.

The MLM has its origins in Article 10 of the Nagoya Protocol, which states that Parties should consider the need for, and modalities of, a global multilateral benefit-sharing mechanism to address cases where the use of genetic resources occurs in transboundary situations or where it is not possible to grant or obtain prior informed consent. The MLM has been under negotiation since [COP Decision 15/9](#), and under the UN CBD [Decision 16/2](#), indicative modalities for operationalising the Multilateral Mechanism were further developed, including on the funding process and implementation.

The Cali Fund has been developed as the enabling financial engine of the Multilateral Mechanism for the Fair and Equitable Sharing of Benefits from the Use of Digital Sequence Information on Genetic Resources. A specific approach was

required for DSI because the rules for accessing this genetic information were described as “generally unclear” ([Scholz *et al.*, 2022](#)), given that it is held in online open-access databases, disconnected from physical access and accompanying permits. This situation led some biodiversity-rich countries to consider that their sovereign rights were being undermined. Scholz *et al.* (2022) also explain that the emergence of DSI was “perceived as a loophole that inhibits fair and equitable benefit-sharing”.

The Cali Fund therefore helps to advance the benefit-sharing objective of the Nagoya Protocol by providing a structure for fair and equitable benefit-sharing from the use of DSI, with a predictable stream of funds. It is intended to receive contributions from businesses and institutions that benefit commercially from DSI and to direct funding towards developing countries, countries with economies in transition, and Indigenous Peoples and local communities. It should be noted that, the Multilateral Mechanism applies to digital sequence information on genetic resources that has been made publicly available and is not otherwise regulated. In addition to a list of indicative sectors (see Section 1.2.1), a set of contribution thresholds and expectations has also been defined to guide companies and Parties in their engagement with the Cali Fund, which are detailed in Box 8 below.

BOX 8

CONTRIBUTION THRESHOLDS AND EXPECTATIONS FROM DSI USERS TO THE CALI FUND

To ensure proportionality, only large entities, as defined by clear financial thresholds, are expected to contribute. An entity is considered “large” if it meets two out of the following three criteria, averaged over the past three years:

- Total assets of at least US\$20 million;
- Annual revenue of at least US\$50 million; or
- Annual profit of at least US\$5 million.

This ensures that contributions come from entities with the capacity to pay, and that smaller players, including start-ups and research-based innovators, are not unduly burdened.

Large entities have the flexibility to choose the indicative contribution model that works best for their business:

- 1% of annual profit or
- 0.1% of annual revenue

These are considered to be predictable, low-burden models, aiming to make it straightforward for entities to plan, report and communicate.

The Cali Fund will receive payments from in-scope entities and institutions ('money-in') and distribute these funds ('money-out') to developing countries and those with economies in transition, as well as Indigenous Peoples and local communities in both developing and, where appropriate, developed countries. An [Ad-Hoc Technical Expert Group on Allocation Methodology](#) (AHTEG) has been established to develop an allocation methodology for distributing funding to eligible Party governments. This formula will be considered by the COP at its seventeenth meeting.

The formula will be developed using the list of criteria for funding allocation within Decision 16/2. The list is as follows:

- a. Biodiversity richness and other biodiversity-related criteria for which data are readily available at a national level;
- b. The geographical origin of the genetic resources from which DSI in the database was derived;
- c. Capacity needs for the conservation and sustainable use of biodiversity, taking into account the circumstances of developing country Parties, in particular the least developed countries and small island developing States, Parties with economies in transition and Indigenous Peoples and local communities.

This formula will aim to provide transparency on the use of funds and ensure support for actions that maximise conservation impact on the ground, with visible and credible evidence of impact and robust governance. Moreover, as per Decision 16/2, at least 50% of the Cali Fund's resources are earmarked specifically for the self-identified needs of Indigenous Peoples and local communities, including women and youth.

The Cali Fund marks an important step in operationalising the CBD MLM and increasing the transparency of contributions and fund allocations arising from the use of genetic information in the digital era. Further development of its modalities will be a key topic of discussion at COP17, particularly in relation to incentivising contributions, as explored in the following section.

2.3 Reasons and Challenges for Companies to Contribute to the Cali Fund

The Cali Fund aims to support the fair and equitable sharing of benefits from genetic resources in the digital era, while maintaining open access to data. Its success could help sustain innovation in key areas such as human health and the sustainability transition. Companies need visibility and stability around data access, but also around compliance rules.

Two years after its establishment at UN CBD COP16, the Cali Fund is being operationalised by the Parties and key stakeholders. The members of the FfB DSI Investor Group

have been following this process and have interacted with governments, companies, and experts to gather insights into the reasons why companies may contribute, as well as the challenges they may face in considering whether to do so. These insights will be presented in this section and inform the recommendations set out in Section 4 of the report.

2.3.1 Overview of Potential Reasons for Companies to Contribute to the Cali Fund

Across this publication, three main sets of reasons have emerged that can help understand the motivation for companies to contribute to the Cali Fund:

- 1. Nature-related dependency** — Genetic diversity is a source of innovation and added value that can be understood as a dependency. A [central estimate](#) suggests that tropical forests could hold US\$714 billion in undiscovered pharmaceutical value. The [vast majority](#) of species on Earth and in the ocean still await description. Overall, companies have an interest and responsibility in protecting biodiversity so that they can continue to learn from nature and draw on the genetic diversity that underpins research and innovation.
- 2. Threat to innovation linked to data access and regulatory risk** — DSI data can accelerate research and innovation across economic sectors, but continued open access to public data — alongside practices that rely on privately held data — needs to be underpinned by fair and equitable benefit-sharing practices that recognise the role of countries, Indigenous Peoples and local communities in stewarding biodiversity, and that are suited to the digital era. Otherwise, the multiplication of national laws on DSI and the reshaping of international data architecture could increase regulatory complexity for all stakeholders and potentially affect existing research and innovation processes.
- 3. Reputational benefits** — Biodiversity is the foundation of economic stability and prosperity, and contributing to the Cali Fund can constitute a meaningful contribution to global sustainability goals. Such contributions to biodiversity protection via a legitimate UN organisation can help generate reputational benefits for companies.

This set of identified reasons for companies to contribute is neither exhaustive nor authoritative. It reflects only the interpretation of the FfB DSI Investor Group.

It is important to recognise that these potential reasons for DSI users to contribute to the Cali Fund are dependent on the prospect of a credible route to the recognition of compliance, and protection against duplicative monetary demands. Uncertainties around the Multilateral Mechanism modalities, as of 2026, are explained in Section 2.3.3.

2.3.2 Focus on Open Access to Data and Regulatory Stability

Among these reasons to contribute, ensuring open data access and navigating regulatory risk may be the most urgent and financially material. The previous section explored how the Cali Fund can help maintain open access within the current international data architecture and how authorities are exploring changes to improve traceability and benefit-sharing. Here, the focus shifts to the second dimension of the current uncertainties that the Cali Fund seeks to address: the emergence of national laws and regulations on DSI.

Due to the growing importance of DSI in research and innovation across economic sectors, as established in Section 1, governments are increasingly developing legislative and regulatory approaches to ensure fair and equitable benefit-sharing — including through bilateral systems of agreements (see Box 9 below).

BOX 9

SOME EXAMPLES OF EXISTING NATIONAL LAWS ON BENEFIT-SHARING FROM DSI USE

- **Brazil** — Under Brazil's new ABS regulations, released in 2015, benefit-sharing conditions are triggered if access to genetic heritage or associated traditional knowledge leads to the commercialisation of a final product and if such access adds significant value to that product. Monetary benefits are set at 1% of the net revenue from the sales of the final product. Non-monetary benefits are set at 0.75% of the net revenue from the sales of the final product.
- **India** — Under India's Biological Diversity Act (2002), its 2023 Amendment and subsequent Regulations of 2024 and 2025, approval from the National Biodiversity Authority is required for the commercialisation of intellectual property rights for any invention based on DSI acquired from India. Users of DSI will now be liable to pay the benefit-sharing amount for *each* of the prescribed activities, with the amount payable linked to annual turnover (as a percentage of the annual gross ex-factory sale price of the product).

A multiplication of uncoordinated national laws could be complex to manage in the context of digital genetic information for the reasons outlined earlier in this document: 1) DSI use appears early on in research processes, mostly through screening material before it is selected for further development; and 2) DSI use can involve genetic information

originating from multiple countries within a single research process. This is compounded by limited traceability of the underlying genetic resources and unrestricted access to DSI data in public databases (discussed in Section 2.2.1). These challenges illustrate why a multilateral mechanism is needed and why clarity on its modalities and benefit-sharing expectations will be essential for its success.

2.3.3 Uncertainties Around the Multilateral Mechanism

The success of the Cali Fund could help reduce the risk of companies having to monitor and comply with uncoordinated national laws on DSI and benefit-sharing. This is why defining the purpose of the certificates that will be issued by the Cali Fund Secretariat, when a contribution is made by a company, is so important, as it is intended to provide greater clarity around monetary benefit-sharing expectations under the Multilateral Mechanism. However, this move towards a multilateral mechanism will depend in part on greater alignment between national measures and the Cali Fund, particularly to avoid duplicative or overlapping benefit-sharing requirements.

A key initiative supporting regulatory alignment is the group of countries called 'Friends of the Cali Fund'. In a [government joint statement](#) published in July 2026, they noted that achieving success will require “addressing key elements, such as encouraging the alignment of national measures on access to and benefit-sharing from the use of DSI with the Multilateral Mechanism, to avoid duplication of expectations of benefit-sharing (...).”

The uncertainty regarding the coherence of benefit-sharing contributions creates a risk commonly referred to as the “stacking of obligations”. It is a key issue for the modalities of the Multilateral Mechanism, which, if not addressed, could create uncertainty for companies considering contributions. Beyond national jurisdictions, similar questions arise in relation to other multilateral bodies that are also developing approaches to DSI-related contributions. These include the [Pandemic Agreement](#), the [International Plant Treaty](#), and the [High Seas Treaty](#). Together, these developments underline the growing international focus on how benefits arising from DSI should be shared fairly and equitably.

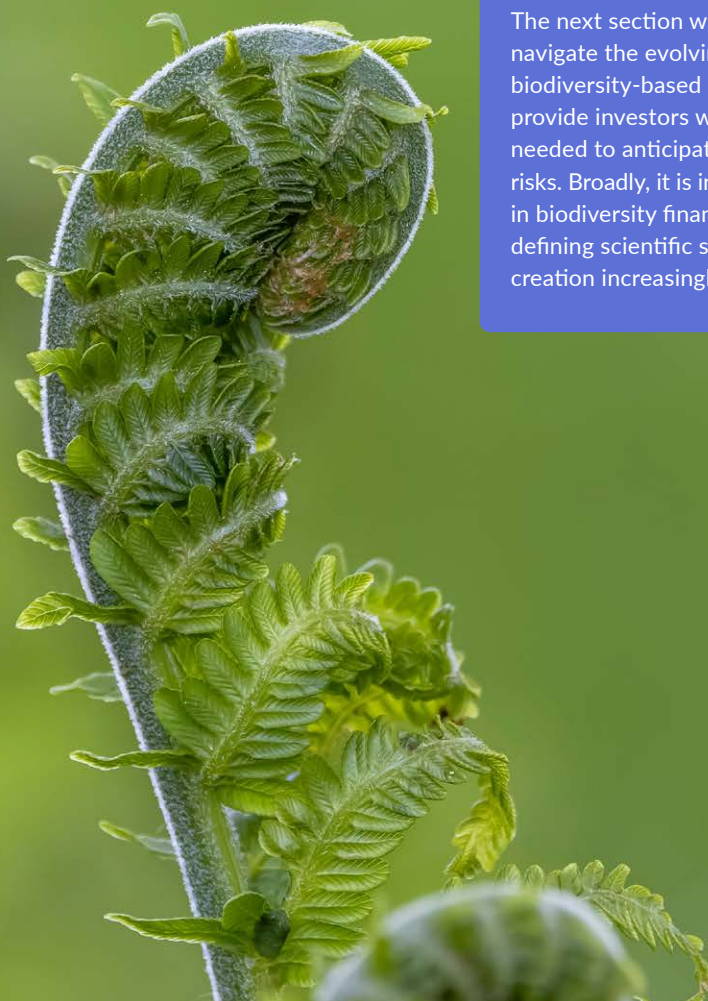
Another identified challenge for mobilising company contributions to the Cali Fund, is the lack of consideration of “DSI intensity” in the contribution rates. This means that whether a company generates 5% or 95% of its revenue based on the use of DSI does not influence its recommended contribution rate. This differs from common technology licenses. It could therefore be perceived as a potential disincentive for some companies to enter biodiversity-based research, with possible implications for innovation and sustainability. This is a key

issue for consideration as part of the evolving modalities of the Multilateral Mechanism that the FfB Foundation raised in its feedback to the CBD draft study on private sector contributions (July 2026).

A related uncertainty sits upstream of DSI intensity: Decision 16/2 asks entities that 'directly or indirectly' benefit from DSI to contribute, without specifying where indirect benefit ends. For example, it is unclear whether a company that purchases an ingredient developed using a supplier's DSI-based R&D is itself in scope. Clarifying this eligibility threshold is a prerequisite for a workable tranche or intensity-based approach, since a rate structure is only as clear as the population of contributors to which it applies to.

This section has explored the links between DSI, benefit-sharing, and the Cali Fund. It has highlighted the difficulties of ensuring the fair and equitable sharing of benefits from genetic resources in the digital era, which are a source of emerging legal risks for companies and investors. In this context, a Multilateral Mechanism can help preserve innovation and societal progress arising from DSI use, notably for human health and sustainability, while safeguarding open access to data and enabling fair and equitable benefit-sharing with countries, Indigenous Peoples and local communities. The goal is to support biodiversity conservation and provide regulatory stability for DSI users. However, this section has also highlighted key challenges, including the risks of stacking obligations, the need to consider proportionality in relation to the contribution of DSI to revenue generation, and the importance of ensuring a transparent and fair disbursement of funds. As the Multilateral Mechanism modalities are still under development, the FfB DSI Investor Group has developed a set of recommendations to support the success of the Cali Fund, which are set out in Section 4.

The next section will focus on helping investors navigate the evolving landscape of benefit-sharing, biodiversity-based research, and DSI use. It will provide investors with the knowledge and tools needed to anticipate macro-trends and transition risks. Broadly, it is intended to help investors involved in biodiversity finance prepare for a potentially defining scientific shift in which innovation and value creation increasingly draw on biological diversity.



Chapter 3

A Snapshot of How to Assess and Engage with Companies

This section is intended to guide interested investors in putting into practice the insights gathered on DSI in the previous sections, starting with an assessment of exposure and then moving to potential company engagement. It will provide investors with a basis for anticipating the macro-trends identified in Section 1, while also helping them prepare for the transition risks – stemming from market shifts in the context of the transition to a sustainable economy – and the regulatory developments that could affect companies’ activities, as explained in Section 2.

This section will focus on company identification and maturity, available tools and data, and early-stage questions for company engagement. The aim is not yet to build the materiality case for DSI, but to help investors develop their own assessment of the importance of this input for research and innovation across economic sectors and in the context of biodiversity finance. It will enable them to use available information on DSI and investigate further according to their individual portfolios and priorities.

3.1 Building the Case for Investor Engagement on DSI

Investors engaging with companies on sustainability issues need to carefully select the topics they prioritise, ensuring alignment with their global strategies while also recognising the practical limits on the number of issues that can be addressed effectively at any one time. Such limitations reflect constraints on knowledge and capacity, the time available for companies to participate in meetings, and reporting capacity. An efficient engagement strategy is focused, strategically integrated and requires time to deliver concrete outcomes that support change in the real economy.

To include a new topic in a sustainability engagement strategy, investors need to be well informed about it and convinced of its materiality – meaning its environmental and financial relevance based on their own exposure to relevant economic sectors, companies, and products. This section will present the current level of investor

maturity identified through the project and develop an “Engagement Starter Rationale” to help biodiversity-minded investors assess the case for integrating DSI into their strategies, notably by linking it to existing references, including the GBF, the Taskforce on Nature-related Financial Disclosures (TNFD), and Nature Action 100 (NA100).

3.1.1 Market Maturity on DSI

In 2026, the FfB DSI Investor Group gathered a small number of financial institutions to explore the topic of DSI and the Cali Fund. Through these discussions, investors demonstrated growing interest in the transformative potential of DSI – notably for innovations supporting more sustainable industrial processes and human health, as well as its implications for biodiversity protection. A growing number of investors are investing in, and paying attention to, the emergence of artificial intelligence and its potential impact on the environment. This provides another angle from which to consider DSI as an emerging source of both opportunity and risk across various economic sectors.

Investors face limited information with which to assess and manage the opportunities, risks, and implications linked to the emerging use of DSI and, more broadly, benefit-sharing. For example, the [2026 Company Benchmark](#) from the Nature Action 100 global investor engagement initiative reveals that only two companies of the 100 companies assessed had a commitment to equitable benefit-sharing, as shown in Figure 6.



Figure 6: Nature Action 100 Company Benchmark on Commitment to equitable benefit-sharing
Source: Nature Action 100 Company Benchmark (2026)

3.1.2 DSI in Biodiversity Finance Strategies Beyond Engagement

It is important to note that this investor assessment of DSI has been developed in the context of the FfB DSI Investor Group, focusing on large organisations investing in both listed equities and debt markets, with a primary focus on their engagement strategies with mainstream companies. Beyond engagement, DSI may be relevant to biodiversity finance strategies through both investment in DSI-enabled solutions and the use of DSI-based tools to support biodiversity assessment and decision-making. Box 10 provides more information on initiatives using DNA and genetic resources for biomonitoring. These examples illustrate how understanding DSI can form part of a broader biodiversity finance strategy.

The capital allocation dimension — towards companies developing sustainable innovations using DSI — should not only focus on publicly listed mainstream companies, but also on innovative small companies financed through private equity and private debt. This would help capture the role of startups, laboratories, and artificial intelligence companies that form an important part of the DSI supply chain. A list of start-ups working on Digital Health & AI in Life Sciences can be found via the [TUM Venture Lab](#), which supports early-stage ventures from research and hypothesis development to commercialisation and real-world impact. A list of AI Labs is also available, in Section 2.2.1 of this publication. The private equity sector was outside the scope of the FfB DSI Investor Group at this stage, notably because only large entities are within the scope of the Cali Fund. However, it constitutes an important part of the wider DSI investment landscape and warrants further exploration with financial institutions.

BOX 10

EXAMPLES OF INITIATIVES DEVELOPING THE USE OF GENETIC RESOURCES FOR BIOMONITORING

- **International Barcode of Life (iBOL)** — A research alliance involving countries seeking to transform biodiversity science by building DNA barcode reference libraries, sequencing facilities, informatics platforms, analytical protocols, and international collaboration required to inventory and assess biodiversity.
- **Biodiversity Genomics Europe Plus (BGE+)** — By combining DNA-based technologies with taxonomic expertise, BGE+ aims to generate the knowledge needed to understand, protect, and sustainably manage biodiversity.

Beyond benefit-sharing itself, it is also essential to consider the relevance of DSI for sustainability strategies across different economic sectors. The level of data and computational infrastructure required to support DSI means it should form part of the growing sustainability focus on artificial intelligence and the technology sector, as explained in Section 1. DSI also carries significant potential for sustainability innovation, making it relevant for consideration within engagement strategies focused on the transition of key economic sectors, including those within the scope of the Cali Fund, such as pharmaceuticals, chemicals, and agriculture.

3.1.3 DSI Engagement Starter Rationale

Through a literature review and discussions with experts, the FfB DSI Investor Group gathered insights into the growing importance of DSI use across economic sectors. A summary of this information can be found below, which provides investors with an overview of the key reasons to begin engaging with companies in their portfolios on this topic, and to further explore the potential financial and environmental materiality of DSI. Figure 7 below provides a synthetic view of the key available DSI-related information for investors.

In a nutshell, this emerging digital resource is generating innovation and added value, especially in the pharmaceuticals and biotechnology sectors, but also in support of the wider sustainability transition more generally. DSI also represents a dependency on genetic diversity as a source of added value, alongside growing regulatory risks linked to benefit-sharing mechanisms in the digital era, which the Cali Fund is intended to help address.



Key available DSI-related information for investors:

- **Mainstream economic opportunity:** The main objective for DSI use is to accelerate research by enabling genetic information to be screened and analysed digitally before laboratory testing. It is already part of the innovation strategies of a number of leading companies, has supported the development of well-known products (including COVID-19 vaccines), and contributed to advances recognised by the 2024 Nobel Prize in Chemistry through Google DeepMind's AlphaFold (see Box 4 in Section 1).
 - **Large sectoral scope:** DSI use has implications across a wide range of economic sectors, particularly those identified within the scope of the Cali Fund, including pharmaceuticals, biotechnology, nutraceuticals, cosmetics, animal and plant breeding, information and AI, etc.
 - **Technological relevance:** The practices and tools related to DSI are already in place, with the cost of genome sequencing having fallen 181,000-fold in 20 years.
- **Potential positive impacts:** Potential benefits for human health include personalised disease diagnosis, drug discovery, and support for synthetic biology practices. Examples of sustainability applications include enzymes to reduce water and energy use in industrial processes, the development of crops resilient to climate change, and the identification of wild species in commercial products. Potential applications will continue to emerge as part of research and innovation processes.
- **Potential negative impacts:** One potential source of environmental pressure associated with DSI comes from the computing power needed for data analysis. As with other data-intensive processes, DSI-related activities can require energy and water for computing and data infrastructure.
- **Dependency on genetic diversity:** DSI users are dependent on the value and bio-based innovation potential contained within genetic materials. [70%](#) of current antibiotics and cancer treatments are derived from natural organisms. Tropical forests could hold around [US\\$714 billion](#) in undiscovered pharmaceutical value. The [vast majority](#) of species on Earth and in the ocean still await description, meaning that much of biodiversity – and its potential value for future research and innovation – remains unexplored. Companies therefore have an interest in preserving nature so they can continue to learn and benefit from it.
- **Regulatory transition risks and/or opportunities:** The emergence of DSI could have wide-ranging implications for society, attracting growing scrutiny and action from policymakers across the following dimensions:
 - **Genetic data open access:** A key dimension of DSI use is the current open access model across public databases. Tensions around benefit-sharing could challenge this model, tighten national regulations, and limit global innovation capacity.
 - **Benefit-Sharing compliance:** International agreements and potential national laws can shape benefit-sharing expectations regarding DSI in the future. The Cali Fund emerged as the financial engine of a multilateral mechanism designed to adapt benefit-sharing practices to the digital era, while supporting biodiversity conservation and the livelihoods of Indigenous Peoples and local communities as nature's guardians.
 - **Bioethics:** Increased capacity to edit genes means that international governance and ethical safeguards are essential to ensure responsible practices. Plans to sequence the genomes of vast numbers of people (a topic outside the scope of the CBD) will also call for civil society scrutiny.
- **Links to international frameworks:**
 - **Global Biodiversity Framework:** Goal C on benefit-sharing and Target 13 explicitly reference DSI, while Target 15c calls for disclosures on compliance with benefit-sharing requirements. Target 19 also refers to benefit-sharing mechanisms as part of innovative schemes for resource mobilisation.
 - **TNFD:** Recommendation that companies disclose a statement of how equitable access and benefit-sharing has been attained, particularly as it relates to Indigenous Peoples and local communities;
 - **GRI 101-3:** Reporting standard stating that an organisation shall describe the process to ensure compliance with access and benefit-sharing regulations and measures, and describe voluntary actions taken to advance access and benefit-sharing that are additional to legal obligations or when there are no regulations and measures.
 - **NA100:** General engagement expectations on benefit-sharing alongside sectoral engagement expectations for the pharmaceuticals, chemicals, and technology sectors.
 - Other multilateral bodies mentioning benefit-sharing from DSI use include the [Pandemic Agreement](#), the [International Plant Treaty](#), and the [High Seas Treaty](#).

Digital Sequence Information

Engagement starter rationale for investors

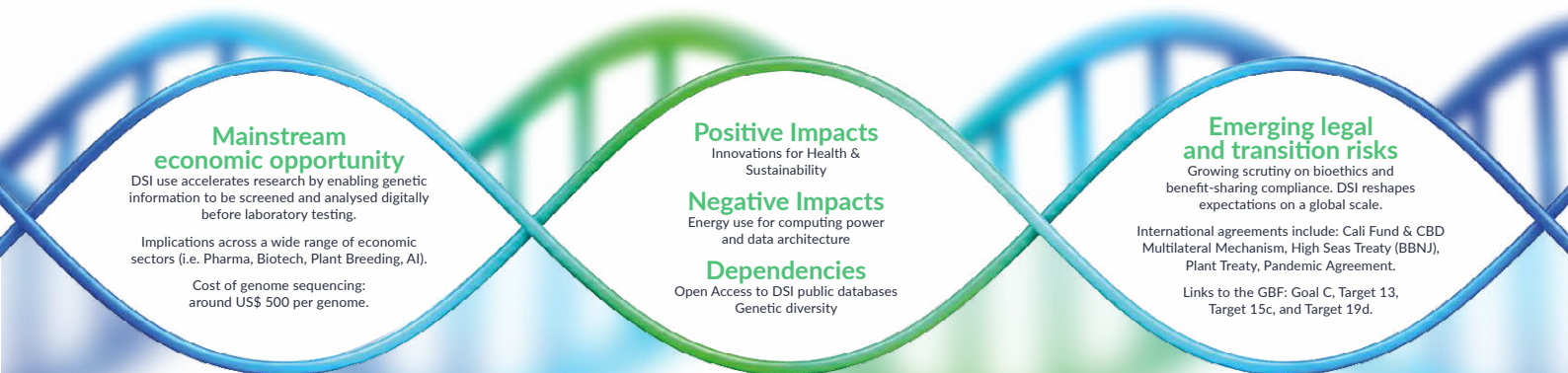


Figure 7: DSI Engagement Starter Rationale for Investors

Source: FfB Foundation (2026)

Against this backdrop, the topic of DSI is generating strong interest among FfB financial institutions in engaging with companies, as part of their biodiversity finance efforts and in anticipation of growing regulatory risks. It also has a capital allocation dimension, as DSI can support innovation and value creation linked to the sustainability transition, while connecting with existing biodiversity frameworks through the objective of fair and equitable benefit-sharing.

The next section will help investors take a first practical step by identifying which companies in their portfolios may use DSI, and understanding how relevant it is to their activities, before considering the development of an engagement strategy.

3.2 Identifying and Understanding DSI Exposure

Due to limited available information, identifying which companies to engage with is likely to be a significant challenge for investors. This section will present recommendations and tools to support investors in identifying priority companies within their portfolios, while also presenting

an initial approach to assessing company maturity and the relevance of DSI-related impacts, dependencies, risks, and opportunities. The recommendations will follow a funnel depicted in Table 2 below, moving from sector-level screening to the identification of individual companies.

3.2.1 Sectoral Screening

Investors' operations, especially the development of engagement strategies, tend to start with sector-level screening to identify potential portfolio exposure to sustainability issues. In the case of DSI, and regarding expected contributions to the Cali Fund, a list of indicative economic sectors is provided in Decision 16/2 adopted by Parties to the UN CBD.

In the report '[From global biodiversity commitments to local action: revenue potential and allocation dynamics of the Cali Fund](#)', Makowska-Curran developed estimates of the number of companies and median revenues, as featured in Section 1 of this report (see Table 1). Going further, the study then applied assumptions to sector-level and ownership-type participation rates, calibrated using a comparative analysis of the literature on voluntary schemes.

From	Sectoral Screening	Cali Fund scope of economic sector and depth of contributions potential
To	Companies Identification	Cali Fund, Announcements and Disclosures
To	Maturity Assessment	Market Associations, Patents Websites, Partnerships, Publications, Involvement in Cali Fund discussions

Table 2: Producing a DSI engagement company list

The result of these assumptions provides a more granular understanding of the relative importance of each economic sector for the success of the Cali Fund. The sectoral distribution of potential contributions to the Cali Fund — which is a voluntary scheme — varies depending on the compliance scenarios applied. The predominance of the pharmaceuticals and biotechnology sector remains across all scenarios. The role and participation of the “Information and Artificial Intelligence (AI)” sector varies most between the full eligible sample and the central compliance scenario. This suggests that participation from this sector may be particularly sensitive to the modalities of the Multilateral Mechanism. This can be seen in Figure 8 below.

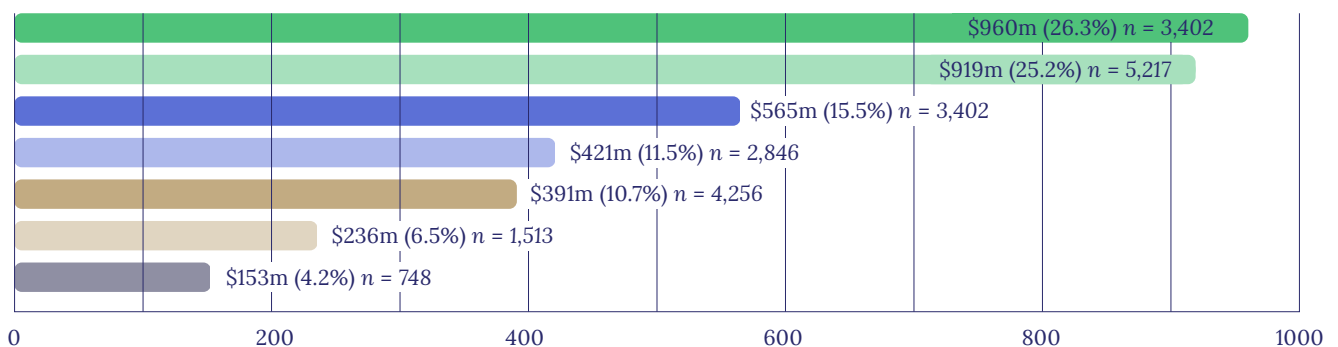
The study then provides further insights into the countries of origin of potential contributing companies, including by income group and region. It presents expectations of a highly concentrated contribution based across key jurisdictions: “China alone accounts for over a quarter of the total, and the top four jurisdictions (China, the United Kingdom, India, and Japan) together represent more than half.”

The first step of the identification funnel, sector-level screening in the context of the Cali Fund, highlights pharmaceuticals, information and AI, and biotechnology as key economic sectors, and Asia-Pacific and the Western Europe and Others Group (which includes Canada, Australia, and other countries) as key geographies. This step is not meant to exclude economic sectors, potential products, or geographies. It only aims to provide investors with a sense of priorities — both to understand their potential portfolio exposure to the transition risks emerging from the use of DSI, and from the establishment of the Cali Fund and the Multilateral Mechanism, and to start considering engagement activities.

3.2.2 Company Identification

Owing to the limited extent of company disclosures, identifying companies for which DSI may be relevant, and selecting those for potential engagement is likely to require careful research into a range of signals. The FfB DSI Investor Group gathered a number of practical insights through its learning process, including keywords to look for and relevant sources across patent websites, specialised media and blogs, academia and research, as detailed in Table 3 below.

S0: Full eligible sample



S3: Central scenario

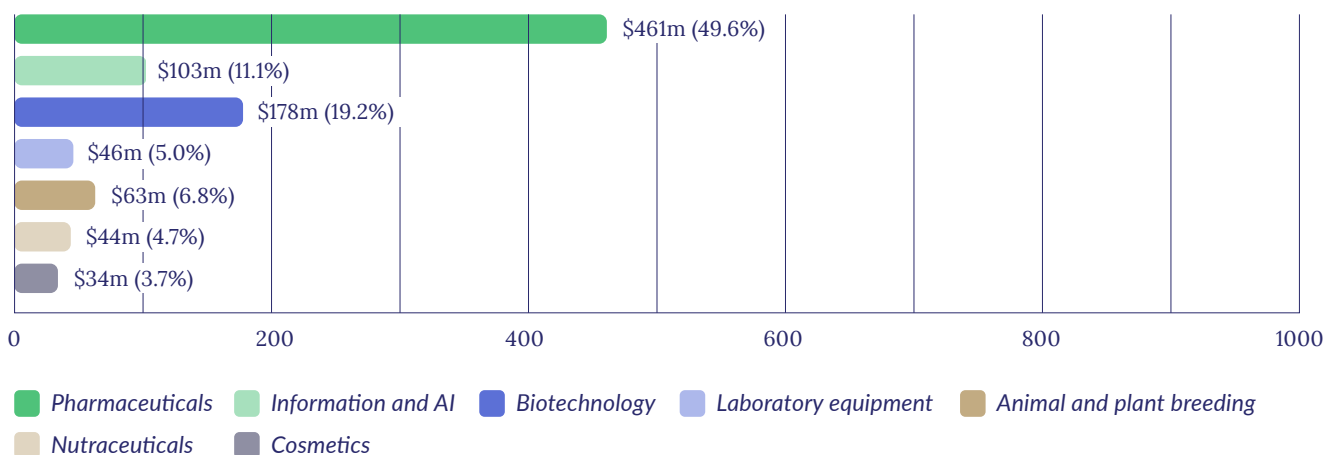


Figure 8: Sectoral distribution of total estimated contributions to the Cali Fund

Source: Makowska-Curran (2026). Notes: S3 central estimates are means of 10,000 Monte Carlo draws under calibrated sector participation (α), ownership (γ), and DSI intensity (ω) parameters.

Beyond these initial ideas for market research and company identification, the FfB Foundation recommends turning to the Cali Fund Index as one of the most advanced tools currently available to support the identification of DSI users, as presented in Box 11 below.

BOX 11

CALI FUND INDEX BY TIERRAVIVA AI

TierraViva AI supports the Cali Fund by developing a global public index of companies to support governments, companies, investors and NGOs in operationalising the Fund to support conservation in developing countries and led by Indigenous Peoples and local communities.

The Cali Fund Index aims to enhance transparency by providing insight into potential contributors to the Fund, according to the contribution thresholds set under Decision 16/2. It provides a public list of companies that have previously filed patent applications containing genetic sequence listings.

It enables users to search for companies by country or sector. Information on patent filings involving sequences is provided through [The Lens](#) and linked to the [EPO World Patent Statistical Database \(PATSTAT\)](#). Information on companies is sourced exclusively from open access sources, including [GLEIF](#), [EDGAR](#), [ROR](#) and the [OECD-UNSD Multinational Enterprise Information Platform](#).

The second step of the funnel is intended to identify matches between the companies most active in relation to DSI – whether in terms of communications, research and publications, or products and patents – and investors' portfolios. At

this stage of limited market maturity, this process still relies on discrete signals and limited publicly available information. However, given the pace of technological development and growing policy attention, visibility of companies' DSI-related activities could improve relatively quickly.

Asking for more transparency and information from DSI users will be a key recommendation from the FfB DSI Investor Group for the success of the Cali Fund (see Section 4). Beyond helping to identify relevant companies, increased transparency will also help investors better assess companies' practices, level of maturity, intensity of DSI use, and approaches to benefit-sharing.

3.2.3 Maturity Assessment

At this stage of market development, it may be difficult to assess a company's maturity in relation to DSI, given low levels of disclosure and minimal contributions to the Cali Fund to date. This assessment will therefore need to be informed in part through engagement with companies, and transparency regarding DSI use can become the first and most important expectation, as explored further in the next section.

In the meantime, investors will need to rely on the market information available in public sources (detailed in Table 3 below) as well as communications from companies themselves. This publication includes concrete examples of life and data sciences combined in practice in Section 1. Research efforts, such as the paper "[How sharing benefits from the use of digital sequence information can evolve to contribute to biodiversity conservation](#)", co-authored by representatives of Bayer and Novonosis, with the University of Aberdeen and the Leibniz Institute, also indicate a high level of engagement and understanding of the topic. However, it is important to note that communicating about the use of genetic data or publishing research on it does not mean that the relevant activities fall under the working definition of DSI, or within the scope of the Multilateral Mechanism.

Keywords to look for (announcements, disclosures, patents...)	A"Machine learning" - "artificial intelligence" - "predictive models" - "data architecture" - "R&D tech stack" - "R&D digital acceleration"
	"digital genetic materials" - "digital genomics" - "DNA sequencing" - "digital sequence data" - "synthetic biology" - "molecular-level drug design"
Patent Websites	The Lens ; EPO World Patent Statistical Database (PATSTAT)
Specialised Media / Blogs	Frontline Genomics ; Biostars ; McKinsey & Company Insights on Life Sciences ; Drug Discovery Trends ; Covington Insights on Life Sciences
Academia & Research	MIT Biology / MIT Technology Review ; European Molecular Biology Laboratory (EMBL); Earlham Institute ; Global Invertebrate Genomics Alliance (GIGA); US National Human Genome Research Institute (NHGRI); Springer Nature Link ; Nature Genetics

Table 3: Supporting sources for investors' DSI-related market research & company identification

Another approach to identifying leading companies in this area is to pay attention to the activities and potential market engagement led by initiatives active on the topic of DSI and benefit-sharing. Some of the most prominent networks are:

- **[International Chamber of Commerce Access & benefit-sharing Taskforce](#):** The ICC ABS Task Force supports business participation in international negotiations and keeps companies informed about their political and business implications. It brings together diverse sectors with activities in bio-based innovation, products and services. The ICC notably published its views on [Enabling business participation in the Digital Sequence Information benefit-sharing mechanism](#), in September 2026 ahead of CBD COP17.
- **[Organisation for Economic Co-operation and Development](#):** For industry engagement, the Chemicals and Biotechnology Committee (CBC) manages the [OECD Programme on Chemical Safety and Biosafety](#).
- **[Global Alliance for Genomic & Health](#):** Formed in 2013, GA4GH brings together an international community dedicated to advancing human health through genomic data. It includes more than 500 leading organisations across healthcare, patient advocacy, research, ethics, government, life sciences, and information technology.
- **[ABS BioTrade](#):** The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH manages three projects hosted on this platform: The ABS Capacity Development Initiative, BioInnovation Africa, and ABS-compliant Value Chains in South(ern) Africa (ABioSA). It notably developed [resources](#) for a better understanding of ABS and capacity development.
- **[DSI Financial Readiness Coalition](#):** Co-led by the African Natural Capital Alliance (ANCA), FSD Africa and Nature Finance, this coalition brings together researchers, businesses, rights holders, policymakers and investors to build a financeable pipeline of African DSI-linked nature-finance opportunities. It approaches the same DSI value chain covered in this guidance from the supply side

by addressing value leakage at each step, from access and sampling through to benefit-sharing and stewardship, and treats the Cali Fund as one of several benefit-sharing mechanisms it is tracking.

Whether mainstream or specialised, these networks have been identified for their publicly visible and dedicated work streams related to benefit-sharing and DSI. However, it is important to keep in mind the role of generalist industry associations at the national and regional level. Investors should pay attention to the messages and publications coming from these local networks, as well as to individual companies' participation in their discussions and positions.

At present, it is likely that maturity on DSI will vary greatly between companies, with more advanced companies combining established use of technologies with policy engagement and strategic partnerships, while the majority of companies in exposed economic sectors may still be exploring the use of DSI as part of their processes or using it only marginally.

Overall, this section on identifying companies and assessing the relevance of DSI to their activities has shown that information is available – albeit limited – for investors to identify relevant companies in their portfolios for initial engagement on DSI. It has set out a funnel, from sectoral exposure to company identification and maturity assessment. It is intended to support investors interested in taking the first steps towards integrating DSI, benefit-sharing, dependency on genetic diversity, and potentially any Cali Fund considerations, into their engagement strategies. By highlighting the limited information available to investors, this section naturally places greater transparency around DSI use as a priority for company engagement, as well as an important factor for the success of the Cali Fund.

3.3 Engaging Companies on DSI and Benefit-Sharing

This section is intended for investors ready to take an active step towards company engagement on DSI and benefit-sharing. It builds on the essential information set out earlier in the “DSI Engagement Starter Rationale” and the practical sources laid out in the company assessment funnel.

Investors can find below a set of recommended company actions on DSI, which links directly to the [FfB Investor Nature Engagement Briefs](#), as well as a first set of engagement questions, developed by the FfB DSI Investor Group, to start collecting information directly from companies on DSI use and governance, dependence on genetic diversity, and benefit-sharing practices.

At this stage, the limited information available for investors and the general low degree of market maturity means that it is too soon to build any fully fledged “investor expectations” on the topic of DSI. However, this section outlines an engagement pathway for initial dialogue. It provides practical engagement questions for management, sustainability, legal, research and investor relations teams.

3.3.1 Recommended Company Actions

The Finance for Biodiversity Nature Engagement Sector Briefs include recommended company actions on benefit-sharing. At this stage, two key actions from companies

regarding DSI are identified: disclosing their use of DSI, and contributing to the Cali Fund.

The recommended company actions on benefit-sharing, which can be found in the biotechnology and pharmaceutical, food and agriculture, and chemicals sector briefs, are the following:

- Require responsible sourcing of raw materials, including certification, where available, and compliance with Access & Benefit-sharing (ABS) rules [for genetic resources].
- Ensure compliance with Access & Benefit-sharing rules when accessing or utilising genetic resources or associated traditional knowledge in breeding, R&D, ingredient discovery, fermentation, biomaterials or similar activities.
- Engage with Indigenous Communities to preserve traditional knowledge about the ecology, taxonomy and usage of medicinally important organisms. The brief on the biotechnology and pharmaceuticals sector gives the 2023 Iwi Māori–Roche agreement as a possible example.
- Implement the Nagoya Protocol to help ensure the equitable sharing of benefits from drug discoveries.

At this stage of market development, there is too little information to develop recommendations on company actions regarding DSI use. For now, two key early-stage actions are emerging, as presented in Table 4 below. Firstly, the key demand from investors is for more information and transparency. Secondly, investors will be attentive to effective contributions to the Cali Fund.

Table 4: Early-stage recommended company actions on DSI

Disclosure of DSI use	As of September 2026, there are no available examples of DSI disclosure from companies. Reporting frameworks such as the TNFD and GRI, as well as GBF Target 15c, include compliance with ABS mechanisms.
Contribution to the Cali Fund	As of September 2026, only two small and medium companies contributed to the Cali Fund for a total amount of US\$600.

Investors are invited to start tracking DSI-related indicators, in alignment with major nature-related disclosures. An initial set of indicators to monitor DSI dependency is proposed by the LSE team in the forthcoming report “Incentivising private sector contributions to multilateral funds for the protection of biodiversity”.

3.3.2 Potential Engagement Questions for Investors

Investors ready to start engaging with companies in their portfolios regarding DSI use, benefit-sharing practices, and dependence on genetic resources, can rely on the following set of questions developed by the FfB DSI Investor Group (see Box 12 below).

Based on these recommended questions, developing an engagement strategy on DSI can already represent a substantive area of engagement for interested investors. This would make sense given rapid technological development and growing political scrutiny, especially for biodiversity-minded investors focused on biodiversity protection. However, investors can also begin by exploring emerging risks and collecting additional information from companies

through their broader engagement strategies. Investors can include considerations of DSI and benefit-sharing in the digital era within regular engagement practices across economic sectors, especially in pharmaceuticals, biotechnology, and agriculture.

At this stage of market development, it is essential that investors collect additional information on company practices to be able to identify – and anticipate – the financial and environmental materiality of DSI use. The most important point across this entire publication, and one that will be reflected in the recommendations in the next section, is the need for greater transparency and information on DSI use across companies and economic sectors, as well as from researchers and policymakers.

BOX 12

EARLY-STAGE QUESTIONS FOR COMPANIES ENGAGEMENT ON DSI:

1. How does the company identify, monitor its use of genetic resources and DSI, including access to public databases and use of proprietary genetic or sequence databases, and assess its strategic importance to its business, R&D pipeline and future innovation?
2. How is the company preparing – including via employee training – for evolving international arrangements on DSI benefit-sharing, especially the [Cali Fund](#), but also the [Pandemic Agreement](#), the [International Plant Treaty](#), and the [High Seas Treaty](#), and what implications does it expect these developments to have for its business?
3. How has the company incorporated biodiversity expertise, environmental analysis and risk assessment into strategic and operational decisions involving genetic resources and DSI?
4. How does the company engage with industry associations, policymakers and other stakeholders, especially Indigenous Peoples and local communities, on DSI, ABS and the Cali Fund, and how does it ensure that the positions it supports are aligned with its own nature-related commitments?

Chapter 3

Recommendations and Next Steps

This section presents recommendations from the FfB Foundation to support the role of financial institutions in fair and equitable benefit-sharing in the digital era. These recommendations build on reflections from the member financial institutions of the FfB DSI Investor Group and on the participation of Anita de Horde, Executive Director of the FfB Foundation, as a civil society observer to the Cali Fund Steering Committee.

These recommendations reflect the need to support the success of the Cali Fund as the financial arm of the Multilateral Mechanism on benefit-sharing, in the face of challenges arising from the digitalisation of genetic information. On the one hand, they include recommendations for policymakers on how to incentivise private sector contributions to the Cali Fund. These cover capacity building and communication as well as the current negotiations on the modalities of the Multilateral Mechanism. On the other hand, they set out a pathway for investor mobilisation, covering both individual action and potential next steps for the FfB DSI Investor Group.

4.1 Recommendations for Policymakers to Incentivise Private Sector Contributions

This section explores possible actions for policymakers to increase the confidence and capacity of stakeholders seeking to understand DSI and consider contributions to the Cali Fund, as well as to build trust at the global level, including with other policymakers and members of civil society. These recommendations are divided into 'capacity building and communication' and 'enabling environment' which are cross-cutting and long-term, and 'modalities negotiations', which focus on upcoming discussions at CBD COP17 (2026) and preparations for the review at CBD COP18 (2028).

4.1.1 Capacity Building and Communications

As this publication highlights (notably in Section 3), investor maturity regarding DSI remains relatively low, and even companies show significant variation in their understanding and use of this emerging enabling technology. Thus, efforts in capacity-building and communications to increase understanding of DSI and help improve practices relevant to its use, such as disclosure practices, can improve awareness, mobilisation and, in time, contributions to the Cali Fund.

The following set of recommendations aims to strengthen capacity building and clearer communication in support of the Cali Fund's success.

1. Communicate clearly on the specificities of the Cali Fund

The Cali Fund was established in 2024, in Cali, Colombia. It is essential to take the necessary time to ensure clarity and trust in the modalities of the Multilateral Mechanism before expecting private sector contributions to scale up. Clearly articulating its role in the benefit-sharing system, the case for valuing nature and the link to business action for nature will also be key to engaging a wider set of stakeholders and improving awareness.

By providing greater clarity and specificity on the modalities of the Multilateral Mechanism, governments can contribute to this strengthened awareness. It is the role of the Cali Fund Steering Committee to ensure clear communication about the Fund's development, while stakeholders also have a role in understanding and supporting its development in a way that reflects its specific characteristics.

2. Support capacity building for stakeholders, especially companies and investors, to understand DSI and the need for international governance

DSI is an emerging topic, and stakeholders' understanding of its potential and implications remains limited. Stakeholders, including the media, NGOs and financial institutions, may have different perspectives or concerns about its potential benefits for human health and sustainability, as well as the associated risks related to ethics and data management. Even companies and academics, which may have more advanced knowledge of DSI, may benefit from capacity building to improve traceability and ensure fair and equitable benefit-sharing in the digital era.

Diverse stakeholders can support the Cali Fund and benefit-sharing more broadly, but they require guidance, translation of scientific knowledge into accessible communications, and collective momentum. For financial institutions, the FfB Foundation proposes to further leverage its DSI Investor Group for this purpose (see next steps in the following section).

4.1.2 Enabling Environment

A set of policy developments alongside the structuring of the Cali Fund could help foster an enabling environment to mobilise private sector contributions. These could include integrating the use of genetic material and DSI into nature-related disclosure and biodiversity finance frameworks, which could help increase legal certainty for potential contributors. They could also include shaping the data infrastructure landscape to support evolving benefit-sharing expectations, particularly by improving transparency around DSI use and disclosure of the origins of genetic resources.

The following recommendations focus on creating an enabling environment to support the success of the Cali Fund:

3. Call for the inclusion of genetic material use and DSI use in disclosure and biodiversity finance frameworks

Transparency around the use of DSI will be essential to ensure a sound understanding of its role and impact across economic sectors and business models. This publication shows, notably through the Nature Action 100 [Company Benchmark 2026](#), that very limited information is available regarding companies' benefit-sharing practices. However, transparency on benefit-sharing is covered in GBF Target 15c and is also reflected in the TNFD recommendations. These frameworks, as well as other disclosure and biodiversity finance frameworks, including the [ISSB](#), should reinforce their recommendations on good benefit-sharing practices and specifically include DSI.

Additional information on DSI is necessary for financial institutions to understand which companies are exposed to these technological and regulatory developments. Increased

visibility of the products, patents and innovations that include DSI use would help financial institutions better understand the value of DSI to companies and, ultimately, assess its materiality within their portfolios.

4. Shape the data infrastructure landscape to accompany evolving benefit-sharing expectations

A key rationale for the establishment of the Cali Fund is the dual realisation that open access data is necessary to support biology-based innovation, but can also impede fair and equitable benefit-sharing. The FfB Foundation calls for specific attention to the evolution of the data landscape to support the expected contribution framework of the Cali Fund.

A specific set of recommendations for data governance under the MLM can be found in the paper "[How can biological databases support the new UN mechanism for benefit-sharing from digital sequence information?](#)" (Raposo et al., 2026). The paper's main conclusions, notably calling for clearer communication and better metadata, can be found in Figure 9 below.

4.1.3 Multilateral Mechanism Modalities

This publication has presented three main potential reasons for companies to contribute to the Cali Fund: managing a nature-related dependency, generating reputational benefits and addressing risks to innovation linked to regulatory uncertainty and potential restrictions on open access to data. The recommendations below present ideas for shaping the Multilateral Mechanism modalities in a way that can build on those reasons, address challenges, and ultimately scale up company contributions and support from other stakeholders such as financial institutions.

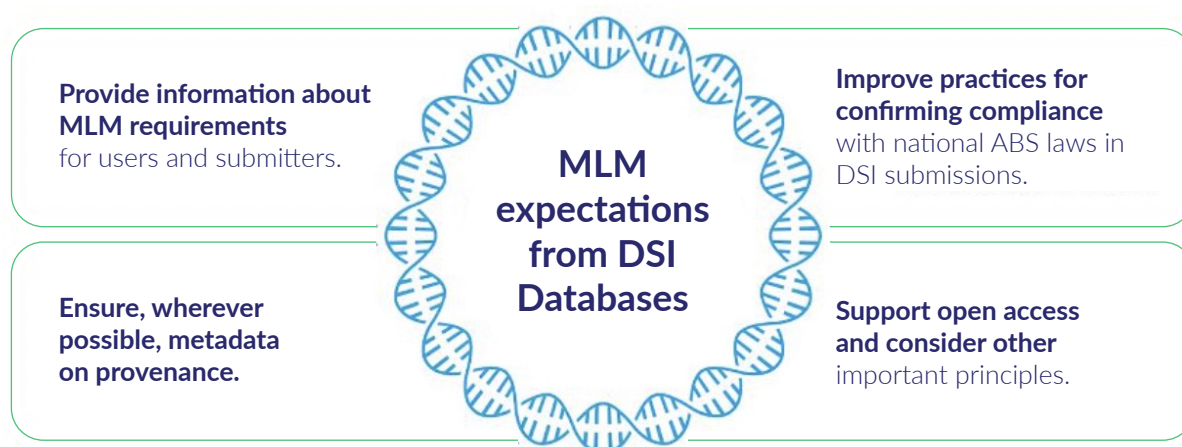


Figure 9: Multilateral Mechanism expectations from DSI Databases

Source: Raposo et al. (2026)

The following recommendations focus on the ongoing negotiations on the Multilateral Mechanism modalities:

5. Explore a tranche approach to contribution rates to account for DSI intensity

The current proposal for contribution thresholds for DSI users contributing to the Cali Fund has the merit of being clear and simple. Any company in a relevant sector above a certain threshold that aims to comply with the Multilateral Mechanism on benefit sharing from the use of DSI contributes a percentage of its turnover or revenue. However, this approach differs from conventional technology licensing models with which investors, companies and technology providers may be more familiar. It also differs from the Nagoya Protocol, where benefit-sharing is linked to revenues derived from the use of genetic resources.

The current approach can be justified, notably as a means of encouraging companies to contribute to efforts to address biodiversity loss, to preserve global stability and safeguard the genetic resources from which they benefit. However, exploring a tranche approach linked to 'DSI intensity' – the importance of DSI in a company's business model – could improve clarity and reinforce the legitimacy of a payment linked to value creation. Exploring a tranche approach would further require clarity regarding the scope of expected contributors, particularly the distinction between companies that directly or indirectly benefit from the use of DSI.

6. Provide legal certainty to companies regarding ABS obligations through the issuance of certificates

A key reason for companies to contribute to the Cali Fund would be a clearer legal framework that reduces compliance costs across multiple jurisdictions. They would benefit from a 'one-stop-shop' for all their DSI benefit-sharing obligations. This is one of the aims of certificates issued by the Cali Fund. However, it is essential that jurisdictions recognise these certificates so that companies are not subject to additional bilateral obligations regarding DSI. This is one of the key messages of the Friends of the Cali Fund and a key priority expressed by DSI users as potential contributors.

A potential tool for providing greater legal certainty is the development of a regulatory 'sandbox' system. The OECD describes a [regulatory sandbox](#) as "a controlled environment, established to understand the opportunities and risks associated with specific innovations and to develop an appropriate regulatory environment to accommodate them effectively." It can be used to test a set of assumptions and practices before they are fully defined and established. It can help identify procedures that work effectively for the stakeholders involved before wider implementation.

Before the review of the Multilateral Mechanism planned for COP18, testing the ABS system and the legal value of certificates issued by the Cali Fund could help increase confidence among potential contributors. Among other items, the sandbox could test which national authorities could recognise an MLM certificate and on what evidence under national ABS measures, and what effect recognition would have on any further monetary demand for the same covered DSI use.

7. Establish a robust biodiversity impact reporting system that can be used by stakeholders

The FfB Foundation and its members do not take a position or make recommendations on the allocation methodology or distribution modalities of the Multilateral Mechanism. However, they emphasise the importance of a robust biodiversity impact reporting system. Such a system should enable aggregation at the Fund level, including state-of-nature metrics in addition to information on actions implemented and reductions in pressures on biodiversity. The goal is for the Cali Fund reporting system to enable companies – and potentially other relevant stakeholders – to demonstrate how their contributions support the preservation of genetic diversity. This can support both external communications and internal buy-in. It is an important condition for enabling companies to generate reputational benefits from contributing to the Cali Fund.

These recommendations on capacity-building and communications, as well as on negotiations on the Multilateral Mechanism modalities, have been developed by the FfB Foundation and its DSI Investor Group. They present greater transparency on companies' use of DSI as a foundational element for success. Policymakers have tools under the GBF to support improvements of nature-related disclosure practices. Moreover, they should ensure legal clarity on benefit-sharing obligations, notably across different governance levels, to create the right incentives for companies to contribute to the Cali Fund.

How can financial institutions leverage these ideas to take an active role in supporting the fair and equitable sharing of benefits arising from the use of genetic resources, notably through the use of DSI? How can they prepare for the technological and regulatory changes driven by rapid advances of genomics and biology-based innovation? The next section lays out a pathway for financial institutions interested in integrating DSI into their biodiversity finance strategies.

4.2 Actions to Continue Fostering Investor Progress on DSI

This publication sets out a rationale for investors to start engaging with companies on DSI, establishing its growing commercial and ecological relevance and the key regulatory risks linked to this resource.

Based on all the insights developed through this publication, this final section maps out a pathway for investor mobilisation, covering both individual action and potential next steps for the FfB DSI Investor Group.

4.2.1 Key Next Steps for Financial Institutions

The FfB Foundation recommends that financial institutions interested in DSI:

- Build their understanding of DSI, including its potential value for sustainability and health, its role as a nature-related dependency, and its links to debates on bioethics and artificial intelligence;
- Build their understanding of benefit-sharing in the digital era, including database architecture and the Multilateral Mechanism shaping the evolution of benefit-sharing practices;
- Assess potential portfolio exposure to DSI users, as well as the potential positive biodiversity outcomes enabled by DSI that could contribute to a biodiversity finance strategy;
- Include benefit-sharing and DSI in existing engagements with companies to start collecting information. This could lead to a better understanding of potential risks and opportunities and help to assess the materiality of DSI.

All financial institutions interested in increasing their knowledge and understanding of DSI are invited to collaborate further on the topic by joining the FfB DSI Investor Group.

4.2.2 Key Next Steps for the Finance for Biodiversity Foundation

The FfB Foundation will strive to increase awareness and understanding among financial institutions and support their role in advancing the fair and equitable sharing of benefits arising from the use of genetic resources as part of its mission to empower financial institutions to act on nature loss and drive positive impact.

The FfB Foundation is an observer to the Cali Fund Steering Committee for civil society and, as such, is contributing to COP17 discussions (2026) on its structure and the modalities of the Multilateral Mechanism. Immediate next steps will include promoting this publication across the market to raise awareness and increase global market maturity on the topic of DSI.

Potential future projects include:

- Launching a collaborative engagement initiative on DSI and benefit-sharing, including meetings with companies and the development of investor expectations.
- Building understanding of benefit-sharing in the digital era, including database architecture and the Multilateral Mechanism, global agreements, and national laws, shaping the evolution of benefit-sharing practices.
- Engaging with policymakers to call for recognition of the value of the Cali Fund certificates, notably by joining the Friends of the Cali Fund, as regulatory stability is essential for the success of the Multilateral Mechanism from the points of view of both companies and investors.
- Exploring other dimensions of DSI as part of biodiversity finance strategies, including capital allocation to DSI-enabled sustainability innovation and start-ups, and biodiversity impact assessment through the use of DSI as a biomonitoring tool.
- Exploring collaboration with the DSI Financial Readiness Coalition, which is building the market infrastructure — pipeline development, financial structuring, and de-risking mechanisms needed for Africa to capture a larger share of DSI-linked bioeconomy value.

All stakeholders interested in learning more about the FfB Foundation's next steps on DSI or wishing to collaborate on this important topic can contact the FfB Secretariat at: info@financeforbiodiversity.org.

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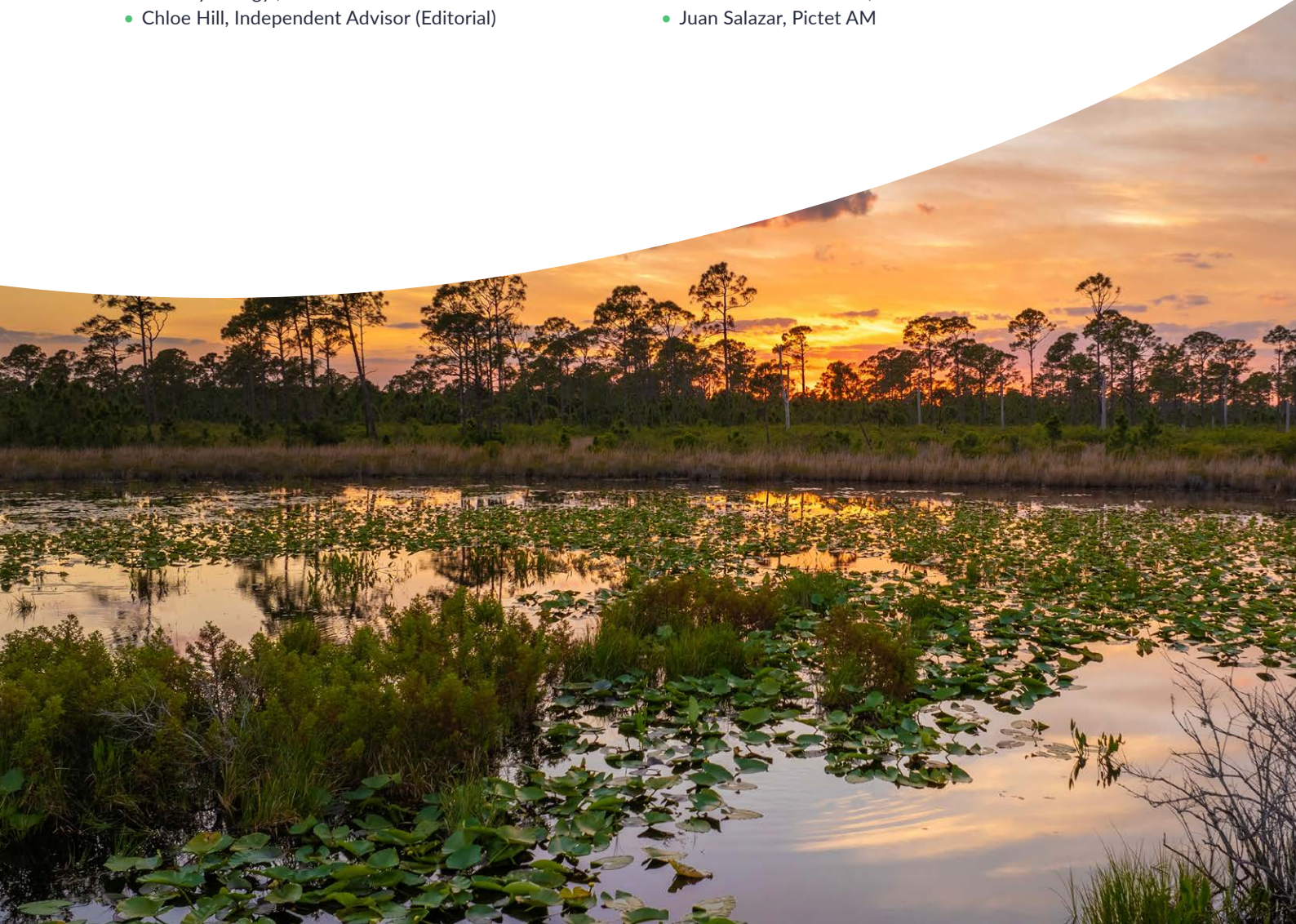
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Glossary

Amino Acids: An amino acid is the fundamental molecule that serves as the building block for proteins. There are 20 different amino acids. A protein consists of one or more chains of amino acids (called polypeptides) whose sequence is encoded in a gene. Some amino acids can be synthesised in the body, but others (essential amino acids) cannot and must be obtained from a person's diet ([National Human Genome Research Institute, 2026](#)).

Computational Chemistry: The area of chemistry that utilizes computer simulations to solve practical chemical problems, employing advanced theoretical methods to determine structural properties and energetics of various chemical systems. It complements experiments and aids in predicting unobserved chemical behaviours in challenging systems ([ScienceDirect](#), AI-generated definition based on: [Green Chemistry and Computational Chemistry, 2022](#)).

Digital Sequence Information on Genetic Resources (DSI): The digital representation of genetic material, including DNA and RNA sequences and potentially other related biological information ([Guide to the Cali Fund, 2025](#)).

Enzymes: An enzyme is a biological catalyst that is usually a protein but could be RNA. The point of a catalyst is to increase the speed with which a reaction happens. And there are many, many enzymes that are encoded by the genome to make proteins or RNAs that speed up various chemical reactions to do thousands of different functions inside a cell ([National Human Genome Research Institute, 2026](#)).

Genes: A stretch of DNA containing a sequence (instruction) with a particular function, such as to make a specific protein. The human genome has around 20,000 genes. Most of our genes contain instructions for the cell to make specific proteins. There are also some genes that contain instructions for the production of other molecules apart from proteins (for instance, short lengths of RNA that regulate gene activation) ([NHS England Genomics Education Programme, 2025](#)).

Genetic resources: Refer to the genetic material from plants, animals or microbes that has actual or potential value for use. These uses can range from basic research that seeks a better understanding of the world's natural resources to the development of commercial products ([CBD, 1992](#)).

Genetic materials: The hereditary information coded within an organism, which is primarily composed of deoxyribonucleic acid (DNA) sequences that are passed down through generations. This material contains traits that influence survival and reproduction, reflecting the evolutionary history of species ([ScienceDirect](#), AI generated definition based on [Bio-inspired Networking, 2015](#)).

Genome: An organism's complete set of DNA. Virtually every single cell in the body contains a complete copy of the approximately 3 billion DNA base pairs, or letters, that make up the human genome ([National Human Genome Research Institute, 2026](#)).

Genomics: The study of the complete set of genes (the genome) of organisms, of the way genes work, interact with each other and with the environment. Genomics incorporates elements of genetics, but is concerned with the characterization of all genes of an organism, rather than individual genes ([World Health Organisation, 2026](#)).

Molecule: The simplest unit of a chemical substance, usually a group of two or more atoms ([Cambridge Dictionary, 2026](#)).

Nature-related Dependency: Aspects of environmental assets and ecosystem services that a person or an organisation relies on to function ([TNFD recommendations, 2023](#)).

Nature-related Impacts: Positive or negative changes in the state of nature caused by an organisation's activities, which may alter nature's capacity to provide ecosystem services and other social and economic functions ([TNFD recommendations, 2023](#)).

Nucleotide: A nucleotide is the basic building block of nucleic acids (RNA and DNA). A nucleotide consists of a sugar molecule attached to a phosphate group and a nitrogen-containing base. The bases used in DNA are adenine (A), cytosine (C), guanine (G) and thymine (T). In RNA, the base uracil (U) takes the place of thymine. DNA and RNA molecules are polymers made up of long chains of nucleotides ([National Human Genome Research Institute, 2026](#)).

Proteins: Proteins are large, complex molecules that play many important roles in the body. They are critical to most of the work done by cells and are required for the structure, function and regulation of the body's tissues and organs. A protein is made up of one or more long, folded chains of amino acids (each called a polypeptide), whose sequences are determined by the DNA sequence of the protein-encoding gene ([National Human Genome Research Institute, 2026](#)).



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