



THE ABS
CAPACITY
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INITIATIVE



L'INITIATIVE DE
RENFORCEMENT
DES CAPACITES
POUR L'APA

African Science-Policy Dialogue on Digital Sequence Information on Genetic Resources

24 – 26 April 2024

International Livestock Research Institute, Nairobi, Kenya

Funded by



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Introduction

The multi-donor funded **ABS Capacity Development Initiative (ABS Initiative)**, in collaboration with the **African Union Commission's Department of Agriculture, Rural Development, Blue Economy, and Sustainable Environment (AUC DARBE)** and the **International Livestock Research Institute (ILRI)** organized the dialogue between African scientists working with digital sequence information on genetic resources (DSI) and African policy makers involved in related legislative work and international negotiations, with the objective of establishing an African science and policy network on DSI.

A mix of technical inputs, targeted group work and plenary sessions (see the agenda in Annex 1) offered participants the opportunity to learn about the role of DSI in research, exchange views and to provide advice on the development of DSI policies and modalities of the multilateral DSI benefit-sharing mechanism with an African perspective. More than 30 participants – representing the biodiversity sector, crop and livestock science, and the health sector – provided a balanced representation of national policy makers / negotiators and scientists working in publicly funded national and international research institutions.

Key recommendations

- 1) AUC and AMCEN, should provide **political and technical leadership** in the upcoming DSI-related negotiations under the CBD. Better coordination of the African Group of Negotiators is important, specifically regarding appropriate timelines to organise common positions. National governments are called upon to support the African proposal at COP 16 for the multilateral mechanism (MLM) and fund for benefit-sharing from the use of DSI.
- 2) **Dialogue is essential**. National governments are called upon to establish and provide finance for national dialogues between the relevant sectors, such as biodiversity conservation and sustainable use, agriculture, fisheries, science policy, IPR policy (specifically regarding traditional knowledge). Dialogue between the Pan-African institutions that are involved in the coordination processes and implementation of DSI related decisions under the CBD, FAO, WHO and WIPO need to ensure consistence in African negotiation positions and subsequent national implementation.
- 3) Pan-African institutions need to **mobilise funding** for the coordination during the negotiation process under the relevant international fora and support for the subsequent implementation of the resulting decisions. National governments are called upon to provide sufficient funding for their delegations to ensure delegations are big enough to be represented in the various parallel negotiation processes at CBD COP 16.

Beyond these key recommendations participants developed numerous additional recommendations addressing among others, capacity building, awareness raising, stakeholder involvement, and coordination, addressed to national governments, Pan-African institutions and African negotiators as well as how to take the African Science-Policy Dialogue on DSI forward. For details refer to Annex 14.

In addition, participants discussed and developed a recommendation regarding the African proposal on DSI for CBD COP 16.

Workshop proceedings

Welcome and Introduction

Hartmut Meyer of the ABS Capacity Development Initiative welcomed the participants and provided a short overview about the multi-donor funded ABS Initiative. He also elaborated why a dialogue between science and policy is important to address the North-South divide regarding research capacities and the changing situation for research institutions in Africa.

Appolinaire Djikeng, Director General of ILRI, thanked the ABS Initiative and its donors for providing support during this journey in a world losing its biodiversity. He highlighted that DSI is a relevant topic in today's research work and that ILRI recognises the importance of ABS, underlining the need for harmonisation and standardisation of ABS regulations among countries.

Øystein Rune Størkersen, Deputy Permanent Representative to UNEP and UN Habitat of the Royal Norwegian Embassy, and **Günther Daniel, Head of Development of the Embassy of the Federal Republic of Germany**, highlighted the long standing commitments of their governments to the DSI and ABS processes under the CBD and the related funding support for the work of the ABS Initiative in the international negotiation processes as well in supporting national implementation and stakeholder involvement with a focus on Africa.

Hartmut Meyer excused the representatives of the AUC and the Embassy of the Netherlands due to conflicting commitments.

Technical introduction: What is at stake?

As a technical introduction, the [video "DSI Simply Explained"](#) was screened followed by a presentation on the scientific and policy angles of DSI by **Pierre du Plessis**, Advisor to the African Group of Negotiators (see Annex 2).

ILRI laboratory visit

Being hosted by an international research organisation which belongs to the three African centres of excellence producing and using DSI, i.e. doing not only basic science, but also applied science, a visit to several laboratories provided an opportunity to see and learn how DSI-related science in the agricultural fields is taking place. For a short description of the laboratories visited see Annex 3.

Starting the dialogue: Exchanging questions and answers

Entering the dialogue, policy makers / negotiators and scientists discussed and identified questions to the respective group, of which up to six prioritised questions were answered in plenary. The full set of questions and answers are listed in Annex 4.

Key Guidance on DSI by COP 15: Nine internationally agreed criteria and how they could / should look like in practice

The topic was introduced with a presentation by **Suhel al-Janabi**, ABS Initiative (see Annex 5). The following panel discussion was moderated by **Pierre du Plessis**, Advisor to the African Group of Negotiators. The panellists, three scientists working in three different sectors (**Jessica da Silva**, South African National Biodiversity Institute, South Africa, **Christian Tiambo** (ILRI), **Ossama Abdel-Kawy** (Egyptian Atomic Energy Authority) discussed what would be "ideal" and "killer" practices for their work of an MLS to be agreed at COP 16.

Jessica emphasized the importance of simplicity and open access to avoid exacerbating inequalities. Ossama highlighted the need for trust, especially in the health sector which heavily relies on sequence data. Christian stressed fair benefits for providers, particularly farmers. Regarding "killer" practices, Christian warned against restricted access hindering research in the livestock sector, while Ossama

emphasized the need for industry to share benefits and show goodwill. Jessica cautioned against overregulation of access, distinguishing between GR and DSI. Concerning bureaucracy, stakeholders discussed the importance of capacity building and equitable benefit-sharing, while Ossama mentioned the potential for affordable drugs for neglected diseases. Envisioning an ideal outcome of COP 16, Jessica emphasized learning from past protocols and compromise. Ossama stressed the establishment of trust and voluntary industry contributions, and Christian emphasized increased visibility of providers to foster trust and open access.

During the following plenary discussion, participants highlighted various challenges and considerations related to access, regulations, trust-building, and benefit-sharing in the context of genetic resources and sequence data. Key points raised:

- Difficulty of accessing GR for sequencing due to national ABS regulations and the need for better understanding of potential benefits.
- Importance of transferring data into global databases to enhance research possibilities.
- Diverging interpretations of "free" access and the need to address overregulation and encourage industry contribution.
- Challenges in maintaining open access while adhering to principles like [CARE](#), with the complexities of licensing data.
- Harmonizing IP&LC rights across countries and the varying interpretations of relevant international regulations.
- The importance of structures that support the development of trust and of trust-building with communities and defining benefits for them.
- Need to enforce social responsibility in the pharmaceutical industry and the need for effective funding allocation and channels.
- The differentiation between sequence data and information.
- Concerns about closing the technology gap between regions, given the slow progress and the role of political will and funding allocation. The need for centres of excellence with advanced technologies that are supported by governments and have a strategic focus on R&D and industry development.

[Impacts on science of working with multiple data bases with different terms and conditions \(instead of INSDC\)](#)

Participants discussed in six small groups **“What are the pro’s and con’s for different scientific sectors of working with one big data base such as the International Nucleotide Sequence Database Collaboration (INSDC), compared to many smaller specialised data bases?”**. The following observations were collected in plenary after the group work:

Participants highlighted the importance of considering specific terms and conditions when evaluating the pro’s and con’s of having different databases. Smaller databases hold value for their specificity. However, the terms and conditions of smaller databases can vary widely, potentially limiting access based on sector or user requirements. Governance of the INSDC was scrutinized, particularly the lack of involvement of scientists from the Global South. Concerns were raised about the terms and conditions for depositing data in INSDC, which may not align with restrictions commonly imposed on DSI under PIC and MAT, thus affecting open access. Despite these challenges, the adaptability of INSDC governance was acknowledged, as evidenced by recent adjustments such as the inclusion of country tags, although progress seems to be slow.

[Mutually supportive implementation of various ABS instruments](#)

During this information session **Claudio Chiarolla**, Bioversity International, presented an **overview of ABS Systems and DSI negotiations under the FAO (Plant Treaty), UNCLOS (BBNJ Agreement), and WHO (Pandemic Treaty)**. For details refer to Annex 6.

Further information in relation to the BBNJ Agreement:

- Short policy brief: “[Digital Sequence Information in the UN High Seas Treaty: Insights from the Global Biodiversity Framework-related Decisions](#)”, LSE Law - Policy Briefing Paper No. 53/2023 (Jan 2023).
- On the BBNJ Standardized Batch Identifier: “ONEST: The Middle way for Monetary Benefit Sharing in BBNJ Negotiations”, available at https://www.researchgate.net/publication/369362732_ONEST_The_Middle_way_for_Monetary_Benefit_Sharing_in_BBNJ_Negotiations
- On the genesis of the G77+China position: “The Expert Briefing Document: A Developing Country Perspective on the Making of The BBNJ Treaty”, [LSE Legal Studies Working Paper No. 30/2023](#)
- DOALOS Briefing on Marine genetic resources, including fair and equitable sharing of benefits, under the BBNJ Agreement ([English](#), [French](#), [Spanish](#))

The presentation of **Mphatso Kalemba**, Malawi, updated participants on the **DSI processes under the CBD until COP 16**. For details refer to Annex 7.

[How can non-monetary benefit-sharing \(NMBS\) and capacity development \(CD\) support the biodiversity strategies and African development priorities?](#)

The fishbowl discussion, facilitated by **Kathrin Heidbrink** and **Hartmut Meyer**, both ABS Initiative, proposed to address the following questions:

1. What could be improved, and how?
2. What do you not get through bilateral NMBS?
3. What NMBS could you lose under a multilateral system?
4. How can NMBS support NBSAP development and implementation?

The ensuing discussion touched on various key areas related to biodiversity and development priorities, focusing on the implementation and communication of the Biodiversity Plan. See Annex 8 for a detailed documentation of the points made by participants.

Overall, the dialogue highlighted the need for better integration, communication, and alignment of biodiversity benefits and plans at all levels, ensuring inclusivity and effectiveness in addressing global biodiversity challenges.

[Key issues: Convergence and divergence](#)

Participants were asked to make statements responding to the following three headline questions:

1. To what extent are sectoral approaches compatible with the agreed principle of open access to DSI?
2. What is the best way to achieve mutually supportive implementation: CBD first or other instruments first?
3. Which is more important for accommodating TK and IPLC in the DSI multilateral mechanism (MLM): Their right to Free Prior Informed Consent (FPIC) or their right to benefit?

The questions had deliberately designed to elicit controversial statements. After each statement participants were asked to position themselves, according to their agreement, near or far to the person making that statement. Depending on their distance to the statement maker individual participants were asked to briefly explain their positioning. Details of the exercise are provided in Annex 9.

[DSI Data / Information: Structure and practical examples](#)

During this information sessions **Hartmut Meyer** (ABS Initiative) demonstrated what open access to genetic data means in practice. He entered into the INSDC database by doing a simple Google search leading to the [Genbank](#) of the US National Institute of Health (NIH), showcasing the genetic sequence data, related metadata/information and links to relevant publications. Access to these data and their subsequent use is not connected to any terms and conditions.

In his following presentation Hartmut focused on the path from data to information, knowledge and products (see Annex 10). **Jessica da Silva** (SANBI, South Africa) and **Mariem Bouhadida** (National Institute of Agricultural Research of Tunisia) explained laboratory practices for using DSI in biodiversity conservation related work in South Africa and agricultural R&D for improving pathogen resistance of plant varieties in Tunisia. For their presentations see Annex 11 and Annex 12 respectively.

[Reflection on key open questions in various UN fora](#)

Before moving to the development of recommendations, Hartmut Meyer presented an overview on the open questions in various UN Fora dealing currently with DSI (see Annex 13 for the presentation).

[Brainstorming, prioritising, and fine-tuning recommendations](#)

In this final group work, participants were tasked to brainstorm recommendations for making progress on the road to a functioning DSI system. Recommendations should address:

- 1) African national governments
- 2) Pan-African institutions
- 3) African negotiators
- 4) How to take the African Policy-Science Dialogue forward?

The key recommendations are summarised at the beginning of this report. A full account of all recommendations is provided in Annex 14.

Annex 1: Agenda

African Science-Policy Dialogue on Digital Sequence Information on Genetic Resources (DSI)

Agenda

24 April 2024: DSI – Introduction to the global developments	
09:30	Registration
10:00	Opening <ul style="list-style-type: none"> • ABS Capacity Development Initiative • International Livestock Research Institution (ILRI) • Embassies of Germany and Norway
10:45	Introduction into the dialogue
11:30	Technical introduction – What is at stake? <i>Pierre du Plessis, ABS Initiative</i> <ul style="list-style-type: none"> • Video” DSI Simply explained” • Presentation: DSI from scientific and policy angle
12:30	Lunch
13:45	ILRI laboratory visit <i>ILRI</i> <ul style="list-style-type: none"> • Visits of the ILRI Livestock, CIP Potatoes, ILRI Azizi Biobank laboratories
15:30	Coffee / Tea
16:00	Starting the dialogue: Exchanging questions and answers <ul style="list-style-type: none"> • Group work & interaction between scientists and negotiators
17:30	End of day's programme
17:30	Reception and dinner at ILRI
25 April 2024: Exchange between Science and Policy	
09:10	Key Guidance on DSI by COP 15: Nine internationally agreed criteria <i>Suhel al-Janabi, ABS Initiative</i> <ul style="list-style-type: none"> • Presentation <i>Pierre du Plessis, ABS Initiative</i> <ul style="list-style-type: none"> • Panel: Three scientists from 3 different sectors to provide their views on 'ideal practice' and 'killer practice' <ul style="list-style-type: none"> - Biodiversity: Jessica da Silva (SANBI, South Africa) - Agriculture: Christian Tiambo (ILRI, Kenya) - Health: Ossam Abdel-Kawy (Egyptian Atomic Energy Authority)

	<ul style="list-style-type: none"> Plenary discussion
10:30	Coffee / tea
11:00	<p>Impacts on science of working with multiple data bases with different terms & conditions</p> <ul style="list-style-type: none"> Group work on three criteria for the DSI system <ul style="list-style-type: none"> Provide certainty and legal clarity for providers and users of DSI Not hinder research and innovation Be consistent with open access to data
12:30	Lunch
14:00	<p>Mutually supportive implementation of various ABS instruments</p> <ul style="list-style-type: none"> Overview of three ABS instruments: main features of the current systems <ul style="list-style-type: none"> Claudio Chiarollo (Bioversity International) Overview of what is on the table at CBD <ul style="list-style-type: none"> Mphatso Kalemba (Department of Environmental Affairs, Malawi)
15:30	Coffee / Tea
16:00	<p>How can non-monetary benefit-sharing and capacity development support biodiversity strategies and African development priorities?</p> <ul style="list-style-type: none"> Fishbowl discussion
17:30	End of day's programme

26 April 2024: Developing recommendations	
09:00	<p>Key issues: Convergence and divergence</p> <ul style="list-style-type: none"> Interactive session
10:30	Coffee / tea
11:00	<p>DSI Data / Information <i>Hartmut Meyer, Jessica da Silva, Mariem Bouhadida</i> Input on structures, and practical examples</p>
11:30	<p>Reflection on key open questions in various UN fora <i>Hartmut Meyer, ABS Initiative</i></p> <ul style="list-style-type: none"> Presentation covering relevant UN fora
12:30	Lunch
14:00	<p>Brainstorming recommendations Group work, report back and plenayr discussion</p>
15:45	Evaluation and Closure
16:00	End of dialogue

Annex 2: Scientific and policy angles of DSI by Pierre du Plessis (Advisor to the African Group of Negotiators)

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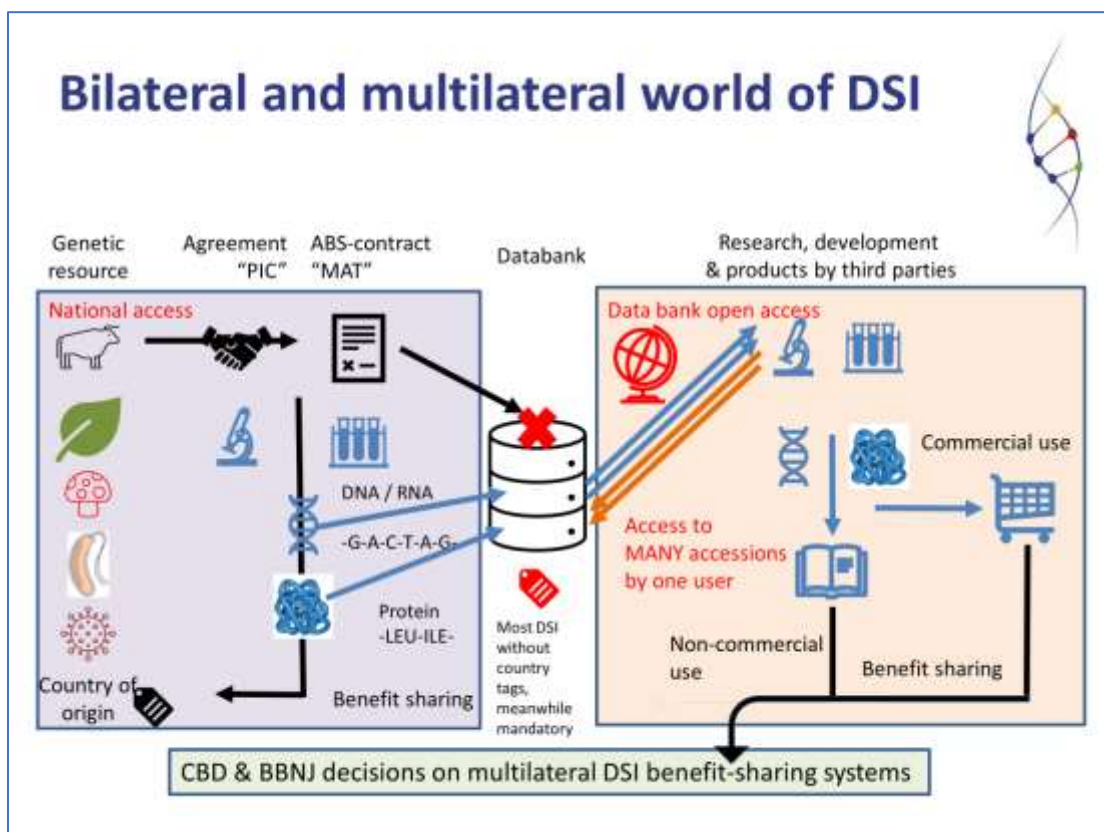
Technical Introduction: DSI from Scientific and Policy Angles

African Science-Policy Dialogue on DSI
24. – 26.04.2024, Nairobi, Kenya

Pierre du Plessis
ABS Capacity Development Initiative
with slides from Dr Hartmut Meyer and Dr Amber Hartman Scholz

Hosted by:

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Genetics is a comparative science

The bigger and more detailed the “background” data set, the more useful it is for everyone

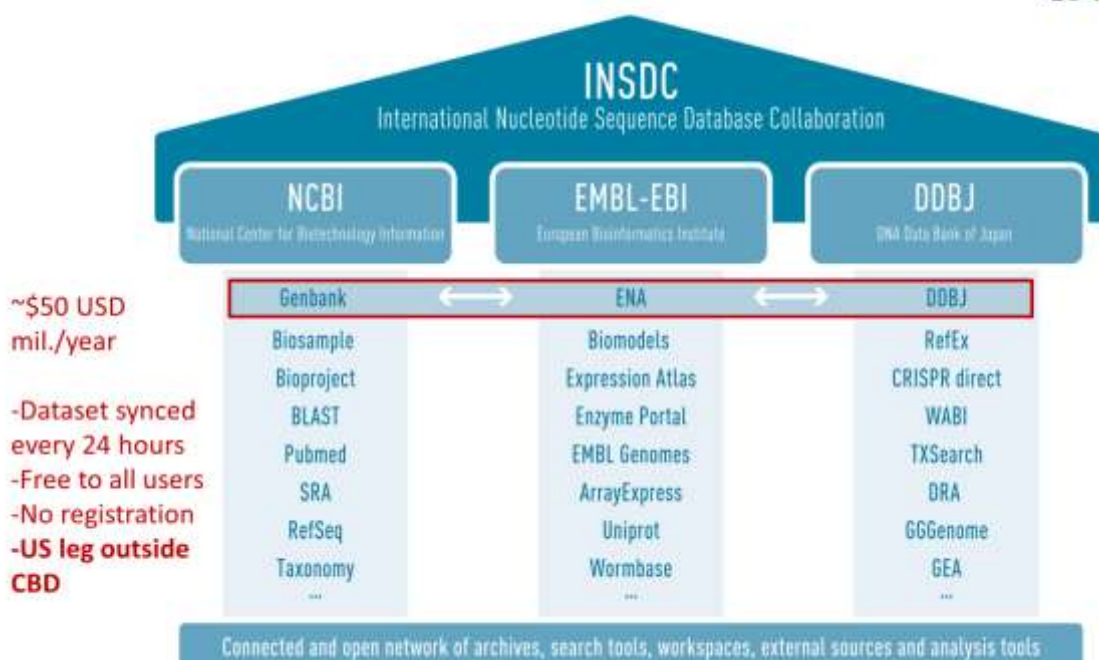


- Individual sequences can encode valuable mutations, but these can only be found by comparing them with thousands of other sequences
- The sheer number of sequences involved makes tracking and tracing difficult and impractical – scientists want to minimise or eliminate administrative burdens and “red tape” associated with accessing DSI
- No legal basis or realistic prospects for controlling or restricting access to sequences already publicly available
- Valuable individual **sequences from GR newly accessed with PIC and MAT** can be protected by keeping them confidential or proprietary (as the private sector routinely does)

BUT...

3

INSDC core infrastructure with dozens of databases & tools



INSDC access and use policy (2002)



Access policy is inherited by downstream databases

- 1....uniform policy of **free and unrestricted access to all of the data** records their databases contain.
- 2.The INSD **will not attach statements to records that restrict access to the data**, limit the use of the information in these records, or prohibit certain types of publications based on these records. Specifically, **no use restrictions or licensing requirements** will be included in any sequence data records...
- 3.All **database records submitted to the INSD will remain permanently accessible** as part of the scientific record...
- 4...information displayed on the Web sites maintained by the INSD is **fully disclosed to the public**...

<http://www.insdc.org/policy.html>

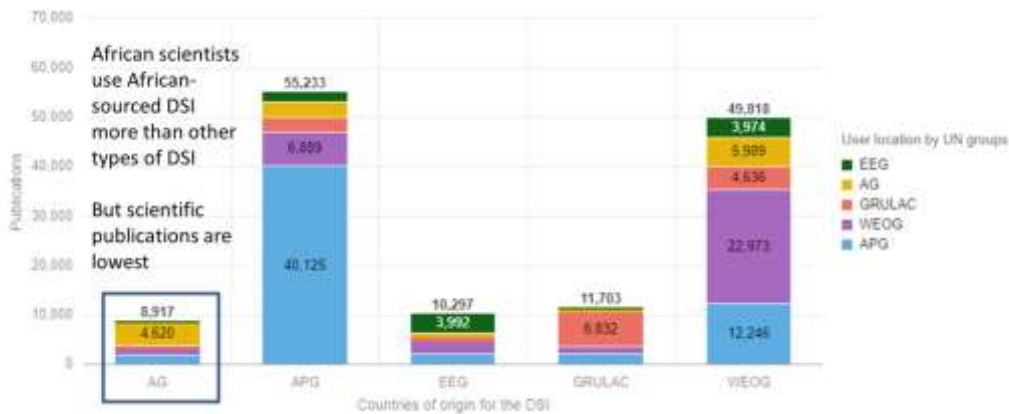
Science 298 (5597): 1333 15 Nov 2002

Why do scientists put their data in public databases for everyone to see and use?



1. **Comparison: ACGTACGT means nothing without context!**
2. **Publishing: Journals *will not publish* papers unless the data is openly available**
3. **Funding: Grant agencies very often *require* it as a condition of funding**
4. **Ethics: Scientific reproducibility, integrity, data security**

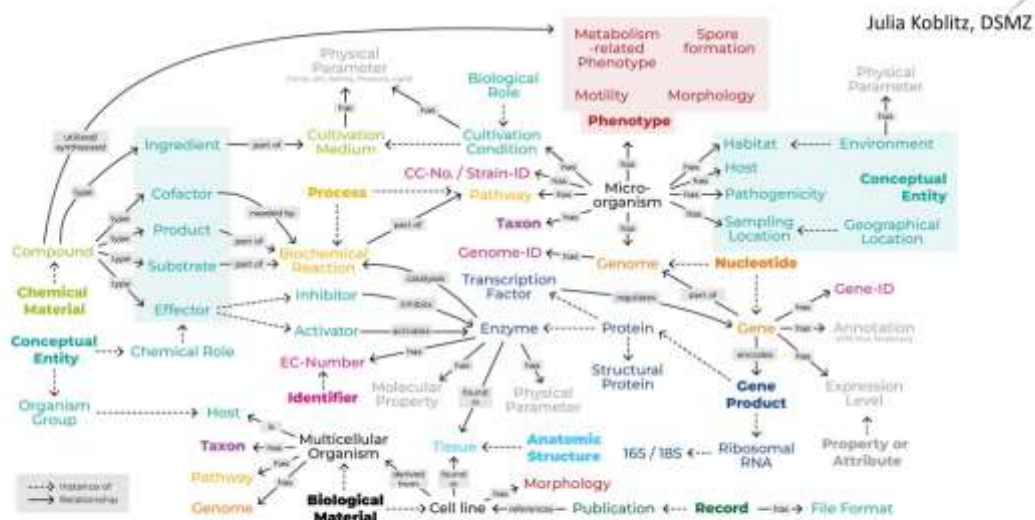
Scientists use "local" data more than "foreign" data



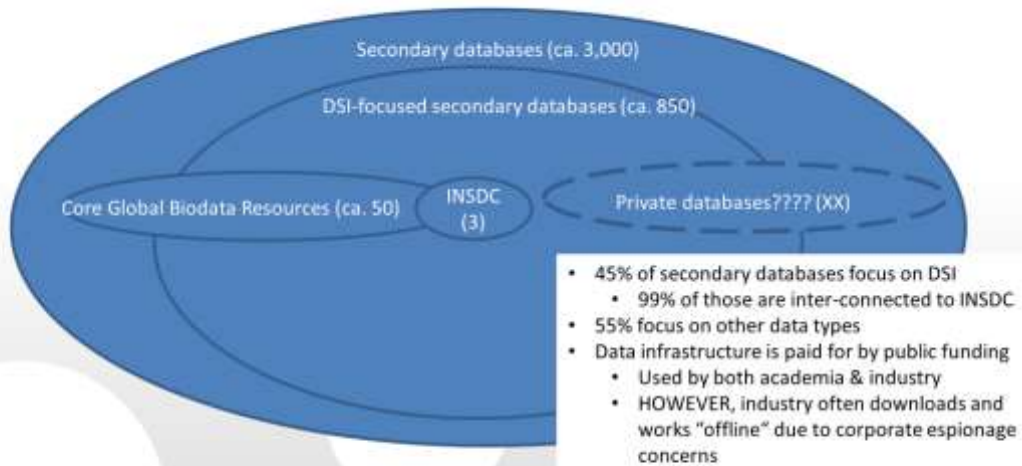
- AG - African Group
- APG - Asia and the Pacific Group
- EEG - Eastern European Group
- GRULAC - Latin American and Caribbean Group
- WEOG - Western European and Others Group

Scholz et al. *Gigascience*. Dec. 2021.
<https://academic.oup.com/gigascience/article/10/12/giab085/6489125>

Open, integrated DSI enables scientists to understand how biology works. Understanding leads to more benefit



How many public DSI databases are there?



Leibniz-Institut • DSMZ Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH

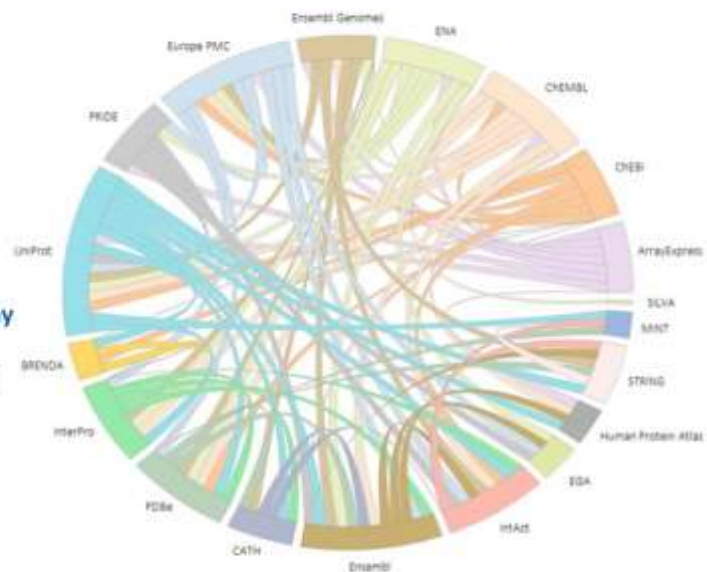
9

Open Access =
Interoperability:
data are free to be
sliced, diced, and
mixed together

This happens automatically every day
across

- hundred of millions of sequences
- thousands of databases
- hundreds of data types

The graph here is just 19 (out of
thousands of) databases!



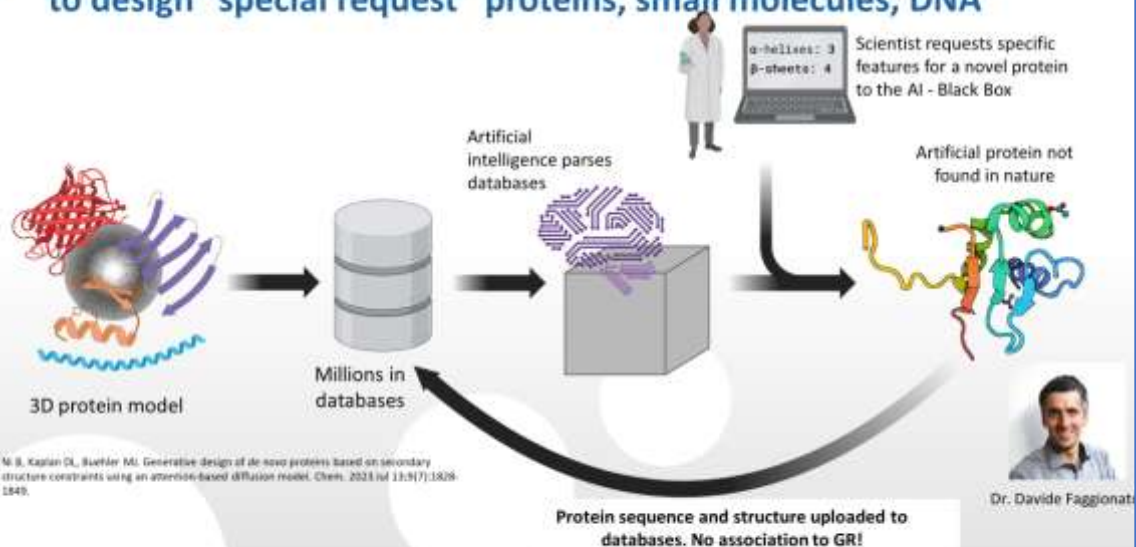
Orydale R, Cook CE, Petryszak R, et al. The ELIXIR Core Data Resources: fundamental infrastructure for the life sciences. *Bioinformatics* (Oxford, England). 2020 Apr;36(8):2636-2642. DOI: 10.1093/bioinformatics/bt559. PMID: 31952984. PMCID: PMC7446027.

Additional science issues to consider

- Uses of DSI are rapidly evolving, due to sequencing technology and ITC (bioinformatics) advances, with the technical cutting edge in the health sector (single cell multi-omics; AI)
- Rapid advances in ability to manipulate genetic material at molecular level might transform how DSI is used - "design from scratch"
- This represents an opportunity for "technological leapfrogging"
 - „As cell phones enabled Africa to leapfrog beyond the need for fiber-optic cables and wired infrastructure, cheap sequencing technology and cloud servers allow African biologists to leapfrog beyond traditional biology laboratories and expensive server infrastructures.“



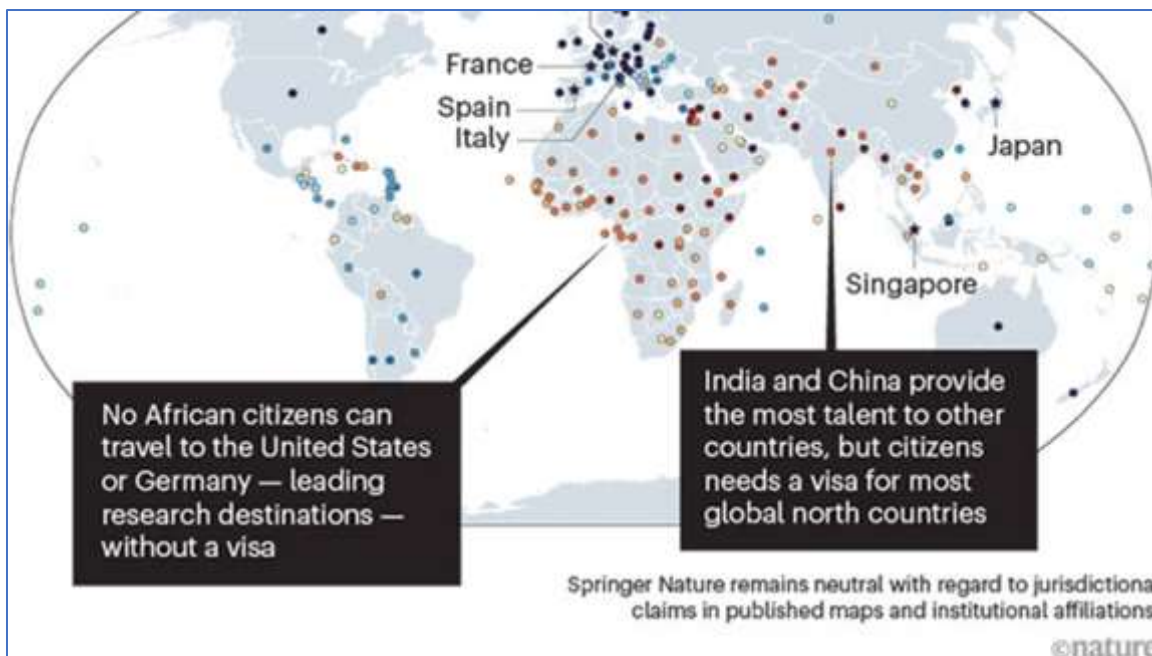
Artificial intelligence uses millions of sequences and structures to design "special request" proteins, small molecules, DNA



Additional science issues to consider



- Scientists are more willing to share sequences if they are sure of recognition and credit for their work (e.g. GISAID vs INSDC for Covid genomes); even more important when the work solves problems, discovers something novel, results in inventions that may be eligible for patent protection
- Support needs include Next Generation Sequencing equipment, reliable access to consumables, fast and reliable data connections, more data storage and local computing power for bioinformatics and AI applications, participation in and learning opportunities associated with collaborative research networks/partnerships, ...



- Citizens of global south countries spend on average three weeks' wages to get a visa for global north countries
- The other way round costs on average less than one day's wages

Computers have changed the world

DSI has fundamentally changed “utilisation of genetic resources”; this trend will continue and accelerate



- ABS is a post-colonial response to inequality, based on the principle of “permanent sovereignty over natural resources”
- As the third objective of the CBD fair and equitable benefit sharing was also understood – by developing countries including Africa – as the driver of sustainable use, leading to conservation
- Pairing access with benefit sharing in a bilateral PIC and MAT system has proven to be dysfunctional: there is simply too much free access available
- Africa has consistently opposed this “issue of scope”, e.g.
 - “African proposal” in negotiating the SMTA of the ITPGRFA MLS (and the MLS itself)
 - “New and continuing uses” in the Nagoya negotiations
 - Global Multilateral Benefit Sharing Mechanism (NP Article 10)
 - Multilateral Mechanism for DSI (tbd)

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Sovereignty is not an absolute principle

The Charter of the United Nations, the “international rules-based order”, the MLS of the Plant Treaty, and every multilateral treaty ever are examples of compromises involving qualified use of sovereignty



- Achieving workable compromises requires striking a balance:
 - between rights and obligations
 - between competition and collaboration
 - between positions and interests
- the very nature of DSI – how it is distributed, created, stored, accessed, and used – would suggest limits to the potential role of the sovereign rights of States to control access; accepting open access to publicly available DSI was indeed key to the agreement reached in Montreal

“decoupling access from benefit sharing”

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DSI, Africa's development & Agenda 2063

DSI has a critical role to play in achieving Agenda 2063 Goals and Priorities

- DSI is closely linked to perennial African priorities like resource mobilisation, capacity development, technology transfer
- Policy makers have a duty to consider (potential) DSI impacts on traditional knowledge and farmers' rights
- There is an urgent need to develop coherent and coordinated African negotiating positions across different international instruments dealing with DSI – this is currently a weak spot
- A better understanding of scientific considerations shared across sectors compared to those specific to a single sector would help policy makers and negotiators to achieve better outcomes



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State of play in various fora

Mutually supportive implementation of sub-optimal systems will not work to Africa's advantage

- CBD: WG to develop multilateral mechanism by October (!) – main issue seems to be how much decoupling of access from benefit sharing is possible/agreeable
- WHO: INB and WGIHR supposed to complete work by May – but ABS and DSI might be kicked down the road
- FAO CGRFA: so far no consideration of benefit sharing, only conservation and sustainable use
- ITPGRFA MLS WG: DSI identified as "hotspot", could possibly be compatible with subscription system but complications resulting from expansion of Annex 1 and potential "out of scope" uses



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The African proposal: 1% of retail

Applied to all products of biodiversity, not just DSI

- Only proposal currently on the table that meets all the criteria of CBD Decision 15/9
- If widely implemented could make a transformative difference to resource mobilisation for biodiversity priorities (no credible alternatives at scale)
- Can be implemented in parallel with more specialised systems but would work better if designed as one comprehensive solution
- Requires creative solutions for TK, non-monetary benefit sharing, capacity development, tech transfer
- Will succeed if universally supported by African policy makers, negotiators, scientists and stakeholders

Policy to support science

Science to inform policy

Let's talk!

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Annex 3: ILRI Biosciences Laboratory Facilities (ILRI)

A shared research and capacity building platform for research scientists with state of art equipment and technology in Biosafety level 1, 2 and 3.

- **The Centre for Tropical Livestock Genetics and Health (CTLGH)** supports partnership programmes that aim to improve livestock-based livelihoods in the tropics. We forge partnerships and catalyse investments that enable scientists, investors, policy makers and user communities to co-produce and apply the knowledge and tools necessary to make our vision a reality. CTLGH is a strategic alliance of ILRI, the Roslin Institute at the University of Edinburgh, and Scotland's Rural College. The Centre's research at ILRI-Nairobi is organized into two key areas:

1. Reproductive Technology

This programme aims to demonstrate new precision breeding technologies and ways they can accelerate the impact of tropical livestock genetics. Featured projects are:

- a) Biobanking of indigenous chicken breeds using the Primordial germ cells (PGC),
- b) Precision and multiplex genome editing to build prototypes of tropical poultry genotypes.
- c) Development of bovine pluripotent stem cell resources: Conservation of tropical indigenous Suidae genetic resources using the induced pluripotent stem cells (iPSC) derived from somatic cells.

2. Health Genetics: This programme selects genetic traits to improve disease resistance and resilience of cattle and poultry in the tropics for healthier livestock and High resolution genotypes and phenotypes associated with livestock disease resistance.

- **Genomics platform:** This platform supports pathogen discovery, metagenomics, viral genomics, diagnostics, genomic epidemiology, phylodynamics, disease surveillance, resequencing, and genetic diversity. Equipment in this platform includes automated liquid handling and library preparation instruments, NGS platforms (NextSeq 550 and NextSeq 2000, MiSeqs and Oxford Nanopore Technology (ONT)), 10X Chromium for single cell RNA-seq (scRNA-seq) technology. Sanger sequencing and a range of next generation sequencing services (library preparation, whole genome sequencing, shotgun and 16S metagenomics), full range genotyping (SSR fragment and sequencing analysis and KASP) KASP primer design and testing, SEQART high quality genotyping (genotyping by sequencing).
- **Bioinformatics platform:** High-performance computing server (220 total CPUs, 2.6 TB of memory (RAM), 317 TB of disk space, over 200 bioinformatics and analytical tools and software) for genome assembly/ annotation, phylogenetic analysis, population genetics, other sequence and statistical analysis.
- **Azizi Biorepository:** Long-term storage system and associated informatics tools that comprise the biorepository. The system supports a number of activities and projects including IDEAL, AVID, PAZ, DDDAC, African Bovine Trypanosomiasis, the ILRI livestock diversity collection and ILRI's unique collection of pathogen isolates. The core collection is approximately 450,000 samples in vapour-phase liquid nitrogen (inhouse produced) with uniquely robust, secure and well monitored ultra-cold conditions for long-term storage. <https://azizi.ilri.org/> and the metadata stored in the Laboratory Management Information System (LIMS).

Hosted Institutions CIP and IITA:

- **Tissue culture and a certified plant transformation:** that the lab hosts all standard molecular biology equipment for plant regeneration, genetic transformation and gene editing including growth chambers, culture rooms with programmable controls and sensors for light, temperature and humidity, BSL1 and BSL2 glass houses with computer-controlled cooling mechanisms to regulate temperature and humidity, and screen house.

Annex 4: Starting the dialogue: Exchanging questions and answers

Policy makers' questions (priority questions in bold):

1. **What would they/you want to see coming out of the negotiation process for the operationalisation of the MLS which will support continued access, R&D, and generate potential income?**
Answers: Something that is not administratively burdensome, i.e. hinders research. Unified across sectors.
2. **What are potential revenues generated from DSI and what could serve as fair and equitable BS?**
Answers: two types of revenues: monetary, but cannot be dealt with by scientist; NMB supporting science; some benefit may come now, other may come in 10 or 29 years; DSI products such as seeds, enzyme, vaccine sales 350 bill USD per annum; *GMOs are DSI products as well, 30 products in the market.*
3. **How do you build and ensure long-term trust with communities/access providers/also policy makers(govs)?**
Answers: Science builds on collaboration and trust – sharing information; Does it work? Never promise more than you can deliver. If scientists claim IPR, there cannot be trust.
4. **How do we better target R&D to better target African development challenges?**
Answers: Partnerships at national and subnational level; AU High-level Expert Group recommendations;
5. **How to better scope DSI, and explain it to policy makers?**
Answers: We all know what DSI is – it has been defined by the AHTEG report – but there is need for discussion about data and information. Problem is the legal definition.
6. **Misunderstanding of the concept of DSI, can scientists possibly define what DSI and what is the difference between data and DSI?**
Answer: Benefit is to sustain biodiversity, normally through projects, but businesses could engage in beneficial projects; refers to nucleotides as products of DSI etc. this is part if the information constituting DSI
7. As the user – what is your understanding of DSI -difference between data and DSI?
8. How do you envisage the sharing of benefits arising from DSI through the MLS to all the stakeholders?
9. Main challenges with the principle of BS?
10. What are you doing to protect data in open access data bases?
11. TK value – how are you considering BS for TK?
12. How do you take information back to the community/access provider?
13. Do we need to / can we define DSI or “utilisation of GR”
14. What do you expect from policy makers to make your life better / work easier?
15. What could serve as equitable BS
16. How do you envisage the sharing

Scientist's questions (priority questions in bold):

1. **How can we come up with policies to strengthen African innovation for utilisation and management of DSI?**
Answers: CB and CD development at all levels through trainings, tech transfer, collaboration/partnerships. Who represents African scientists in the DSI process? Science needs a voice! This points to a policy challenge in Africa, AUC is a strong policy making body. Need to come with positive messages.

2. **What kind of CD is needed to understand and implement the COP 15 decision on DSI?**
Answers: Organisational and institutional capacity, ranging from legislation to necessary national policy development.
3. **What does DSI mean?**
Answers: made-up term in COP 14; in others UN bodies other terms used; Defining DSI is a complete trap, don't go there; go back to 3rd objective of CBD; Need to differentiate between negotiations and explaining to policy makers:
4. **How to ensure that countries have equal access to benefits in a MLS?**
Answers: Still a big element needed to be worked out: MLS of Plant Treaty used project approach, which is limited; Biodiversity does not correlate with value, but where is the money needed for CSU – long-term investments. IPBES can set priorities
5. **What kind of communication language**
Answers: for scientists: need for communication specialists to explain to policy makers; both, scientist and policy makers talk about money/funding or public opinion about the biodiversity crisis; should have the some understanding what the country and its people need
6. **What will be the role of scientists to enhance their negotiation role?**
Answers: by working together; Scientific communication needs to be very pragmatic, relate to CSU; science needs to give information to policy makers, but needs to understand their responsibility (making the world better); science is one of the few bridges between the South and North: policy maker listen to science and scientist of the North and South can build the bridges; At international level IPCC and IPBES try to play that role, but obviously it doesn't at national level.
7. What strategies and criteria were used to come up with the 1% retail?
8. How will the 1% retail be shared?

Annex 5: Key Guidance on DSI by COP 15: Nine internationally agreed criteria
by Suhel al-Janabi (ABS Initiative)



THE ABS
CAPACITY
DEVELOPMENT
INITIATIVE

L'INITIATIVE DE
RENFORCEMENT
DES CAPACITES
POUR L'APA

Key Guidance on DSI by COP 15: Nine internationally agreed criteria

African Science-Policy Dialogue on DSI
24. – 26.04.2024, Nairobi, Kenya

Suhel al-Janabi
ABS Capacity Development Initiative

Funded by:

- German Ministry for Economic Cooperation and Development
- Ministry of Environment, Forests & Rural Affairs
- AGRIUM UNIVERSITY OF FRIEDLAND
- giz
- giz

Implemented by:

giz The German Engineering Technology and Innovation Consulting Group

Decision COP 15/9. Digital sequence information on genetic resources



The Conference of the Parties,

9. Also agrees that a solution for fair and equitable benefit-sharing on digital sequence information on genetic resources should, inter alia:

- (a) Be efficient, feasible and practical;
- (b) Generate more benefits, including both monetary and non-monetary, than costs;
- (c) Be effective;
- (d) Provide certainty and legal clarity for providers and users of digital sequence information on genetic resources;
- (e) Not hinder research and innovation;
- (f) Be consistent with open access to data;
- (g) Not be incompatible with international legal obligations;

Decision COP 15/9. Digital sequence information on genetic resources



The Conference of the Parties,

- (h) Be mutually supportive of other access and benefit-sharing instruments;
- (i) Take into account the rights of indigenous peoples and local communities, including with respect to the traditional knowledge associated with genetic resources that they hold

10. Recognizes that the monetary and non-monetary benefits arising from the use of digital sequence information on genetic resources should, in particular, be used to support conservation and sustainable use of biological diversity and, inter alia, benefit indigenous peoples and local communities;

3

Decision COP 15/9. Digital sequence information on genetic resources



Criteria relevant for the Dialogue

- (d) Provide certainty and legal clarity for providers and users of digital sequence information on genetic resources;
- (e) Not hinder research and innovation;
- (f) Be consistent with open access to data;
- (h) Be mutually supportive of other access and benefit-sharing instruments;

4

Criteria important for R&D



d) Certainty and legal clarity

- Certainty and legal clarity is important for all actors
- Clear terms and conditions for access to and use of DSI
- Private users stated that they might pay for it
- Basis for risk mitigation during product development (clarity about costs and rights of use)
- Basic condition for global collaborations, incl. with academic partners
- Lack of legal certainty undermines investment and predictability in research and product development

5

Criteria important for R&D



e) Not hinder research and innovation

Features of the DSI Mechanism

- Worldwide trend towards open access, open science and open innovation
- Open access to DSI is essential for successful research and innovation
- Easy rules for benefit-sharing, no PIC and MAT for access to DSI

Capacity development and technology transfer

- Close the technology gap between North and South
- Support DSI collaboration projects

6

Criteria important for R&D



f) Be consistent with open access to data

- Open access to data benefits research and innovation
- But only those who have the capacity to use DSI effectively enjoy these benefits directly
- A single sequence is not helpful, “comparing and contrasting” is necessary and requires open access
- Bureaucratic and administrative process must be minimal and understandable for all stakeholders
- Does open access mean free access or could it come with terms & conditions resp. open access & use licences?
- Benefit-sharing conditions attached to uploaded data would be against open access by next user

7.

Criteria important for R&D



f) Be mutually supportive of other ABS instruments

- Sovereignty over genetic resources and principle of sharing the benefits arising out of their use is accepted by other UN fora (FAO, BBNJ, latest draft of the WHO CA+)
- Still unclear how to decide on mutual supportiveness and who should do this
- DSI benefit-sharing systems should not stack obligations to a single use
- What alternative setups ?

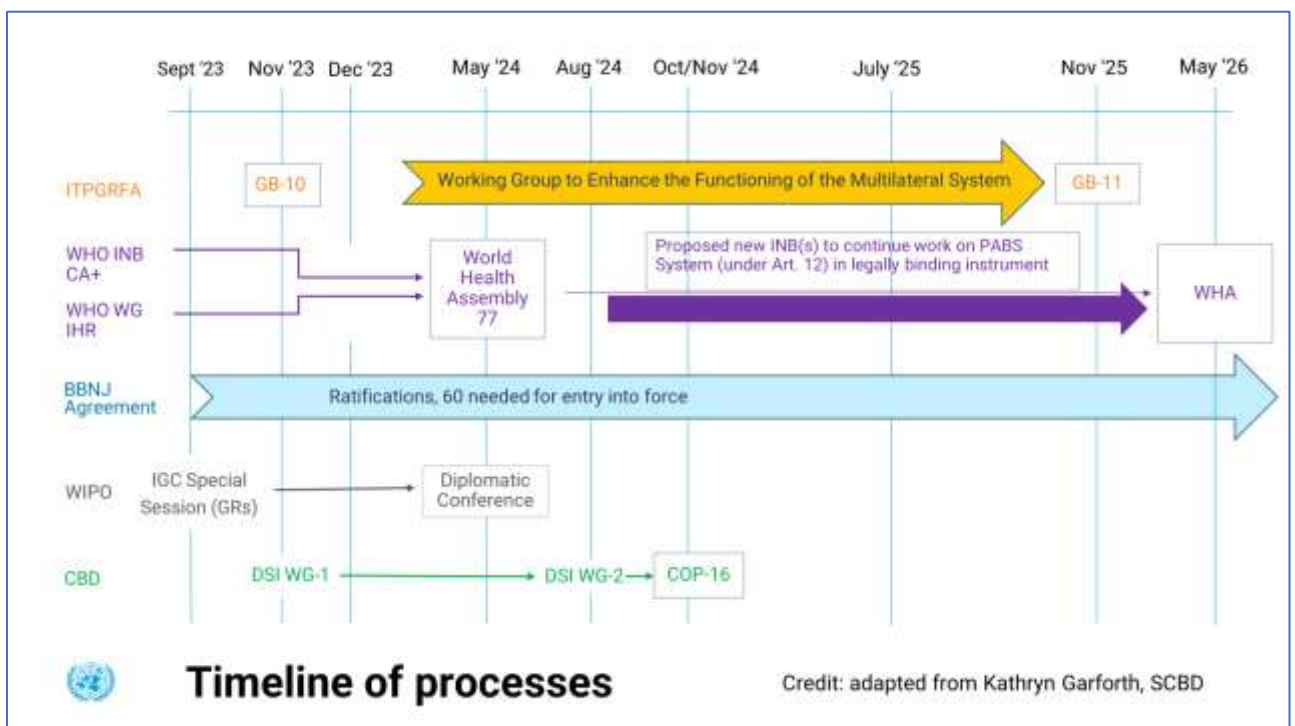
8.

Annex 6: Overview of ABS Systems and DSI negotiations under the FAO (Plant Treaty), UNCLOS (BBNJ Agreement), and WHO (Pandemic Treaty) by Claudio Chiarolla (Bioversity International)

An Overview of ABS Systems and DSI Negotiations under the FAO Plant Treaty (ITPGRFA), the UN Oceans Treaty (BBNJ), and WHO draft Pandemic ABS instrument

Claudio Chiarolla, PhD
Legal Officer, Bioversity International

AFRICAN SCIENCE-POLICY DIALOGUE ON DIGITAL SEQUENCE INFORMATION
24 TO 26 APRIL 2024 IN NAIROBI, KENYA





- 151 contracting parties
- Text adopted in 2001. Came into force in 2004.
- SMTA adopted after 2 years negotiations in 2006.
- Plant Treaty contains commitments by CPs re conservation, sustainable use, farmers' rights, creation of global information system for PGRFA, etc
- Creates the multilateral system of access and benefit-sharing
- Recognizes the importance of in trust collections maintained by CGIAR Centers and invites us to sign 'Article 15' agreements
 - Make materials available under SMTA ('Annex 1' and 'non-Annex 1')
 - Take policy guidance from Governing Body

Multilateral system of access and benefit-sharing

- Includes PGRFA of 64 ('Annex 1') crops and forages that are:
 - Under management and control of contracting parties and in public domain
 - Voluntarily included by natural and legal persons
 - Collections managed by international institutions that sign 'Article 15 agreements'
- All agree to provide facilitated access for the purpose of research training and breeding for food and agriculture, using the SMTA
- Default benefit sharing formula (SMTA Article 6.7):
- Recipient required to make payments to international benefit sharing fund if
 - Incorporates materials received in new product,
 - commercializes the product, and
 - prohibits others from using it, without restrictions, for further research and breeding

Performance to date

Between 2007-December 2022:

Re access:

- 1.4 million accessions of PGRFA known to be included in the system (GLIS)
- 6.6 million PGRFA samples transferred with more than 100,000 SMTA

Re monetary benefit sharing:

- 22 million dispensed through the fund through 4 rounds of successive grants
- 21.5 million came in from of voluntary payments from governments, stakeholders
- 4 payments from users. Two mandatory, two voluntary

Re non-monetary benefit sharing:

- Tech transfers, information sharing, capacity sharing

MLS Enhancement Process

WG started in 2013 to 2019 – then negotiations paused (re: disagreement on benefit sharing from DSI)

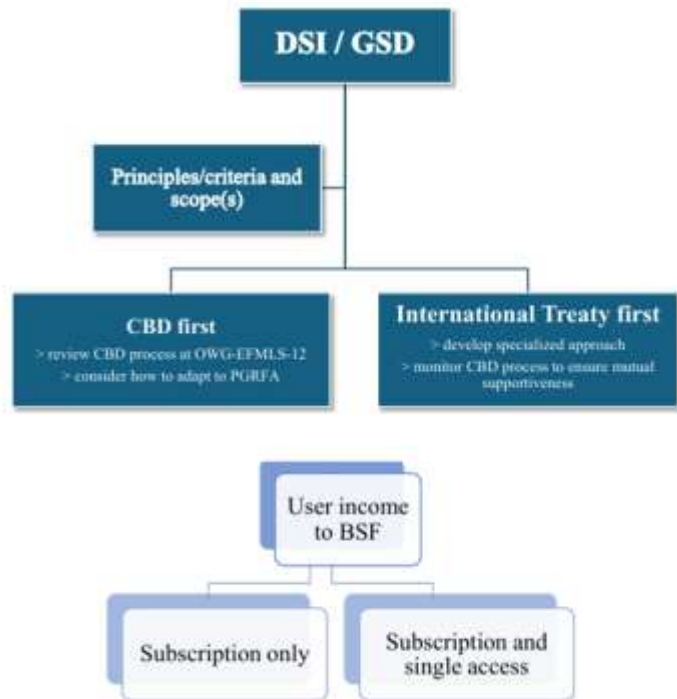
In the wake of the CBD COP 15 DSI Decision, the Governing Body decided to restart the MLS enhancement process, which is being conducted on the basis of the "[June 2019 Draft Package](#)":

- a **draft amendment of Annex I** (list of crops in the MLS): possible expansion to all PGRFA in *ex situ* conditions plus national or regional lists of exemptions.
- a **draft revised Standard Material Transfer Agreement (SMTA)**: subscription option involving upfront benefit-sharing payments vs. a dual system, allowing users to choose between subscription and a single-access option
- a draft resolution on implementation.

Additional issues: direct use, and **non-food and feed uses** of materials from the MLS

Current focus of the WG to address three hotspots:

1. digital sequence information/genetic sequence data
2. expansion of Annex I, and
3. payment structure and rates



Signatories : 89. Parties : 4

BBNJ Agreement

The objective is to ensure the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction...

ABNJ: high seas and the Area



Certified true copy.



Source: Excerpt from DOALOS Briefing on Marine genetic resources, including fair and equitable sharing of benefits, under the BBNJ Agreement (English, French, Spanish), 6 March 2024



What is in the Agreement?

UN
Office of Legal Affairs
Division for Ocean Affairs
and the Law of the Sea
Source: Excerpt from
DOALOS Briefing on
MGRs, 6 March 2024

- A package of issues
- Cross-cutting issues

Part II Objectives MGRs & Benefit Sharing

- (a) The fair and equitable sharing of benefits arising from *activities* with respect to MGRs and DSI of ABNJ
- (b) The building and development of the capacity of Parties, particularly developing States Parties, ...to carry out activities with respect to MGRs and DSI of ABNJ
- (c) The generation of knowledge, scientific understanding and technological innovation, including through the development and conduct of MSR
- (d) The development and transfer of marine technology

Scope

- The Agreement applies to **activities** with respect to MGRs and DSI collected and generated after its entry into force
- The application of the Agreement extends to the **utilization** of MGRs and DSI **collected or generated before entry into force**, unless a Party makes an exception in writing
- Exclusions:
 - a) Fishing
 - b) Fish or other living marine resources known to have been taken in fishing activities, if not regulated as **utilization**
 - c) Military activities

Notifications to the CHM

- Pre-collection
- Post collection
- Utilization

....including a data management plan

CHM automatically generates a BBNJ standardized batch identifier

Benefit sharing

- Developed States Parties shall make annual contributions to the special fund
- A Party's rate of contribution shall be 50% of that Party's assessed contribution to the budget adopted by COP
- COP shall decide the modalities for BS from the utilization of MGRs & DSI of ABNJ, taking into account the recommendations of the ABS Committee

Modalities

(a) **Milestone payments**

(b) Payments or contributions related to the **commercialization** of products, including payment of a percentage of the revenue from sales of products

(c) Tiered fee paid on a periodic basis, based on a diversified set of indicators measuring **aggregate level of activities** by a State Party



NINTH MEETING OF THE INTERGOVERNMENTAL
NEGOTIATING BODY TO DRAFT AND NEGOTIATE
A WHO CONVENTION, AGREEMENT OR OTHER
INTERNATIONAL INSTRUMENT ON PANDEMIC
PREVENTION, PREPAREDNESS AND RESPONSE
Provisional agenda item 2

A/INB/9R/3
April 2024

Proposal for the WHO Pandemic Agreement

Article 12. Access and benefit sharing

(f) “pathogen with pandemic potential” means any pathogen that has been identified to infect a human and that is: novel (not yet characterized) or known (including a variant of a known pathogen), potentially highly transmissible and/or highly virulent with the potential to cause a public health emergency of international concern;

“PABS Material and Information” means the biological material from a pathogen with pandemic potential, as well as **sequence information** relevant to the development of pandemic-related health products

Latest WHO PABS
text proposed by
Co-Chairs (in
Article 12):

<https://healthpolicy-watch.news/wp-content/uploads/2024/04/DRAFT-WHO-Pandemic-Agreement-16-April-2024.pdf>

Mandate – interim report of INB9

The INB requested the Bureau, with the support of the Secretariat, to develop a proposed draft the WHO Pandemic Agreement for negotiation at the resumed session of the ninth meeting of the INB.

In furtherance of the mandate of the INB, the text should:

- operationalize equity
- be focused,
- build on potential areas of consensus already identified, and
- address the critical aspects of pandemic prevention, preparedness and response.



Foundations

1. The commitment to share, on an equal footing, PABS Material and Information and the benefits arising therefrom;
2. Complementarity with the PIP Framework;
3. Governance, review, and accountability mechanism(s);
4. Not seeking to obtain IPRs on PABS material and information;
5. Consistent with, and does not run counter to, the objectives of the CBD and its NP / **recognized as a specialized international ABS instrument** (Article 4.4 of the NP);

Modalities, terms & conditions of the PABS System shall be defined in a legally-binding instrument, operational no later than 31 May 2026:

- 1. Sharing of PABS Material and Information**
- 2. Sharing of benefits, both monetary and non-monetary, arising from access to PABS Material and Information, including:**
 - (i) in the event of a pandemic, real-time access by WHO to **20%** (10% as a donation and 10% at affordable prices to WHO) **of the production of pandemic-related health products**; and
 - (ii) **annual monetary contributions** from PABS System users administered by WHO

Conclusions: ABS implications

Benefit sharing in the era of DSI can only be fair and equitable if it:

- delinks payment obligations from incorporation of DNA sequences into final products, and
- Recognizes, reflects and rewards the value contributed by DSI through upstream research



De facto multilateral access and use of DSI

Multilateral reality:

- Digital infrastructure facilitates pooling and availability of data from genetic resources worldwide
- Stimulating scientific break-through/create value at multiple levels
- Ag R&D is now dependent on generation, availability and use of DSI

Reality check:

- Lots of non-monetary benefit sharing. Largely unmeasured
- No monetary benefit sharing
 - Need a solution that raises funds, reflects value addition of DSI to R&D, shares those benefits, and supports continued availability of DSI

Thank you

c.chiarolla@cgiar.org



Genebank
Initiative

Annex 7: DSI processes under the CBD until COP 16 by Mphatso Kalemba
(Department of Environmental Affairs, Malawi)

TOWARDS COP 16: UPDATES ON DSI PROCESSES UNDER THE CONVENTION ON BIOLOGICAL DIVERSITY

Mphatso Martha Kalemba
25/04/2024

Adapted from presentations made by the CBD Secretariat

DECISION 15/9

- **CBD/COP/DEC/15/9 + CBD/NP/MOP/DEC/4/6** Digital Sequence Information on Genetic Resources
 - Decides to establish, as part of the Kunming-Montreal Global Biodiversity Framework, a multilateral mechanism for benefit-sharing from the use of digital sequence information on genetic resources, including a global fund;
 - Also decides to establish a fair, transparent, inclusive, participatory and time-bound process to further develop and operationalize the mechanism, as outlined in paragraphs 18 and 20 to 22 below, to be finalized at the sixteenth meeting of the Conference of the Parties; 18.
 - Establishes an ad hoc open-ended working group on benefit-sharing from the use of digital sequence information on genetic resources to undertake further development of the multilateral mechanism, including the elements identified in the annex, a

PROCESS TO DATE AND MOVING FORWARD

- Submissions of views - **February-March 2023**
- Lessons learned compilation-**2023**
- Synthesis of submissions-**2023**
- OEWG-DSI 1-**November 2023**
- Studies:Value-Chain revenue points; Modeling of policy points –**Underway**
- **Peer Review of the studies**
- Information session -**19th May 2024 -Nairobi**
- OEWG-DSI-2-**August 2024**
- COP 16-**October 2024**

MODALITIES FOR INTERSESSIONAL WORK

1. Information sharing

2. Informal Advisory Group

3. Informal consultations facilitated by the Co-Chairs

The Co-Chairs will prepare a report on the outcomes of the intersessional work.

FIRST MEETING OF THE WORKING GROUP ON BENEFIT-SHARING FROM THE USE OF DSI

- Areas of potential convergence
- Elements on which there is a need for further discussion
 - A. Contributions to the fund
 - B. Disbursement from the fund
 - C. Non-monetary Benefit-sharing
 - D. Governance
 - E. Relation to other approaches and systems
- **CBD/WGDSI/1/3** Report of the Ad Hoc Open-ended Working Group on Benefit-sharing from the Use of Digital Sequence Information on Genetic Resources on its first meeting
 - Annex "Possible elements of a multilateral mechanism for benefit-sharing from the use of digital sequence information on genetic resources, including a global fund"

INFORMAL ADVISORY GROUP

*Building on the experience of the WG2020 Co-Chairs IAG,
Provide opportunity for technical discussions among Parties, non-Parties, IPLCs and stakeholders
These may contribute to moving forward discussion on the "Elements on which there is a need for further discussion".*

Month	Topic	Paras.	Clusters
January	• DSI databases, research methodologies and products	6-7, 10-12	A
	• Data governance (incl. assoc. traditional knowledge)	53, 55, 56-59	D
February	• Collaboration and cooperation with other approaches and systems – whom, what and how	62, 69	E
	• Legal considerations, and incentives to participate	5, 8-9, 64, 66, 68	A, E
March	• Non-monetary benefit-sharing	32-36	C
	• Modalities for disbursement of funds	23-26	B
April	• Fund governance and governance of mechanism	13, 47, 50, 51-52, 54	A, D
	• Fund host	48-49	D
May	• How the mechanism will meet the requirements laid out in decision 15/9 paras 6-10	4-12, 14	A
	• Compatibility with the CBD and the Nagoya Protocol		
June	• Trigger points for contribution	63	E
		22, 64-68	B, E

POSSIBLE ELEMENTS OF A MULTILATERAL MECHANISM FOR BENEFIT-SHARING FROM THE USE OF DIGITAL SEQUENCE INFORMATION ON GENETIC RESOURCES, INCLUDING A GLOBAL FUND

- * The elements outlined in the present document provide a non-exhaustive list that Parties may wish to consider as a priority in future work. Parties retain the right to raise and consider additional elements in line with the annex to decision 15/9. Where lists are presented, the order is not intended to set a hierarchy or precedence among the items.

CONTRIBUTIONS TO THE FUND

potential convergence

The global fund should contribute to the achievement of Target 19 and Goal D of the Framework without changing the existing international obligations of all Parties to the Convention, including under Article

CONTRIBUTIONS TO THE FUND

FURTHER DISCUSSION

- Whether the following triggers could meet the criteria in paragraphs 9 and 10 of decision 15/9 and mobilize timely and predictable funding at the intended scale:
 - Access to DSI;
 - Use of DSI;
 - Generation of revenue arising from the use of DSI;
 - Commercialization of products derived from the use of DSI
 - Any other triggers already identified or to be identified.
- Whether in the case of a voluntary system, a trigger is needed.
- Whether all users of DSI could be potential contributors to the mechanism.
- Whether donors, including Governments, should contribute to the fund, for example in its start-up phase to ensure sufficient initial capitalization, or make contributions on an ad hoc or regular basis.
- could be done through a legally binding instrument or a non-legally binding framework and the timelines associated with these options

CONTRIBUTIONS TO THE FUND

FURTHER DISCUSSION

- How obligations for sharing the benefits from the use of DSI in the multilateral mechanism can be created; whether this would facilitate a predictable level of contributions and fairness among potential contributors; and whether this could be done through a legally binding instrument or a non-legally binding framework and the timelines associated with these options.
- How the scale of contributions to the fund could be determined.
- Whether contributions to the fund should be proportionate to the revenue generated from the use of DSI.
- The scale and sectors of the industries that use of DSI including information on, for example, turnover, profit, people employed, countries of operation and reliance on DSI.
- Which elements of the modality for assessing contributions would need to be agreed by the Conference of the Parties, and which could be left to the governing body of the fund.
- Whether and how possible criteria for the scale of contributions could include:
 - 1 per cent of the retail price of all commercial income net revenue from products resulting from all utilization of DSI;
 - The profits or revenue generated from the use of DSI
 - The profits or revenue generated from the use of DSI

DISBURSEMENT FROM THE FUND

- The strategic priorities and disbursement criteria of the fund should be decided by the Conference of the Parties.
- Funding should be directed towards activities that support the conservation and sustainable use of biodiversity and the implementation of national biodiversity strategies and action plans, especially in developing countries, in particular the least developed countries and small island developing States, as well as countries with economies in transition.
- Funding could be directed towards other biodiversity-related priorities, including the relevant Sustainable Development Goals.
- Funding should be allocated in a fair, equitable, transparent, accountable and gender-responsive manner.
- The fund should allow for the allocation of funding to indigenous peoples and local communities in all regions, in particular in developing countries.
- Various factors could be used to determine the level of funding allocated, including:
 - The self-identified needs of indigenous peoples and local communities, women and youth, taking into account their major contribution to the conservation and sustainable use of biodiversity;
 - The biodiversity, ecological or ecosystemic richness of the country;
 - The capacity needs of countries, in particular with regard to digital sequence information on genetic resources;
 - Regional balance and particular consideration of the needs of developing countries;
 - Capacity needs with respect to conservation and sustainable use.

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 - The capacity needs of countries, in particular with regard to digital sequence information on genetic resources;
 - Regional balance and particular consideration of the needs of developing countries;
 - Capacity needs with respect to conservation and sustainable use.

DISBURSEMENT FROM THE FUND

FURTHER DISCUSSION

- How indigenous peoples and local communities should access funds, whether they should be able to access the funds directly and/or indirectly and how they can be involved in the decision-making.
- Whether or not countries that require, through national legislation, benefit-sharing from the use of DSI in international public databases should also receive benefits from the multilateral mechanism.
- Whether funding should be disbursed according to country allocations, on a project basis, a combination thereof, or another modality altogether.
- Whether the level of development of the country should be considered or assessed when allocating funding.
- Whether the level of funding disbursed should always be on the basis of a needs assessment.
- Whether funding allocations should be based, at least in part, on the geographical origin of the genetic resources from which the DSI is derived, noting that current studies suggest there are only incomplete data available on geographical origin in databases.

NON-MONETARY BENEFIT-SHARING

- Criteria for the sharing of non-monetary benefits could include:
 - The need for additional capacity for the purposes of conservation and sustainable use;
 - The capacity gap, especially between developed and developing countries, and in particular with respect to the ability to generate, access, use, analyse and store DSI
 - The self-identified needs of indigenous peoples and local communities, women and youth taking into account their major contributions to the conservation and sustainable use of biodiversity;
 - The needs of national agencies and institutions, including research and academic institutions.
- Work to facilitate capacity-building and development and technology transfer and development on DSI should contribute to the implementation of the **relevant provisions on technical and scientific cooperation and technology transfer and development under the Convention, building on decision 15/8 of COP, needs assessments, NBSAPs, and the regional and/or subregional technical and scientific support centres;**

NON-MONETARY BENEFIT-SHARING

- The work to facilitate capacity-building and development, technical and scientific cooperation and technology transfer and development on DSI for use in the conservation and sustainable use of biological diversity would have the high-level goals of:
 - Improving the ability to manage and conserve biodiversity and use it sustainably;
 - Closing the gap in capacity to generate, access, use, analyse and store DSI, in particular between developed and developing countries;
 - Delivering national priorities for capacity-building and development, scientific and technical cooperation and technology transfer and development by building and developing individual, organizational and enabling capacity, as well as research infrastructure;
- Target beneficiaries of capacity-building and development include indigenous peoples and local communities, women, youth, as well as Governments and researchers.
- There are many ways in which non-monetary benefits are already being shared and the future sharing of non-monetary benefits should take into account lessons learned from those experiences.

NON-MONETARY BENEFIT-SHARING

FURTHER DISCUSSION

- Whether there is a need for a new platform or facility for sharing non-monetary benefits, such as technologies and capacities that are developed using digital sequence information on genetic resources and what the potential modalities would be.
- Whether the needs of stakeholders could be a criterion for the sharing of non-monetary benefits, and if so, which stakeholders;
- Whether the discussion on non-monetary benefit-sharing should take into account the outcomes of the meeting held in 2020 by the Ad Hoc Technical Expert Group on Digital Sequence Information on Genetic Resources with regard to key areas for capacity-building and development.
- Whether the use of digital sequence information on genetic resources could serve as a trigger for non-monetary benefit-sharing.

NON-MONETARY BENEFIT-SHARING

FURTHER DISCUSSION

- Whether non-monetary benefits from the use of digital sequence information on genetic resources could include the following:
 - Projects for the conservation or sustainable use of biodiversity or for the protection and maintenance of knowledge, innovations or practices of indigenous peoples and local communities etc ;
 - Technology transfer and technology development;
 - Making the product available in the public domain;
 - Licensing of products free of charge;
 - Training of human resources in topics related to the conservation and sustainable use of genetic diversity or associated traditional knowledge;
 - Free distribution of products in social interest programmes;
 - Establishment of national databases;
 - Promoting joint research-partnerships;
 - Joint ventures.

GOVERNANCE

- The multilateral mechanism will be guided by strategic principles set out by the Parties to the Convention, including those in decision 15/9, in particular paragraphs 9 and 10; and monitored against those principles
- The global fund should operate under the supervision and guidance of the Conference of the Parties;
- There should be a governing body for the global fund, and it should operate in a transparent way;
- The governing body of the fund should include Party representatives;
- The private sector and other contributors should be able to contribute to the fund without significant administrative burden;
- The fund should be able to receive and disburse funding soon after a decision is taken by the Conference of the Parties at its sixteenth meeting;
- The operation of the multilateral mechanism should be monitored against the principles set out in decision 15/9, in particular paragraphs 9 and 10;
- The monitoring and evaluation framework for the fund could be developed in coordination with the monitoring framework for the Kunming-Montreal Global Biodiversity Framework, and in particular for Target 13 and Goal C, and a system and associated capacity should be established for regular review;
- The multilateral mechanism should be evaluated and reviewed in accordance with an agreed methodology in a transparent manner;
- The multilateral mechanism must respect the rights of indigenous peoples and local communities over their traditional knowledge, traditional knowledge associated with genetic resources, and genetic resources and data related to them.

GOVERNANCE

FURTHER DISCUSSION

- Whether and how the governance of the fund should include the participation of representatives of: **Indigenous peoples and local communities; The private sector; Civil society; Youth; Women; Academia; Non-Parties; Infrastructure and database providers; Other access and benefit-sharing instruments.**
- Options for new or existing funds which could host the global fund, including how quickly they could be operational;
- Options for revisions to the operating modalities of the Global Environment Facility or the Global Biodiversity Framework Fund, under request from the Conference of the Parties, to enable them to serve as the host of the global fund;
- Whether, and if so how, the work of the relevant advisory committees and advisory groups under the Convention could be taken into account in the work of the Working Group on Benefit-sharing from the Use of Digital Sequence Information on Genetic Resources, and vice versa;
- How to ensure the global fund is consistent with principles of inclusivity, equity and transparency;
- The difference, if any, between governance of the mechanism as a whole and governance of the fund and the need for coherence between them

GOVERNANCE

FURTHER DISCUSSION

- Whether and, if so, how, a family of linked databases under the mechanism should be created and any potential implications of this, such as the possible fragmentation of databases;
- The factors to be considered in the regular monitoring of the operation and performance of the mechanism;
- Whether the multilateral mechanism has implications for data governance;
- How the mechanism could operate in a way that is consistent with open access to data in public databases;
- Whether and, if so, how, the multilateral mechanism should operate in a way that does not affect the current operations or working practices of public databases;
- Whether the mechanism should agree to, and encourage the use of, data governance guidelines that encourage the application of the findability, accessibility, interoperability and reusability (FAIR) principles and the collective benefits, authority to control, responsibility, ethics (CARE) principles in an integrated and balanced way;
- How the multilateral mechanism will operate in a way that respects the rights of indigenous peoples and local communities over their traditional knowledge, traditional knowledge associated with genetic resources and genetic resources;

RELATION TO OTHER APPROACHES AND SYSTEMS

- Depending on its final form, the multilateral mechanism could learn from a number of existing approaches and systems, such as community protocols and examples of monetary and non-monetary benefits;
- There needs to be ongoing coordination and cooperation with the other forums that are considering benefit-sharing from the use of digital sequence information on genetic resources or related issues (e.g. the International Treaty on Plant Genetic Resources for Food and Agriculture, the Commission on Genetic Resources for Food and Agriculture of the Food and Agriculture Organization of the United Nations, the World Health Organization, the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction, and the World Intellectual Property Organization) to ensure legal clarity and enable the multilateral mechanism to be mutually supportive of and adaptable to the other instruments while recognizing that other forums may develop specialized approaches;

RELATION TO OTHER APPROACHES AND SYSTEMS

FURTHER DISCUSSION

- Whether and if so, how an inter-forum body or process on access and benefit-sharing for digital sequence information on genetic resources could facilitate coordination among the forums considering digital sequence information on genetic resources;
- 63. For models where the multilateral mechanism operates alongside bilateral arrangements for access and benefit-sharing on digital sequence information on genetic resources, issues for further discussion include:
 - (a) Whether and how any such models could be designed in such a way to meet the criteria set out in paragraphs 6 to 10 of decision 15/9 and the mandate set out for the Ad Hoc Open-Ended Working Group on Benefit-sharing from the Use of Digital Sequence Information on Genetic Resources;
 - (b) The practical means of implementing these models;
 - (c) Whether the risk of double payment is significant or problematic;
 - (d) Whether arrangements would need to be put in place to prevent jurisdiction shopping;
 - (e) The advantages and disadvantages of using such models on a time-limited basis;
 - (f) Whether it would be appropriate for Parties that do and those that do not operate national access and benefit-sharing measures on digital sequence information on genetic resources to benefit from the multilateral mechanism to the same extent.

RELATION TO OTHER APPROACHES AND SYSTEMS

FURTHER DISCUSSION

- How to ensure that the multilateral mechanism does not run counter to Articles 15.1 and 15.7 of the Convention.
- Whether the scope of the multilateral mechanism, either initially or in future, should be extended to include genetic resources;
- Whether the multilateral mechanism could conflict with mutually agreed terms on access and benefit-sharing under the Nagoya Protocol that include digital sequence information on genetic resources and, if so, how they could be reconciled.
- Whether the multilateral mechanism could learn from approaches under the Nagoya Protocol, such as customary laws, community protocols and procedures.
- How the multilateral mechanism could be designed so as not to undermine the rights and responsibilities that exist under the Protocol and to be without prejudice to national access and benefit-sharing measures.
- Whether any coordination and cooperation with other forums should also include the United Nations Educational, Scientific and Cultural Organization and possibly others.
- How to ensure the mechanism is future proof and captures, inter alia, the results of artificial intelligence applied to digital sequence information on genetic resources.

CONTRIBUTING TO THE PROCESS

- Respond to survey by KPMG
- Peer review of the studies
- Take advantage of intersessional work (IAG) and other informal sessions
- Take advantage of the Information Session planned for 19th May in the margins of SBSTTA
- Formal and informal documents on DSI
- Preparation for the Second OEWG planned in August in Montreal, Canada.
 - Recommendations to the COP

Thank you

mphakalemba@gmail.com

Annex 8: How can non-monetary benefit-sharing (NMBS) and capacity development (CD) support the biodiversity strategies and African development priorities?

During the fishbowl discussion the following topics were addressed:

- Need to identify what are real benefits for the providers, what benefits are needed.
- Need for strong partnerships between scientific communities, sharing results, reducing the gaps between North and South.
- What mechanisms do we have in place for people to understand what is discussed at national and international level regarding biodiversity and development priorities – do we have alignments? Do we know what the gaps are for implementing the Biodiversity Plan.
- MLS might foster capacity to develop and use DSI and what is information leading to. No isolated measures but rather a coordinated, structured approach. Need for continuum to be involved in all steps.
- ABSAP focus on resource mobilisation. Weaknesses: data management, communication and information sharing between institutions, administrative burdens in institutions. How do people get proper training?
- Need to talk the same language when discussing in different fora. Limited understanding what is going on in other fora. Different needs in different African countries regarding implementation of Biodiversity Plan and development priorities.
- BS is only useful, if it is needed and useful for the recipient. May be easier in bilateral NMBS system than in a multilateral system. What could a multilateral BS system do better?.
- Need to support the NBSAP (mainstreaming biodiversity in all sectors of society). NMBS happens almost at random and not in line with the priorities identified in the NBSAPs. Would make a big difference and it could be reported in a national clearinghouse to make it transparent.
- The concept of NMBS requires the right perception (to who it is NMBS). Applies differently from community to community: availability of electricity, internet etc. – Agrees to use NBSAP priorities.
- What is BS as compared to what users need to do anyway, e.g. setting up a databank?
- To make it equitable you need to talk to the right person / community.
- For ITPGRFA NMBS: can directly go to the communities/farmers for community seedbanks incl. necessary training.
- GR value can change substantively: e.g. coral reef ecosystems for coastal protection, fish breeding, tourism. The ethical aspects (God's creation) are relevant!
- IPLC participation in CD is necessary to involve them in value chains and even to bring their own products to the international markets with their own companies – not only to provide raw material.
- In a multilateral system monetary BS often turn into NMBS (project). Need to connect the dots through appropriate indicators in the GBF. E.g. producing a scientific publication is a NMB for the scientist, but not necessarily to the community.
- BS should support target 19 (RM) of the GBF.
- NMBS is an opportunity for countries. Revision of NBSAPs can identify needs and priorities for CB/CD and infrastructure needs. NMBS can be used to implement NBSAPs.
- What we lose under a multilateral system: the direct link to the provider and to the ecosystem; the partnerships and relationships we have built in the bilateral system.
- DSI MLS will not break down those relationships. In a bilateral system NMBS will only deliver based on PIC and MAT. A MLS, if designed well, creates many opportunities for (project oriented) NMBS.
- Through a MLS also those who are not providing resources can get NMBS, opening new opportunities.

- Countries can channel funds under a MLS to NBSAP priorities, which bilateral NMBS can never address and cover.
- Need to measure the value of NMBS, to what extent gaps are addressed.
- R&D is done anyway and integrating in NBSAPs is high value at no cost. Need to differentiate in-kind vs. no-cost.
- Part of the science community sees that one of the 9+1 criteria relates to conservation and sustainable use., while others see the technical, equipment related part not directly leading to conservation and sustainable use benefits.
- Participants in the dialogue come from different background. In the process of dialogue participants will change perspectives. Here we talk much about regulations, which are made by the powerful. Dialogue is therefore important. E.g. NMBS can contribute to empowerment of esp. women, skills and orientation needed, generating ownership is key to unlocking values, exemplified by cellphones as a tool leading to marketing through TikTok.

Annex 9: Key issues: Convergence and divergence

Headline questions:

1. To what extent are sectoral approaches compatible with the agreed principle of open access to DSI?
 - They are compatible to the extent that the T&C in the sectoral approaches are compatible with the principle of open access.
Partly agree, agric., health are compatible, but I am not sure about other sectors.
Totally disagree, as there are different players in the different sectors.
The question is misleading. How can open access be a principle for anybody?
Agree, as one of the most important conditions are the Terms & Conditions.
 - As long as the T&C in the sectors are not against the principle of open access, they are compatible.
Much agreement
Unclarity: Many do not understand the principle of open access.
We don't have an agreed principle of open access.
 - Open access means that once uploaded in INSDC, information can be used by anyone without restrictions.
Much agreement
That is exactly how I interpret it.
In the reality there is restricted access, i.e. meaning restrictions for use, in many data bases.
 - The principle of open access is an idea, which requires further discussion.
Much agreement.
We need more clarification and a common understanding what the principles exactly means.
2. What is the best way to achieve mutually supportive implementation: CBD first or other instruments first?
 - Neither – the best way forward would be if fora come together to agree upon mutually supportive instruments.
Quite some distance by many.
Doubtful, CBD refers to all GR, the other instruments deal only with subsets of GR.
The instruments should go in parallel, as waiting for CBD might lead to ongoing business as usual.
Experiences in other instruments could guide decision making in the CBD.
The principle of mutually supportiveness has already been agreed. Why do we need to discuss this.
 - CBD first, as CBD it's the foundation.
Much agreement.
Disagree, BBNJ first as BBNJ is the first agreement which deals with DSI. What means mutual supportiveness? Not undermine? Not complicate work for science?
At national level, the other sectors come to Environment to work together to solve the problems.
Need for a dialectic process between the CBD and the other sectors. The CBD is most general and should guide other sectors.
The CBD confirmed national sovereignty and established ABS, i.e. CBS was norm-setting for other sectors.
3. Which is more important for accommodating TK and IPLC in the DSI multilateral mechanism (MLM): Their right to Free Prior Informed Consent (FPIC) or their right to benefit?
 - IPLCs are under the governance of their respective governments. FPIC depends on the national government.
Quite mixed positioning.
FPIC is a non-negotiable matter of ethics. Don't confuse with benefits, which might not

come.

Its an ethical issue which is regulated in most countries.

FPIC should be necessary

Disagree, IPLC are not considered sufficiently at national level.

- Both should be considered, as both are important.

Quite close positioning.

Agree in principle the right for benefits is now an agreed principle and should be the focus until COP 16.

Benefits should be in the focus at this point of time.

Disagree, IPLCs must have a clear voice in the process

Disagree, ethical principles must be respected and cannot be just considered.

Annex 10: Data versus Information by Hartmut Meyer



THE ABS
CAPACITY
DEVELOPMENT
INITIATIVE

L'INITIATIVE DE
RENFORCEMENT
DES CAPACITES
POUR L'APA

Data versus Information

African Science-Policy Dialogue on DSI
24. – 26.04.2024, Nairobi, Kenya

Hartmut Meyer
ABS Capacity Development Initiative


Funded by:

- Ministry of Science, Technology and Innovation
- Department for International Trade & Regional Affairs
- AFRICANA CENTRE
- giz

Implemented by:


giz

genetic data / genomic data sequence information



Escherichia coli promoter region of the phosphoenolpyruvate carboxylase gene (PPC, EC 4.1.1.31)

GenBank: X01700.1
FASTA Graphics

Gen: 

LOCUS X01700 360 bp DNA linear BCT 26-JUL-2010

DEFINITION Escherichia coli promoter region of the phosphoenolpyruvate carboxylase gene (PPC, EC 4.1.1.31).

ACCESSION X01700

VERSION X01700.1

KEYWORDS inverted repeat; phosphoenolpyruvate carboxylase; promoter.

SOURCE Escherichia coli

ORGANISM Escherichia coli
Bacteria; Pseudomonadota; Gammaproteobacteria; Enterobacterales; Enterobacteriaceae; Escherichia.

REFERENCE 1 (bases 1 to 360)

AUTHORS Izui,K., Miwa,T., Kajitani,M., Fujita,N., Sabe,H., Ishihama,A. and Katsuki,H.

TITLE Promoter analysis of the phosphoenolpyruvate carboxylase gene of Escherichia coli

JOURNAL Nucleic Acids Res. 13 (1), 50-71 (1985)

PUBMED 3888833

ORIGIN

```

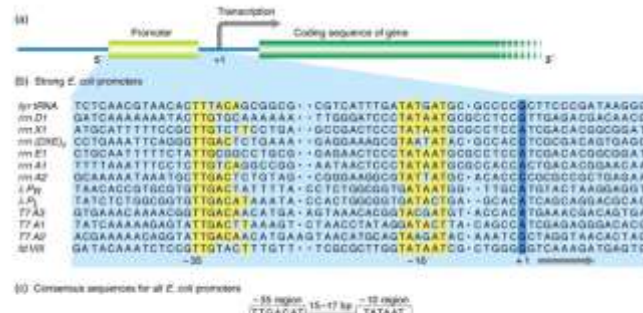
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```

<https://www.ncbi.nlm.nih.gov/nuccore/X01700.1>

2

genetic data / genomic data sequence information



Transcriptional Promoters

A **promoter** is a short DNA sequence that signals the **RNAPol** where to begin transcription. Comparison of many *E. coli* DNA gene sequences shows two common promoter motifs (yellow boxes) with similar sequences, which are located approximately -10 [the **TATA Box**] & -35 [the **CAT Box**] bases 5' (upstream) from the start point of RNA transcription (blue box). Similar promoter regions occur in other prokaryotic and eukaryotic genes.

It is important to remember that the promoter is a DNA signal for the downstream start point of transcription at position +1. The start point of translation is recognizable in the DNA still further downstream, but is actually on the transcribed RNA molecule, at the **AUG start codon** of the gene. The start codon does not appear in the diagram.

Figure © 2004 by Griffiths et al.; text © 2024 by Steven M. Carr.

https://www.mun.ca/biology/scarr/MGA2_03-09.html

3

genetic data / genomic data sequence information

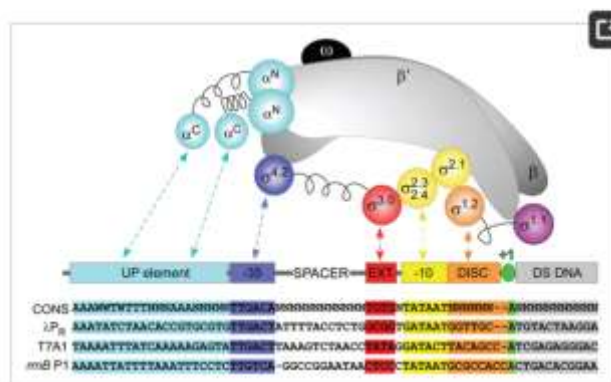


Figure 1. Sequence-specific interactions between σ^{70} RNAP and regions of the promoter. Schematic representations of the subunits of RNAP core, σ^{70} , and promoter DNA. RNAP: α_2 : cyan; β and β' : gray; ω : black. σ regions: as shown. Promoter: UP element: cyan; -35 element: blue; extended -10: red; -10 element: yellow; discriminator: orange; transcription start site: green; DNA downstream of the transcription start site: gray. Linker regions in α and σ subunits are shown as springs. Nontemplate strand sequences of a "consensus" and λP_R , T7A1 and mmB P1 promoters are shown below; missing bases are indicated by dashes.

Ruff et al. 2015, <https://www.mdpi.com/2218-273X/5/2/1035>

4

genetic data / genomic data sequence information

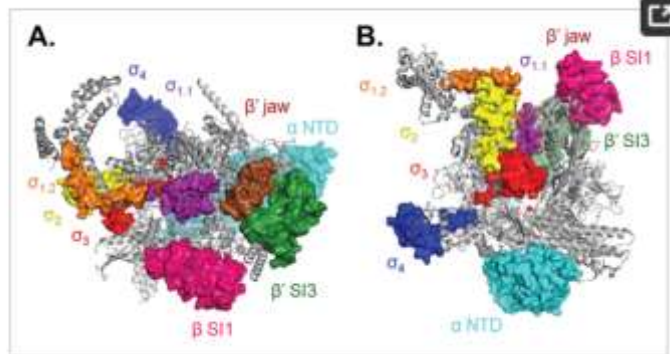


Figure 2. Structural representation of key functional regions of $E\sigma^{70}$ holoenzyme. Structure created from PDB 4LK1, looking down the cleft in (A) and rotated 90° into the page and 90° counterclockwise in (B). Colors of regions of σ are the same as in Figure 1. Additionally shown: β' jaw (β' 1149–1990), brown; β' SI3 (β' insert 6; β' 943–1130), green; β SI1 (β insert 4; β 225–343), pink; active site Mg^{2+} , red ball; α NTD (α 1–234), cyan.

Ruff et al. 2015, <https://www.mdpi.com/2218-273X/5/2/1035>

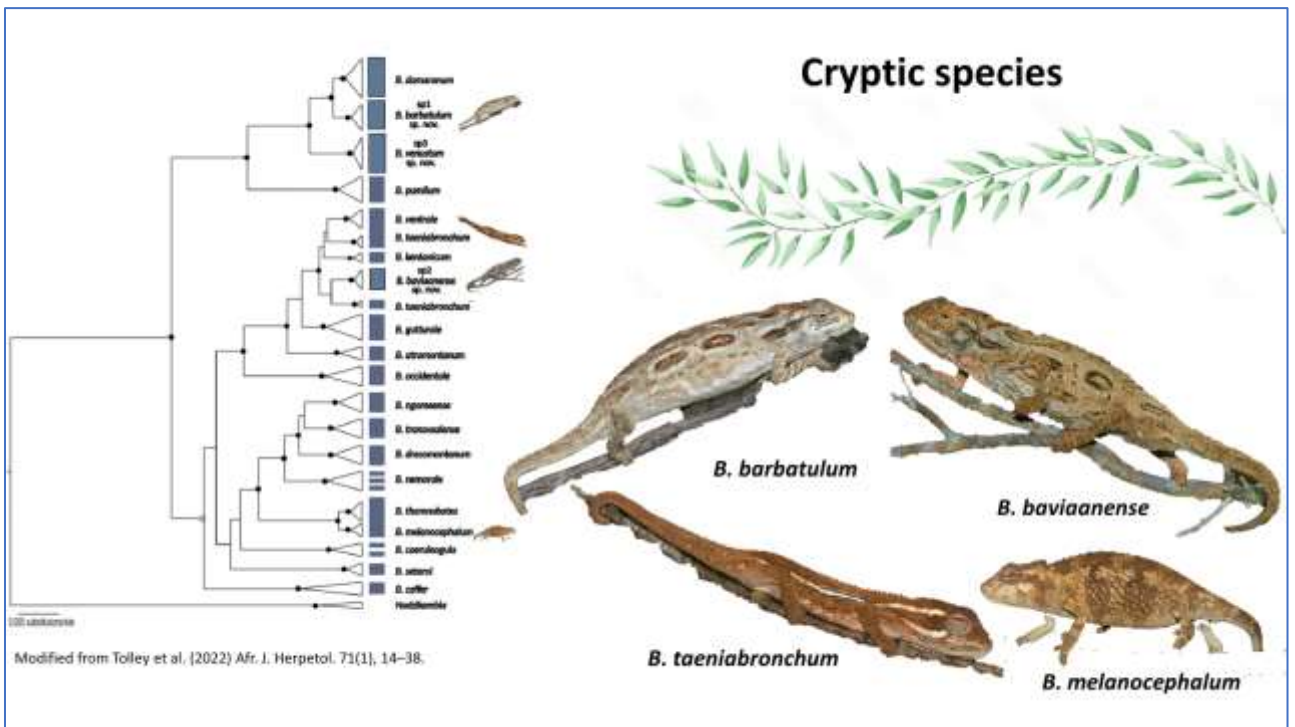
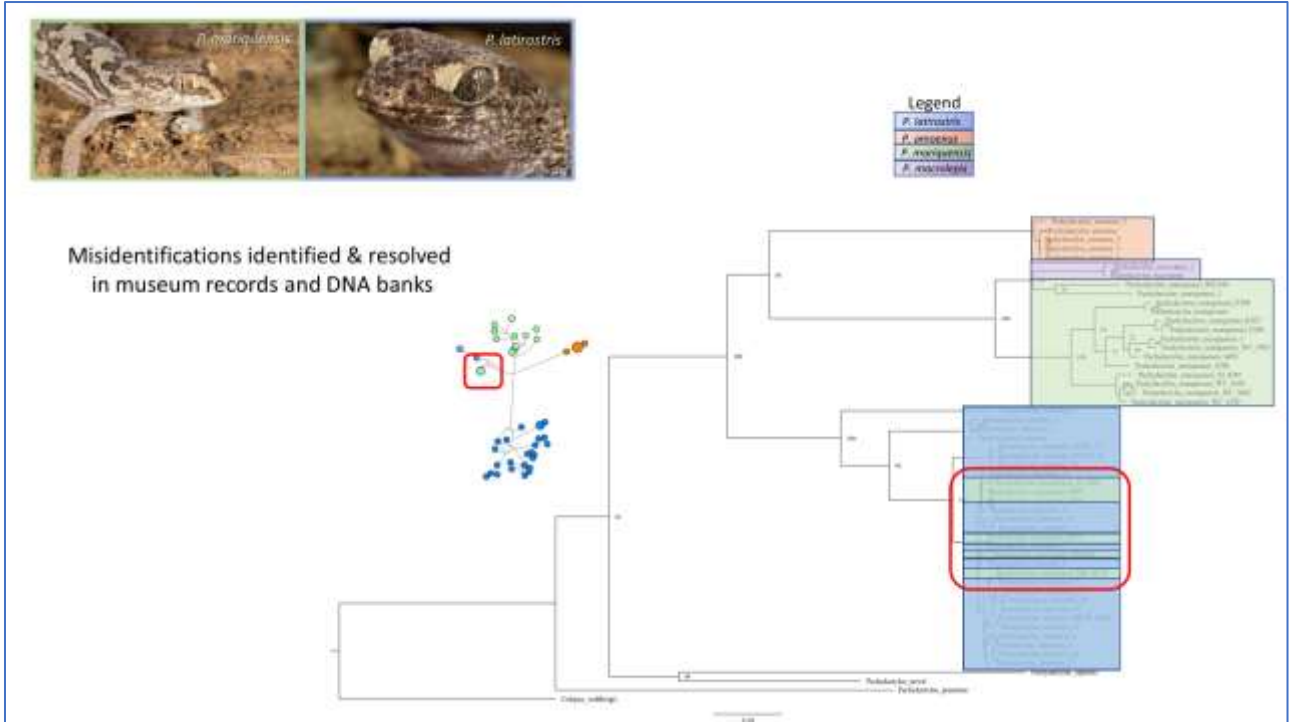
5

Annex 11: Generation and Use of DSI in Biodiversity Conservation by Jessica da Silva (SANBI, South Africa)

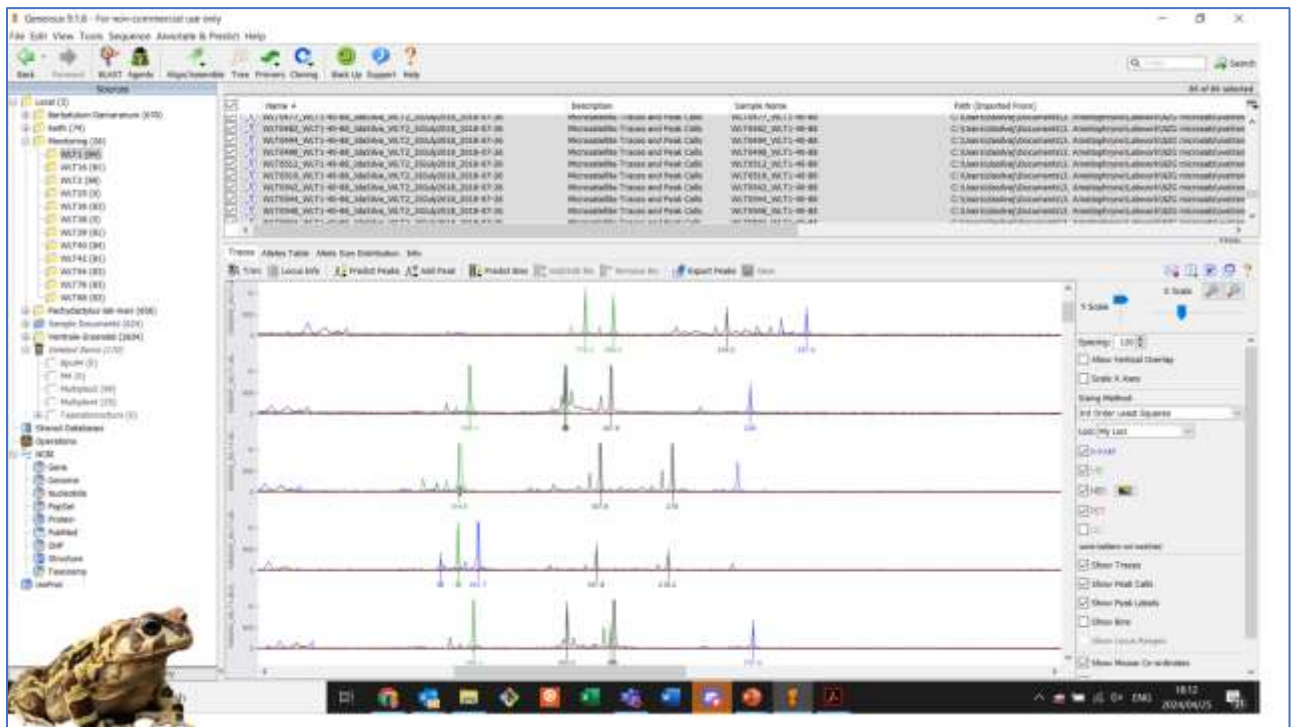
Taxonomic Clarity for Biodiversity Conservation

The image displays a composite of three elements related to biodiversity conservation and genetic data:

- Top Left:** Two photographs of geckos. The left one is labeled *P. mariquensis* and the right one is labeled *P. latirostris*.
- Bottom Left:** A map of South Africa showing sampling locations marked with colored dots (blue, green, orange) across the country.
- Top Right:** A screenshot of a GenBank record for *Pachydactylus mariquensis*. The record includes details such as LOCUS, DEFINITION, ACCESSION, VERSION, KEYWORDS, SOURCE, ORGANISM, REFERENCE, and FEATURES. A red box highlights the location information in the FEATURES section: `/country="South Africa: N. Cape, 5 km N Prince Albert"`.



Microsatellite Data

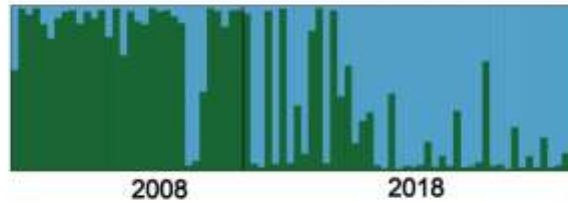


Genetic monitoring to inform species recovery

Table 4 Results of an analysis of molecular variance examining the temporal variation within *Sclerophrys pantherina*

Source of variation	Sum of squares	Variance components	Percentage variation	F-statistics	P
Among sampling years	15.12	0.15	3.02	F_{CT} 0.030	<0.001
Among individuals within sampling year	353.02	0.29	5.92	F_{IT} 0.061	<0.001
Within individuals	322.50	4.42	91.06	F_{IT} 0.089	<0.001

Significant values highlighted in bold



Change in Population Genetic Structure through time

microsatellite

Start Over microsatellite

Limit your search

Subject keyword

Geographical Location

Journal

Institution

File Extension

Folder

Microsatellite genotypes

Chan, Lauren, Painter, Charlie, Hill, Michael, Hobbitts, Tony, Leavitt, Daniel, Ryberg, Wade, Walsby, Danielle, and Fitzgerald, Lee. 2020. Aug 26. Phylogeographic divergence and population genetic diversity within species reflect the impacts of habitat connectivity, demography, and landscape...

Orchis nuclear microsatellite data

Bersweden, Leif. 2022. Feb 24. Premise of the study The genetic structure of hybrid zones provides an insight into the potential for gene flow to occur between plant taxa. Four c...

Physaria thamnophila microsatellite dataset

Pepper, Alan. 2023. Oct 4. Taxonomy, genetics and biogeography each make key contributions to biological conservation. However,

The screenshot shows a web browser displaying the DRYAD dataset page for 'Microsatellite genotypes'. The page includes the DRYAD logo, a search bar, and navigation links. The main content area lists the authors: Chan, Lauren (Pacific University), Painter, Charlie (New Mexico Department of Game and Fish), Hill, Michael, Hibbitts, Toby (Texas A&M University), Leavitt, Daniel (Naval Facilities Engineering Command), Ryberg, Wade (Texas A&M University), Walkup, Danielle (Texas A&M University), and Fitzgerald, Lee (Texas A&M University). The contact email is lchan@pacifcu.edu. The dataset was published on August 26, 2020, with a DOI of 10.5061/dryad.sxsn0316. A 'Data Files' section shows the 'Aug 26, 2020 version files' (32.52 KB) and a 'Download full dataset' button. A 'Related works' section features a 'Primary article' link to a journal paper. A 'Share' section provides social media icons for LinkedIn, Facebook, Twitter, YouTube, Email, and Print. A 'Metrics' section is also visible.

Macrogenetic studies

This is a Preprint and has not been peer reviewed. This is version 1 of this Preprint.

The figure is a world map showing the global distribution of population-level nuclear genetic data. A vertical color scale on the left indicates the number of local populations within 8,000 km² hexagons, ranging from yellow (low) to blue (high). Yellow hexagons represent the proportion of local populations within the hexagon inside a Protected Area (PA).

Downloads
[Download Preprint](#)

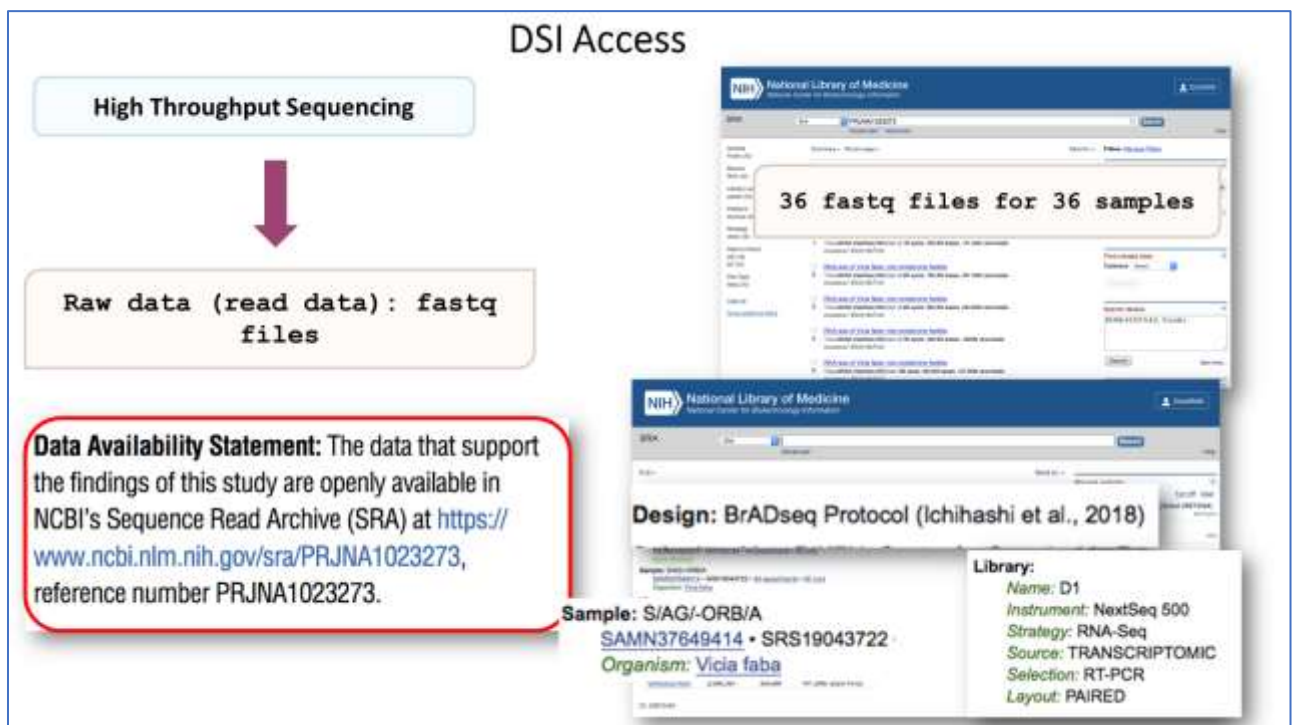
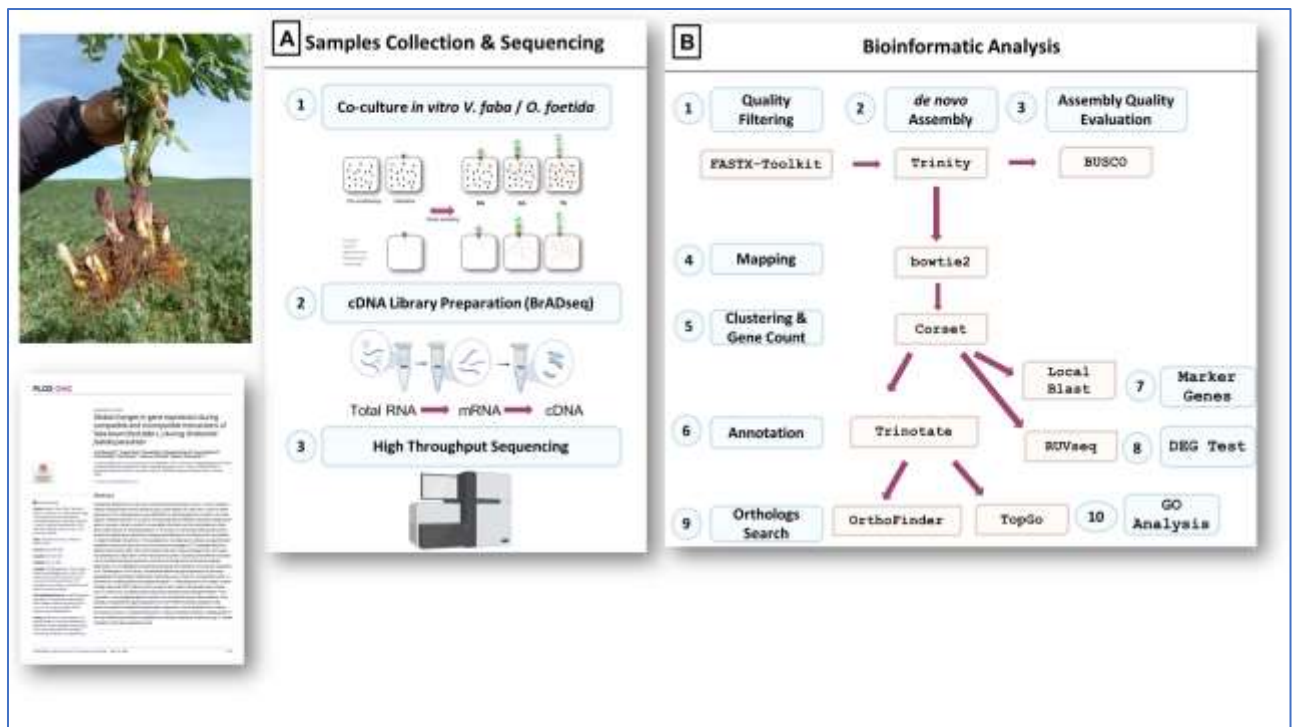
Authors
 Ivan Paz-Vinas, Amy Vandergast, Chloe Schmidt, Deborah M Leigh, Simon Blanchet, René D. Clark, Eric Crandall, Hanne de Kort, Jeff Falgout, ... [more](#)

Abstract
 Increasing the extent of protected areas (PA) through 30x30 and other area-based conservation initiatives can help to achieve global biodiversity conservation goals across all biodiversity levels. However, intraspecific genetic variation, the foundational level of biodiversity, is rarely explicitly considered in PA design or quality performance assessments. Repurposing existing genetic data could rapidly inform area-based conservation planning and improve the preservation of genetic variation. Through a global compilation of population-level nuclear genetic data (>2 million individuals; 36,356 populations; 2,809 species), we identified bot... [more](#)

DOI
<https://doi.org/10.32942/XZ2CB4>

Subjects
 Biodiversity, Ecology and Evolutionary Biology, Environmental Policy

Annex 12: Use of DSI in plant breeding by Mariem Bouhadida (National Institute of Agricultural Research of Tunisia)





Example of use of DSI

Assembled transcriptome


Detection of difference in gene expression

Local Blast for Functional Annotation



Downloaded sequence from public database





Arabidopsis thaliana specific database



PlantTFDB Plant Transcription Factor Database





Specific database for WRKY family genes

Example of use of DSI

Assembled transcriptome

Investigate the expression of specific genes (Orobanchol)


Downloaded sequence from public database

Target Gene Sequence

Detection of difference in gene expression (Presence /absence)

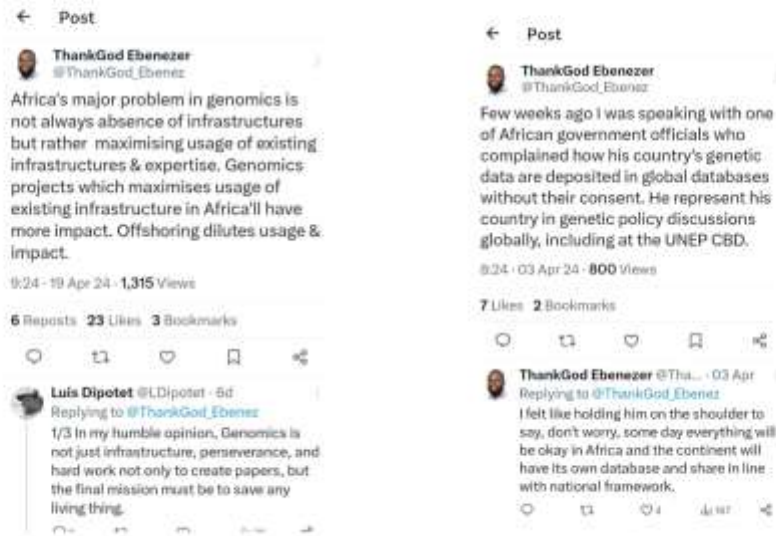
Primer3 Output



Primer Design (Primer 3)

PCR to check the presence /absence of non-expressed genes in Vicia faba genome

Some testimonies on scientific issues related to Genomics and Omics technologies in Africa



Bridging Gaps: Tunis R User Group's Journey in Bioinformatics Education



A. Boukteb H. Tnani

A group of ladies launched an initiative in Tunisia by creating [Tunis R User Group](#). Their objective is to bridge the gap between North and south and between academia and industry. The Tunis R User Group organizes exciting online gatherings to link R enthusiasts throughout the MENA region, Africa and worldwide. These events aim to encourage R usage and cultivate expertise in data science and bioinformatics.

With a deep commitment to inclusivity and empowerment, they've dedicated themselves to breaking down barriers that women and individuals from low-income countries face accessing education in these cutting-edge areas. By organizing workshops tailored to these communities, they aim not only to provide valuable skills and knowledge but also to foster a more diverse and equitable future in the bioinformatics field.

Tunis R User Group

Email: tunis.rusergroup@gmail.com / X (Twitter): <https://twitter.com/TunisRUserGroup/>

YouTube Channel: <https://www.youtube.com/@TunisRUserGroup> / LinkedIn:

<https://www.linkedin.com/in/tunis-r-user-group-496a83214/>

Annex 13: Reflection on key open questions in various UN fora: CBD (Geneva and IAG), FAO, WHO, BBNJ by Hartmut Meyer, ABS Initiative

THE ABS
CAPACITY
DEVELOPMENT
INITIATIVE

L'INITIATIVE DE
RENFORCEMENT
DES CAPACITES
POUR L'APA

Reflection on key open questions in various UN fora

African Science-Policy Dialogue on DSI
24. – 26.04.2024, Nairobi, Kenya

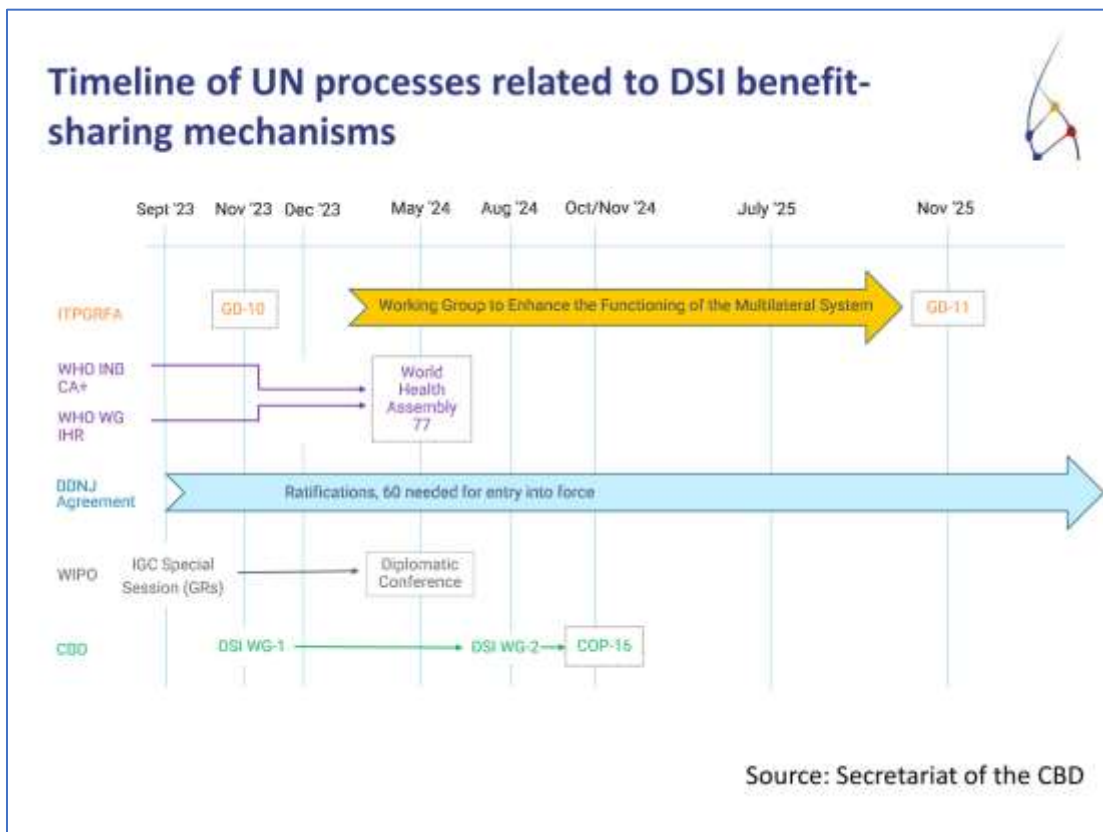
Hartmut Meyer
ABS Capacity Development Initiative

Funded by:

- German Ministry for Economic Cooperation and Development
- DFP (Deutscher Forschungsförderungspool) für Umwelt- und Naturerhaltung
- AFRICANA UNIVERSITY OF POLYTECHNIC STUDIES
- International Centre for Tropical Agriculture (CIAT)
- International Centre for Invasive Species Assessment (ICISA)

Implemented by:

giz



Decision CBD COP 15/9 on DSI



The Conference of the Parties,

2. Also agrees that the benefits from the use of digital sequence information on genetic resources should be shared fairly and equitably;
5. Recognizes that tracking and tracing of all digital sequence information on genetic resources is not practical;
6. Also recognizes that a multilateral approach on the sharing of the benefits arising from the use of digital sequence information on genetic resources has the potential to meet the criteria identified in paragraph 9 of the present decision;
10. Recognizes that the monetary and non-monetary benefits arising from the use of digital sequence information on genetic resources should, in particular, be used to support conservation and sustainable use of biological diversity and, inter alia, benefit indigenous peoples and local communities;

3

Decision CBD COP 15/9 on DSI



The Conference of the Parties,

16. Decides to establish, as part of the Kunming-Montreal Global Biodiversity Framework, a multilateral mechanism for benefit-sharing from the use of digital sequence information on genetic resources, including a global fund;
17. Also decides to establish a fair, transparent, inclusive, participatory and time-bound process to further develop and operationalize the mechanism, as outlined in paragraphs 18 and 20 to 22 below, to be finalized at the sixteenth meeting of the Conference of the Parties;

4

Key open DSI issues: CBD



A) Contributions to the fund

- Voluntary or mandatory benefit-sharing
- Type of decision: COP decision, CBD protocol, separate treaty
- Trigger points for benefit-sharing in value-chain
- Calculation method for monetary benefit-sharing

B) Disbursement from the fund

- Access of IP&LCs to the fund
- Participation of countries with domestic DSI legislation in the fund
- Types of disbursement: country allocation, project-based, bidding
- Relation between geographic origin of the GR / DSI and eligibility to receive funds
- Access of developed countries to the fund

5

Key open DSI issues: CBD



C) Non-monetary benefit-sharing

- Types of NMBS in a multilateral mechanism
- Trigger points for NMBS in a multilateral mechanism
- Way of delivery of NMBS in a multilateral mechanism
- Need for an international platform organising NMBS

D) Governance

- Right- and stakeholders participating in the fund's governance
- Reform of the Global Environment Facility (GEF)
- Localisation of the fund – GEF, GBF Fund, separate fun
- Ensuring transparency, accountability, interoperability
- Not challenging open access to DSI
- Not challenging the rights of IP&LCs

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Key open DSI issues: CBD



E) Relation to other approaches and systems

- Creation of an inter-forum body or process for coordination between the fora
- Extension of the multilateral mechanism to genetic resources
- Relationship between multilateral DSI mechanisms and any domestic rules

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Key open DSI issues: UNCLOS Biodiversity Beyond National Jurisdiction



Monetary benefit-sharing for marine genetic resources and DSI

- No definition of DSI, waiting for the CBD
- After entry into force, developed State Parties will share monetary benefits in the form of decoupled payments based on the State Parties' assessed contributions to the BBNJ core budget
89 signatories – 4 members as of April 2024
- Taking into account recommendations by the access and benefit-sharing committee, the COP will after 5 years decide each 2 years on other modalities, e.g., introducing milestone payments or payments of percentage of the revenue from product sales
- Payments go into a fund under GEF and into a "special fund"; a future COP will decide on its nature and institutional home

8

Key open DSI issues: WHO Pandemic Treaty



Based on the draft text of April 2024, setting up a legally-binding Pandemic ABS System (PABS) until May 2026

- Language not precise yet: benefit arising from access / sharing / utilising material and information; streamlining necessary
- No definition of DSI, waiting for the CBD
- Implementation mutually complementary with the Pandemic Influenza Preparedness Framework, the CBD, and the Nagoya Protocol
- WHO receives 20% (10% as donation and 10% at affordable prices) of the production of pandemic-related health products and annual monetary contributions from PABS users
- Modalities, terms, conditions, and other forms of benefit-sharing to be decided upon
- Distribution mechanism to be decided upon

9.

Key open DSI issues: FAO International Treaty on Plant Genetic Resources for Food and Agriculture



Negotiations on revision of the multilateral system incl. DSI restarted in September 2022

- DSI identified as one of the three key hotspot topics
- No definition of DSI, waiting for the CBD
- The multilateral system could include monetary benefit-sharing for the use of DSI as part of the discussed subscription system
- Negotiations ongoing, next Governing Body is meeting in November 2025

10.

FAO Commission on Genetic Resources for Food and Agriculture & WIPO



FAO CGRFA

- Consultations on DSI with the aim of recommendations but no decisions or obligations on member states expected

WIPO

- Standard 26 on nucleotide and amino acid sequence disclosure in a patent application entered into force in July 2023, might support identification of DSI-based inventions and products
- Diplomatic Conference in May 2024 will decide on an International Legal Instrument Relating to Intellectual Property, Genetic Resources and Traditional Knowledge Associated with Genetic Resources that contains no references to ABS and DSI

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Annex 14: Recommendations for making progress on the road to a functioning DSI system

To make progress on the road to a functioning DSI system: (ranked by number of priority points given by participants)

Points	What needs to be done by African national governments? Recommendations by the participants of the African Science-Policy Dialogue on DSI
9	Political buy-in and finance for DSI Dialogue in Africa
8	Support the African proposal for COP 16
6	Provide funds for negotiators
3	Help resource custodians access funds from the DSI Fund
2	Identify relevant stakeholders and IP&LCs
1	Awareness raising for policy makers
1	Provide funds /resources for capacity building and development for DSI
0	Promulgation of national legislation
0	Engage with the stakeholders (IP&LC, science, industry)
0	Intersectoral coordination (e.g. OneHealth)
0	Awareness and outreach activities about DSI
0	Capacity building for research (doing & using)
0	Better coordination and dialogue between countries
0	Valorisation of biodiversity
0	Add to funding point: to allow better participation of African delegates as DSI requires specific expertise.

Points	What needs to be done by Pan-African institutions? Recommendations by the participants of the African Science-Policy Dialogue on DSI
12	Provide leadership in negotiations, e.g. AUC and AMCEN
4	Mobilise funding
4	Foster dialogue between Pan-African Institutions, but not only
3	Elaborate African programs on DSI (e.g. data base) t promote international collaboration and monitoring
2	Establish African database of/for DSI experts
1	Encourage and promote experience sharing on DSI and related issues
0	Commitment from African sub-regional organisations to include the DSI system in their policies
0	Be party to the negotiations
0	Set priorities
0	Support negotiations
0	Support AGN coordination
0	Enhance capacity for negotiations
0	Cooperation
0	Harmonisation
0	Coordination, incl. coordination/harmonisation of instruments (synergies & mainstreaming)
0	Create enabling platforms
0	Coordinate capacity efforts

Points	What needs to be done by African negotiators? Recommendations by the participants of the African Science-Policy Dialogue on DSI
12	Better coordination – timelines to organise common positions
4	Take into account African development priorities
3	Consult with scientists frequently and other relevant stakeholders
3	Mentorship of upcoming negotiators
2	Maintain the consistency of the negotiators
1	Sharing experiences
1	Follow processes and negotiation in other for a or multistakeholder processes, e.g. WHO, ITPGRFA, WIPO, BBNJ
1	Engage local communities and bring their issues on board
0	Communicate outcomes/positions
0	Strong negotiation to the benefit of Africa
0	Request political support
0	Take accountability and responsibility
0	Create public awareness
0	Get views of business and industry
0	Bring the media along

Points	How to take the African Policy-Science Dialogue forward? Recommendations by the participants of the African Science-Policy Dialogue on DSI
8	Request meetings to follow up
4	Simple focused reporting (in relation to policy-science dialogues)
3	Network for policy-science – who??? – how?
3	Pan-African institutions to take the lead, e.g. NEPAD
3	Find dedicated funding for the process
2	Unpack and ensure proper understanding of the modalities (ref. Hartmut's summary)
0	Ensure common ground between providers and users of DSI so that it is beneficial for all
0	Mainstreaming DSI dialogue in respective government departments
0	More regular engagement
0	Capacity to deal with emerging issues
0	Supporting institutions provide all relevant documents
0	Centralised repository of all relevant information
0	Improve/create a common communication “language”