UCLouvain

Faculté de droit et de criminologie

Science, narrative and argumentation in negotiations on the dematerialization of genetic resources: feedback from the last session of the Plant Treaty Governing body (ITPGRFA, FAO)

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Presentation outline

Introduction

Intersection between science and Law.

Critical discourses analysis.

Focus: Digital sequence Information (DSI).

Research questions: How science (narratives and arguments) are used as political and legal arguments

Keys Questions

How scientific arguments shape DSI negotiations?

Approach: interdisciplinary (legal philosophy, philosophy of science, and sociology of law).

Methodology: (Legal) comparative analyses of states' positions on DSI in different fora : CBD, ITPGRFA, PIP Framework, …

Three subjects:
1. Terminology.
2. DSI and genetic material.
3. DSI within the ABS.

Central Findings

Science is essential to solving these complex problems. But...

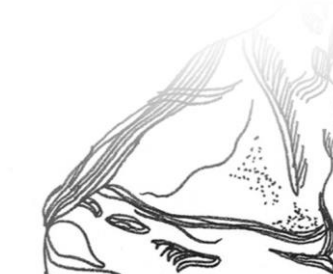
Epistocracy :

The strategic and rhetorical use of scientific arguments for political interests

Inconsistencies:

Occurring in state positions, particularly when interests diverge (ITPGRFA vs. PIP).

DSI	*Digital Sequence Information*
GSD	*Genetic Sequence Data*
CBD	Convention on Biological Diversity
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
PIP	Pandemic influenza preparedness framework



Background

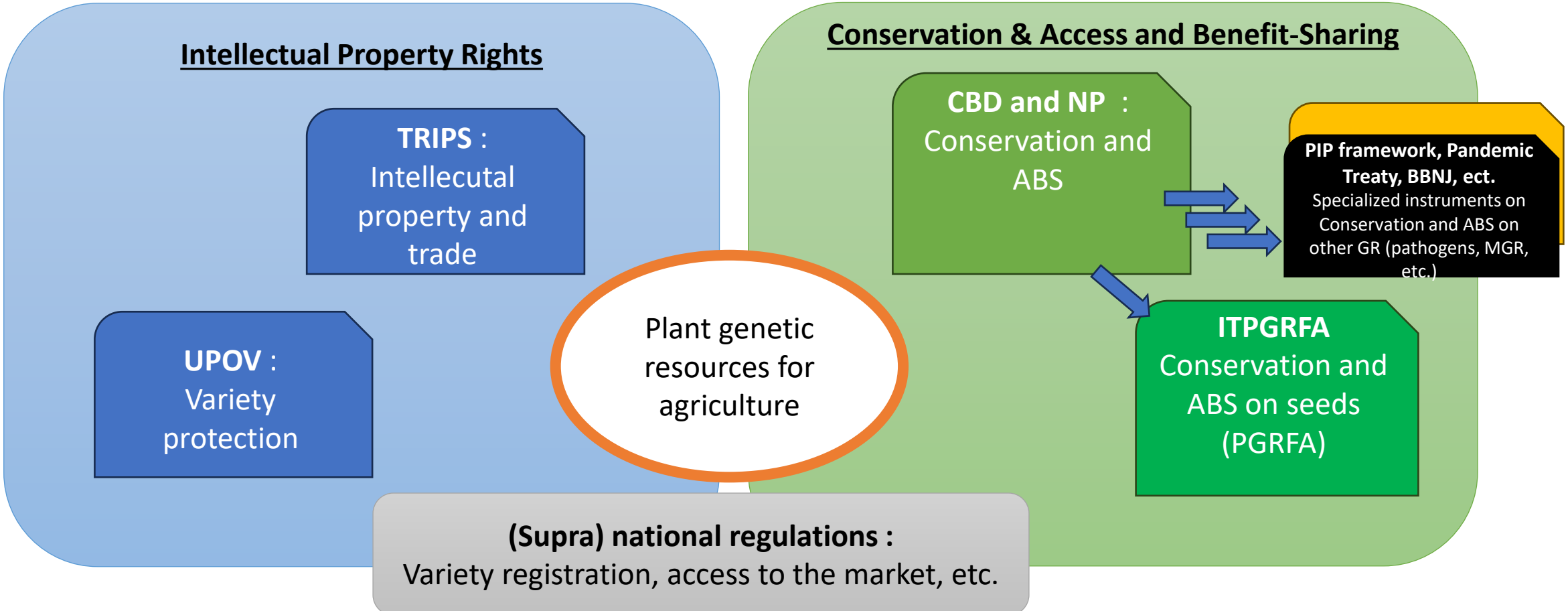
The seed Regime Complex and the DSI

- The seed (and genetic resource) **Regime Complex** (Raustalia and Victor 2004).
- Fragmentation of the Regime Complex with the **DSI question**.

  Digital Sequence Information covers "*the information and knowledge content of genetic material [that could be] extracted, processed and exchanged in its own right, detached from the physical exchange of the plant genetic material*." (Frison 2018, 83).
- DSI as placeholder term in CBD and ITPGRFA negotiations (COP15).
  - CBD's studies to define the scope.
  - DSI vs "Genomic sequence information" (GSD) under the PIP framework.
  - Tensions and discrepancies:
    - How to regulate DSI? Should we consider DSI as a genetic material?

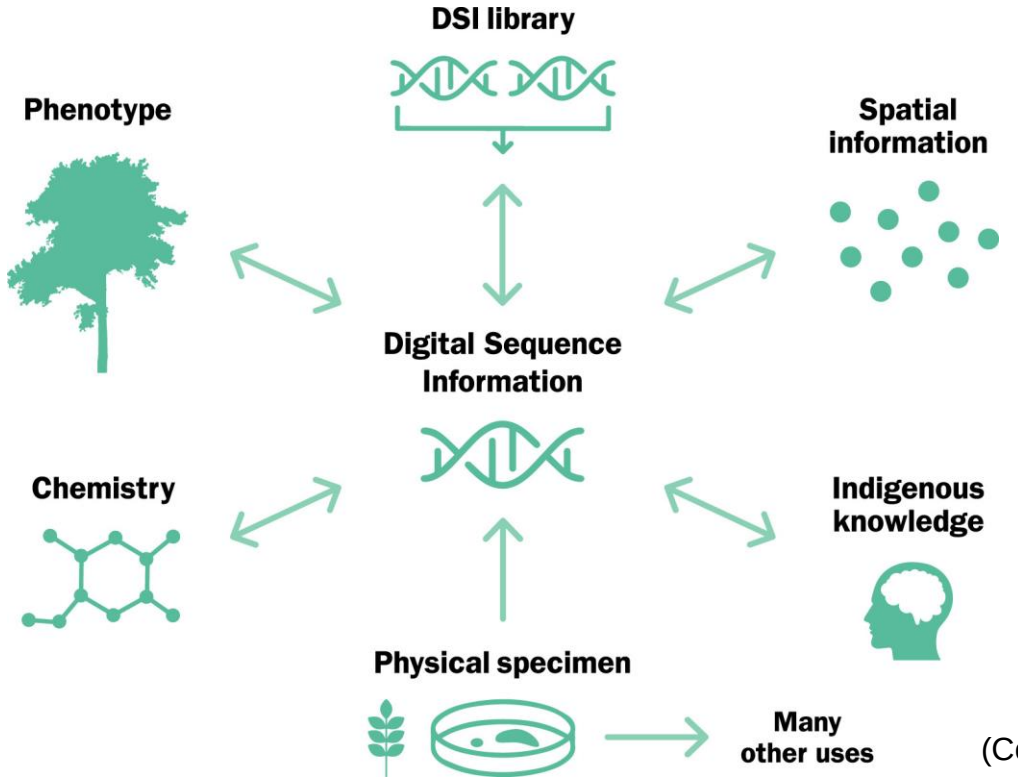
The Regime Complex of PGRFA

- The *Regime Complex* of Seeds, Genetic Resources and Benefit Sharing (ABS) (Raustalia and Victor 2004).



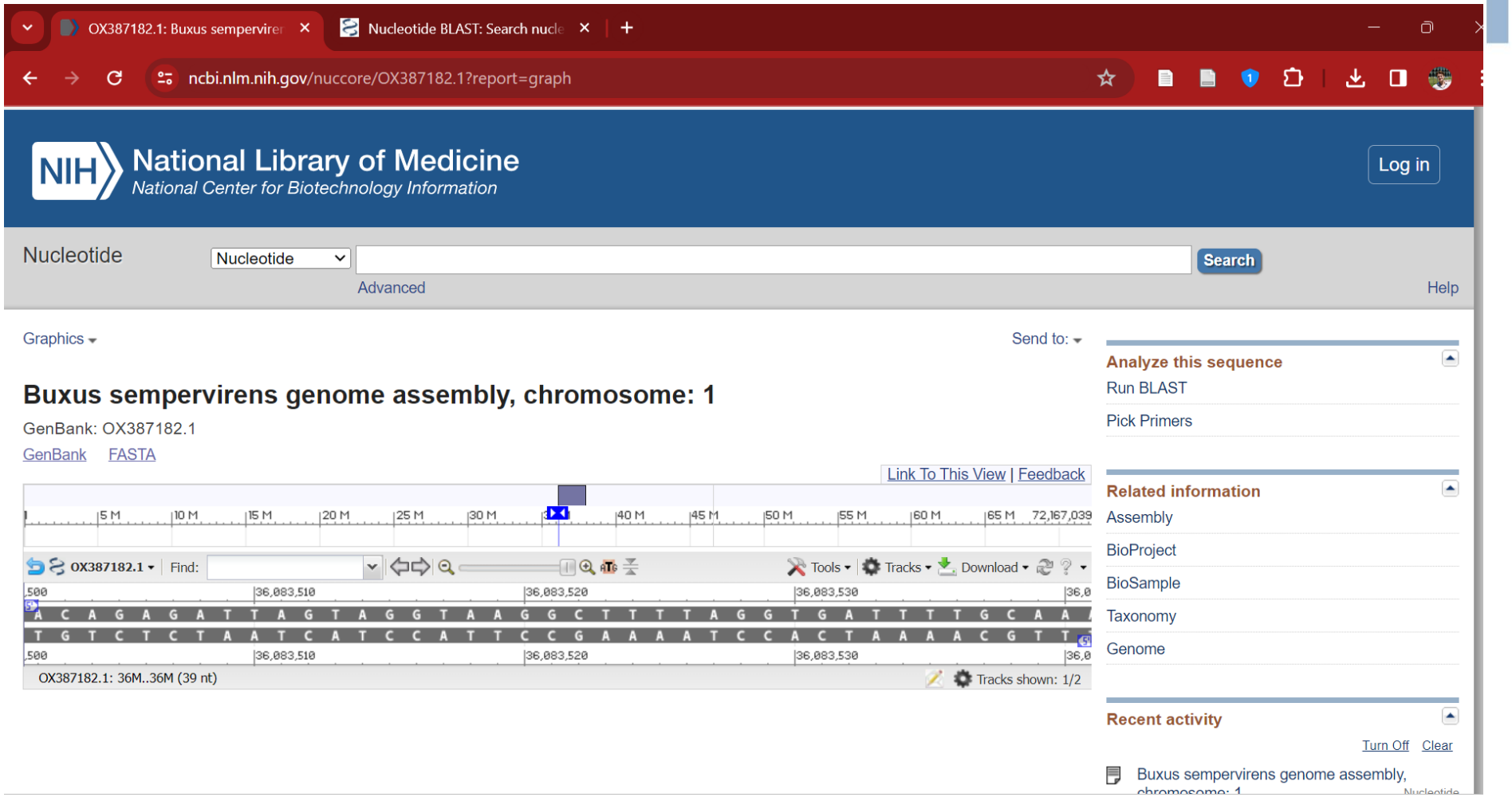
The fragmentation of the Regime Complex

- *Digital Sequence information* (DSI) and the Fragmentation of the Regime Complex
  DSI covers "the information and knowledge content of genetic material [that could be] extracted, processed and exchanged as such, detached from the physical exchange of plant genetic material." (Frison 2018, 83).



(Cowel *et al*, 2021)

Regime Complex fragmentation - example



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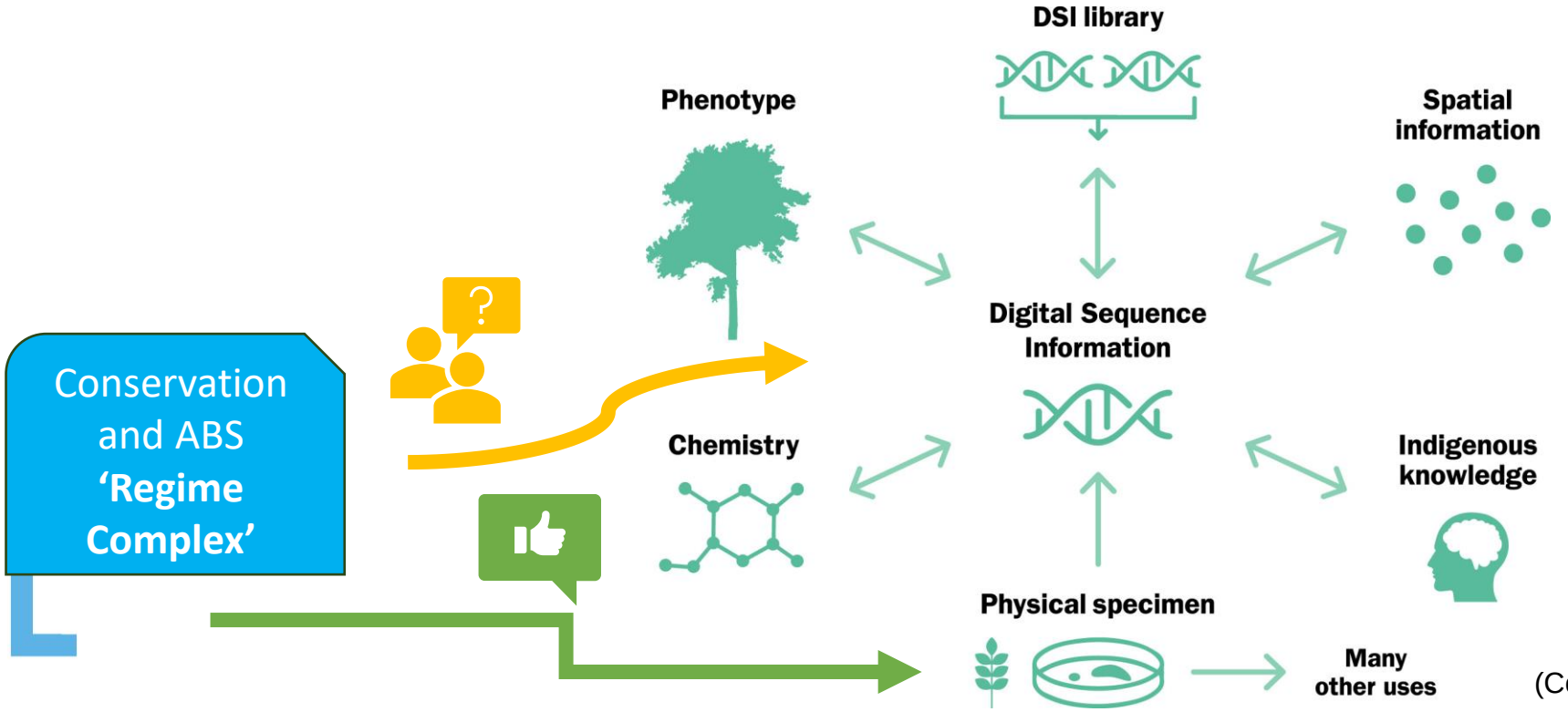


(Cowel *et al*, 2021)

International negotiations on DSI

The two fragmentations of Regime Complex

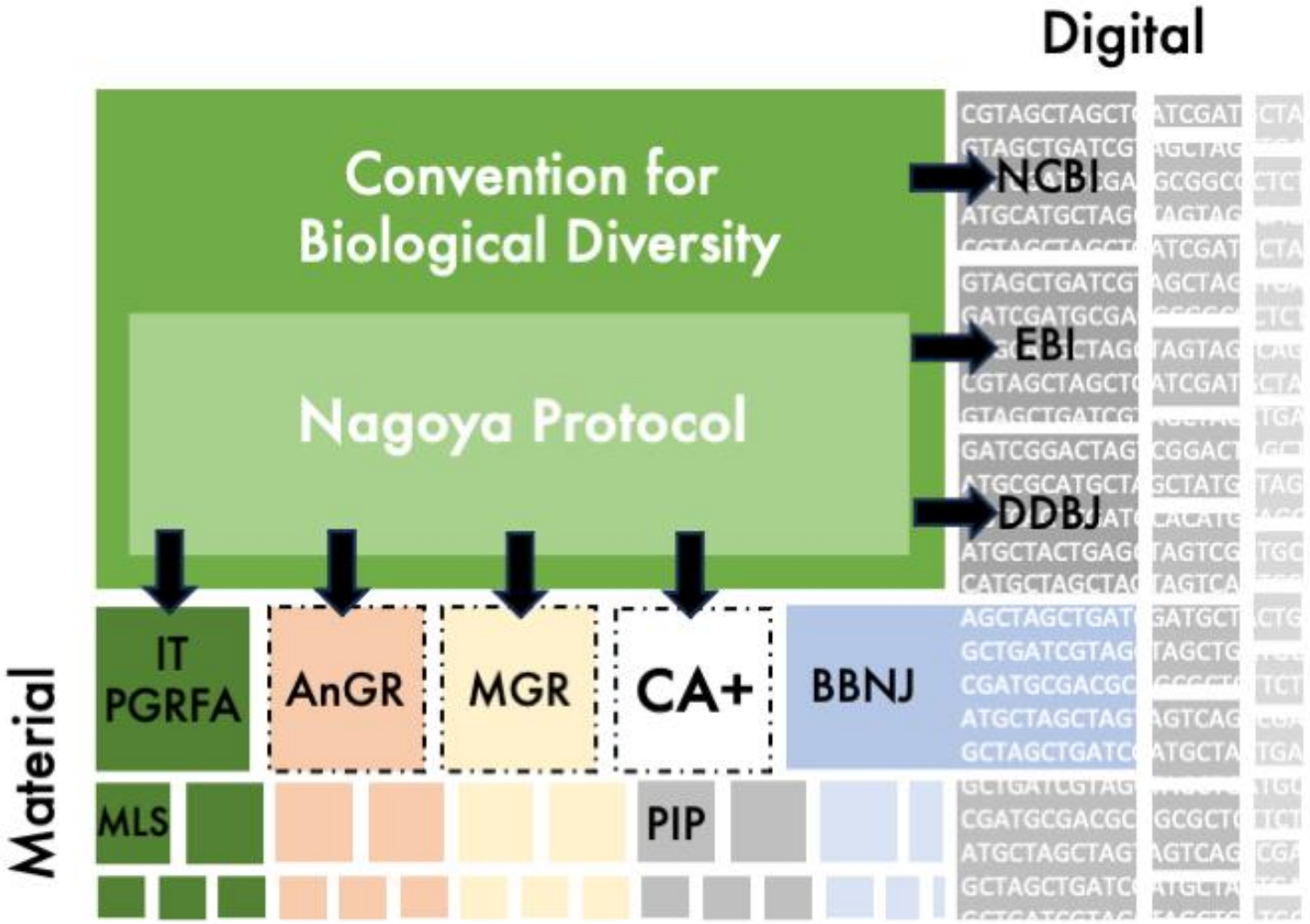
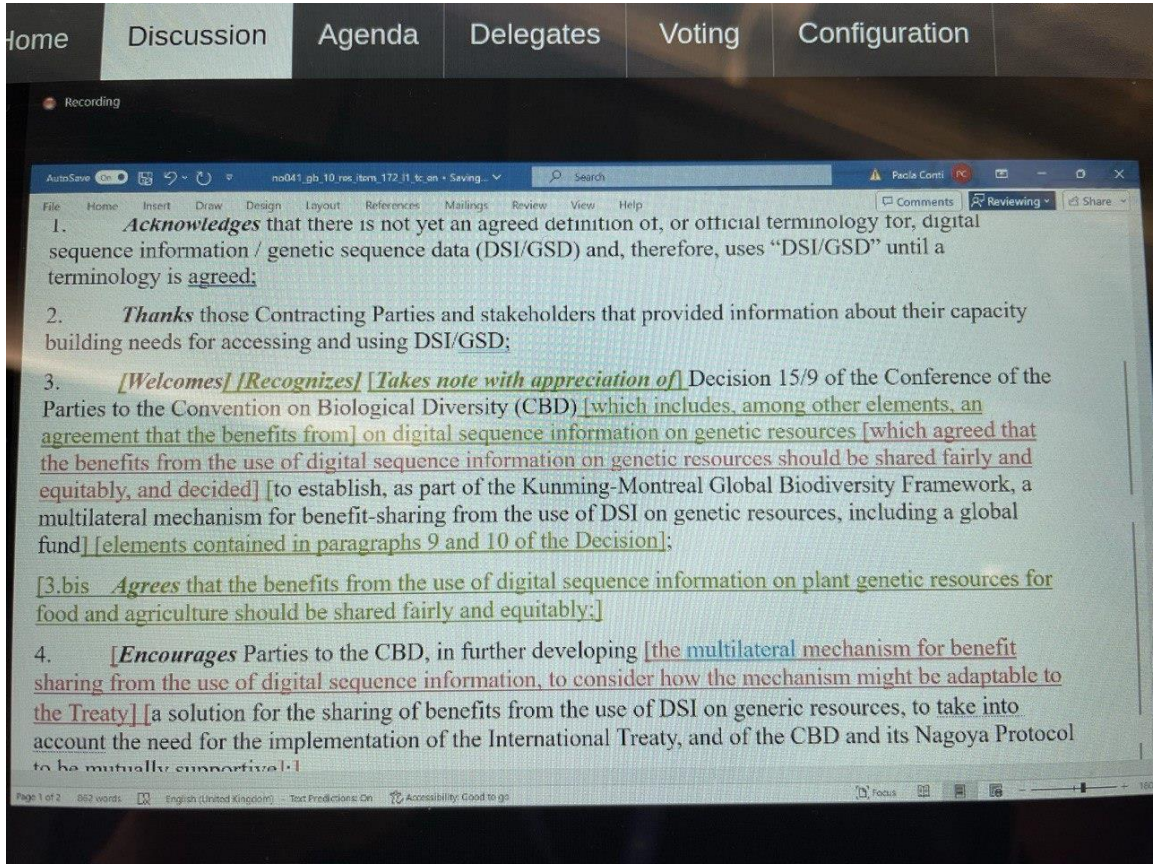


Figure 1. Two forces are trimming apart the Convention for Biological Diversity and its Nagoya Protocol genepool: the multiplication of sub-sectorial instruments that extract specific subsets and try regulating them ad hoc (vertical arrows) and the split between material and digital resources.
(Aubry, Frison, Walckiers, 2024)

DSI	*Digital Sequence Information*
GSD	*Genetic Sequence Data*
CDB - *CBD*	Convention sur la Diversité Biologique
TIRPAA – *ITPGRFA*	Traité international sur les ressources phytogénétiques pour l'alimentation et l'agriculture
PIP	Cadre de préparation en cas de grippe pandémique
AnGr	Antartic Genetic Resources
MGR	Marine Genetic Resources
BBNJ	Traité international pour la protection de la haute mer et de la biodiversité marine
CA+	Pandemic Treaty

International negotiations on DSI

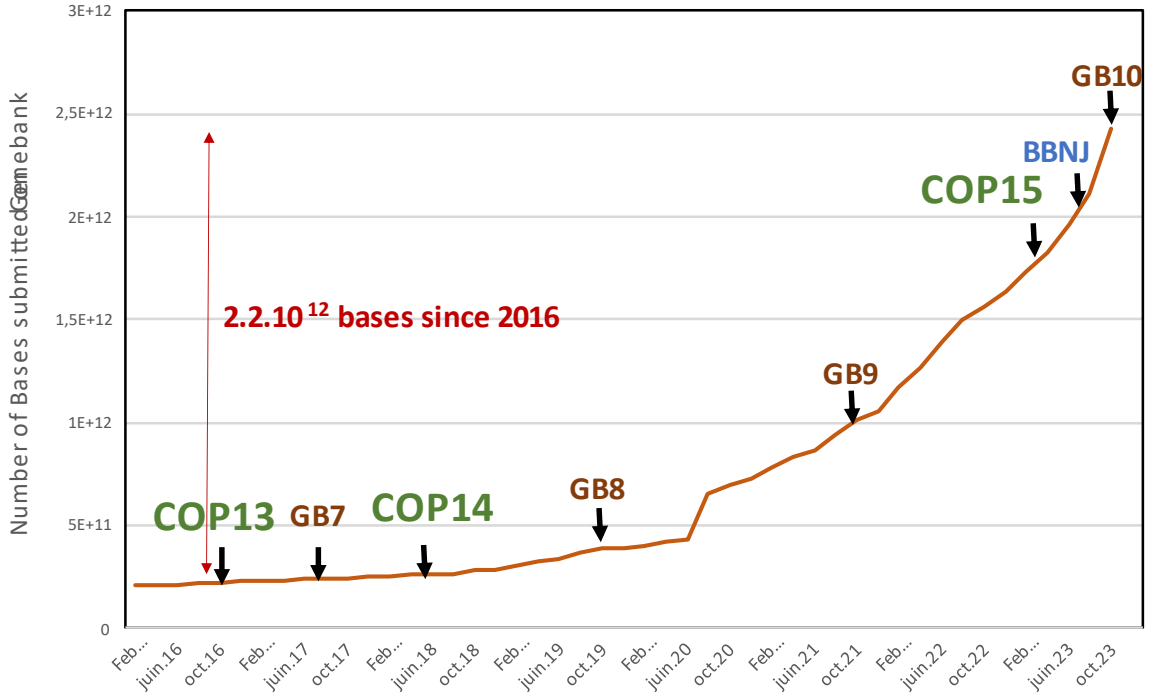
FAO, Rome, 2023.
ITPGRFA – 10th session of the Governing Body



International negotiations on DSI

- International negotiations on DSI (2013-2020):
  - North/South opposition and deadlock.
  - How to regulate DSI? Should we consider DSI as genetic material? *Ad Hoc* ABS system?
- Call for science-based policy (Decision 14/20)
  - 4 CBD Studies: the scope and coverage of DSI ;
  - their use in databases (public/private);
  - their traceability for ABS rules;
  - national measures adopted by the parties.
- Use of terms and scope?
  - DSI *vs* les « *genetic sequence data* » (GSD).
- Strategic ignorance: decision 15/9 (COP15)
  - DSI as a generic term in the CBD negotiations (COP15) and at the BBNJ.
  - DSI/GSD combination for the ITPGRFA (GB10).
  - GSD for the PIP.

One COP after another, the amount of DSI is increasing



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

(Aubry, Frison, 2023)

Scope of DSI

CBD

Convention on Biological Diversity

Distr.
GENERAL

CBD/DSI/AHTEG/2020/1/3
29 January 2020

ENGLISH ONLY

AD HOC TECHNICAL EXPERT GROUP ON
DIGITAL SEQUENCE INFORMATION ON
GENETIC RESOURCES
Montreal, Canada, 17-20 March 2020

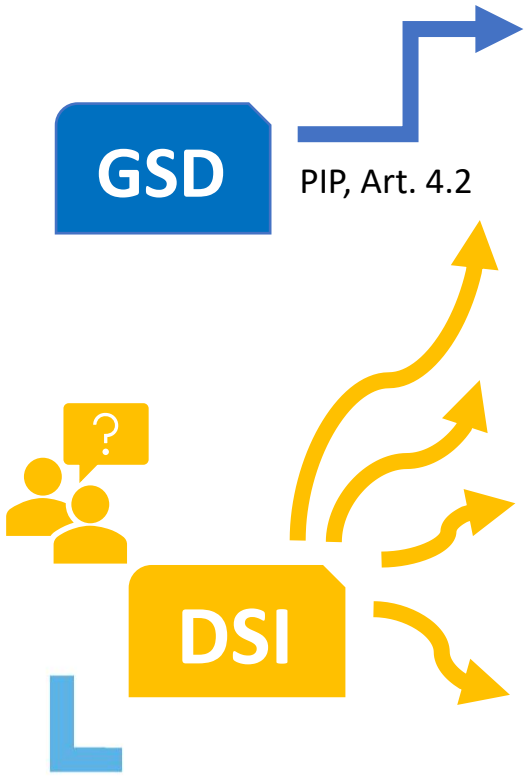


Table 5. Selected examples of applying the proposed DSI subject matter groupings to the different life-sciences sectors.

DSI Subject Matter Grouping	Taxonomy & Conservation	Agriculture & Food Security	Industrial & Synthetic Biology	Healthcare & Pharmaceuticals
Narrow (Group 1) (DNA/RNA)	Most critical to this field of use is DNA/RNA sequence data, and ability to compare these the sequence databases	Reference genomes are needed to carry out any marker assisted breeding or genetic modification. Metagenomes critical to understand health of soil microbiome.	Availability of multiple related gene sequences for comparison is essential for this field.	DNA and RNA sequences essential to this field.
Intermediate (Group 2) (DNA/RNA/Proteins)		Gene annotations needed for marker assisted breeding. Gene expression information relevant. Epigenetic heritable elements are important. Protein sequences less important than DNA/RNA sequences. Proteomic data used to assess effect of breeding/genetic modification.	Gene annotations needed to discover related enzymes. Information on protein sequences is essential for the engineering of enzymes. Molecular structure of proteins is important needed for targeting modifications.	Gene annotations needed to discover related proteins. Information on gene expression is needed to understand essential metabolic processes in pathogens. Protein sequences are important to understand how small molecule metabolites are biosynthesized. Molecular structures of proteins are necessary to understand and engineer metabolite biosynthesis.
Intermediate (Group 3) (DNA/RNA/Proteins/Metabolites)	Metabolome of organism can be used to assist taxonomy.	Metabolomic data important to understand nutritional value of crops.	Information on molecular structure of metabolites needed for many products.	Information on molecular structure of metabolites needed for many products.
Broad (Group 4) (DNA/RNA/Proteins/Metabolites and subsidiary information)	For taxonomic description this includes morphological data. Species richness and assemblage may change in response to abiotic and environmental influences.	Phenotype, ecological relationships, environmental and abiotic factors are relevant.	Understanding external biotic and abiotic stresses that elicit protein and metabolite production.	Ecological relationship and abiotic environmental factors are important to understand pathogen evolution and spread.

Perspectives from STS and philosophy of science

Against a rhetoric use of science

- Epistocracy: using science to justify policies
- Science in action vs transcendental truth
- (Normative) science and hybrid problems
- Ontological turn: “Western science” vs “traditional knowledge”

See : Haraway, Foucault, Latour, Jasanoff, Stengers, Oguamanam, Whitt, etc.

Science in the DSI negotiation

- Call for a “science-based” discussion:
  - which science?
- Trends to mobilize scientific data:
  - to justify decisions and interpretations that would be convenient
  - But the use of a scientific rhetoric is not constant (voy. infra)
- The scientific definition of DSI will influence its legal scope
- Open access and DSI: another scientific narratives

Case Studies

Subject 1: Terminology

Scope: DSI > GSD

- A science-based policy in the DSI definition is at stake :
- Narrative Policy Framework analyses on Parties' submission :

- EU: "As pointed out in the Fact-finding study on DSI (CBD/DSI/AHTEG/2018/1/3), differences in scientific terminology reflect differences in the material referred to";
- US: "GSD are neither genetic material nor a genetic resource. It is essential to maintain a conceptual and definitional distinction between genetic material itself and data associated with that material."

- South-Africa argues for "a definition that explicitly make reference to the genes or genetic material which constitute a genetic resource."
- AUC : "Our view is that a prolonged focus on terminology is not helpful for obtaining clarity on the concept of 'DSI'. The goal of a focus on terminology is to narrow the scope of applicability of the Nagoya Protocol, and have certain subject matter excluded from it."

Subject 1: Terminology

States	Terminology	Justification	DSI and "genetic material"?	DSI and ABS?
Argentina	GI	scientifically correct; broader scope of application	Yes	Yes
Australia	GSD; In silico	Inconsistencies in the terminology used (GSD/DSI/in silico)	No	No
Belarus	/	/	/	/
Brazil	GI on genetic resource	Consistency with PIP framework; national legislation links GR to its GI	Yes	Yes
Canada	GSD; G*SD	DSI is not used by the scientific community; Coherence with the PIP Framework; science-based approach; GSD/G*SD would be better from a science operation viewpoint	No	No
Colombia	DSI	broader scope of application	Yes	Yes
Costa-Rica	DSI	ATHEG recommendations; broader scope of application	Yes	Yes
Ethiopia	GI; GSD	The term DSI is not appropriate to capture the various information on GR	Yes	Yes
EU and its member states	GSD; NSD; GS	Importance of a "science-based" approach (ATHEG); DSI as a generic term; definition must be scientifically correct;	No	No; Open access
India	SI; SD	Broader scope; DSI is not appropriate for the different kinds of information on GR	under the utilization of GR	Yes
Iran	/	Scope on SI on GR; science-based process (AHTEG)	Yes	Yes, for commercial use
Japan	GSD	The term GSD is the most appropriate term; Coherence with the PIP Framework; term used by the scientific community	No	No
Madagascar	/	/	yes	Yes
Mexico	/	DSI is not the most appropriate term but may be used as a placeholder term; discussion on the scope	DSI could render CDB obsolete	Yes
Republic of Korea	GSD	DSI is not used by the scientific community; GSD is more used and appropriate	No	No; Open access
South Africa	GI; NI; GSD; DSD	DSI not the most appropriate term but may be used as a placeholder term; Definition should refer to the genes (scope)	Yes	Yes
Switzerland	GSD	Concept must be clarified	No	No; could address MAT
United States of America	GSD	Narrow scope: definition must distinguish GSD from physical GR	No	No
African Union Commission	GI; NI	DSI is not appropriate; focus on the scope	Yes	Yes

DSI	Digital Sequence Information
GI	Genetic Information
GR	Genetic Resource
GS	Genetic Se quence
GSD	Genetic Sequence Data
G*SD	Genomic Sequence Data
NI	Natural Information
SI	Sequence information
MAT	Mutyally Agreed Term

Table 1- Statements on terms for DSI - CBD/DSI/AHTEG/2020/1/INF/1.

Subject 2: Position on the DSI and genetic material

State	ITPGRFA	CDB	PIP Framework
Australia	Open access to DSI is as form of ABS. DSI should be open access. Should not intervene in scientific progress.	Does not support the inclusion of DSI in ABS regime. DSI should be Open access for scientific innovation.	Welcome GSD management under the PIP framework, with ABS mechanism. GSD should be managed under the PIP framework as not circumvent Benefit sharing.
Germany (and EU for the CDB)	DSI should be open access. Open access to DSI is as form of ABS. Importance of DSI for scientific progress	DSI should be open access. Open access to DSI is as form of ABS. Importance of DSI for scientific progress, human health, environment.	GSD should be included in the ABS of the PIP Framework.
United States of America	Open access to DSI is as form of ABS.DSI should be open access. Should not intervene in scientific progress.	Importance of GSD for scientific research. Sharing of GSD is a form of benefit sharing. Sharing of GSD should not be restricted.	Access to GSD should trigger different types of benefits. Example: development of sensitive virus detection methods and the generation of candidate vaccine virus

Table 2 Compilation on comment on DSI regarding the relation with the definition of biological material.

Topic 2: Position on DSI regarding ABS

State	ITPGRFA	CDB	PIP Framework
Australia	DSI is not a physical material and not a genetic resource under the ITPGRFA	DSI is not a physical material and not a genetic resource under the CDB. DSI is not a derivative under the NP. Changing the definition would require renegotiation of the CDB/NP	GSD should be handled under the PIP Framework (…) to ensure consistency with the principles of Sharing other PIP material. Changing the definition of PIP biological material would require significant amendments (complex and timely). Prefer developing an Annex to include GSD
Germany (and EU for the CDB)	DSI is not a physical material and not a genetic resource under the ITPGRFA.	DSI is not a physical material and not a genetic resource under the CDB/nor a derivative under the NP.	GSD should be handled under the PIP Framework. PIP Framework's objective does apply for GSD.
United States of America	DSI is not a physical material and not a genetic resource under the ITPGRFA	DSI is not a physical material and not a genetic resource under the CDB.	GSD should be handled by the PIP Framework Future discussion would benefit from the difference between GSD and biological material. Stresse the importance of a complete understanding of GSD

Table 3 Compilation of comments on DSI/GSD on ABS

Conclusion

Conclusion of the discourse analysis on subjects 1:

Discourse analysis on subject 1 (terminology):

- ✓ Similar discursive patterns where a “science-based policy” is used to reinforce a position that suits the member states.
- ✓ The terms used will influence the scope and content of the definition.
- ✓ The positions on definition will influence subject 2 and 3 (“genetic material" and ABS).

Discourse analysis on subjects 2 (biological material) and 3 (ABS):

- ✓ Contradictions between their positions on similar subjects (ITPGRFA; CBD >< PIP Framework).
  - ➢ Closed positions on ABS and genetic material in the ITPGRFA and CBD ; flexible positions in the PIP framework.
- ✓ On ABS, there is the argument of keeping open access for scientific progress.
  - ➢ This argument can be found in the ITPGRFA and the CBD, but not in the PIP framework.

Reference

Materials:

- **ITPGRFA**, *Compilation of information on "digital sequence information" with respect to plant genetic resources for food and agriculture*, August 2019, IT/GB-8/19/16.1/Inf.1. Available online at: https://www.fao.org/3/na770en/na770en.pdf (Accessed July 20, 2023);

- **ITPGRFA**, *Consideration of Digital Sequence Information in Accordance with Resolution 13/2019 and the Multi-Year Programme of Work*, July 2022, IT/GB-9/22/17.2 Rev.1. Available online at: https://www.fao.org/3/ni857en/ni857en.pdf (Accessed July 20, 2023);

- **CBD**, *Compilation of views and information on digital sequence information on genetic resources submitted pursuant to paragraphs 9 and 10 of decision 14/20,* 4 February 2020, CBD/DSI/AHTEG/2020/1/INF/1. Available online at: https://www.cbd.int/doc/c/abcf/b9df/be9859f376997cf8cc00d175/dsi-ahteg-2020-01-inf-01-en.pdf (Accessed July 20, 2023);

- **PIP Framework**, *Implementation of Decision WHA70(10) 8(b) - Compilation II. GSD Analysis*, 16 October 2017. Available online at : https://cdn.who.int/media/docs/default-source/pip-framework/governance/analysis-of-seasonal-influenza-gsd-under-the-pip-framework/related-documents/gsdcompilation.pdf?sfvrsn=6b4945bf_6 (Accessed July 20, 2023).

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- Raustiala K and Victor DG, 'The Regime Complex for Plant Genetic Resources' (2004) 58 International Organization 277.
- Frison C, *Redesigning the Global Seed Commons* (Routledge 2018).