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Ignorance et discussions juridiques d'arguments scientifiques ?

Analyse critique de l'utilisation des données scientifiques dans le cadre des discussions juridiques relatives à la dématérialisation des ressources (phyto)génétiques

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Plan de la présentation

Introduction

Intersection entre sciences et droits.

Analyse critique des narratives, discours et arguments

Illustration: négociations sur les *Digital Sequence Information* (DSI) dans le TIRPAA, CDB, Cadre PIP.

Questions de recherches : *Comment les sciences (narratives et arguments) sont utilisées comme des arguments politiques et juridiques*

Méthodologie

Approche interdisciplinaire : philosophie du droit, philosophie des sciences et sociologie du droit, *Narrative Policy Framework.*

Méthodologie : analyses comparatives des commentaires et interventions des États sur les DSI dans différents forums : CDB, TIPRAA, Cadre PIP…

3 sujets : la terminologie, DSI et le « matériel génétique », DSI et le régime d'APA.

Résultats

Bien que le soutien de la science soit essentiel pour ces questions techniques, nous notons :

1. Épistocratie :

L'utilisation stratégique et rhétorique d'arguments scientifiques pour des intérêts spécifiques.

2. Inconsistances :

Trouvable dans les positions des États pour différents traités (TIRPAA vs PIP).

DSI	*Digital Sequence Information*
GSD	*Genetic Sequence Data*
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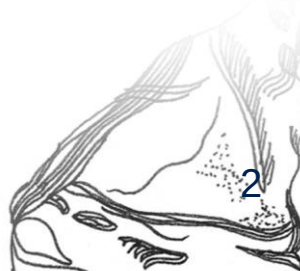
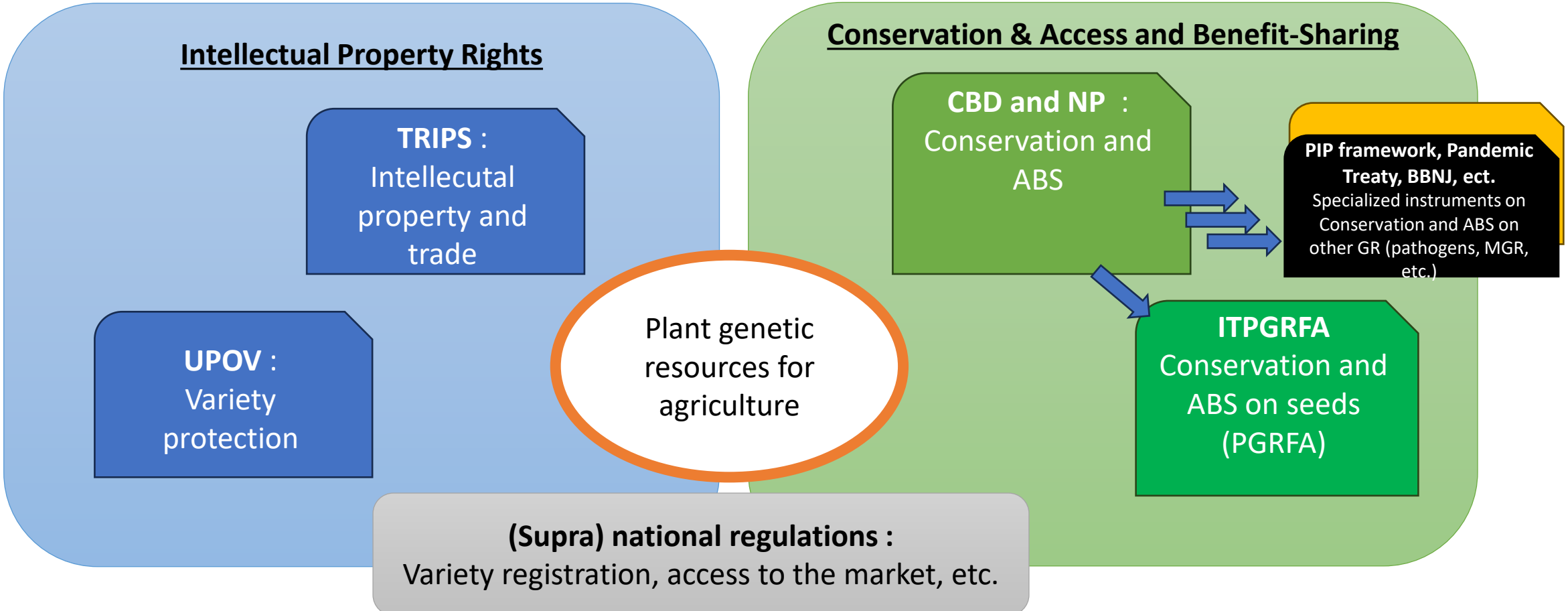
TIRPAA – *ITPGRFA*	Traité international sur les ressources phytogénétiques pour l'alimentation et l'agriculture
PIP	Cadre de préparation en cas de grippe pandémique



I. Contexte

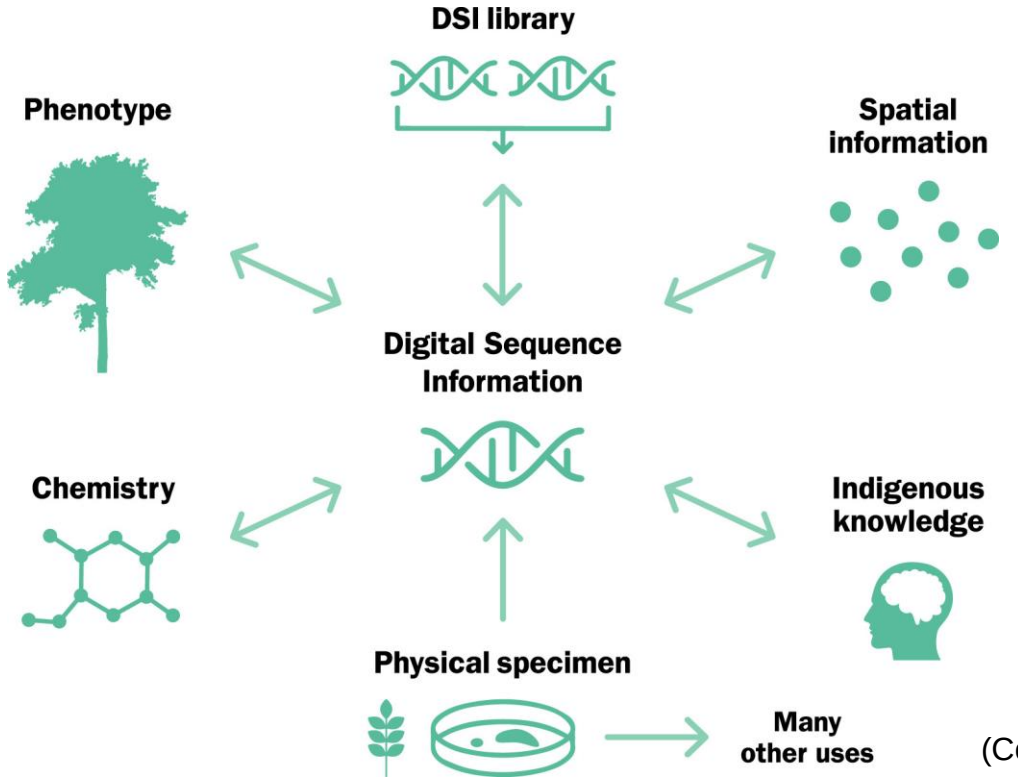
Le Regime Complex des ressources génétiques pour l'alimentation et l'agriculture

- Le **Régime Complex** des semences, des ressources génétiques et du partages des avantages (APA) (Raustalia et Victor 2004).



La fragmentation du Regime Complex

- **Fragmentation** du Regime Complex avec la question des DSI.
  - Les DSI couvrent « le contenu en informations et en connaissances du matériel génétique [qui pourrait être] extrait, traité et échangé en tant que tel, détaché de l'échange physique du matériel génétique végétal. » (Frison 2018, 83).



(Cowel *et al*, 2021)

La fragmentation du Regime Complex – exemple

OX387182.1: Buxus sempervirer | Nucleotide BLAST: Search nucle

ncbi.nlm.nih.gov/nuccore/OX387182.1?report=graph

National Library of Medicine
National Center for Biotechnology Information

Log in

Nucleotide | Nucleotide | Search | Advanced | Help

Graphics | Send to:

Buxus sempervirens genome assembly, chromosome: 1

GenBank: OX387182.1

GenBank FASTA

Link To This View | Feedback

5 M 10 M 15 M 20 M 25 M 30 M 40 M 45 M 50 M 55 M 60 M 65 M 72,167,039

OX387182.1 | Find: | Tools | Tracks | Download

36,083,510 36,083,520 36,083,530

OX387182.1: 36M..36M (39 nt) | Tracks shown: 1/2

Analyze this sequence
Run BLAST
Pick Primers

Related information
Assembly
BioProject
BioSample
Taxonomy
Genome

Recent activity
Turn Off Clear
Buxus sempervirens genome assembly, chromosome: 1 Nucleotide

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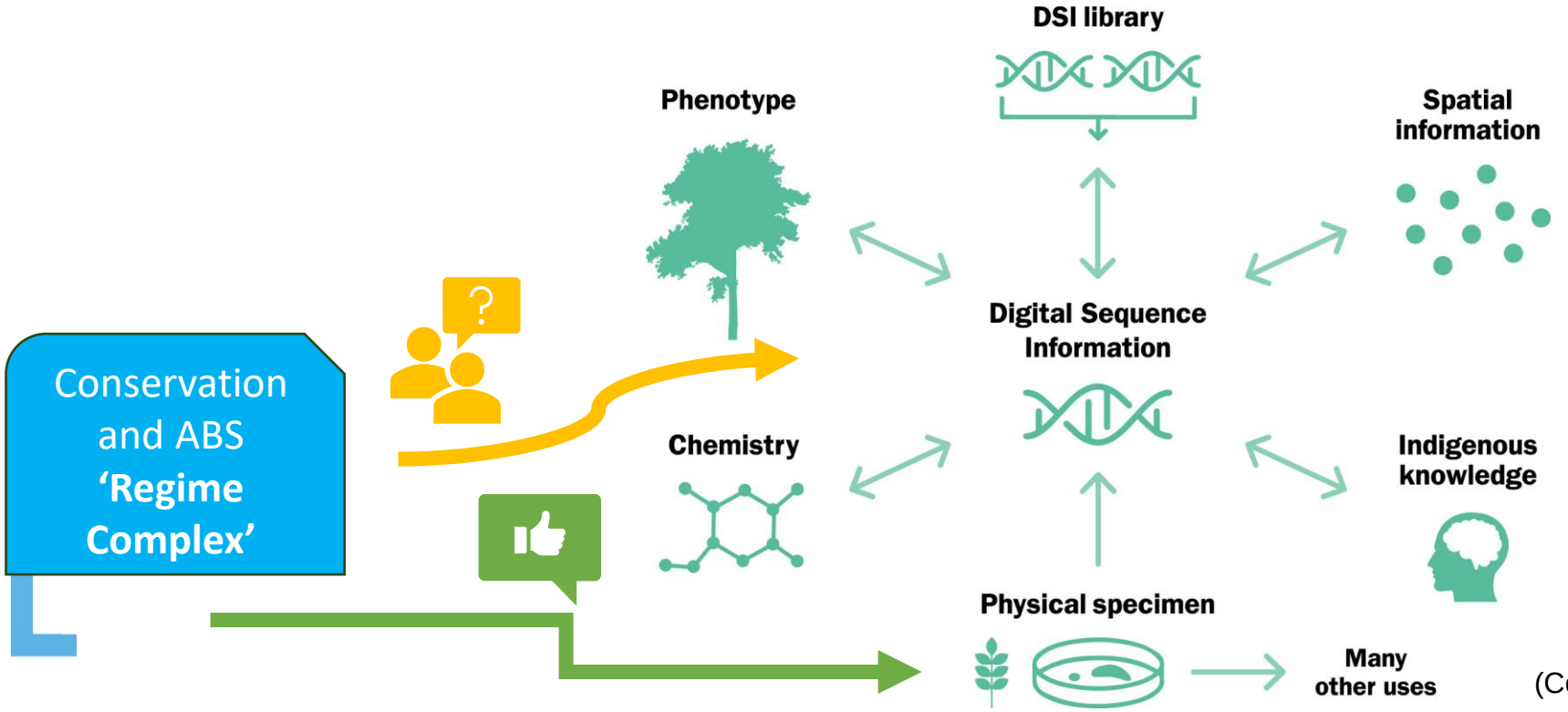

(Cowel *et al*, 2021)

Les deux fragmentations du Regime Complex

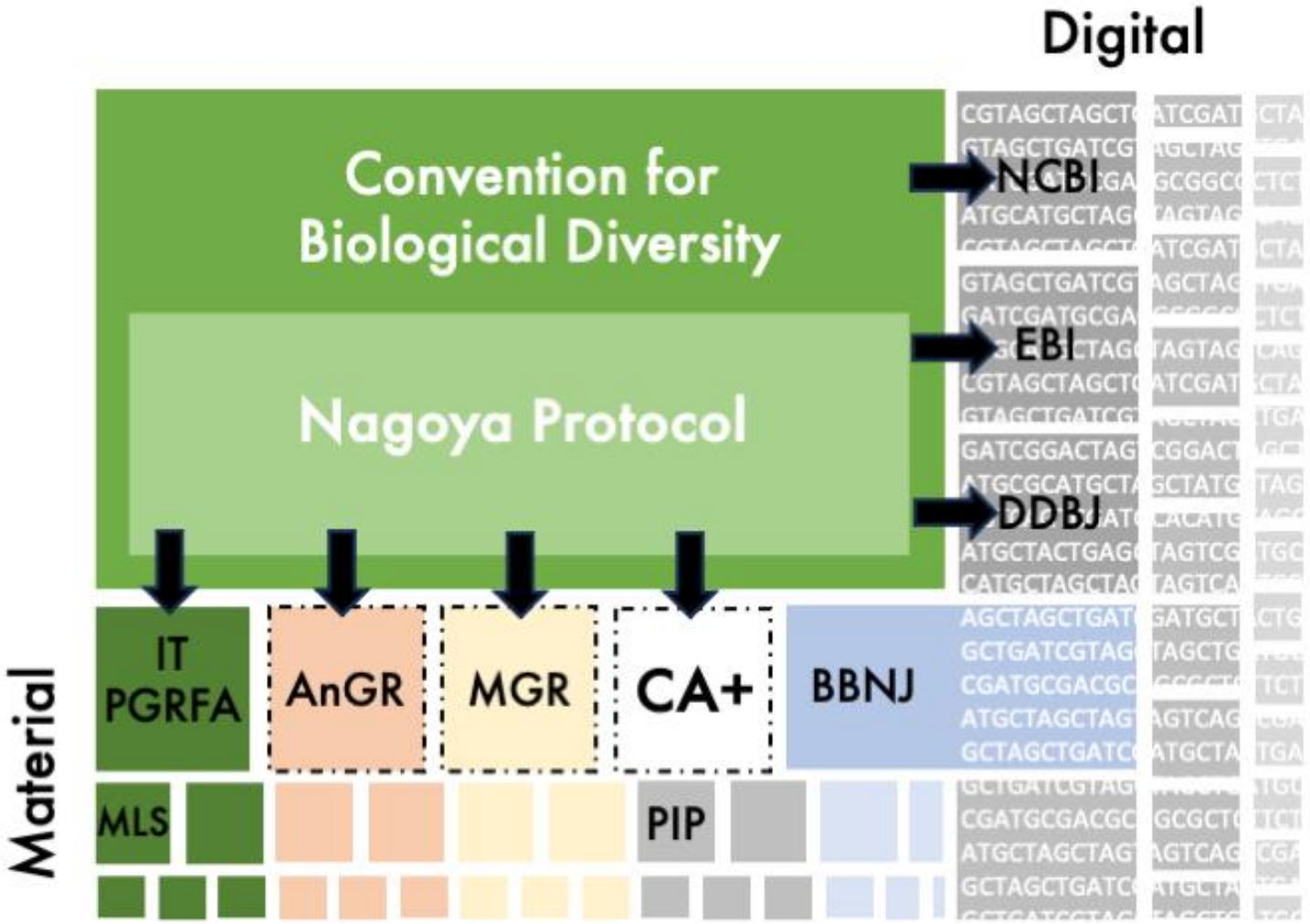

Figure 1. Two forces are trimming apart the Convention for Biological Diversity and its Nagoya Protocol genepool: the multiplication of sub-sectorial instruments that extract specific subsets and try regulating them ad hoc (vertical arrows) and the split between material and digital resources.
(Aubry,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

DSI	*Digital Sequence Information*
GSD	*Genetic Sequence Data*
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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

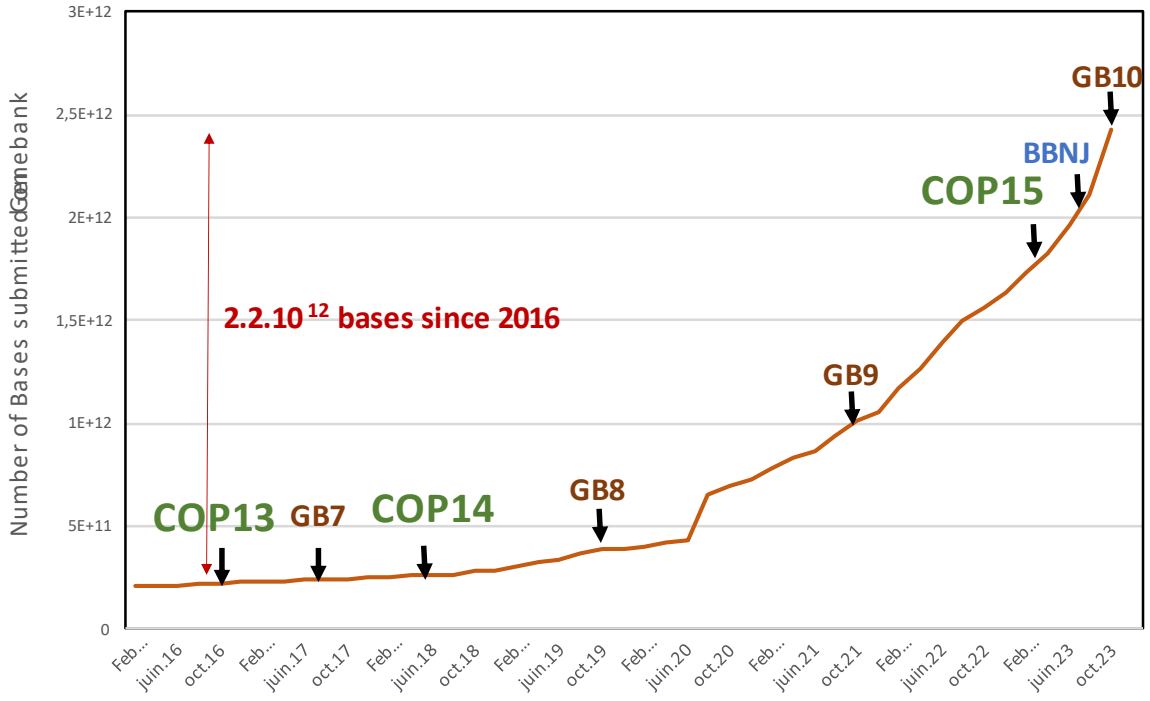
La fragmentation du Regime Complex

Les **négociations internationales** sur les DSI (2013-2020):

- Oppositions Nord/Sud et blocages.
- *Comment réglementer les DSI ? Devrions-nous considérer les DSI comme du matériel génétique ?*

- Appel à une politique basée par la science (Décision 14/20) - 4 Études de la CDB :
  - la portée et la couverture des DSI ;
  - leurs utilisations dans les bases de données (publiques/privées) ;
  - leurs traçabilités pour les règles d'APA ;
  - les mesures nationales adoptées par les parties.
- Ignorance sur les termes et les éléments couverts?
  - DSI *vs* les « *genetic sequence data* » (GSD).
- Ignorance constructive : *décision 15/9* (COP15)
  - ✓ **DSI** comme terme générique dans les négociations de la CDB (COP15) ou et à la BBNJ.
  - ? Combinaison **DSI/GSD** pour le TIRPAA (GB10).
  - ? **GSD** pour le PIP.

One COP after another, the amount of DSI is increasing



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

(Aubry, Frison, 2023)

Ignorance du champ d'application du DSI ?

CBD

UNEP

Convention on Biological Diversity

Distr.
GENERAL

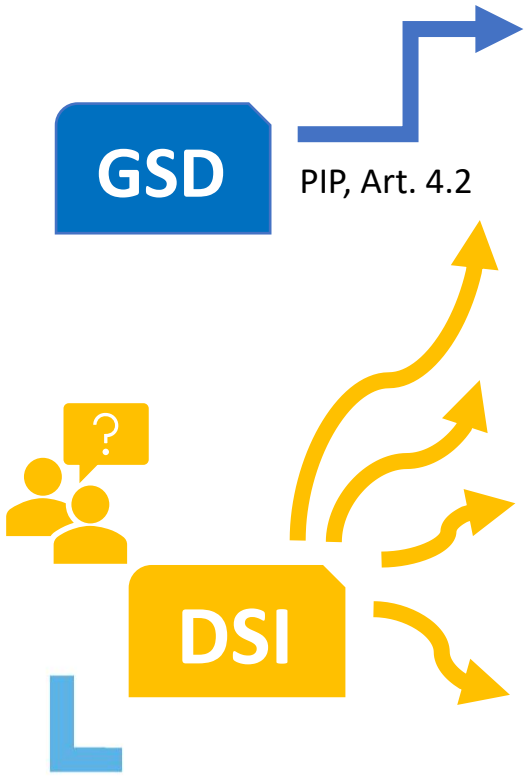
CBD/DSI/AHTEG/2020/1/3
29 January 2020

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 de la philosophie du droit et des sciences

Crainte de l'utilisation rhétorique de la science

- Epistocratie : utiliser la science pour justifier les politiques (Viala 2022)
- Science en action et vérité transcendantale
- Science (normative) et problèmes hybrides
- Tournant ontologique :
  - Science « occidentale » contre « savoir traditionnel »

Voir : Haraway, Oguamanam, Foucault, Latour,

La science dans la négociation des DSI

- Appel à une discussion « basée sur la science » :
  - Mais quelle science ?
- Tendances à mobiliser les narratives scientifiques
  - Pour justifier des décisions et des interprétations qui seraient favorable…
  - … mais l'utilisation d'une rhétorique scientifique n'est pas constante (*voy. infra*)
- La définition « scientifique » des DSI influencera la portée « juridique »
- Libre accès et DSI : autre narrative?

II. Analyses comparatives des discours

Sujet 1: Usage des termes

Différence : DSI > GSD

➢Une politique basée sur la science dans la définition de la DSI n'est pas neutre.

➢ Analyses des soumissions des parties (COP15).

- EU: "As pointed out in the Fact-finding study on DSI (…) differences in scientific terminology **reflect differences in the material referred to**";
- USA: "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."

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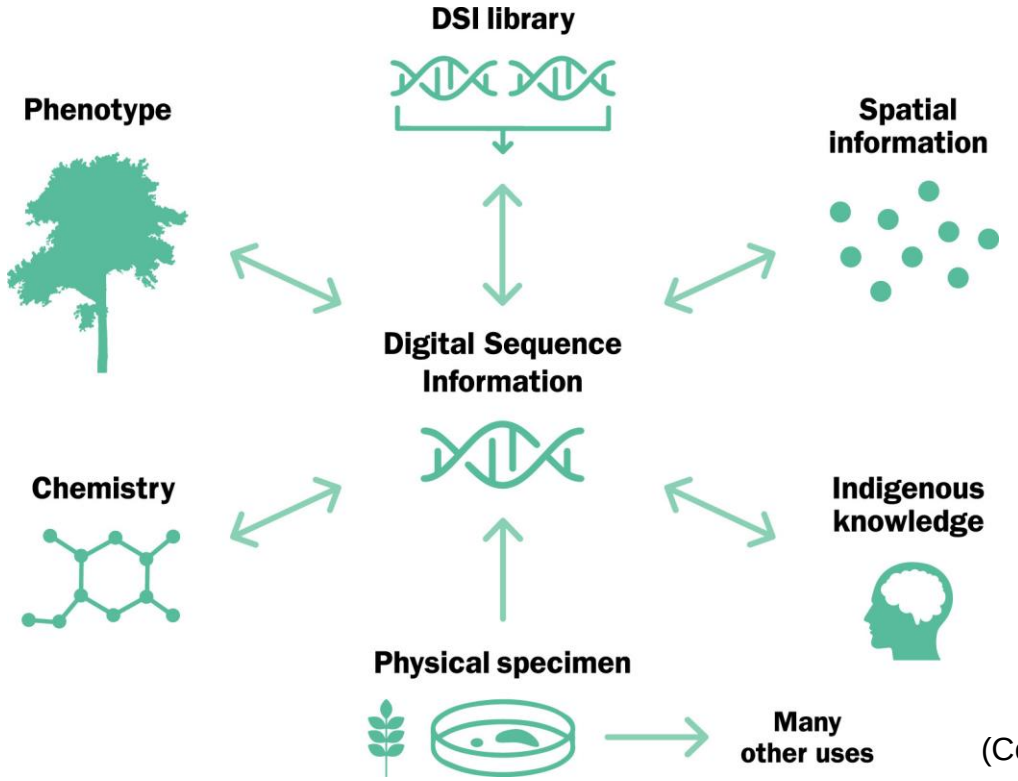

(Cowel *et al*, 2021)

Sujet 1: Terminologie

Tableau 1. Position pour la COP15 sur les termes de la DSI.

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

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 on behalf of the African Group	GI; NI	DSI is not appropriate; focus on the scope	Yes	Yes

Sujet 2 : Position sur la DSI et la définition de matériel génétique

Tableau 2 Compilation des commentaires sur les DSI/GSD concernant le matériel biologique

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

Sujet 3 : Position sur la DSI et le régime d'APA

Tableau 3 Compilation des commentaires sur les DSI/GSD concernant l'APA

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

Conclusion

Conclusion of the discourse analysis on subjects 1:

Analyse des commentaires sur le sujet 1 (terminologie) :

- ✓ Des schémas discursifs similaires où une « politique fondée sur la science » est utilisée pour renforcer une position qui convient aux États membres.
- ✓ Les termes utilisés influenceront la portée et le contenu de la définition.
- ✓ Les positions sur la définition influenceront les sujets 2 et 3 (« matériel génétique » et APA).

Analyse des commentaires sur les sujets 2 (matériel biologique) et 3 (APA) :

- ✓ Contradictions entre leurs positions sur des sujets similaires (TIRPAA ; CDB >< Cadre PIP).
- ✓ Positions fermées sur l'APA et le matériel génétique dans le TIRPAA et la CDB ; positions flexibles dans le cadre du PIP.
- ✓ En ce qui concerne l'APA, il y a l'argument du maintien d'un accès ouvert pour le progrès scientifique. Cet argument se retrouve dans le TIRPAA et la CDB, mais pas dans le cadre du PIP.

Futures recherches : intérêts divergents concernant les DSI/GSD pour les virus et les semences, et les ressources génétiques.

Reference

Matériel

- **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);
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