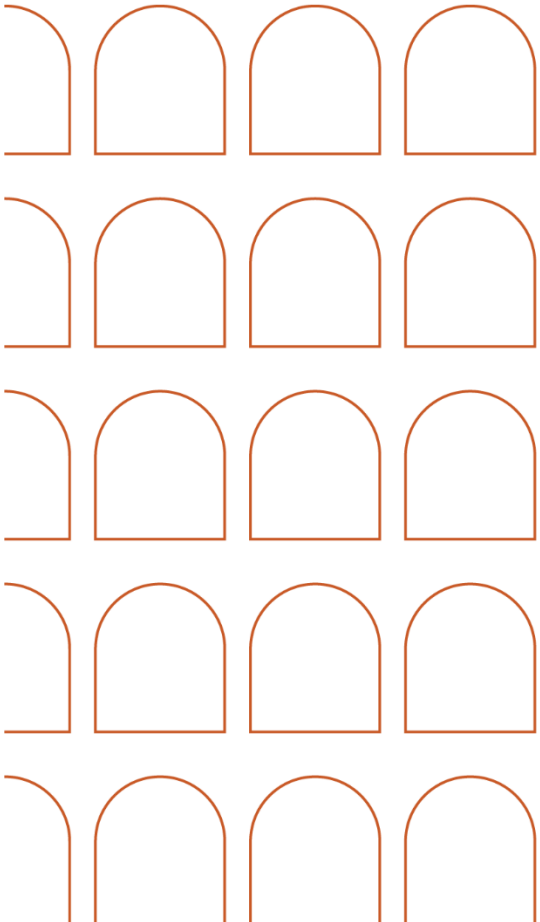




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**Technological change and international law:
ESIL annual conference, Vilnius,
5-6 September 2024**

Nathan Ehrenfreund, Eirini-Erasmia Fasia, Katia Fach Gómez, Jonathan Hafetz, Nora Hertz, Henning Lahmann, Andrea Leiter, Agnè Limantè, Tiina Pajuste, Yuval Shany, Ellie Smith, Adam Strobeyko, Erik Tuchtfield, Anna Ventouratou, Pierre Walckiers, Kebene Wodajo, Gention Zyberi

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ESIL Annual Conference, Vilnius, 5-6 September 2024

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Beyond the Natural and (Im)Material. Interpreting the International Treaty on Plant Genetic Resources for Food and Agriculture from Legal, Post-human, and Relational Perspectives

Pierre Walckiers

Abstract

In the context of technological advancements, genetic resources are increasingly utilised in their “dematerialised” forms, commonly referred to as Digital Sequence Information. This dematerialisation poses significant tensions for international instruments governing access to genetic resources and benefit-sharing, as well as for the negotiations related to their implementation, since the use of digital sequence information instead of physical genetic resources allows users to pragmatically bypass access and benefit-sharing rules. This paper interprets the International Treaty on Plant Genetic Resources for Food and Agriculture and its definitions of genetic material and genetic resources, including digital sequence information. This inclusive interpretation is defended as the most coherent under the Vienna Convention's interpretative methods (analysis of the text, context, object, and purpose of the treaty). Additionally, this interpretation is supported by a post-human and relational approach to international law, acknowledging the interconnected social, cultural, and informational dimensions of seeds.

Keywords

Digital sequence information, ITPGRFA, Vienna Convention, Interpretation, Posthuman theory

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1. Introduction

In a context where new technologies and scientific advancements are revolutionising the bioeconomy and agrifood systems, the mechanisms of North-South equity in international law governing genetic resources find themselves at a turning point. While these instruments have traditionally regulated “physical” genetic resources, they now face the risk of being entirely surpassed by the current use of “dematerialised” genetic resources, referred to here by the placeholder term: digital sequence information (DSI).¹

This paper focuses on the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), a multilateral treaty adopted in 2001 and entering into force in 2004. Using the Vienna Convention on the Law of Treaties (Vienna Convention), this article seeks to determine whether the ITPGRFA applies to DSI. In addition to a posthuman and relational approach to the ITPGRFA, a doctrinal analysis of the treaty, particularly of the definitions of “Plant Genetic Resources for Food and Agriculture” (PGRFA), defined as “any genetic material of actual or potential value for food and agriculture,” and “genetic material,” understood as “any material containing functional units of heredity,” will support the conclusion that DSI falls within the scope of the ITPGRFA.

2. Context

PGRFA are governed by several international instruments with different, and sometimes contradictory, objectives, forming a “regime complex.”² Within the PGRFA regime complex, the literature identifies conflicts between instruments that favour the appropriation of PGRFA through Intellectual Property Rights (IPR), and mechanisms for fair and equitable Access and Benefit-Sharing (ABS).³ On the one hand, the Trade-Related Aspects of Intellectual Property Rights (TRIPS) and the International Union for the Protection of New Varieties of Plants (UPOV) establishes a (hyper)appropriation approach to PGRFA.⁴ On the other hand, other instruments regulate the conservation and sustainable use of genetic resources, including rules for access to the PGRFA, and their fair and equitable benefit sharing. Since 1992, the Convention on Biological Diversity (CBD) is the umbrella convention for ABS concerning all genetic resources. For specific genetic resources (seeds, viruses, marine genetic resources), sector-specific ABS treaties, conventions, and instruments have been adopted, such as the ITPGRFA.

The CBD and ITPGRFA share several related principles: sovereignty of States over their genetic resources; rules to access to genetic resources; linked to the fair and equitable sharing of the benefits from their use. In practice, the CBD, as specified by its Nagoya Protocol, establishes access to genetic resources through a bilateral contract with Prior Informed Consent (PIC) and Mutually Agreed Terms (MAT) on benefit-sharing.⁵ Rather than a bilateral

¹While the definition of DSI is still to be determined, it may encompass *stricto sensu* DNA, RNA, and *largo sensu*, proteins, metabolites and associated contextual information or even related traditional knowledge; Sylvain Aubry and others, ‘Bringing Access and Benefit Sharing into the Digital Age’ (2022) 4 Plants, people, planet 5.

²Kal Raustiala and David G Victor, ‘The Regime Complex for Plant Genetic Resources’ (2004) 58 International Organization 277.

³*ibid* 277; Christine Frison, *Redesigning the Global Seed Commons* (Routledge 2018) 32.

⁴Sabrina Safrin, ‘Hyperownership in a Time of Biotechnological Promise: The International Conflict to Control the Building Blocks of Life’ (2004) 98 American Journal of International Law 641.

⁵Raustiala and Victor (n 2) 277.

approach, the ITPGRFA establishes a multilateral system facilitating ABS through a common pool of PGRFA and a benefit sharing fund.⁶

Often criticised,⁷ these ABS instruments find themselves overwhelmed by the dematerialisation of PGRFA and the growing use of DSI. Over the last twenty years, it has become easier and much cheaper to sequence and “dematerialise” genetic resources for research and commercial purposes, i.e., identifying new traits, breeding, etc.⁸ DSI are broadly analysed as a phenomenon of dematerialisation of PGRFA. It 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.”⁹ Contrary to physical genetic resources, DSI is widely available in open-access databases. This allows researchers and breeders to access relevant information about a seed variety without triggering any benefit-sharing compensation.¹⁰ Therefore, using DSI instead of physical genetic resources is viewed as a loophole that enables the circumvention of ABS obligations.¹¹ However, the accessibility of DSI without meeting ABS obligations is a *de facto* situation, which does not imply compliance with current international law.¹²

The issue of DSI has been raised in different fora with significant disagreements.¹³ In these negotiations, there are strong opposing blocs between countries. Many countries in the “Global North” considered that DSI do not fall within the scope of these rules, arguing for a strict separation between “physical” and “intangible” genetic resources.¹⁴ In contrast, “Global South” countries consider that the ABS rules should apply to DSI to be in line with the objective of the Treaty.¹⁵ Although the history of ITPGRFA's Governing Body meetings has shown major stumbling blocks, the latest meetings have been more consensual, welcoming CBD's decision 15/9.

Independently from these political negotiations, there is a legal controversy whether DSI falls within the scope of the definitions of PGRFA and “genetic material.”¹⁶ In this context, states assert partial interpretations to defend positions that meet their interests. For instance, some

⁶Frison (n 3).

⁷Aubry and others (n 1) 6; Elisa Morgera, Matthias Buck and Elsa Tsoumani, *The 2010 Nagoya Protocol on Access and Benefit-Sharing in Perspective: Implications for International Law and Implementation Challenges* (Martinus Nijhoff 2012).

⁸Charles Lawson, Fran Humphries and Michelle Rourke, ‘The Future of Information under the CBD, Nagoya Protocol, Plant Treaty, and PIP Framework’ (2019) 22 *The Journal of World Intellectual Property* 103.

⁹FAO ‘Report of the Governing Body of the ITPGRFA Fifth Session’ (2013) IT/GB-5/13/4; Stefanie Sievers-Glotzbach and others, ‘Beyond the Material: Knowledge Aspects in Seed Commoning’ (2021) 38 *Agriculture and Human Values* 509, 514; Frison (n 6) 83.

¹⁰Raquel Ajates, ‘From Land Enclosures to Lab Enclosures: Digital Sequence Information, Cultivated Biodiversity and the Movement for Open Source Seed Systems’ (2023) 50 *The Journal of Peasant Studies* 1056.

¹¹Frison (n 3) 86; Molly R Bond and Deborah Scott, ‘Digital Biopiracy and the (Dis)Assembling of the Nagoya Protocol’ (2020) 117 *Geoforum* 24.

¹²Margo A Bagley, ‘“Just” Sharing: The Virtues of Digital Sequence Information Benefit-Sharing for the Common Good’ (2022) 63 *Harvard International Law Journal* 33.

¹³Frison (n 3) 83.

¹⁴I acknowledge that “Global North” and “Global South” are not precise representations of global economic and social realities, but they may help to identify certain global dynamics; Anis Bendimred and Christine Frison, ‘Séquençage des données issues des ressources génétiques : trouble-fête du régime international d'accès et de partage des avantages du Protocole de Nagoya’ (2022) 83 *Louvain Law Review*, 405.

¹⁵Frison (n 3) 86.

¹⁶Lawson, Humphries and Rourke (n 8) 4; Frison (n 3) 83.

states claim that the term “material” implies the tangibility of PGRFA, thereby excluding DSI.¹⁷ Yet, this paper argues that this is an incomplete and biased interpretation aimed at satisfying a political agenda that does not respect the text, context, and purpose of the Treaty.

3. Methodology

This article examines whether the ITPGRFA could be authentically interpreted, following the principles of the Vienna Convention, to include DSI within the definitions of PGRFA and “genetic material,” and explores the contributions of a post-human and relational approach to international law in supporting this interpretation. This paper is based on a legal analysis of the Treaty and its subsequent developments, working documents from the FAO secretariat, States’s submission, FAO archive consultation, and is enriched by legal, political and historical literature.

As main research method, we implement the legal technique to interpret the ITPGRFA which is specified in Article 31(1) of the Vienna Convention as: “a treaty shall be interpreted in *good faith* in accordance with the *ordinary meaning* to be given to the terms of the treaty *in their context* and in *the light of its object and purpose*.”¹⁸ According to this article, there are three methods of interpretation: textual (ordinary meaning), contextual, and teleological (object and purpose). While the exercise begins with an analysis of the ordinary meaning, the final interpretation must harmoniously incorporate the outcomes of all three methods of interpretation.¹⁹ It implies to reject a restrictive interpretation advocated by some states, which focuses solely on the text “material” to exclude DSI while disregarding the context and the objective of the Treaty.²⁰

Subsidiarily, we consolidate the positivist analysis with a post-human and relational approach to international law.²¹ Post-human and relational approaches critically identify a series of dichotomies (nature and culture, object and subject), characterised by externalisation and exclusion.²² Taking the ITPGRFA and DSI as an illustration, Western countries defend a dualistic interpretation of PGRFA, separating humans from nature, modified plants from raw material, and tangible genetic resources from intangible data extracted from genetic resources.²³ These posthuman and relational approaches enable a critical analysis of the state of negotiations and support a holistic interpretation of the Treaty, as demonstrated in the following section.

¹⁷Charles Lawson and Michelle Rourke, ‘Digital Sequence Information as a Marine Genetic Resource under the Proposed UNCLOS Legally Binding Instrument’ (2020) 122 *Marine Policy* 103878, 2; Bond and Scott (n 11); Bagley (n 12); Sarah Laird and Rachel Wynberg, ‘A Fact Finding and Scoping Study on Digital Sequence Information on Genetic Resources in the Context of the Convention on Biological Diversity and Nagoya Protocol’ [2018] CBD/DSI/AHTEG/2018/1/3.

¹⁸Emphasis added by author.

¹⁹Claire Portier, ‘Le Droit de La Responsabilité à l’épreuve Des Activités de Fusion Nucléaire : Contribution à l’étude de La Responsabilité Du Fait Des Activités à Risque’ (PhD Dissertation, Aix-Marseille 2022) 124.

²⁰Bendimred and Frison (n 14) 420; Contra: Tade Matthias Spranger, ‘Expert Opinion on the Applicability of the Convention on Biological Diversity and the Nagoya Protocol to Digital Sequence Information’ (2017) submitted on behalf of the German Federal Ministry of Education and Research 15.

²¹Matilda Arvidsson and Emily Jones, *International Law and Posthuman Theory* (Routledge 2024).

²²Emily Jones, ‘Posthuman International Law and the Rights of Nature’ (2021) 12 *Journal of Human Rights and the Environment* 76, 98.

²³Sarah Whatmore, *Hybrid Geographies: Natures, Cultures, Spaces* (SAGE 2002) 115; Sievers-Glotzbach and others (n 9) 511.

4. Result

4.1. State of Play

A preliminary analysis was conducted to provide an overview of the negotiations and points of contention, based on the submissions to the ITPGRFA (2019 and 2022) with some arguments from the CBD, where applicable (as definitions, articles or logical differs).²⁴ Table 1 presents two views: a restrictive one and an inclusive one.

Table 1 Current Status: Political and Legal Arguments. Legend: T – Textual method of interpretation; C – Contextual; OP – Object and Purpose.

Views	View 1 (restrictive): DSI is not in the definition of PGRFA	View 2 (inclusive): DSI is in the definition of PGRFA
States and stakeholders	Primarily “Global North” countries. Position explicitly supported by Canada, Australia, US, Japan, European Union. Industry.	Primarily “Global South” countries. Position explicitly supported by Lebanon, Argentina, Brazil. NGO/farmers' organisations.
Main arguments from States' declarations	PGRFA is of “tangible” material, excluding DSI. ^T DSI does not contain “functional units of heredity” or genes (Italy, Canada, Australia). ^{T,C} Open access to DSI is a form of non-monetary benefit sharing. ^C ABS should not hinder scientific progress. ^{OP}	Ambiguity of the term material: does not mean tangible (Argentina). ^T The definition of PGRFA (could) includes DSI (both material and immaterial). ^{T, OP} Unregulated use of DSI will impact the functioning of the Treaty. ^{OP} States sovereignty over PGRFA. ^{C, OP}
Implications	DSI should be outside of the ITPGRFA scope: MLS, ABS, IPR protection. Keep DSI freely accessible, against national legislations limiting their access. Compensation outside of the framework can be negotiated.	DSI should be within the scope of the ITPGRFA: ABS, MLS, IPR provisions. National legislations linking DSI to genetic resources, which limits their access, are legitimate.

Treaty Interpretation:

Based on the Vienna Convention methods of interpretation, we argue that the definitions of “genetic material” and PGRFA are already sufficiently dynamic to be interpreted inclusively of DSI (Table 2).

Table 2 Summary of the interpretation of the ITPGRFA following the Vienna Convention

Methods	Analyses
Textual Analysis	The Locution “ actual or potential value ” opens for dynamic and inclusive interpretation. ²⁵ “ Material ” is used as a noun, not an adjective; therefore, it contests a physicalist interpretation. “ Functional units of heredity ,” is

²⁴Bagley (n 12) 34; Abbie-Rose Hampton, ‘Pathogen Dematerialization and the ABS Loophole’ (2023) 10 Journal of Law and the Biosciences 1, 15; Lawson, Humphries and Rourke (n 8) 7.

²⁵Emphasis added by author; AHTEG, ‘The Concept of “Genetic Resources” in the Convention on Biological Diversity and How It Relates to a Functional International Regime on Access and Benefit-Sharing,’ (CBD 2010) UNEP/CBD/ WG-ABS/9/INF/1 10.

	derived from the CBD, is not a precise scientific category but rather the result of political compromise. It allows for broad interpretation, already encompassing DNA, living cells, chromosomes, genes, and DNA fragments. ²⁶
Contextual analysis	Several articles and principles can reinforce a contextual inclusive interpretation of DSI. In particular: Article 1 – complementary objective: conservation and ABS. Article 3, 10 – Scope and sovereignty of States over PGRFA. Articles 5, 9, 12, 17 – Link between PGRFA and related information. Yet, Article 13 recognises information as non-monetary benefit-sharing. Article 12 – “genetic parts or components” should be interpreted in conjunction with the definition of genetic material. ²⁷ The Governing Body is the competent authority for an authentic interpretation, but there is a lack of consensus in this forum. In the regime complex , progress is ambivalent (BBNJ, COP15). Yet, the principles of <i>pacta tertiis nec nocent nec prosunt</i> apply. The analysis of IPR or data protection instruments, however, shows a transmateriality between the material and immaterial.
Object and purpose of the Treaty	The tele-subjective method (determining the intention of the parties at the time of the conclusion of the treaty) demonstrates an inclusive interpretation (cf. the International Undertaking 1983) and a willingness to create a long-term system (which would have included DSI if it had existed), without considering the physical or immaterial dimensions of PGRFA. The tele-objective method (applying the “intelligence” of the text in response to new challenges) confirms this inclusive interpretation, as the definitions are already flexible and dynamic.

Firstly, the analysis according to the ordinary meaning of “genetic material” and PGRFA can include DSI. First, DSI can be considered as “any material [used as a noun and not as an adjective, a generic term that could be replaced by carrier, container, or device] of plant origin, that contains the functional units of heredity”. Although still debated, the scope of DSI clearly contains “functional units of heredity.” Therefore, DSI can be textually included in the PGRFA definition as “any genetic material of plant origin of actual or potential value for food and agriculture.”

Secondly, our inclusive interpretation is confirmed by the analysis of the context. Against an artificial distinction between material and immaterial, the ITPGRFA creates links between PGRFA and their intangible elements. Firstly, PGRFA are recognised for their “value,” which can be social, or cultural.²⁸ Secondly, the Treaty establishes numerous connections between PGRFA and their intangible elements, their information, related traditional knowledge, passport data, via Articles 5.1(b) and (e), 9.2(a), 17.1, 12.3(c) and (d), and 13.2(a). In the context of relations between the ITPGRFA and intellectual property rights, Article 12.3(d) uses the locution “parts or components” which aligns contextually with the definition of PGRFA, thus supporting an inclusive interpretation²⁹.

Finally, the inclusion of DSI would align with the object and purpose of the Treaty, whether analysed from a teleobjective or telesubjective perspective. The telesubjective interpretation of the ITPGRFA confirms that the original intent of the parties would have included DSI, particularly in their aim to establish a sustainable and long-term fair and equitable multilateral

²⁶Kerry Ten Kate and Sarah A Laird, *The Commercial Use of Biodiversity: Access to Genetic Resources and Benefit Sharing* (Earthscan Ltd 1999) 18; Gérald Moore and Witold Tymowski, ‘Explanatory Guide to the International Treaty on Plant Genetic Resources for Food and Agriculture’ (IUCN 2005) 36; Spranger (n 20) 17.

²⁷Aubry and others (n 1) 7.

²⁸This point was explicitly taken up by the AHTEG and can also be found in the drafting of the International Undertaking ; AHTEG (n 25) 10.

²⁹Frison (n 3) 83; Aubry and others (n 1) 7.

system.³⁰ This interpretation is confirmed by a teleobjective approach, which, anticipating the Treaty's autonomy from its original intent, highlights that the definition of PGRFA is already dynamic enough to include DSI, considering the evolution of research practices.

4.2. Post-Human and Relational Contributions

In addition, this inclusive interpretation is supported by a relational and post-human approach to the ITPGRFA. These approaches criticise the artificial separation between the tangible and intangible dimensions of PGRFA, divisions that are ontologically marked by Western dichotomies (nature vs. culture, material vs. immaterial, improved plants vs. raw materials).³¹ These divisions have led to a “physicalist” view of PGRFA, where they are understood solely through their physical attributes. As illustrated in Figures 1 and 2, this physicalist view artificially imposes a material/immaterial axis, whereas historically, the ITPGRFA has been positioned along a vertical axis of state sovereignty over PGRFA, with principles varying between common and exclusive ownership of PGRFA.³²

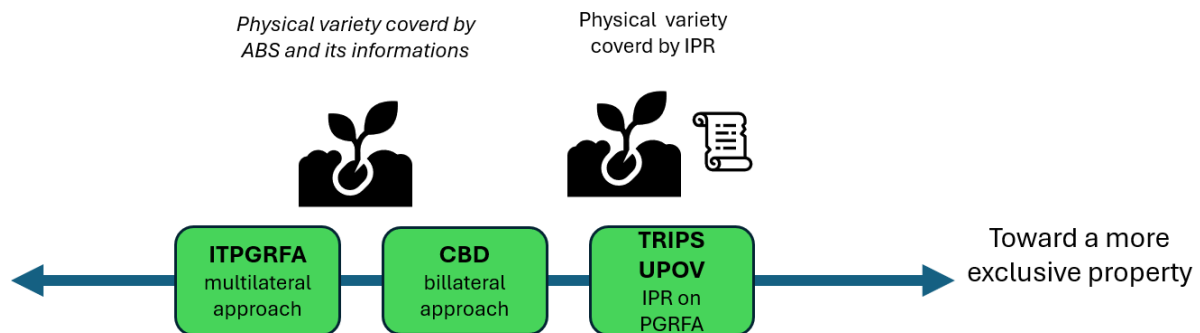


Figure 1 horizontal axis common vs appropriation approaches to PGRFA

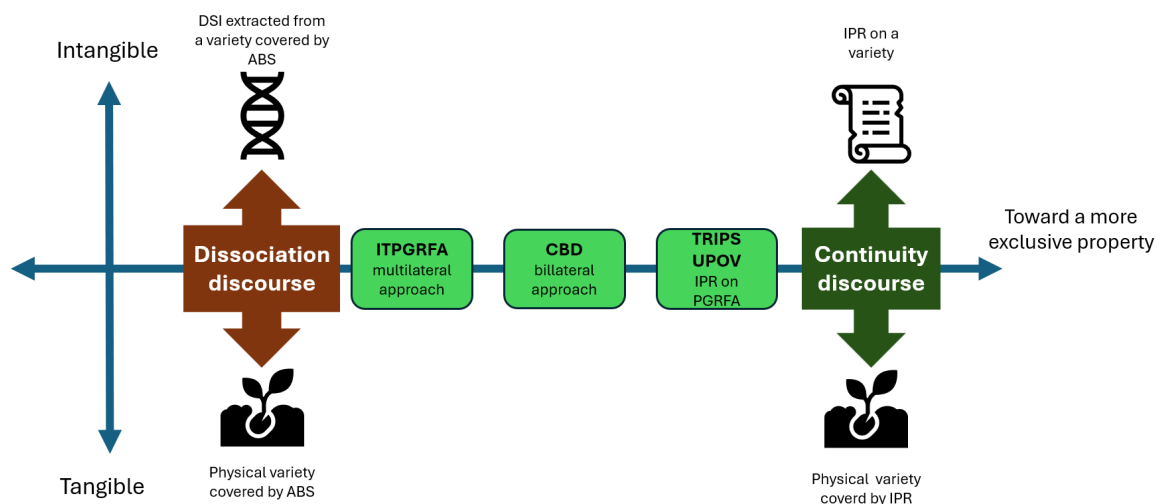


Figure 2 Two axes in PGRFA governance.

We argue that the ITPGRFA positions itself on the horizontal axis concerning the governance of PGRFA (towards exclusive ownership of PGRFA). However, with the dematerialisation of

³⁰Stuart Coupe and Roger Lewins, *Negotiating the Seed Treaty* (Practical Action Publishing 2007) 14.

³¹Whatmore (n 23) 108.

³²Coupe and Lewins (n 30) 14; Frison (n 3) 32; Moore and Tymowski (n 26) 98.

PGRFA, a new vertical axis of material/immaterial distinctions emerges. Relying on Western ontological dichotomies, some states are artificially reinforcing the tangible/intangible distinction to impose a physicalist definition of PGRFA, thereby excluding DSI. In sum, we criticise the ambiguities of these ontological assertions, particularly considering the inseparability between the material and in dimensions of seeds (Figure 3), the conceptual shortcuts referring to the “immateriality” of DSI when it is rather a change of support; or the flexibility and relationality of Law in extending to intangible elements in other domain (IPR, personal data protection, etc.).

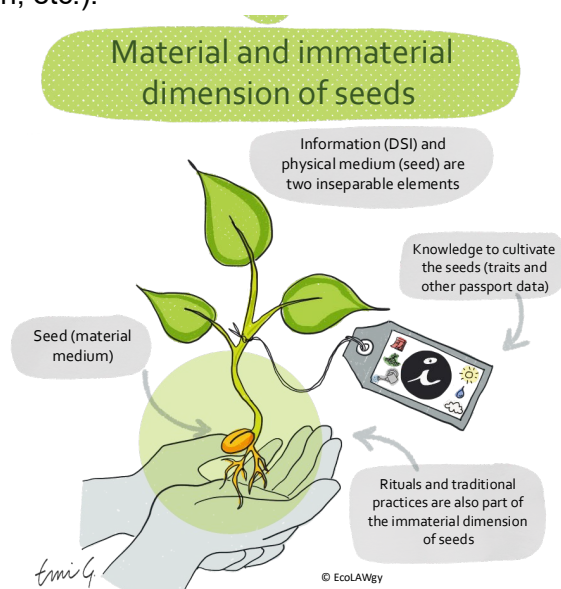


Figure 3 Continuity between the material and informal dimensions of seeds³³.

5. Conclusion

By coherently mobilising the methods of interpretation outlined in the Vienna Convention (textual, contextual, and teleological), this paper interprets the ITPGRFA and its definition to include DSI. Indeed, DSI can be included in the definition of “genetic material” as “a material (used here as a noun and a generic term, which can also be replaced by carrier/container/device) that contains functional units of heredity (i.e., DNA information).” As genetic material “of actual or potential value for food and agriculture,” DSI fits within the scope of PGRFA. Additionally, post-human and relational approaches are useful for critiquing a physicalist interpretation of the Treaty, which strategically imposes an artificial ontological dichotomy between the material and the immaterial.

³³Figures resulting from Christine Frison’s research, related to the six unchanging principles for the sustainable management of seeds: Frison (n 3) 183.

