

Peer Review by Joseph Henry Vogel* of the “Study on Concept and Scope” by Wael Houssen et al with reference to “Combined Study on Traceability and Databases” by Fabian Rohden et al and the “Study on Domestic Measures” by Margo A. Bagley et al

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Key messages:

- *The commission for Study 1 on Concept and Scope is unlike that of Combined Study (2&3) on Traceability and Databases or Study 4 on Domestic Measures. Analysis of the concept and scope of “Digital Sequence Information on Genetic Resources” (DSI) was possible. Nevertheless, the authors do not evaluate all the terms that could have replaced the placeholder. Glaringly absent is “natural information”.*
- *Study 1 is meticulously constructed. Lack of due diligence does not explain the absence of natural information. Taboo does. To understand taboo in the Conference of the Parties (COP), one must consider the evolutionary psychology of dominance in nested hierarchies.*
- *Necessary but not sufficient for ABS is naming correctly the “phenomenon which temporarily goes by the placeholder DSI”, aka the Phenom. Once the Phenom is duly named, action can proceed on policy implications.*

Preamble: Non-conducive to peer review is the template format. Like the reviews for Combined Study 2&3 and Study 4, this review appears in narrative form. “Natural information” is the best term to replace DSI yet is taboo in Study 1. This review breaks the taboo and is the last in a trilogy of reviews on studies commissioned under Decision 14/20. The review would have appeared first had the studies been published sequentially. Whereas the reviews of the Combined Study and Study 4 can stand alone, such separation was not achieved for Study 1. Ideas developed in the other reviews are also central to this one. Rather than extensively quote them, I will reference the relevant passages in parentheses. Advisable is leaving open all three reviews and toggling between them. They interlock and lead to a hopeful conclusion: a fair, equitable and efficient ABS is within reach.

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1. Introduction

Evaluation of a replacement term for “digital sequence information” (DSI) cannot be divorced from its policy implications. Anticipating the implications of any suggested term frames the decision of the Conference of the Parties (COP).¹ Nevertheless, the authors of Study 1 have no fear of cognitive bias in the evaluation: “This study is scientific in scope and does not cover associated policy implications” (line 21, p. 8). Reason for fear would be the inadvertent suppression of a term whose policy implications run counter to the status quo. As argued in the Reviews of the Combined Study (RCS) and Study 4 (RS4), “natural information” implies that the multilateralism of a Global Multilateral Benefit-Sharing Mechanism (GMBSM) supplant the bilateralism of Material Transfer Agreements (MTAs) (RCS, p. 8; RS4, pp. 7-9).² The absence of natural information in Study 1 is evidence of cognitive bias(es) in the vetting of replacement terms.³ Although revision could correct the omission, the analysis would have to be restructured.

The cynic who reviews Study 1 will suspect that the authors eliminated natural information because of its policy implications and the disclosed conflict of interest (lines 5-7, p. 46).⁴ The charitable skeptic will rejoin that the omission was probably unintentional. In light of a substantial literature on natural information, how is such charity not naïve? The answer is simple: Natural information is taboo. As Garrett Hardin discerned in his capstone *Living Within Limits*, taboo is “an effective gatekeeper of the mind” because “it does not call attention to itself”.⁵

The best way to grapple with taboos is to recognize that analysis of taboos is also taboo. The taboo on taboos is understandable. To suggest that the authors of Study 1 are bowing to the natural-information taboo is undiplomatic. In the spirit of seeking consensus, why not just chalk it up to oversight? The reason is time. If taboo preempted natural information from

¹ Amos Tversky and Daniel Kahneman, "The Framing of Decisions and the Psychology of Choice", *Science* 211 (1981), https://www.uzh.ch/cmsssl/suz/dam/jcr:fffff-fad3-547b-ffff-ffffe54d58af/10.18_kahneman_tversky_81.pdf

² Peruvian Society of Environmental Law, "Even best case for bilateralism supports need for a Global Multilateral Benefit-Sharing Mechanism: Common ground in ‘bounded openness over natural information’ as the modality for ABS” in response to Notification for Submission of views and information further to decisions NP-3/13 on Article 10 of the Nagoya Protocol (SCBD/NPU/DC/VN/KG/RKi/87805), <https://www.cbd.int/abs/submissions/Art10/2019/SPDA-EN.pdf>

³ Among the possibilities: outcome bias, selection perception, Semmelweis reflex, status quo bias and zero-sum bias. For an overview, see Buster Benson, “Cognitive Cheat Sheet”, 1 September 2016. *Medium*, <https://medium.com/better-humans/cognitive-bias-cheat-sheet-55a472476b18>

⁴ Benefits received by Providers are costs paid by Users. The pharmaceutical industry will be the most impacted by the policy implications of “natural information”. The inelasticity of industry demand implies that the incidence of a significant royalty will fall largely on the consumer through higher prices. See, "New Approaches to Access and Benefit Sharing: The Case for Bounded Openness and Natural Information", Side Event, Conference of the Parties XIII to the UN Convention on Biological Diversity, 9 December 2016. Transcript, Sociedad Peruana de Derecho Ambiental, pp. 8-10, <http://www.actualidadambiental.pe/wp-content/uploads/2017/12/TranscriptSideEventCOP13BoundedOpenness.pdf>

⁵ Garrett Hardin, *Living Within Limit*, New York, Oxford University Press, 1993, p. 4.

consideration, walking on eggshells will never resolve ABS. Non-consideration of natural information will persist. Just in 2019, at least five publications appeared where natural information was not included in the list of replacement terms for DSI. All five were meticulously executed.⁶ The natural-information taboo also has precursors. In 2002, ten years after the first of many applications of the “economics of information” to genetic resources,⁷ due diligence could no longer explain the absence of citations in the ABS literature. The less charitable explanation is conveyed in “Monitoring and Tracking the Economics of Information in the Convention on Biological Diversity: Studied Ignorance (2002-2011)”.⁸ Should a sequel appear on the decennial anniversary of that publication, the subtitle might read “Studied Ignorance Morphs into Taboo (2012-2021)”.

2. Missing Economics

The authors of Study 1 write boldly, figuratively and literally, that “**This study seeks, firstly, to ensure sufficient technical grounding with which to consider the concept of DSI**” (lines 8, p 5). Given the economic nature of the CBD and the Nagoya Protocol (NP), “**technical grounding**” should include “economic grounding”. Yet Study 1 does not deploy economics to consider concept and scope. Note well: cost reduction in sequencing is not economics but accounting (p. 18). Similarly, the tabulation of industries that deploy genetic resources is not economics but business journalism (Table 3, p. 27). Missing from the concept and scope of Study 1 is a framework to make sense of the sundry facts about costs and industries. The missing element is not unique to Study 1. The Combined Study also reads as if economics did not exist. Study 4 pays all-too-faint lip service to economics (RS4, p. 6).

Besides missing economics, all the studies have one thing in common: information overload. The Combined Study releases a torrent of information about databases. Study 4 releases a torrent about regulatory measures. The torrent from Study 1 is on the origin and take-off of molecular biology, with its fragmentation into the “-omics” disciplines and associated technologies.

⁶ Besides Study 1 and the Combined Study (2&3), are “Webinar on ABS & Digital Sequence Information (DSI)” Global ABS Project / UNDP, 25 September 2019, <https://community.abs-sustainabledevelopment.net/knowledge/webinar-on-abs-digital-sequence-information-dsi/>; “Digital Sequence Information on Genetic Resources: An Introductory Guide for African Policymakers and Stakeholders”, August 2019, http://www.abs-initiative.info/fileadmin/media/Knowledge_Center/Pulications/DSI/Introductory_Guide_-_DSI_-_ABS_Initiative_-_201908.pdf; and “Digital Sequence Information (DSI): Options and Impact of Regulating Access and Benefit-sharing - Stakeholder Perspectives”, 8 May 2019, <https://library.wur.nl/WebQuery/wurpubs/548853>

⁷ Joseph Henry Vogel, *Privatisation as a Conservation Policy*, Melbourne, Australia: CIRCIT, 1992; *Genes for Sale*, New York, Oxford University Press, 1994; White Paper: The Successful Use of Economic Instruments to Foster the Sustainable Use of Biodiversity”, Discussion paper for Summit of the Americas on Sustainable Development, *Biopolicy Journal*, volume 2, Paper 5 (PY97005), 1997, <http://www.bioline.org.br/request?py97005>; Joseph Henry Vogel (ed) *The Biodiversity Cartel: Transforming Traditional Knowledge into Trade Secrets*, Quito, Ecuador, CARE, 2000.

⁸ Omar Oduardo-Sierra, et al., “Monitoring and Tracking the Economics of Information in the Convention on Biological Diversity: Studied Ignorance (2002-2011)”, *Journal of Politics and Law*, 11 May 2012, <http://dx.doi.org/10.5539/jpl.v5n2p29>

Garrett Hardin viewed theory as the remedy (RSV, p. 4). Theory compacts the deluge and mercifully eliminates almost all of it. Hardin's thesis was not totally original. "Nothing in biology makes sense except in the light of evolution" is the title of a seminal article by Theodosius Dobzhansky, published in the *American Biology Teacher* in 1973. The title is inspirational and not just for biologists. "Nothing in the International Regime Makes Sense Except in the Light of [The Economics of Information]" was a side-event at COP10.⁹ I had suggested the title to the organizers, which I have now come to regret. The economics of information requires a willingness to entertain economics, as well as some rudimentary knowledge of its principles.¹⁰ Information overload can only be knowingly dispensed.

The authors of Study 1 preface the analysis of concept and scope with exploration of technical terms from molecular biology and allied disciplines (Sections 3.1 to 3.8.1, pp. 11-22). If the authors accept that economics is relevant to the commission of Decision 14/20 --- would that they be so queried --- then technical terms from economics and its allied disciplines also merit exploration. Like the technical terms from molecular biology, they too are numerous.

3. Application of Economics: Key Words and Analogies for "*the phenomenon which temporarily goes by the placeholder DSI*",¹¹ aka the Phenom

Cognitive dissonance in risk perception: Confusion of low probability of an event as if the mathematical expectation were also low. With respect to hits from bioprospecting, Providers suffer cognitive dissonance while Users exploit it (see RS4, pp 9-10).

Economics: Common to all definitions is "resource allocation". The three objectives of the CBD and the full title of the NP, lend themselves to resource allocation more so than does any other discipline, viz., anthropology, biology, geography, law, political science and so on.

⁹ Sponsored by the Peruvian Society of Environmental Law, 21 October 2010.

¹⁰ At COP14, the Peruvian Society of Environmental Law sponsored "How to Celebrate ABS on the Silver Jubilee of the CBD? Move Foreword on the GMBSM", 26 November 2019. See Catherine Saenz, "Economically Sound Fair Global Genetics Benefit Sharing Mechanism System Possible Panelists Say", *IP-Watch*, 29 November 2019, <http://www.ip-watch.org/2018/11/29/economically-sound-fair-global-genetics-benefit-sharing-system-possible-panellists-say/>

¹¹ See note 2, p. 6.

Economic rents: Payment in excess of the price that would obtain if markets were perfectly competitive (see *Price-equals-marginal cost*). The concept entered Decision IX/12 at the suggestion of the Ecuadorian delegation. It vanished en route to COP10.¹²

Efficient wages and refusal a la Capuchin: Nobel Memorial Laureate George Akerlof perceived that labor markets do not clear. Higher-than-equilibrium wages are a way to diminish shirking. An analog exists in primatology. Frans de Waal observed that caged monkeys (*Cebus apella*) refuse to participate in experiments on rewards if they did not receive the same reward as that viewed in the adjoining cages (a grape or a cucumber?).¹³ Monopoly intellectual property for Users and ruthless competition for Providers are wholly analogous to the controlled experiment. The 0.1% royalty in the 2015 Brazil ABS legislation is the cucumber waiting to be hurled.¹⁴

Self-correcting markets vs. equilibrium of unemployed factors / evolutionarily stable strategies vs resilient maladaptive behaviors. John Maynard Keynes elaborated the equilibrium of unemployed factors of production.¹⁵ Markets do not self-correct as economists had long thought. Keynesianism justifies State intervention. The watershed invites a contemporary analogy. E.O. Wilson elaborated the eusociality of *Homo sapiens sapiens* in a trilogy of non-specialist books¹⁶ One may infer that the proclivity to respect taboos lies in “war as humanity’s hereditary curse”, which is the title of Chapter 8 in the first book of the trilogy.¹⁷ The last Section (VI) is “Where are we going?” and the last chapter (27), “A New Enlightenment”.¹⁸ Thinking in terms of eusociality, taboos would have preserved the dominance hierarchies necessary for defense and offense in our ascent. The proclivity is now hijacked to prevent discussion of initiatives that deal with existential threats. A new enlightenment means State intervention to break taboos.

Fair and equitable: Equal treatment of economic rents for information, be it artificial or natural.

Free-rider effect. Users take advantage of Providers by not defraying the opportunity costs of conservation.

¹² “Requests the Executive Secretary to invite, in consultation with the Co-Chairs of the Working Group, relevant experts to address the Working Group on Access and Benefit-sharing, at the appropriate time, on the following issues: Should economic rent be charged for access to genetic resources and what is the justification for such a rent or against such a rent? What should be the basis for the valuation of such rent?” CBD Secretariat, 2008, COP9 Decision IX/12: Access and benefit sharing, <https://www.cbd.int/decision/cop/default.shtml?id=11655>

¹³ Frans de Waal, *Our Inner Ape*. New York Penguin, 2005, pp. 217-218.

¹⁴ Brazil: Law No. 13.123 of May 20, 2015, Article 20, <http://www.wipo.int/edocs/lexdocs/laws/pt/br/br161pt.pdf>. See M. Brown, ‘New Brazilian law on genetic heritage gives one year to companies to report on their past activities having used Brazilian heritage’, 7 December 2017, <https://www.lexology.com/library/detail.aspx?g=3f8fb766-b4f0-437d-80ee-ae2ee742f360>

¹⁵ John Maynard Keynes, *The General Theory of Employment, Interest and Money*, London, Macmillan, 1936.

¹⁶ E.O. Wilson, *The Social Conquest of Earth*, New York, W.W. Norton, 2012; *The Meaning of Human Existence*, New York, W.W. Norton, 2014, and *Genesis*, New York, W.W. Norton, 2019.

¹⁷ *Ibid*, *The Social Conquest*, p. 62.

¹⁸ *Ibid*, pp. 285 and 287.

Fungibility: To the extent that an activity is already financed, earmarking may undercut financing from old sources. Dedication of revenues from a GMBSM to conservation hazards the problem of fungibility. Bounded openness over natural information runs no such risk (see RCS, p. 9.). Providers are rewarded in proportion to the habitat conserved regardless of the need to finance conservation or lack thereof. Often no money is needed. For example, the Amazon may be conserved by not clear-cutting, not opening highways and not damming rivers. In a GMBSM, unsustainable activities reduce the Provider's share of royalties. Incentives are aligned. Revenues from having not clear-cut, etc., may go to whatever social activity yields the highest return.

Government failure: Because industries successfully shift costs to third parties, markets fail to allocate resources optimally. Government intervention is justified. However the State often does not intervene effectively. The solution to government failure includes election of better administrations, independence of the technocracy from politics and privatization (see below).¹⁹

Half-Earth / “*Economic Possibilities for Our Grandchildren*”.²⁰ Despite depressing news, neither E.O. Wilson or John Maynard Keynes succumbed to “a bad attack of...pessimism”.²¹ Wilson's vision of *Half-Earth* is analogous to Keynes' of future prosperity.

Labor Theory of Value: Marxist economics maintains that all worth originates in work.²² The tenet resonates across time and cultures, which is a good indicator of an innate receptivity molded by natural selection. The mental frame of war calls into question the legitimacy of land, capital and the inheritances thereof; that of work is less disputed. Users deploy the labor theory of value, albeit unwittingly, when they justify infinitesimal royalties on monopoly-protected utilizations.²³

LeChâtlier's Principle: “Any change in status quo prompts an opposing reaction in the responding system”.²⁴ Bilateralism does not contemplate transnational flight of R&D to the USA, a megadiverse non-Party; the design of the GMBSM does (see RS4, pp. 7-8).

¹⁹ Paul R. and Anne H. Ehrlich lament, “In an article that should have been more influential than it was, Princeton Economist Alan Blinder...”, *One with Nineveh*, Washington, D.C., Island Press, 2005, p. 305. They refer to “Is Government Too Political?”, *Foreign Affairs*, 1997.

²⁰ E.O. Wilson, *Half-Earth*, New York, W.W. Norton, 2016; John Maynard Keynes, *Essays in Persuasion*, New York: W. W. Norton & Co., 1963 [1931], p. 358, <https://www.marxists.org/reference/subject/economics/keynes/1930/our-grandchildren.htm>

²¹ Ibid, p. 358.

²² Isaak Illich Rubin, *Essays on Marx's Theory of Value*, 1928, Miloš Samardžija and Fredy Perlman, Moscow: *Gosudarstvennoe Izdatel'stvo*, <https://www.marxists.org/archive/rubin/value/index.htm>

²³ Jack Kloppenburg identified the irony in *First the Seed: The Political Economy of Plant Biotechnology*, 2 ed, Madison, Wisconsin, University of Wisconsin Press, 2004 [1988], p. 185.

²⁴Svyatoslav Yatsyshyn, *Handbook of Thermometry and Nanothermometry*, Barcelona, Spain, International Frequency Sensor Association, 2015, p. 185.

Natural Information (biotic): “Expression generated and extracted from matter that is living or was once alive, where ‘expression’ refers to any distinction, non-uniformity or difference that was unintentional”.²⁵

Nested dominance hierarchies: The COP conforms to E.O. Wilson’s generalization that societies “are partitioned into units [and] can exhibit dominance both within and between the components...Team play and competition between human tribes, businesses, and institutions are also based upon nested hierarchies, sometimes tightly organized through several more or less autonomous levels.”²⁶ Taboo inhibits opinions that would threaten hierarchies within and among delegations.²⁷ Opinions from stakeholders trigger the Xenophobia Principle: “The newcomer is a threat to that status of every animal in the group, and he is treated accordingly... Outsiders are almost always a source of tension.”²⁸ Twenty-seven years after publishing those words, Wilson would double down: “In its power and universality, the tendency to form groups and then favor in-group members has the earmarks of instinct”.²⁹

Opportunity Costs: “The value of the next-best use (or opportunity) for an economic good, or the value of the sacrificed alternative”.³⁰ Habitat loss has long been identified as the leading cause of species extinction.³¹ The opportunity costs of conservation is the commercial use of the land. Royalty income from conservation would be a Galbrathian countervailing force against political pressure to relax existing regulation.

Price-equals-marginal-cost: The rule derives from the marginalist revolution of the 1860s, associated with Stanley Jevons, Leon Walras and Alfred Marshall.³² In competitive markets, price is driven down to the marginal cost of production. For information, that cost approaches zero. Software exemplifies the policy implications. The cost of connection time to download MicroSoft OfficeSuite is pennies yet the package sells for USD 99.99 (Amazon, 6 December 2019). Without copyright protection, would the market clear at a penny or two? The answer is no

²⁵ Manuel Ruiz Muller, Joseph Henry Vogel, Klaus Angerer, “Propuesta de elementos legales para un ‘Mecanismo Mundial Multilateral de Participación en los Beneficios’”, pp. 121-128 in Manuel Ruiz Muller *Recursos genéticos como información natural*, 2ª ed, Lima, Peru, SwissAid, SPDA, 2017, p. 124. For French and English translations, “Proposal: Legal Elements for the “Global Multilateral Benefit-sharing Mechanism”, <https://uni-giessen.academia.edu/KlausAngerer/>

²⁶ E.O. Wilson, *Sociobiology*, Cambridge, Massachusetts, Harvard University Press, 1975, p. 287.

²⁷ Alexander Hamilton perceived just such a problem in *Federalist Paper No. 79*. “In the general course of human nature, a power over a man’s subsistence amounts to a power over his will”. https://avalon.law.yale.edu/18th_century/fed79.asp

²⁸ See note 26, p. 286.

²⁹ See note 16, *The Social Conquest*, p. 59.

³⁰ Paul A. Samuelson and William Nordhaus, *ECONOMICS*, 19th ed.McGraw-Hill, New York, 2005, p. 746.

³¹ HIPPO is the mnemonic for the multiple causes of extinction. H stands for habitat loss. “Threats to Biodiversity”, GEOG 30N, Penn State College of Earth and Mineral Sciences, 2017, <https://www.e-education.psu.edu/geog30/node/394>

³² Robert L. Heilbroner, *The Worldly Philosophers*, 7th ed., New York, Simon & Schuster, 1999.

because neither OfficeSuite nor MicroSoft would exist.³³ When the fixed costs of creation cannot be recovered in the market, the good does not emerge. For genetic resources, monopoly intellectual property rights suggest an oligopolistic GMBSM (see *Fair and equitable*).

Privatization: For some Providers, an unforgivable taboo, for some Users, illicit enrichment, for some economists, a theoretical construct. Why unforgivable? Privatization-of-benefits is concomitant with socialization-of-costs. Why enrichment? The State auctions off publicly owned assets at fire-sale prices to cronies. How a theoretical construct? Given government failure, privatization is only preferable if there are many bidders at auction and no barriers-to-entry thereafter. For goods and services which were open access (*res nullius*), the first step toward privatization is state ownership. Ratification of the CBD took that step in 1993. Whether a Party should continue to align incentives through homesteading (genesteading) depends on the relative efficiency of stewardship between public and private sectors. This point was highlighted in the introduction to *Privatisation as a Conservation Policy* (1992) which was re-published as *Genes for Sale* (1994).³⁴ With reference to the thorny question of land titles, “*Justice in determining who owns what is a necessary condition for the policy*”.³⁵

Race-to-the-bottom: Much of the ABS literature uses the metaphor in the context of competition among Providers. The bottom is the price of genetic resources, say, the 0.1% royalty of the 2005 Brazilian ABS legislation (see *Price-equals-marginal-cost*). Because the cost of physically accessing genetic resources may be as low as filling a zip-lock bag with scooped-up soil or gathering a few kilos of dry leaves, the price of genetic resources is largely the transaction costs of Material Transfer Agreements (MTAs) (see below).

Sunk Costs: The definition is the salvo that opens the Review of Study 4 (p. 1). Sunk costs occurs when future marginal costs exceed future marginal benefits; the decision already made should be abandoned. However, people do not lightly abandon decisions.³⁶ Neither do ants. Wilson observes ““*the more elaborate and expensive the nest is in energy and time, the greater the fierceness of the ants that defend it*” [italics in original].³⁷ The COPs have invested heavily in bilateralism. Taboo is the first line of defense.

Taboo: By swapping out “population” for natural information, one channels Garrett Hardin:

An element of behavior that is transferred from one culture to another is likely to suffer a sea change. So it has been with taboo. Pacific islanders apparently have no hesitancy in explicitly giving taboo as a reason for stopping a discussion. In contrast, Westerners,

³³ Inasmuch as MicroSoft is hated, the example also illustrates cognitive bias in the framing of arguments.

³⁴ See note 7.

³⁵ See note 7, *Privatisation*, p. 3, *Genes for Sale*, p. 4.

³⁶ Sunk cost is also one of the fallacies modeled in “Prospect Theory”, see note 1.

³⁷ See note 16, *The Social Conquest*, p. 130.

with their cherished tradition of free speech and open discussion, would be embarrassed to say (for instance), ‘We will not discuss [natural information] because it is under a taboo.’ Instead they change the subject.³⁸

Theory of Second Best. The Brazilian ABS Law of 2015 recognizes genetic resources as information, allows unencumbered access, and streamlines the procedure for benefit sharing. Nevertheless, the Law is not bounded openness over natural information. It does not reflect agreement among Providers over price or the distribution of economic rents to countries of origin. Removing some distortions but leaving others in place, amplifies the harm of the remaining distortions. The mathematical proof of the previous sentence is the theory of second best.³⁹ Brazil sells its genetic patrimony for the equivalent of baubles, bangles and beads.

Transaction Costs: Think lawyers. The greatest transaction cost of bilateralism are MTAs, which will never be sufficiently standardized to eliminate the need for counsel.⁴⁰ One may even fear the opposite: boiler-plate MTAs will lure Providers to seek customization that ends up maximizing demand for contract attorneys over time. Nobel Memorial Laureate Joseph E. Stiglitz writes “[f]or lawyers, transaction costs are a benefit, because they are a source of their income”.⁴¹

4. Conflation of the Scope of ABS with naming the Phenom

Articles 32 of the Vienna Convention on the Law of Treaties allows consideration of the context in which a convention was written for interpretation of ambiguities.⁴² Such consideration should extend to decisions in framework treaties. As emphasized in the Review of Study 4, “[d]iscussion on DSI cannot divorce from whence it came, viz. the evasion of ABS obligations” (p. 5). Evasion is rooted in the interpretation of “material” in Article 2 of the CBD. Does it mean only matter or matter plus information? Should it mean the former, DSI is out of scope of ABS. That implication invigorates Users.

³⁸ See note 5, p. 4.

³⁹ R. G. Lipsey, R. G and Kelvin Lancaster, "The General Theory of Second Best", 1956m *Review of Economic Studies*. 24 (1): 11–32 Lipsey and Lancaster. For a non-technical explanation, see Legal Theory Lexicon, 2003, <http://legaltheorylexicon.blogspot.com/2003/11/legal-theory-lexicon-011-second.html>

⁴⁰ For an unintended illustration, see Morten Walløe Tvedt in collaboration with Olivier Rukundo, *The ABS Contract Tool: Version 2.0*, The ABS Capacity Development Initiative, 2019, http://www.abs-initiative.info/fileadmin//media/Knowledge_Center/Publications/Contract_Tool/Contract_Tool_-_ABS-I_-_201909.pdf

⁴¹ Joseph E. Stiglitz, “Economic Foundations of Intellectual Property Rights”, *Duke Law Journal*, Vol. 57 (20008), p. 1706, <http://scholarship.law.duke.edu/dlj/vol57/iss6/3/>.

⁴² Vienna Convention on the Law of Treaties (with annex), 23 May 1969, p. 340, <https://treaties.un.org/doc/Publication/UNTS/Volume%201155/volume-1155-I-18232-English.pdf>

Article 2 of the CBD provides no clarity. It defines “genetic material” using the word “material”. The sloppiness of defining a term with an undefined fragment of the same term, reminds the COP of the wisdom of drafters in having made the CBD a framework treaty. Reasonable interpretation can lead to future decisions which will clarify the ambiguous language. As Malaysia expressed at COP14, “genetic resources minus information has no value”.⁴³

Article 2 of the NP expands the interpretation of “matter only” but also fails to achieve clarity. “‘Derivative’ means a naturally occurring biochemical compound resulting from the genetic expression or metabolism of biological or genetic resources, even if it does not contain functional units of heredity”.⁴⁴ The insight from Malaysia has a corollary: Biochemical compounds minus information has no value.

In essence, Decision 14/20 has conflated the scope of ABS with naming the Phenom. Responding to the commission, the authors of Study 1 suggest four groupings of DSI (line 12-16, p. 30). They go in gradations from the specific to the global. The most specific is nucleotide sequence information/data. One may start the analysis with the most global:

“Group 4 - Broad: (DNA, RNA, protein, metabolites) + traditional knowledge, ecological interactions, etc” (lines 15-16, p. 30).

Inclusion of traditional knowledge is an egregious error. Traditional knowledge is no more the Phenom than are the words I am now typing into this computer. Traditional knowledge is artificial information about natural information (see Diagram, RCS, p. 4). Obligations of benefit sharing are explicit under the CBD (Article 8(j)) and NP (Articles 12 and 16). Because Decision 14/20 conflates the scope of ABS with naming the Phenom, so too do the authors.

One imagines that the COP will reject Group 4. Besides traditional knowledge, another objection is the non-traceability of Groups 2 & 3, also elaborated in the Combined Study. The prediction I made in the Review of the Combined Study is that the COP will adopt “Group 1 - Narrow: DNA and RNA”. If they do, they will be acting on a false premise. *Traceability of a sample to a country of origin is unnecessary for ABS* (RCS, p. 2).

Study 1 seems to set up a straw man that complements the talking points of Users (RCS, p.9)

- Suggest something ridiculous in a replacement term of DSI (traditional knowledge);
- Concede and offer an alternative (nucleotide sequence information/data);
- Hammer one message: User monies spent on public databanks is a sufficient benefit.

⁴³ Gurdial Singh Nijar, Contact Group on Digital Sequence Information, COP14, Sharm el-Sheikh, Egypt, 19 November 2019.

⁴⁴ Text of the Nagoya Protocol, Article 2, <https://www.cbd.int/abs/text/articles/?sec=abs-02>

5. Conclusion.

This peer review goes to the heart of what has eluded fourteen Conferences of the Parties, umpteen commissioned studies, workshops and the like: Natural information is taboo.

Just as the 18th-century taboos of the South Pacific were not taboos in the England of Captain Cook, so too natural information is not taboo outside the COP. Breaking the taboo in Study 1 means vetting the Phenom diagrammed in the Review to the Combined Study (p. 4). Which elements of natural information should lie within the scope of ABS? Users need not panic. Much natural information should be considered public domain because of the expiry of intellectual property that utilized it. Providers also need not panic. Much natural information has never experienced a value added that was once protected by monopoly intellectual property rights. Incentives aligned through a GMBSM would be mutually beneficial for future utilizations that enjoy monopoly intellectual property rights.

Economics can explain the dynamics of scope. Different forms of natural information will become worthwhile for ABS as transactions costs fall with technological advance. Because the GMBSM eliminates MTAs, contract attorneys should panic.

Keynes famously quipped that we are all dead in the long run. The element of time can re-orient perspectives. Thinking in evolutionary time, taboo need not be maladaptive. Although the natural-information taboo has frustrated conservation and sustainable use, the same psychology will become essential in the very long run. Should humanity choose Half-Earth, the best hope to sustain that decision will be a taboo on its relaxation. The importance of the humanities will then take center stage.⁴⁵

⁴⁵ Within the humanities is ecocriticism, defined as "The field of enquiry that analyzes and promotes works of art which raise moral questions about human interactions with nature, while also motivating audiences to live within a limit that will be binding over generations", Camilo Gomides, "Putting a New Definition of Ecocriticism to the Test: The Case of *The Burning Season*, a film (mal)Adaptation", *ISLE* (2006) 13.1.