

"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)

Simultaneous Submission in English, French, Portuguese and Spanish
28 June 2019

Peruvian Society for Environmental Law / Sociedad Peruana de Derecho Ambiental
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Part I. Introduction:

The need for a Global Multilateral Benefit-Sharing Mechanism (GMBSM) is almost absolute. It applies to all cases for which intellectual property rights (IPR) over the value added to a genetic resource are commercially successful. The need arises from the words “fair and equitable” which modify “access” and “benefit sharing” (ABS) in “Article 1. Objectives” of the Convention on Biological Diversity (CBD). That need is reiterated in the Nagoya Protocol (NP) some twenty-five times. Fairness and equity begin with equal treatment. In reductionist terms, the value added to a genetic resource is artificial information while the resource itself is natural information. Whereas IPR allow holders of artificial information to enjoy “economic rents”,² the CBD confers no such privilege to holders of natural information. The price of genetic resources collapses as Users comparison shop among Providers of the same resource. Brazil is exemplary of the race to the bottom. Royalty percentages have been institutionalized as low as 0.1%.³ Scale matters. Insignificant

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² “Economic rent” is the differential between the price paid and what would have been paid had the market been competitive. Hence, rents vary proportionally with the monopoly power to extract them. Intellectual property rights justify such power as a means to recoup the fixed costs of innovation. Similarly, the opportunity costs to conserve habitats are huge yet the costs of sampling are negligible.

³ Brazil: Law No. 13.123 of May 20, 2015, Article 20, <http://www.wipo.int/edocs/lexdocs/laws/pt/br/br161pt.pdf>. See also M. Brown, “New Brazilian law on genetic heritage gives one year 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>

royalties eliminate *de facto* the third objective of the CBD, viz., ABS, which thereby frustrates the first two, respectively, conservation and sustainable use.

To explore “the need for a GMBSM” *in lieu* of bilateralism, one may test the best case for bilateralism. Should the need be established for that case, then how much more so for all the rest! Endemism is the only conceivable scenario in which competing Providers cannot undercut one another on price. However, finding a case of an endemic species bioprospected can be challenging. The work of Paul Oldham establishes that most species bioprospected are cosmopolitan.⁴ Even for the few endemic species found, the lead agent may be diffused across taxa in species which are transboundary. So, the best case for bilateralism is one for which the lead agent, not necessarily the species, resides in one Party alone. The well studied poison dart frog (*Epipedobates anthonyi*) meets that criterion. Part II shows that even this, the best case for bilateralism, unequivocally supports the need for the GMBSM.⁵

To think abstractly, one must identify the object of access abstractly. Part III explores the phenomenon which temporarily goes by the placeholder “digital sequence information” (DSI) and then analyzes a joint statement of objections to the *perceived* expansion of scope for ABS obligations. Whether the objections resonate in audiences or fall flat, follows the usual divide between Users and Providers. “Bounded openness” as the modality of the GMBSM offers common ground. Part IV highlights legal elements of the GMBSM extracted from draft legislation suggested by the authors. Part V concludes in the recommendation that Parties to the CBD and NP engage the relevant literature that promises resolution of ABS, which is not only fair and equitable but also efficient.

Part II. The Poison Dart Frog (*Epipedobates anthonyi*)

A counterfactual history for what is ostensibly the most favorable scenario for bilateral ABS is “Case Study I: *Epipedobates anthonyi* under ‘bounded openness’” by Klaus Angerer.⁶ Because the events occurred before the ratification of the CBD in 1993, the case is a thought experiment for what might have been. How would have ABS proceeded had the events occurred after 1993?

⁴ See, for example, Paul Oldham, Hall, Stephen and Forero, Oscar, “Biological Diversity in the Patent System” *PlosOne* (2013), <https://doi.org/10.1371/journal.pone.0078737>

⁵ The case also shows how economic reasoning should supplant the perennial call for case studies. Twenty-five years of ABS case studies, always hoping to find a paragon, has proven itself a Sisyphean endeavor.

⁶ Pages 98-109 in Manuel Ruiz Muller, *Genetic Resources as Natural Information: Implications for the Convention on Biological Diversity and Nagoya Protocol* (London: Routledge, 2015).

Angerer begins with a thumbnail sketch:

The alkaloid epibatidine was first isolated from the secretions of *E. anthonyi*, which is endemic to south-western Ecuador and northern Peru. The discovery was deemed a decisive contribution to pharmaceutical research and ‘a possible first step toward producing a long-sought drug: a powerful non-sedating, non-opioid painkiller’ (Brakley 1993, p. 1117). Research and development based on secretions of the thumbnail size frogs was frequently cited in the press about bioprospecting in the 1990s. In *The Future of Life*, E.O. Wilson hailed the discovery as an example of the enormous potential value of biodiversity while NGO campaigns condemned it as a flagrant example of biopiracy and an ‘invasion of the frog-snatchers’ (Saavedra 1999) (Angerer, 2015, p. 98).

Inasmuch as *E. anthonyi* is found in Ecuador and Peru, one may question whether the case meets the criterion of sole Provider. Could not each country have entered into a reverse auction---the race to the bottom? The answer is negative because the lead agent was not found in populations of the frogs in Peru or, surprisingly, in Ecuador on subsequent field excursions:

Like most poison frogs, the toxins secreted by *E. anthonyi* are accumulated from dietary sources, leading to variable alkaloid profiles in different populations of the same species...Despite several excursions over more than a decade, some to the same sites, the researchers only detected significant amounts of epibatidine on two occasions. What is the significance of such scarcity? Vital for discovery may be local conditions that do not persist over time, even under natural conditions. In the case of epibatidine, the alkaloid reflected the available prey of specific population of frogs at a certain moment in time. In terms of the ‘economics of information’, Daly [the lead scientist] had accessed ephemeral natural information. The inference for ABS policymaking is strong: the transaction costs for collection should be minimized as the object of value may go extinct even though the sampled population survives (Angerer 2015, pp. 104-105).

Although Ecuador turned out to have been the sole Provider of the lead agent *ex post facto*, the thought experiment does not mean that any bilateral agreement would have ever been *physically* possible. The time lost in negotiating an agreement would undoubtedly have closed the temporal window. Similarly, the exigency of Prior Informed Consent would have probably precluded identification of species of interest in the first instance:

[S]cientists often employ a trial-and-error method for identifying interesting specimens---in the case of *E. anthonyi*, by literally touching and tasting the frogs in the field---not knowing precisely which species to collect before they actual start to collect (Gillis 2002; Myers et al, 1978, p339) (Angerer 2015, p. 104).

Although Users in the field may need *carte blanche* to collect non-endangered species, legal counsel for Providers will be loathe to so accommodate. But even if the hurdles of not-enough-time and *carte blanche refusée* could somehow be surmounted, a third hurdle presents itself: an accurate expectation of market value:

Prior to the reports on epibatidine, little expectations existed of an economic value of poison frogs; after the reports, high expectations emerged based on misperceptions. To date, the expectations have not been fulfilled... (Angerer 2015, p.105).

For steadfast adherents to bilateral ABS who remain undaunted by (1) not-enough-time (2) *carte blanche refusée* and (3) inaccurate market expectations, a final hurdle looms large: (4) the psychology of dealmaking. The User will artfully challenge whether the Provider is really in a position to exact any economic rent at all. Fortune-100 companies (e.g., Abbott Laboratories, Pfizer, Inc. and Merck, Inc.) will have more patent attorneys and top-tier MBAs on the payroll than do whole countries like Ecuador. The specter of “jurisdiction shopping” will be raised.⁷ One can easily imagine a Director of Product Development, cocking his head and saying affably “Granted the lead agent may be endemic but (pause and sigh) various paths may also lead to the same function, so...” In the case of the *E. anthonyi*:

...the N[ational] I[nstitutes] of H[earth] frog alkaloid program would eventually become global in reach...Not surprising Daly’s group preferred collection of species with ready access and stated so frankly: ‘The research has been hindered by difficulties in obtaining permits to collect any amphibians for scientific investigation, especially in neotropical countries of Central and South America, where the alkaloid-continuing dendrobatid frogs are found. For this reason, in the past decade our research has shifted to bufonid frogs of Argentina and to mantellid frogs of Madagascar’ (Daly 2003, p. 449) (Angerer 2015, p. 102).

Lest the aforementioned four hurdles not be reason enough for why all “cases cannot be covered under the bilateral approach set out in the Nagoya Protocol”, the Parties should consider a fifth: the non-Party. Samples obtained through unauthorized access (aka ‘biopiracy’) in any of the 196 Parties are *res nullius* in the United States of America.⁸ The chronology of the poison dart frog proves Karmic. Epibatidine was elucidated in Bethesda, Maryland in 1992, which is the same year that the 40th President of the USA, George H.W.

⁷ Peruvian Society of Environmental Law, “Lawful Avoidance of ABS: Jurisdiction Shopping and Selection of non-Genetic-Material Media for Transmission”. In response to “Proposals for new and emerging issues for SBSTTA-21 and COP-14” (SCBD/OIC/DC/RH/84326) (2017), <https://www.cbd.int/doc/emerging-issues/SPDA-submission2017-05-en.pdf>

⁸ See landmark Supreme Court of California Decision, *Moore v. Regents of the University of California* (9 July 1990), <https://caselaw.findlaw.com/ca-supreme-court/1774382.html>

Bush, declined to sign the CBD.⁹ Although the 41st President William Jefferson Clinton did sign on 4 June 1994, the treaty went nowhere fast. Senate Resolution 239 of 11 July 1994 spelled out multiple concerns for any future ratification.¹⁰ Over the years and into the new millennium, the concerns have broadened and deepened. Perversely, the USA now enjoys a decisive advantage in R&D for not being a Party.

To the extent that the overwhelming majority of resources are transboundary, a GMBSM would facilitate claims from a collective of aggrieved Parties rather than a claim from just one Party. The claims would also be for royalties which reflect economic rents rather than, say, the 0.1% of sales in the Brazilian bilateral system.

Lastly, a wrinkle in the case of *E. anthonyi* also “supports the need for a GMBSM”:

By the early 1990s, Abbott Laboratories had already pursued years of research on a nicotinic cholinergic receptor (nAChR) agonist, which is the substance class to which epibatidine belongs (Arneric et al 2007: p. 1094)...Although the program had one clinical candidate, no significant advance occurred until learning about epibatidine. One Abbott scientist relates how upon reading the report in *Science*, he ‘immediately recognized that NCEs [new chemical entities] with similar structural motifs were being made at Abbott’ (Arneric et al, 2007, p. 1097)...The contact between Abbott scientists and Daly did not involve any transfer of [physical] materials (Angerer 2015 pp. 100-101).

The object of access for Abbott Laboratories was not biological matter but a molecular structure transmitted through print. That accessed information was not a sequence and not even transmitted digitally.

Part III: The Phenom which Temporarily Goes by the Placeholder “digital sequence information” (DSI)

Consensus sometimes emerges quickly. Participants to the Ad Hoc Technical Expert Group on Digital Sequence Information on Genetic Resources (13-16 February 2018, Montreal) found that “the term ‘digital sequence information’ (DSI) is not the appropriate term to refer to [types of information on genetic resources that may be relevant to the three objectives of

⁹ Robert F. Blomquist, “Ratification Resisted: Understanding America's Response to the Convention on Biological Diversity, 1989-2002”. 32 *Golden Gate U. L. Rev.* (2002), <https://digitalcommons.law.ggu.edu/cgi/viewcontent.cgi?article=1844&context=ggulrev>

¹⁰ See 103rd Congress 2nd Session (11 July 1994), <https://www.govinfo.gov/content/pkg/BILLS-103sres239pcs/html/BILLS-103sres239pcs.htm>

the Convention and the objective of the Nagoya Protocol]”¹¹. Similarly, “...there was general agreement that ‘digital’ only refers to the method by which the information is stored and transmitted and that new alternative forms of storage or transmission could raise similar questions”¹².

Before exploring the “appropriate term” for the phenomenon which temporarily goes by the placeholder “digital sequence information”, one may first ask “why bother?” The answer is that under bilateralism the phenom has enabled lawful avoidance of ABS largely through “digital biopiracy”.¹³ Note that in the previous sentence, “phenom” replaces the cumbersome phrase “the phenomenon which temporarily goes by the placeholder ‘digital sequence information’”. In philosophical terms, the apocope avoids reification of the highly objectionable placeholder “DSI” and will be used hereafter whenever possible.¹⁴

Transitivity suggests a contradiction in the search for the “appropriate term”. If “material” is interpreted as “matter” in the definition of “genetic material” (Article 2 CBD), then the COP is discussing, not the digitization of information but the digitization of matter, which appears contradictory. Nevertheless, the indulgence may seem tolerable given the intolerable thought that ABS obligations will be applied to the phenom. The objections of the Northern delegations to the placeholder DSI resonate among Users. Collective revulsion is expressed in the four-page joint statement titled “Promoting sustainable use and conservation of biodiversity through open exchange of Digital Sequence Information”, launched at the Fourteenth Conference of the Parties (COP14).¹⁵ On the last page of the statement appears the logos of seventy-eight public and private sector organizations, academic and scientific institutions, data repositories and collections.¹⁶

And the body of the statement? Four pages list objections, some 1263 words, which serve as a preamble to a penultimate sentence of only 21 words: “Numerous legal interpretations have

¹¹ UNCBD, Report of the ad hoc Technical Expert Group on Digital Sequence Information on Genetic Resource (2018), CBD/DSI/AHTEG/2018/1/4, p. 5. <https://www.cbd.int/doc/c/4f53/a660/20273cadac313787b058a7b6/dsi-ahteg-2018-01-04-en.pdf>.

¹² Ibid, p. 6.

¹³ “Captain Hook Awards for Biopiracy 2016”, SynBioWatch.org, <http://www.synbiowatch.org/captain-hook-awards-2016/?lores>. Media other than biological matter or digitization are possible, including: “film recordings, sound-analog recordings and, more fundamentally, gas, liquid and light for the sensory perceptions of smell, sound, taste, touch and sight”, see note 7, p. 3.

¹⁴ Joseph Henry Vogel, 2019, “DSI is not the Phenom”. Comment to Sipke Joost Hiemstra, Brink, Martin and van Hintum, Theo, “Digital Sequence Information (DSI): Options and impact of regulating access and benefit sharing - stakeholder perspectives” (2019) , <https://library.wur.nl/WebQuery/wurpubs/548853>

¹⁵ CIOPORA and 77 signatory organization, “Promoting sustainable use and conservation of biodiversity through open exchange of Digital Sequence Information” (November 2018), <https://www.cbd.int/doc/c/e5c6/e8e7/f0aab5ae9fad61a2f7ff9094/np-mop-03-dsi-other-01-en.pdf>

¹⁶ Ibid, p. 1.

confirmed that the definition of genetic resources refers to tangible material and does not include immaterial information”.¹⁷ If genetic resources do not include the phenom, then none of the previous 1263 words is necessary. The phenom would be out of scope---end of story.¹⁸ So why the preamble? Cognitive linguistics may suggest that the body of the statement fires neurons into a mental frame where the phenom is out of the scope of ABS obligations.

“Numerous legal interpretations...” begs the question of whether or not other “legal interpretations” exist to the contrary, and they do. One rigorous brief even hails from the North.¹⁹ A caveat is in order. Exposure of the illogical structure of the joint statement may lead the reader to the *non sequitur* that the phenom be subject to the ABS obligations of bilateral agreements. The inference is faulty as it assumes that no alternative modality exists.²⁰ “Bounded openness over natural information” is the alternative that benefits all seventy-eight signatories of the joint statement. “Bounded openness” especially benefits those engaged in public taxonomy who will enjoy royalty revenues from genetic resources that are globally diffused. Much common ground exists among Users and Providers, and even among many of the agents.²¹ A win-win outcome for the principals, i.e., Users and Providers, is within reach.

The proposed GMBSM is grounded in economic reasoning rather than in an opinion poll of experts. One daresay that the solution would not be controversial among economists.²² The challenge is to translate the concept into law without distorting the economics *en route*.

¹⁷ Ibid, p. 4.

¹⁸ In terms of formal logic, denote the concept “the phenom is not included in the definition of ‘genetic resources’” as “A”. Denote the concept “the phenom is out of scope of ABS obligations” as “B”. If “A” then “B” is a valid argument (*modus ponens*). But the joint statement is laboriously structured to persuade the reader that the phenom is out of scope, “B”, and ends with a deference to “numerous legal interpretations” to affirm “A”. If “B”, then “A” is an invalid argument (the fallacy of affirming the consequent).

¹⁹ K. Sollberger, “Digital sequence information and the Nagoya Protocol. Legal expert brief on behalf of the Swiss Federal Office for the Environment (FOEN), Australia” (2018), <https://www.bafu.admin.ch/bafu/en/home/topics/biotechnology/law/rechtsgutachten.html>

²⁰ See, A. Deplazes-Zemp, “‘Genetic resources’, an analysis of a multifaceted concept”. *Biological Conservation* 222 (2018): 86–94.

²¹ Manuel Ruiz Muller, Angerer, Klaus, Vogel, Joseph Henry and Acabá-Torres, Juan Carlos, “Common Ground, Cause and Sense for Users, Providers and Agents: Bounded Openness over Genetic Resources” In response to Invitation to submit views and other information on ‘Digital sequence information’ (NCP GB8-016 MYPoW/DSI) for the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture. Food and Agricultural Organisation of the United Nations. International Treaty on Plant Genetic Resources for Food and Agriculture Submissions on digital sequence information (DSI) (2019), <http://www.fao.org/3/ca4018en/ca4018en.pdf>

²²S. Winands-Kalkuhl and K. Holm-Müller, ‘Bilateral vs. multilateral? On the economics and politics of a global mechanism for genetic resource use’, *Journal of Natural Resources Policy Research*, (2015) vol 7, no 4, pp305-322, <http://dx.doi.org/10.1080/19390459.2015.1097022>

Part IV “Legal Elements of the GMBSM”

Legislation of a Global Mutlilateral Benefit-Sharing would be either through an amendment to the Nagoya Protocol or through the presentation of a new protocol to the CBD. Whichever avenue incurs fewer transaction costs should be the one pursued. “Legal Elements of the GMBSM” Version 1.0 was published in Spanish as an appendix to the second edition of *Recursos naturales como información natural*, which is the translation of the *Genetic Resources as Natural Information*.²³ English and French versions of “Legal Elements” are also available in open access.²⁴ The legal project runs eight pages with some 3,034 words, consisting of seven sections and 22 articles.

A sample of the suggested amendment or protocol is reproduced below:

Section 5: On the technical mechanism for the determination of the distribution of natural information

Article 14.- The technical mechanism of the determination of the distribution of the natural information is designed to identify, as precisely as possible, the country(ies) of origin of the species from which said information could have been extracted. Identification includes the geography of the habitats, deploying the technology available at the time of commercial success to calculate said distribution, so that the percentage of benefits will be shared fairly and equitably.²⁵

Article 15.- In cases where the expected costs to ascertain the distribution of species is greater than the monetary benefits to be shared, the benefits which accumulated annually up to the expiry of the granted intellectual property, will be used to defray the costs for developing and maintaining the capacities and infrastructure of the technical mechanism for the determination of the distribution of the natural information.

Article 16.- The technical mechanism for the determination of the geographic distribution of natural information comprises those international institutions of

²³ For *Genetic Resources as Natural Information*, see note 6. For Spanish translation, see <https://spda.org.pe/wpfb-file/rrgg-final-pdf/>

²⁴ For English, Spanish and French versions of “Proposal: Legal Elements for the “Global Multilateral Benefit-sharing Mechanism” as contemplated in the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization”, see <https://uni-giessen.academia.edu/KlausAngerer>

²⁵Execution of the technical mechanism for the distribution of natural information is sequential: To analyze through molecular biology the presence or absence of natural information in the populations, then in populations from the same species, species from the same genus, genera from the same family, families from the same order and so on, until no longer present; develop modeling of the species where there is the presence of the natural information; and in function of the analyses, weigh the possibility of carrying out verification *in situ* of the identified habitats based on the models.

recognized standing, working in activities of taxonomy, monitoring biodiversity, patterns of distribution, developing models of speciation and phylogeny and other activities to understand how and by what means marine and terrestrial biodiversity are distributed.²⁶

Part V: Conclusion and Recommendations

Moving forward on ABS requires a willingness to acknowledge error, which in turn requires humility. Parties and stakeholders are heavily invested in bilateralism in terms of money, time and emotion. They are understandably reluctant to embrace a GMBSM which covers all cases. The fallacy of sunk costs is palpable. Nevertheless, the failure to achieve ABS, the third objective of the CBD, is no less palpable. The failure to achieve the third objective undermines the first two objectives and hence the treaty itself. Prominent and well organized stakeholders are calling for a review.²⁷ Among the critics of the CBD, feelings will be mixed about joining such a call; a negative review can lead to cynicism and Party withdrawal. Disgruntled stakeholders note that the non-Party already enjoys an advantage in biotechnology from never having acceded to the CBD.

Common ground in “bounded openness over natural information” allows ABS, which facilitates the other objectives of the CBD and thereby safeguards its continued acceptance among Parties. Like the objectives of the CBD, the recommendation here is threefold and interrelated: (1) that Parties and stakeholders avail themselves to the literature about the multilateral solution²⁸ (2) that “bounded openness over natural information” be formally vetted and (3) that a coalition of Parties representing both Users and Providers assume leadership.

²⁶ See note 25. pp 6-7.

²⁷ K.D. Prathapan and Rajan, Priyadarsanan Dharma, “Convention on Biological Diversity Need for a Review” *Economic & Political Weekly* (2019), vol. 11V no.3 https://www.researchgate.net/publication/330579897_Convention_on_Biological_Diversity_Need_for_a_Review

²⁸ An entrée into the literature is a trilogy of short essays published open-access in *IP-Watch* in 2018. See Joseph Henry Vogel, Manuel Ruiz Muller, Klaus Angerer and Omar Oduardo-Sierra, “Ending Unauthorised Access to Genetic Resources (aka Biopiracy): Bounded Openness”, <http://www.ip-watch.org/2018/04/06/ending-unauthorised-access-genetic-resources-aka-biopiracy-bounded-openness/> ; Joseph Henry Vogel, “Not Just A Matter Of Matter: ‘The Way Forward’ For The UNCBD, NP And Half-Earth”, <http://www.ip-watch.org/2018/09/07/not-just-matter-matter-way-forward-uncbd-np-half-earth/> ; Vogel, Joseph Henry, “The Global Multilateral Benefit-sharing Mechanism: Where will be the Bretton Woods of the 21st Century?”, <http://www.ip-watch.org/2018/10/05/global-multilateral-benefit-sharing-mechanism-will-bretton-woods-21st-century/>