**PREVENTING "JURISDICTION SHOPPING" FOR TRANSBOUNDARY RESOURCES IN A NON-PARTY: THE CASE OF PUERTO RICO**

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Submission on New and Emerging Issues Relating to the Conservation and Sustainable Use of Biodiversity

Decision IX/29, paragraph 11

*(a) Why the issue needs urgent attention by the Subsidiary Body on Scientific, Technical and Technological Advice (including how it impacts biodiversity);*

The Puerto Rico Science, Technology & Research Trust (PRSTRT) has committed financial resources to a bioprospecting initiative (Rodriguez 2015), hereafter referred to as the Initiative. The archipelago lies in the jurisdiction of the United States of America, a megadiverse and non-Party signatory to the CBD. The genetic resources of Puerto Rico, when understood as "natural information,"[1] are largely transboundary throughout the neotropics. The PRSTRT formed a Steering Committee in December 2014 which was exposed in January 2015 to the legal advice that researchers in the US would be "well advised" (Bagley and Rai 2013) to abide by the Nagoya Protocol (NP) to the CBD. The Chair of the Committee responded that the technical and legal issues of bioprospecting could be separated and suggested that the latter would be contemplated at a later, unspecified date; also left unheeded was the legal advice that the Initiative pledge not to invoke retroactivity over transboundary genetic resources should the US become a Party to the CBD and NP. Disconcertingly, at least one member of the Committee appears to have engaged in systematic collection of genetic resources in CBD-ratified countries without authorization or Prior Informed Consent (Engerman 2006).

The comparative advantage of "jurisdiction-shopping" for transboundary resources in a non-Party warrants urgent attention inasmuch as (1) Parties which hold transboundary resources will not share in the benefits of future utilization of the transboundary resource accessed in the non-Party (2) the USA, being both a megadiverse Provider and leading User, will impact many Provider Parties by facilitating free access (*res nullius*) to transboundary resources within its jurisdiction and (3) the COP, according to Article 24 ("Non-Parties") of the NP, may "encourage non-Parties to adhere to this Protocol".

*(b) How it affects the attainment of the objectives of the Convention (citing relevant articles);*

[1] "Natural information" can be understood using the Merriam-Webster definitions of "information" and "natural", respectively, "the attribute inherent in and communicated by one of two or more alternative sequences or arrangements of something (as nucleotides in DNA or binary digits in a computer program) that produce specific effects" and "existing in or produced by nature".

By exploiting the *res nullius* status of transboundary resources in a non-Party, the PRSTRT frustrates Article 1 (Objective) and Article 5 (Fair and Equitable Benefit Sharing) of the NP as well as Article 1 (Objectives) of the CBD, specifically "the fair and equitable sharing of the benefits arising out of the utilization of genetic resources". The USA, also a signatory country to the Vienna Convention on the Law of on Treaties (1969), is obliged "not to defeat the object and purpose of a treaty prior to its entry into force".

Also relevant to the objectives of the CBD and NP is Article 11 (Transboundary Cooperation) of the NP. Article 11 does not contemplate "instances where the same genetic resources are found *in situ* within the territory of more than one Party" *and* a non-Party; the lacuna is a loop hole for User compliance of fair and equitable benefit sharing. The User and the Provider non-Party may cite the definition of "genetic resources" as "material" (Article 2 "Use of Terms" of the Convention on Biological Diversity) to argue that physical "material" cannot be in two jurisdictions at once. Therefore, the meaning of "transboundary" turns on the definition of "genetic resources". Rigorous examination of the current definition versus the proposed alternative, viz., "natural information," is merited.

*(c) Thematic programmes of work and/or cross-cutting issues that could contribute to the resolution of the issue;*

"Access to Genetic Resources and Benefit Sharing" is the primary cross-cutting issue. Of the seven thematic programs of the CBD (Agricultural biodiversity, Dry and sub-humid lands biodiversity, Forest biodiversity, and so on), all are relevant to "PREVENTING 'JURISDICTION SHOPPING' FOR TRANSBOUNDARY RESOURCES IN A NON-PARTY" with the possible exception of "Inland Waters Biodiversity."

The "Global Taxonomy Initiative" could also contribute to the resolution of what transboundary resources (*sensu* "natural information") are found in the US Commonwealth of Puerto Rico.

The concept of genetic resources as information was a linchpin in "POTENTIAL POSITIVE AND NEGATIVE IMPACTS OF COMPONENTS, ORGANISMS AND PRODUCTS RESULTING FROM SYNTHETIC BIOLOGY TECHNIQUES ON THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY", the new-and-emerging issue of COP12.

Resolution of "'jurisdiction shopping' for transboundary resources" for COP13 could also cut across the issue of disclosure of the geographic origin of genetic resources utilized in R&D. The following excerpt from Nuno de Pires Carvalho, Director, Intellectual Property and Competition Policy of the World Intellectual Property Organization, presents a nexus for discussion of "jurisdiction shopping":

> The requirement that applicants for patents in the field of biotechnology disclose the source of the genetic resources eventually used as raw materials or tools in the inventive activity and, in addition, provide information (and evidence, if any, by means of contracts or licenses) on prior informed consent is not a new concept...

> The manner of obtaining genetic resources used in the development of inventions is an external condition. The outcome of the inventive activity is indeed independent of the ways and means employed to reach it. The situation that arises from an invention derived from the use of genetic resources that have been illegally extracted from their in situ environment is similar to the situation of an invention that has been developed with the assistance of a stolen microscope. This event would infringe the common law but not patent law under article 27.1 of the TRIPS Agreement. In both situations inventors would still be entitled to the patent, provided the conditions of patentability were met (Carvalho 2000, 374-380)

Carvalho argues that the requirement of disclosure of geographic origin would not be a substantive requirement of patentability as established in TRIPS, thereby frustrating the monitoring of patents which utilized genetic resources. In other words, Parties of transboundary resources that are also Parties to TRIPS cannot require disclosure of geographic origin in national patent applications without violating TRIPS as well as the CBD, which establishes that all measures "shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights" (Article 16.3) as well as "in accordance with international law" (Article 16.5) (Carvalho 2007, 255). Nevertheless, the analogy in the above passage between a stolen microscope and an illegally extracted genetic resource holds only because the CBD has misdefined genetic resources as "material", in other words, similar to a microscope.

Rather than challenge the arguments against mandatory disclosure of geographic origin, one can vacate them with an alternative object of disclosure: simply whether or not "natural information" was utilized (yes or no). The proposed requirement would fall within the first two criteria of patentablity, viz., novelty and inventiveness. Is the compound patented sufficiently novel? Inventive from what occurs in nature? An inventor whose patent application progresses through examination, would subsequently be asked to disclose the natural information to the Patent Office. Although the information will usually be a molecular structure, it could also be the phenotypical expressions utilized in biomimicry. Failure to disclose whether or not "natural information" was utilized in the application would be grounds for revocation. After successful commercialization of the patent, the self-interest of Users is to also disclose the geographic location of the *species of origin*, inasmuch as a royalty would be charged regardless of the additional disclosure. Such cooperation helps to assure sustainablity of the habitat for the User's access to the genetic material. Incentives are aligned.

As "genetic resources" are recognized as "natural information" for the purpose of adding value through R&D, "species of origin" will replace the notion of "country of origin". Once the species of origin *is/are* identified, the notion "countries of origin" (note well the plural) becomes essential for the fair and equitable sharing of benefits.

*(d) Work already under way by relevant organizations addressing the issue; and*

As of September 2015, the Global Multilateral Benefit-Sharing Mechanism (GMBSM) of Article 10 of the Nagoya Protocol has not taken form. Dr. Manuel Ruiz Muller, Director of the Program

of International Affairs and Biodiversity at the Peruvian Society for Environmental Law (SPDA) crafted the following language to prevent invocation of "retroactivity" should the US ratify the CBD and should the COP adopt a GMBSM based on the economic implications of genetic resources being information for the purposes of R&D :

> Once a multilateral system is established for access and benefit sharing that reflects the transboundary nature of genetic resources and their essence as natural information, the agreements and bilateral contracts will be subject to the principles and rules of this new international system.

Joseph Henry Vogel, PhD, Professor of Economics at the University of Puerto Rico-Río Piedras, a member of the Steering Committee at the time, presented the language of Ruiz Miller to the other members on 6 February 2015. He posed two short questions for the paid consultant to the Initiative on 2 March 2015 :

> (a) If you are in agreement with the suggested language, in what documents do you recommend that it be incorporated so that it may become binding on the Initiative? Please send your reply by email with a detailed justification.
>
> (b) If you are not in agreement, what are the bases for your disagreement, citing economic or other arguments that would support your opposition. In such a case, please let us have the documents by email with detailed justification supported by the literature [Translation from the Spanish].

No answers to the questions were ever provided. The director of the PRSTRT responded the same day by "excus[ing]" Vogel from the Steering Committee. A reasonable inference is that the PRSTRT intends to lever "jurisdiction shopping" of transboundary resources to attract transnational Users.

*(e) Credible sources of information, preferably from peer-reviewed articles;*

Three academics, working independently from one another, have long perceived how market pressure among Providers would drive the price of access of natural information down to the marginal cost of collecting the material in which it is stored, essentially nothing (for the trajectory of the idea since 1990, see, Vogel 2015). In other words, the simple application of "the economics of information" to genetic resources predicted that bilateralism would fail to achieve the objective of the CBD for a "fair and equitable sharing of benefits". As early as 1997, the need for a multilateral "Special Protocol" over ABS to the CBD was advocated in the context of the threat posed by competition among Providers and epitomized through "jurisdiction shopping" in a megadiverse non-Party:

> Even more troubling is the fact that the major country of demand for biological samples, the USA, has not ratified the CBD and can bioprospect many of the same organisms in reefs within its own jurisdiction (e.g., the US Virgin Islands, Puerto Rico, and the Florida keys; or in the example of papuamine, Hawaii, Guam, and Samoa). In the long run, multilateral accords will probably emerge that recognize the rights of countries of origin to participate in economic rents whenever they could have supplied the same organism (see Bioprospecting [Case 6] for a similar argument regarding plant medicines). Cooperation toward such multilateral accords is extremely important inasmuch as one quarter of marine biological diversity lies in the reefs... (Vogel 1997).

Vogel repeated the warning about "jurisdiction shopping" for transboundary resources in a megadiverse non-Party over the next ten years:

> The mere threat of carrying out bioprospecting within the US gives US-based firms tremendous leverage in negotiating meager royalties with Third World providers. Ironically, it also deprives the US government of 'benefit sharing' over the resources provided by its own federal park lands (Vogel ed, 2000, 6).
>
> [T]he non-ratification of the CBD by the U.S. poses a monumental threat to benefit sharing for the countries that have ratified the CBD. Further aggravating that threat is the biogeography of the U.S. The habitat of many species in the U.S. extends outside U.S. jurisdiction: Hawaii, Guam, and Samoa (ecosystems similar to those found in the jurisdictions of South Pacific Island nations), Alaska (Canada and Russia), Puerto Rico (Latin American nations), ex-situ genebanks, botanical and zoological gardens, and possibly even U.S. embassy grounds. A comparative advantage has emerged for the U.S. in bioprospecting simply for not having ratified the CBD. This became apparent shortly after the CBD entered into force in December of 1993. The chairman of Bayer AG expressed diplomatically the rationale for the relocations of laboratories: 'North America [U.S.] has not replaced Germany as a location for business, but there are certain innovative activities which are best performed in the U.S.' While foreign firms were coming to America to test their genetically modified organisms (GMOs), American firms, using the same logic, were staying home to bioprospect (Vogel 2007, 68).

Although the threat of "'jurisdiction shopping' in a non-Party" identified Puerto Rico as a likely location eighteen years ago, the issue is nevertheless new and emerging: institutionalization only began with the formation of a Steering Committee of the Initiative in December 2014.

*12. Further decides that the following criteria should be used for identifying new and emerging issues related to the conservation and sustainable use of biodiversity:*

*(a) Relevance of the issue to the implementation of the objectives of the Convention and its existing programmes of work;*

Fair and equitable benefit sharing is impossible for transboundary resources accessed in a non-Party. The issue is of most relevance for the objectives of the CBD and NP given (1) the abundance of transboundary resources in the US Commonwealth of Puerto Rico and (2) a private-public alliance to develop the requisite infrastructure through the PRSTRT. Without a pledge by the PRSTRT to forego retroactivity, any success of the Initiative will facilitate "jurisdiction shopping" and enhance the *de facto* status of Puerto Rico as a "safe haven" for the entry of unauthorized genetic material from Parties, especially from those located in the neotropics.

*(b) New evidence of unexpected and significant impacts on biodiversity;*

Two hundred fifty of the 3,100 flora species found in Puerto Rico are endemic yet no known endemic family or genus is endemic to Puerto Rico (Miller and Lugo 2009, 27). Counterintuitively, transboundary resources include not just the 2,850 non-endemic species of Puerto Rico, but also the endemics species whenever the natural information utilized is dispersed across taxa and obtainable in other species in other jurisdictions. An example of such dispersion comes from the temperate zones: the compound paclitaxel is found in both new-world *Taxus brevifolia* (Wani et al 1971) and old-world *Taxus baccata* (Malik et al, 2011). N.B. Sales revenues of TAXOL, the anti-cancer derivate of paclitaxel, exceeded $9 billion between 1993 and 2002 (Henderson 2014, 291). So, had the species of origin (*T. brevifolia*) gone extinct before discovery of paclitaxel, the valuable natural information would still have been available to discover in *T. baccata*. Because the Caribbean exhibits high endemism (Myers, et al. 2000) and intense anthropogenic threats (IUCN 2015), free access in a non-Party undermines incentives for conservation of the transboundary resources in the Parties. The impact of "jurisdiction shopping" requires filtering the genera and families of the 250 endemic species of Puerto Rico against those both endemic to the Caribbean and reported as vulnerable.

*(c) Urgency of addressing the issue/imminence of the risk caused by the issue to the effective implementation of the Convention as well as the magnitude of actual and potential impact on biodiversity;*

Precisely because the Initiative is still in its initial stages of forging public-private alliances and raising finances, international measures may succeed in persuading the PRSTRT to pledge not to invoke retroactivity over transboundary resources collected in Puerto Rico or those fraudulently procured in a Party and subsequently transported to Puerto Rico.

*(d) Actual geographic coverage and potential spread, including rate of spread, of the identified issue relating to the conservation and sustainable use of biodiversity;*

The area of impact depends on the range of each transboundary resource, *sensu* "natural information." If the information utilized in R&D is dispersed in species found only throughout

the tropics, the issue impacts 104 Parties, of which Puerto Rico enjoys just 0.02% (one fiftieth of one percent) of the habitat (data culled from *The World FactBook* 2013-2014). If the information is dispersed in species found only throughout the neotropics, the issue impacts 46 Parties, of which Puerto Rico enjoys just 0.05% (one twentieth of one percent) of the habitat. If the information is dispersed in species found only in the Upper Antilles, the issue impacts 6 Parties, viz., Cayman Islands, Cuba, Dominican Republic, Jamaica, Haiti, Jamaica, of which Puerto Rico enjoys 4.39% of the habitat.

The impact on conservation and sustainable use depends on the diffusion of the natural information across jurisdictions. A nearly absolute misalignment of incentives obtains when the natural information is dispersed throughout the tropics. The other end of the spectrum is natural information unique to an endemic species of Puerto Rico, where misalignment would be restricted to the non-Party. Although the question of dispersion is empirical, given the geographic size of Puerto Rico and no known endemism among families and genera of flora, *one strongly expects nearly absolute misalignment of incentives from "'jurisdiction shopping' of transboundary resources.*

*(e) Evidence of the absence or limited availability of tools to limit or mitigate the negative impacts of the identified issue on the conservation and sustainable use of biodiversity;*

Any infrastructure which facilitates storage of genetic material for bioprospecting in a non-Party aggravates future losses of benefit sharing over transboundary resources. Inasmuch as unauthorized genetic material from Parties appears to have already flowed into the non-Party, Parties may wish to consider enhanced border controls for visitors from the non-Party, whose professions indicate engagement in R&D. Measures could include visa requirements for entry and physical searches of genetic material upon exit.

*(f) Magnitude of actual and potential impact of the identified issue on human well-being;*

The Initiative undermines the alignment of incentives for conservation among Parties that are Providers and Users of genetic resources thereby diminishing human well-being of present and future human generations.

*(g) Magnitude of actual and potential impact of the identified issue on productive sectors and economic well-being as related to the conservation and sustainable use of biodiversity;*

The expected value of genetic resources for biotechnology is unknowable within two or more orders of magnitude. Early economic models projected abysmally low values (Simpson et al 1996) and were contested by other models that adopted more realistic assumptions (Rausser and Small, 2000). Meanwhile fundamental uncertainty over the whole exercise arose. Rents from anecdotes could have surpassed the transaction costs of institutionalizing a Global Multilateral Benefit Sharing Mechanism (GMBSM). Besides the aforementioned commercial success of TAXOL, the sales of Polymer Chain Reaction, derived from *Thermus aquaticus*, generated some

$2 billion over its patent life (Fore 2006). “Is Enclosure Worth It?” has become a moot question; the relevant question is “Who Gets What?” Meanwhile, the cost of sequencing a whole genome plummeted from $100 million to less than $10,000 in the first decade of the new millennium (Khatib 2015). As technology reveals natural information ever more cheaply, new uses will be perceived that were unimaginable just a few years prior. One marvels, for example, of archiving artificial information---whole movies--- through DNA encoding (Munson 2015).

Any “‘jurisdiction shopping’ for transboundary resources in a non-Party” amplifies the loss of justifiable economic rents. The monies foregone could enable the emergence of biotechnologies from still uncharacterized molecular structures and phenotypical expressions that are faced with extinction due to the high opportunity costs of habitat conservation.

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