

THE **ABS**  
CAPACITY  
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INITIATIVE



L'INITIATIVE DE  
RENFORCEMENT  
DES CAPACITES  
POUR L'**APA**

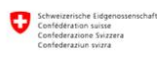
## Report

# Digital Sequence Information on Genetic Resources: New Studies on Potential Approaches to Access and Benefit Sharing

Global Webinar

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## I. Introduction

Welcoming words and introduction and by

**Gaute Voigt-Hanssen**, Ministry of Climate and Environment, Norway

**Simon Malete**, Department of Forestry, Fisheries and the Environment, South Africa

**Andreas Gettkant**, Head of ABS Capacity Development Initiative (GIZ), Germany

**Suhel al-Janabi**, ABS Initiative, Germany

- COP 14 acknowledged the divergence of views among Parties on benefit-sharing from the use of DSI, and Parties committed to working towards resolving this divergence through a science- and policy-based process and further consultations
- ABS Initiative to continue activities on DSI in the context of the Norwegian – South African Environmental Cooperation Program, organising technical webinars and 2 Global Dialogues on DSI bringing together governmental experts/negotiators, stakeholders from various sectors, IPLC representatives
- Objective: offer a forum for the informal exchange on DSI before OEWG 3.2 beginning the negotiation of the future post-2020 Global Biodiversity Framework
- As a contribution to the informal inter-sessional process, the ABS Initiative will focus on informing/ discussing key documents, topics and processes related to DSI discussion – guided by Co-Leads of the contact group on DSI of the OEWG

## II. Overview of New Studies and Publications

**Timothy Hodges**, Strategic Global Affairs, Institute for the Study of International Development, McGill University, Montreal

**No. 1:** Study on National ABS Approaches to DSI: Perspectives, Options and Limits (prepared for the ABS Initiative by Henry Novion)

**No. 2:** Study on Digital Sequence Information (DSI): lessons from multilateral mechanisms (prepared for DEFRA (UK) by Natalie Clare and Mar Maestre of ICF Consulting Services Ltd)

**No. 3:** Draft publication “Just” Sharing: The Virtues of the Digital Sequence Information Benefit-Sharing for the Common Good (prepared by Margo Bagley)

Study#1: National ABS Approaches to DSI: Perspectives, Options and Limits (prepared for the ABS Initiative by Henry Novion)

- An assessment of three approaches (“scenario”) to the regulation of DSI in national ABS regimes
- Assessed through the potential impacts of the three scenarios, from three perspectives:

- Evaluated based on (desirable) characteristics of an effective ABS system as described by Sirakaya (2019)<sup>1</sup>

### Three national ABS regulatory scenarios

- Absence of ABS regulations
- ABS regulations requiring PIC/MAT
- Open access under terms and conditions

### Evaluated on basis of Sirakaya’s characteristics of an effective ABS system

- Legal certainty
- Sustainable use
- Cost-effectiveness
- Low transaction costs
- Predictable conditions
- Fairness and equity
- Transparency

### Assessed through potential impacts of the three scenarios, from 3 perspectives

- Providers
- Users
- Databanks

### Scenario 1 Absence of ABS Regulations

Perspectives/ Characteristics	Providers	Users	Databanks
<b>Legal certainty</b>	none	none	none
<b>Sustainable use</b>	lowest	lowest	lowest
<b>Cost-effectiveness</b>	lowest	lowest	lowest
<b>Transaction costs</b>	highest	highest	rather high
<b>Predictability</b>	none	lowest	lowest
<b>Fairness and equity</b>	lowest	lowest	lowest
<b>Transparency</b>	lowest	lowest	lowest
<b>Remarks</b>	Monitoring compliance may lead to high technical/administrative burdens and costs, which are	Proving compliance may lead to a high technical/administrative burden and costs, which are likely to outweigh benefits.	Expectations that databanks will include private data access and use agreements may lead to high technical burdens and costs.

<sup>1</sup> <https://www.frontiersin.org/articles/10.3389/fpls.2019.01175/full>

	likely to outweigh benefits.		
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### Scenario 2 ABS Regulations Requiring PIC/MAT

Perspectives/ Characteristics	Providers	Users	Databanks
Legal certainty	intermediate	intermediate	intermediate
Sustainable use	low	low	low
Cost-effectiveness	rather low	rather low	rather low
Transaction costs	rather high	rather high	rather high
Predictability	rather low	rather low	rather low
Fairness and equity	low	rather low	rather low
Transparency	rather low	rather low	rather low
Remarks	The technical complexity of monitoring DSI use may be beyond the capacity of most provider countries.	Legal uncertainty due to the complexity of different ABS rules in different countries.	Expectations on databanks to include IRCC (PIC/MAT) may lead to high technical burden and costs. Low predictability due to uncertainty about the legal implications of sharing DSI.

### Scenario 3 Open Access Under Terms & Conditions

Perspectives/ Characteristics	Providers	Users	Databanks
Legal certainty	highest	highest	high
Sustainable use	highest	rather high	highest
Cost-effectiveness	highest	rather high	highest
Transaction costs	lowest	rather low	lowest
Predictability	rather high	highest	highest
Fairness and equity	intermediate	intermediate	high
Transparency	intermediate	highest	rather high

<b>Remarks</b>	<p>Transparency is key but depends on willingness of all stakeholders to comply.</p> <p>Low control over DSI use.</p> <p>High benefit-sharing compliance costs and dependence on third parties.</p> <p>High cost of creating and maintaining an ABS online registration system is likely to outweigh the benefits for most provider countries.</p>	<p>Pre-set terms and conditions allow users to acknowledge their rights and obligations before deciding to start DSI use/description, clarifying costs and risks beforehand.</p> <p>Bulk DSI use will require more complex and burdensome compliance efforts, in which case benefit-sharing and compliance may increase transaction costs, reducing cost-effectiveness.</p>	<p>Instead of requiring PIC/MAT for DSI use/description, data-banks would have to require the IRCC/ certificate of registration prior to the depositing of the DSI – not as a condition of use, but as a condition for the deposit of the sequence.</p> <p>Political pressure to create such fields may lead to technical burden and costs for data-banks, while users may be reluctant to accept this change.</p>
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### Selected Conclusions

- Feasibility of tracking/tracing DSI use under a purely bilateral approach would be extremely costly and entangled
- Without DSI use, benefits will not be generated
- Frequency of use should be fostered and not regarded as a transaction cost, as is the case in all three scenarios

### Take-home Messages

- *“DSI description and use regularization could perhaps be better addressed through a multilateral governance structure, to be subsequently implemented on the national level.”*
- *“However, timidity does not help solve global issues. Bold thinking that moves outside the box or reconceptualises the box can assist with identifying effective workable solutions.”*

Study #2: DSI: lessons from multilateral mechanisms (prepared for DEFRA (UK) by Natalie Clare and Mar Maestre of ICF Consulting Services Ltd)

- DEFRA commissioned ICF Consulting Services to conduct “a rapid case study review of multilateral mechanisms in a range of fields to draw out lessons which could support international discussions on possible modalities for a DSI access and benefit-sharing mechanism ahead of CBD COP 15”
- Seeks to contribute to the wider evidence base available to the Parties to the CBD, including the UK
- Does not represent the view of the UK Government

**Aim to develop an understanding for each mechanism on**

- Operational models and governance structures
- Resources (e.g., money, skills/personnel, time) required for mechanism set up and on-going operation, including potential funding sources to support this
- Technical rules, requirements and associated processes governing decisions on and disbursement of funds, as well as obligations on fund recipients
- Lessons and implications of each mechanism, which are relevant for further discussion

#### **Four case studies chosen for analysis**

- International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)
- Pandemic Influenza Preparedness Framework (PIP Framework)
- Lion's Share Fund
- Global Environment Facility (GEF)

#### **Lessons from case studies re-funding mechanism**

- In nearly all cases funding remains reliant on just one source – most commonly public sector contributions not directly linked to utilisation of genetic material/use of the resources
- A stable funding stream is important to support long term planning and operational activities
- Private sector contributions require the right type of incentives to remain stable; payment upon commercialization may not generate meaningful levels of benefit-sharing, and voluntary contributions can be unstable
- Payments can be linked to commercial benefits, so long as the link is not overly direct
- Non-monetary benefit-sharing hard to establish, track and enforce

#### **Lessons from case studies redistribution of benefits**

- Recipients of benefits in the mechanism do not need to also be the providers
- Mechanisms use criteria-based approaches to allocate benefits, where the criteria are linked to the priorities of the mechanism.
- Monetary benefits are typically shared through the funding of projects
- Monitoring and evaluation are core functions, providing assurance and accountability for monetary benefit-sharing

#### **Lessons from the case studies re governance structure**

- There are core components to a benefit-sharing governance structure including:
  - A secretariat or governing body to manage and govern the mechanism
  - An evaluation team, either as an independent office or as a team within the mechanism
  - An external advisory group, to oversee the mechanisms and guarantee its accountability and transparency
- The administrative costs of mechanism governance may be in the region of 10% or more of a mechanism's total funds

Publication #3: "Just" Sharing: The Virtues of DSI Benefit-Sharing for the Common Good (prepared by Margo Bagley)

- A review and exploration of the DSI issue in the CBD, and well beyond

- An example of real-world relevant scholarship

## **Introduction**

- Reviews the successful development of the Ebola drug *Inmazed*
- Poster child for the ‘problem’ or ‘opportunity’ known as DSI
- DSI an example of domestic and international law/policy playing catch-up with technological advances

## **What’s at Stake?**

*“Much as the digitization of music and movies facilitated a flood of online peer-to-peer copying that threatened the prime revenue streams of the music and movie industries, the monetary benefits that developing countries were expecting to flow from the Access and Benefit Sharing (“ABS”) regime instituted through the Nagoya Protocol are seemingly being threatened by the declining need for researchers to seek access to tangible genetic resources once sequence information from those resources has been made publicly accessible.”*

## **Key characterization of contending positions**

- Users say:

*“‘What’s Yours is Mine and What’s Mine is Mine’: I can use your resources (DSI) and not share any monetary benefits I generate from them with you.”*

- Providers say:

*“‘What’s Mine is Mine and What’s Yours Is Mine’: We own the DSI, and you need our permission to use it and must share with us significant monetary benefits from whatever you create using it no matter the size of the actual DSI contribution.”*

## **What’s needed?**

*“Monetary benefit-sharing...is just and necessary both to fulfill all three objectives of the CBD and perhaps even to basic human flourishing. Without monetary benefit-sharing, necessary investments of financial and human resources to conserve biodiversity (which benefits us all) and aid in socio-economic development for the most vulnerable among us are unlikely to occur....”*

## **Part I: Background on CBD and Nagoya Protocol**

- Background on CBD and Nagoya Protocol implementation issues affecting DSI ABS discussions in treaty negotiations
- Sub-section on DSI and Scope provides clarity

## **Part II: DSI, CBD, Nagoya Protocol**

- Examines definitional and scope issues raised by DSI re domestic ABS regimes and the complexity of DSI use scenarios that threaten benefit-sharing goals
- Unpacks three main sets of views on DSI
- DSI is not within the definition of “genetic resources” but may result from utilization of GRS and can be addressed in MAT
- CBD/Nagoya Protocol definition of “genetic resources” should be interpreted to include DSI
- DSI is not within the definition of “genetic resources,” but does result from utilization of genetic resources and monetary benefits should be shared from commercial uses

## **Part III: Need for a new approach**

- Benefit-sharing matters
- IPLCs matter
- Current framework inadequate to deal with DSI

- But possible to improve the current system from within to deal with both tangible GRs and DSI

### Ways forward

- Guiding principles needed for DSI approaches:
- Open access
- Simplicity and certainty
- Viability
- Flexibility (for use of funds from multilateral benefit-sharing)
- Differential benefit-sharing obligations for non-commercial and commercial research
- Maintaining bilateral approach for tangible GRs and ATK
- Interest convergence

### Some conclusions

- A global benefit-sharing mechanism (Article 10) could ensure open access while providing meaningful benefits for biodiversity conservation, sustainable use, and economic development
- This can happen through
  - political will
  - less greed from users and providers
  - recognizing we are a pivotal moment for the health of our planet

### Take-away message

*“... ‘just’ benefit-sharing can improve conservation and socioeconomic development while maintaining access and innovation, but getting there will require adjustments in mindset from ‘mine’ to ‘ours’ for both users and providers of physical genetic resources and DSI”*

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## III. Panel Discussion

Questions asked by Timothy Hodges. Regulated speaking time per panelist: 3 min

**Timothy Hodges**, Strategic Global Affairs, Institute for the Study of International Development, Mc Gill University, Montreal

**Margo Bagley**, Asa Griggs Candler Professor of Law, Emory University School of Law, Atlanta, USA

**Chloe Johnson**, Dept. Convention on Biological Diversity, Department of Environment, Food and Rural Affairs (Defra), UK

**Henry Novion**, Advisor ABS Capacity Development Initiative, Formerly: Genetic Heritage Department, Ministry of the Environment, Brazil

ARE THE MENTIONED HIGHLIGHTS OF YOUR PAPER THE ONES YOU WOULD HAVE UNDERLINED? WHICH ARE THOSE OR WHAT SHOULD BE BROAD MORE TO OUR ATTENTION?

### Henry Novion

- CBDs bilateral approach was deeply concentrated on the collection of biological material under national control
- Thus, it is difficult to apply the same regulation on biological information that can be exchanged through the internet



- A possible approach on the conflict of using DSI could be: focusing on results (patents, products, scientific paper....) instead of processes (downloading, exchanging, ...)
- Bureaucracy should be minimized for the user without harming or overgoing the provider
- Whatever the solution might be, it should be future proved as technology is advancing fast

#### **Chloe Johnson**

- Our particular study aimed to learn lessons for multilateral mechanisms and provide key lessons from them: funding operations and governance
- Some extra points: why did we choose those case studies? We decided that those cases give a useful insight into the DSI policy context. They give a good overview of what modalities can be considered. What works and what does not work very well in multilateral approaches
- Aim of the study: available for parties and stakeholders and building a collective understanding
- It is important to identify gaps within our understanding and where our study can help to plug these gaps
- It would be interesting to hear the opinion about further gaps from the participant side

#### **Margo Bagley**

- Highlights were well captured
- There is a lack of trust in multilateral fora. There are often conflicting visions of the parties and none is willing to listen to the other or to accept that the concerns might be legitimate. Furthermore, the expectations are often unrealistic
- It was important for me to show both sides have their legitimacy

#### **WAS THERE ANYTHING SURPRISING IN TERMS OF THE FINDINGS?**

#### **Chloe Johnson**

- Few surprises
- Some findings distinct a little bit more: especially multilateral funding and governance
- Administrative costs for the multilateral mechanisms were higher than anticipated
- The mechanism relies on a variety of funding streams and the certainty that the funding will be available
- Study findings showed that external economic weak factors can be an issue. There is a need for multiple funding inputs. The admin costs of such a system are high
- Costs and administrative burden can be a point of contention
- The study did not look at funding systems in bilateral systems. Here Henry Novion pointed out that the administrative burden in the regulation process is also high
- Any future mechanism can only be reliable and fully operational with a reliable funding system and a robust admin procedure.

#### **Henry Novion**

- It is important not to focus too much on trying to set regulations to avoid free riders. Instead, focus more on a regulatory environment that stimulates the users that are willing to abide the ABS law
- Regulatory environments that are attractive and provide benefits for the complied user
- The implantation of ABS measures may contribute to reducing the benefit for free riders
- Free riders will avoid regulations no matter how easy or facilitated it is
- Eventually free riders will be required to prove compliance. If this would happen there should be the opportunity to “re-regularise”
- We have to invest in mechanisms that increase users’ commitment to compliance and benefit-sharing.

- Compliance must be transparent. Therewith conscious consumers are willing to pay more for those products
- Two important pillars: Realistic and feasible access measures combined with user measures effectively implemented meeting the objectives and delivering the benefits of the expected results for conservation

#### **Margo Bagley**

- DSI benefit-sharing is important to all three objectives of the CBD (conservation, sustainable use and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources)
- Analogies: sometimes provider countries act like US universities technology transfer offices who had been criticized for making the process of licensing out technology too difficult due to fear of missing out on a lucrative project. In the end, this attitude leads to avoidance by some companies who then chose other universities or countries where processes are easier.
- Researchers will do the same and avoid genetic resources from countries with restrictive ABS regulations

#### **CAN BOTH APPROACHES; MULTILATERAL AND BILATERAL COEXIST?**

#### **Margo Bagley**

- Yes. If we going to have a multilateral mechanism, it has to coexist with bilateral, at least initially
- Some countries will be skeptical about an unproven multilateral mechanism and will stick to the bilateral approach.
- A multilateral mechanism can be used across jurisdictions and fora because the way DSI is used by scientists or companies is always the same
- Uniformity of approach: uniformity has its benefits, but I am also in favor of legal experimentation

#### **Henry Novion**

- A multilateral approach will most likely be cheaper and more feasible
- Multilateral approach has greater chances to reduce regulatory difficulties and brings additional benefits such as transparency, predictability, sustainable use and potential reduction of transaction costs
- It is the most viable option
- Either the global community finds a mechanism that works for everyone or it will not work at all

#### **Chloe Johnson**

- The UK acknowledges that there are bilateral regimes within national systems, but we believe that it would be really useful if there would exist more information on how successful these regimes have been
- The ability for different approaches to coexist will likely depend on the modalities adopted
- Most important: establish a system that provides certainty to users and facilitates access
- Useful set of guiding principals were highlighted by the UK, these were only a few examples of the principles we have outlined: being consistent with international law, ensuring that science and innovation is facilitated and not hindered, any outcome should be future proved and needs of relevant actors should be met

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Questions were made by the audience in the chat. Due to the number of questions, thematical clusters were identified and then forwarded to the panel.

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**MANY COUNTRIES DO NOT SEE DSI AS A GENETIC RESOURCE: WHAT WOULD YOU ADVISE THOSE COUNTRIES?**

**Margo Bagley**

- Nagoya Protocol: genetic resources are comprised of genetic material and material sounds tangible. Some countries interpret that DSI falls within genetic resources. Then DSI must be subject to PIC and MAT
- A better way: DSI itself is not a genetic resource, but it results from the utilisation of genetic resources. Therefore, benefit-sharing is required

**Henry Novion**

- CBD gives the wording to interpret DSI within the scope
- There are many other important issues for example associated with traditional knowledge. This also exists regarding DSI as when you look for Stevia on DSI Databanks you find in the description of the gene sequence involved in the biosynthesis of sweeteners: aTK

**Chloe Johnson**

- Definition of DSI is still missing
- It could be that it is an issue that goes beyond the CBD
- Other international treaties could also cover this topic
- But in the first place we have to focus on what helps us to move forward alongside discussing the scope of DSI

**IT IS DISCUSSED THAT TRANSACTION COSTS COULD BE TOO HIGH FOR RESEARCHERS. HOW CAN WE LEAVE AS MUCH AS POSSIBLE SPACE FOR ACCESS AND USE AT THE LEVEL OF ACADEMIA?**

**Margo Bagley**

- Important to differentiate between commercial and non-commercial users
- Building a mechanism, it is important to think about who will be impacted by a potential fee
- Researchers should make their benefit-sharing obligation to non-monetary approaches (if possible)
- A multilateral mechanism could contain monetary and non-monetary approaches

**Chloe Johnson**

- Mechanisms must be transparent about their costs. That gives greater incentives for users and shows that benefits are being shared
- Transparency is a core aspect to satisfy all stakeholder groups

**Henry Novion**

- In Brazil is not charging benefit-sharing from all users that are obtaining benefits from it
- Only the finished product that is commercialised leads to an obligation to share benefits
- There is no distinction between commercial and non-commercial research; only the end-user has to share benefits
- We have to require monetary benefits from those who are obtaining monetary benefits and not from those who participated at some part of the value chain

- Non-monetary benefits: every publication, scientific paper, DSI, etc. have to mention IPLCs as providers of raw material or partners
- ABS is not a policy to collect money, but a policy to create innovative sustainable value chains, new ways to do business and with that create a new environment where benefits for conservation are being generated
- Monetary benefits sharing is not the goal, but a mean to achieve biodiversity conservation

#### IMAGINE WE WOULD HAVE A MULTILATERAL SYSTEM: WHICH TRIGGERS WOULD BE APPROPRIATE FOR BENEFIT-SHARING IN A MULTILATERAL SYSTEM?

##### **Margo Bagley**

- User fee for the final product
- Low transaction fee
- Fee paid by governments going to a multilateral fund
- Important to have also non-monetary benefit sharing in terms of tech transfer and partnership, so everyone can use DSI at the same level

##### **Chloe Johnson**

- We should consult the users

##### **Henry Novion**

- Changing to the product will increase compliance
- Monitoring results is cheaper and easier; to monitor thousands of user requests will be more expensive if only one will produce a product
- Expectations should not be regulated. People will be hindered to develop products
- The willingness to comply will be higher for the users if they have already a product or a patent

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## IV. FURTHER COMMENTS AND QUESTIONS FROM THE CHAT, SORTED BY ISSUES

### **Multilateral system**

- Can you address the spectrum of (enforceable) ethics, policy and law in terms of a multilateral benefit sharing mechanism? Can criteria-based approaches provide effective protection for the values and issues of different provider groups, and in particular IPLCs? In the analogy with licensing software, many users simply click the checkbox and never read/understand/comply with terms.
- Multilateralism is just as much an expression of sovereignty as is bilateralism.
- Two questions: 1. One panelist highlighted the importance of „user measures“. To my knowledge, such measures exist mainly in European countries for the utilization of physical GR. Are there any existing national user measures that address intangible aspects of GR? 2. The Multilateral Mechanisms in the Treaty and in the PIP Framework are also mainly dealing with physical GR. Can those Systems really be a Model for BS of intangible aspects of GRs?
- Use-based income on the Treaty (ITPGRFA) is just starting to come in. Plant breeding takes quite some year, so if first SMTA's were used in 2007 than it is not realistic to expect use-based contributions instantly.
- Step one is collecting fair and efficiently funds from DSI from a multilateral system. This is all that seems to concern now. Step two is re-distributing. How can a fair and efficient system for that be created?

- Step 1 is - in my view - the difficult part, Step 2 can follow which is based on agreed principles of the CBD (conservation & preservation of biodiversity across the globe), and championed by individual member countries, with their own needs and sovereign laws...
- As DSI involves new technologies, please consider in your reflections that non-developed countries are at a disadvantage in multilateral mechanisms.
- I think that since we are discussing DSI on GR, I see many challenges (and even dangers) in not discussing and reaching a specific level of international agreement under the CBD. The CBD addresses many other issues relevant to DSI, such as associated traditional knowledge. On DSI, we require a comprehensive approach, which the CBD contributes to move towards it. This does not prevent a synergistic approach on DSI on GR with other multilateral agreements.
- Mostly In the process of capitalising DSI especially from scientific community the Universities, Research Institutes are basically accessing Genetic Resources, so exception in local communities (holders of traditional knowledge associated to GR) who generally live in the Hotspots of Biodiversity with largest numbers of Genetic Resources not yet digitised. Therefore, I think that the results of these studies have prescribed particular emphases on adequate mechanisms for future appropriate and transparent decision-making on DSI-ABS on GR.

### **Transaction costs**

- Lawyers benefit from transaction costs.
- Lawyers are trained to argue points, and not necessarily be strategists. This can therefore be a paradigmatic limitation to their contributions.
- Some transaction costs are valuable, especially if they trigger dialogues that provide space for values, rights and interests to come out. PIC/MAT is an example.
- Transaction "costs" (economist epistemic bias in labelling them all as costs) are particularly valuable when dealing with communities with fundamentally different worldviews.
- Does the Brazilian approach work without (what seems like) the many transaction costs involved of notifying/registering multiple intermediary stages before getting to the final product that does require benefit-sharing?
- The criterion for Public Finance is not just transaction costs. A regressive retail tax makes no economic sense.

### **Benefit-sharing / economic rent / taxation**

- "Benefit-sharing is not only about greed, and that there was greed on both sides" is indeed the presumption when industry advocates "expectations management". The lower bound of the Brazilian royalty rate is 0.1%. The WiLDSI Project contemplates royalties as low as 0.01%. Is this "realistic"?
- Benefit-sharing and profit-sharing are not the same thing. Profit-sharing for the public good is called taxation. Assuming that there is agreement on the need for taxation to support biodiversity, the process of levying the tax should not stifle research, effectively eliminating the taxable base.
- "Profit sharing [...] is called taxation". We're talking global taxation, rather than national taxation...
- So far we hear "transaction costs", "free-rider effect" and "cost effect[iveness]" which are core concepts from economics that are relevant. But so too are "excess burden", "fungibility" and "rents". Where are they in the papers?
- The question is whether there is commercially successful intellectual property over the value added to natural information or not. If there is, then fairness and equity, should imply an economic rent for natural information.

- I agree it is a continuous, but in my country it needs a commercial permit when there is a product in the market.
- Instead of asking which uses are commercial or not, wouldn't it be more useful to focus on which benefits are generated and should be shared?
- At COP 9, in Decision 12/9, the question of "economic rents" was supposed to be one of four that would go to Nagoya.
- For Decision 9/12 from COP9: "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 COP9 Decision IX/12: Access and benefit sharing (2008). Available at <https://www.cbd.int/decision/cop/default.shtml?id=11655>
- Paying on product requires defining what is a "product" and that requires tracking of DSI through processes and products - all of which increases complexity and goes against simplicity. Better to pay upfront for open access. For companies who use GR in any way, payment to be proportionate to R&D spend - for companies who invest in R&D - so the more innovation the greater the fee. This reinforces facilitation of innovation. Different fees for generics (no R&D) and nominal fee for academics. Biotrade potentially different (higher) fee (some form of weighting for bio-footprint sustainable use) because higher bio-footprint means lower sustainable use. Fund can be used per need - whether upskilling in DSI or for bio conservation. Need not be link between benefit and provider. Suggest bio-investor mark on company websites could increase uptake as corporate responsibility ethics brand. Or note in financial accounts to show paid up. Consumers will reinforce through spend habits.
- With respect to the comment on complexity of "paying of product", value added tax and or income tax surely are well established mechanisms?

### **Non-monetary benefit-sharing**

- Maybe that I am too concrete, but would you imagine that a researcher training a PhD student from a developing country would earn some 'certificates' to use to get sequence data from Genbank, as a kind of non-monetary participation to Benefit-sharing for DSI?
- Many academic researchers already engage in partnerships with LMIC to develop capacity. However, this is fragmented and it is not recorded nor is much credit or recognition accorded to those who engage in it. Check out this report: <https://www.aosis.org/international-framework-for-laws-governing-deep-sea-depends-on-the-technological-readiness-of-small-island-states/>

### **'Embodied/embedded' TK**

- I do not agree with the proposed "declining need for researchers to seek access to tangible GR once sequence information from those resources has been made publicly accessible" Breeding offspring from DSI alone may be not practicable
- Is the paradigm shift which one panelist calls for one which would seek to regulate outcomes rather than access (i.e. keeping a level of open access)? In an ideal world, would this paradigm also be applied to 'tangible GRs'?
- IIFB has introduced the idea of "embodied/embedded TK." Since we have at one patent lawyer in the room, I ask what happens if a researcher, sequencing a sample, comes across a genetically modified patented sequence (e.g., collecting organic rapeseed that has accidentally cross-bred with Monsanto hybrid rapeseed?). Since patents require publication of invention, this may not be a perfect analogy. Perhaps a better analogy is in studying a plant variety that

has breeders' rights protection, and the relevant genetic sequences underlying the variety are discovered. Does research and open publication just proceed?

- Problem in Plant Breeding is the accumulation: to produce one new variety you easily use more than 10 tangible genetic resources. If on top of that the use of DSI from public databases also comes with benefit sharing obligations it will add to the BS for the tangible GR, which you absolutely need. Unfortunately, there are no cut-off points in BS-agreements.

### Knowledge generation / Innovation

- A key constituency of DSI is academia. It is critical that DSI/ABS 'governance/regulation' does not impact knowledge-generating research. In my opinion, almost all models proposed do, and unless we find a/the pragmatic solution we are at risk of massive 'political' fall-out ...
- What I always miss in these presentations and panel discussion is the involvement of an active researcher to voice her/his view as important stakeholder
- If data in GenBank is no longer free, biodiversity and ecological research in some developing countries would be crippled fatally

### Other

- "**Open access**, under terms and conditions" is not really "open access" as "open access" implies that there are no conditions or terms.
- I disagree that **absence of ABS Regulation** provides "none" legal certainty. E.g. Austria, UK and other countries expressly confirm that ABS is not regulated, including DSI, which provides the greatest legal certainty.
- In my view of what is meant, is that ABS regulation without defined regulation is very uncertain...
- "**Just**" can be interpreted very differently depending on context. E.g. Developing world "Just" is different from Developed world "Just".
- I fully understand the desire for a **future-proof** solution but having heard that for some years I wonder whether this is possible without using a crystal ball. How much "future-proof" legislation is out there when it comes to technological developments? Probably all countries are updating legislation on technological issues regularly, e.g. traffic laws. It might be more rewarding to create a system to report problems with present legislation in a way that provides specific descriptions of actual cases, and a secretary to compile that for every COP to draw conclusions from that
- Nothing is future proof. Remember the 2nd law of thermodynamics.
- A question for the panel: music and film data controlled as a common good to generate cash-flows for the film and music industry is used one-dimensional, i.e. by looking a film of listening to a song. There are several other examples of **common goods**, which are used/exploited in such a linear fashion. DSI data however is multidimensional, i.e. it can be used in many different ways by many different users for quite different purposes. Instead of treating DSI as a common good in a linear fashion, why not understanding DSI as a **public digital good**, which is open to be used, but which require to share benefits if DSI is used, either monetary or non-monetary. There are many examples, e.g. open access software, which is accessible for

different users, but under different conditions, and with different obligations for different users. Such an approach offers the required flexibility, encourage DSI use, and also help to avoid applicability or implementation issues, and would be in line with OECD's Open Science approach.

- The Nagoya Protocol deals not with "tangible" but with "genetic material". The **interpretation of "material"** is the linchpin.
- The object of R&D is "natural information" whether or not it is dematerialized and not matter what is the medium of its communication. See "Bounded openness: A robust modality of access to genetic resources and the sharing of benefits". *Plants, People, Planet* 4(1), 13–22. <https://doi.org/10.1002/ppp3.10239>
- There is also "unnatural information" resulting from human selection.
  
- I suppose **artificially assembled in silico DSI** would not be strictly consistent, but there is a question remaining that the rules for meaningful in silico DSI assembled by machine learning/AI come from analysis of DNA or RNA. It's simple to take the 5 letters of amino acids and generate a vast number of sequences, but they would not likely be meaningful.
- One part of AHTEG DSI definition covers that question: <https://www.cbd.int/doc/c/fe9/2f90/70f037ccc5da885dfb293e88/dsi-ahteg-2020-01-03-en.pdf>
- Without the utilisation of the GR no DSI would result. It is the work of the scientists who undertake an effort to produce knowledge.

Note: For data protection reasons, all chat contributions have been anonymised. Some postings in the chat concerned criticism of specific statements and/or quotations from the papers presented. We kindly refer debates with individual authors to the corresponding scientific forums.

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## V. ANNOUNCEMENT OF FURTHER PUBLICATIONS

### **New study on economic concepts for a DSI benefit-sharing framework**

Fairness, Equity and Efficiency for the Convention on Biological Diversity and the Nagoya Protocol

Analysis of five policy options for DSI benefit-sharing based on economic concepts uses four cases of utilizing organisms in R&D and commercialization to illuminate the advantages and disadvantages of alternative modalities to "Bilateral-Nagoya Protocol".

A multilateral ABS regime must be informed by peer-reviewed literature ... Rather than a brokered policy riddled with gaps, loopholes and contradictions, the framework should address the two dozen issues identified and tabulated in this Report

Two crucial questions need to be answered: Does probable cause exist that a given modality will cover the costs of implementation? Which modality will most likely achieve the first two objectives of the CBD?

Only Modalities "Bounded openness over natural information" and "Open access-subscription fee/levies" afford rents. The latter generates a heavy excess burden.

Recommendation: Ruiz Muller, Vogel, Angerer et al. (2021) Fairness, Equity and Efficiency for the Convention on Biological Diversity and the Nagoya Protocol: Analysis of a Rodent, a Snail, a Sponge and a



Virus <https://www.abs-biotrade.info/fileadmin/Downloads/Resources/Fairness-Equity-Efficiency-for-the-CBD-and-the-NP/Study-Fairness-Equity-Efficiency-for-the-CBD-and-the-NP-2021.pdf>

Multilateral benefit-sharing from digital sequence information will support both science and biodiversity conservation

- 41 authors from 17 countries
- Scholz, Amber Hartman; Freitag, Jens; Lyal, Christopher H. C.; Sara, Rodrigo; Cepeda, Martha Lucia; Cancio, Ibon et al. (2022): Multilateral benefit-sharing from digital sequence information will support both science and biodiversity conservation. In Nature communications 13 (1), p. 1086. DOI: 10.1038/s41467-022-28594-0.
- members of the recently established DSI Scientific Network, providing a concrete framework for how DSI benefit-sharing could work
- <https://www.dsiscientificnetwork.org/>

#### **Links to other papers, provided by participants in the chat**

- [On] the history of genetic resources as information for the purpose of ABS: See Foreword “On the Silver Jubilee of “Intellectual Property and Information Markets: Preliminaries to a New Conservation Policy” in Ruiz Muller, Manuel; Vogel, Joseph Henry (2017): Genetic resources as natural information. Implications for the Convention on Biological Diversity and Nagoya Protocol. London, New York: Routledge Taylor and Francis. [https://s3-us-west-2.amazonaws.com/tandfbis/rt-files/docs/9781138801943\\_foreword.pdf](https://s3-us-west-2.amazonaws.com/tandfbis/rt-files/docs/9781138801943_foreword.pdf)
- This article proposes a global instrument to deal with DSI: <https://nph.onlinelibrary.wiley.com/doi/full/10.1002/ppp3.10186>
- For the UK's first study [on the nature and economic value of DSI] please find the link here - <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20365&FromSearch=Y&Publisher=1&SearchText=BE0167&SortString=ProjectCode&SortOrder=Asc&Paging=10%23Description>