

The Nagoya Protocol could backfire on the Global South

Regulations designed to prevent global inequalities in the use of genetic resources apply to both commercial and non-commercial research. Conflating the two may have unintended consequences for collaboration between the Global North and biodiverse countries in the Global South, which may promote global injustice rather than mitigate it.

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Research in ecology and evolution is essential to achieve effective environmental policies, for example, in relation to biodiversity conservation strategies. At the same time, policy decisions directly influence research activities and outcomes in ecology and evolution. This bidirectional interaction takes place in a context involving societal, economic, cultural and other aspects. The Nagoya Protocol (NP) for the Convention of Biological Diversity is an example of an international agreement established in such an interacting context. The NP aims to ensure fair and equitable sharing of benefits originating from the utilization of genetic resources and thus addresses the unbalanced situation in which users of genetic resources are typically located in industrialized countries in the Global North, whereas countries that are the most biodiversity-rich providers (provider countries) are located in the Global South, often representing low-income countries. Regulations on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS), as outlined in the NP, were designed to reduce global inequalities originating from the commercial utilization of genetic resources. However, these regulations are also applied to non-commercial research, potentially creating unwanted side-effects.

This Comment addresses the complex interplay between scientific, economic, social and ethical factors from the point of view of an interdisciplinary group of researchers studying the impact of global change drivers on biodiversity and ecosystem services. We initiated collaborations involving exchange of genetic resources with researchers in various provider countries, and experienced that the NP has a strong effect on non-commercial research as has been noted previously^{1–6}. We are concerned that the consequences of the NP can have

further effects that go far beyond the administrative burden for researchers in ‘user’ countries. We argue that provider countries will also be affected, because the NP unintentionally impedes collaboration between researchers in provider and user countries. Consequently, researchers from many provider countries, typically located in the Global South, will have increasing difficulties to connect with researchers in user countries, usually located in the Global North. Such an impeding effect of the NP would not only be troubling for scientific researchers but also from an ethics perspective, because it increases global injustice between academic institutions. In addition to being unethical, it also contradicts the purpose of the NP to increase global fairness and equitability.

Motivation behind the NP

A strong request for a binding agreement on ABS for genetic resources was particularly put forward by biodiversity-rich countries in the Global South. Even before this request was finally granted with the adoption of the NP (Box 1), various countries already had ABS regulations and legislation in place⁵. However, in cases in which genetic resources were illegally accessed and removed from their territory, provider countries were not able to prosecute illegal beneficiaries. Therefore, these countries mostly voted in favour of implementing a binding protocol⁷.

The NP may impede collaboration

During negotiation and implementation of the NP, different authors commented on the fact that the NP — although drafted with a focus on commercial utilization of genetic resources — strongly affects non-commercial research^{1–6}. In only one of the NP’s 36 articles — namely article 8a — it is mentioned that a distinction between non-commercial and commercial research should be made. The rationale to introduce this distinction in article 8a is to promote

and encourage research that contributes to the conservation and sustainable use of biological diversity. However, the list of suggested non-monetary benefits in the NP Annex clearly shows that non-commercial research is just as much a target of this protocol as commercial use. Whether — and to what extent — researchers working with genetic resources across countries need to enter ABS negotiations depends on the regulatory framework of the provider country. Some countries, such as Brazil or Australia, have introduced simplified measures for non-commercial research in their ABS legislation^{8,9}.

Some authors expected that the NP would encourage collaboration between research groups in user and provider countries of genetic resources^{7,10}. However, on the basis of experiences and observations in our scientific environment (Box 2), we argue that the opposite is the case, and that the NP is likely to cause unintended negative effects and to impede such collaborations. International collaborative research is essential in global change and biodiversity sciences. We consider it a question of good scientific practice that the needs of all collaboration partners are taken into account, including particular interests of less-affluent provider countries¹¹. Therefore, sharing of ‘non-monetary benefits’ (NP Annex) should be part of the scientific routine, even when no genetic resources are involved.

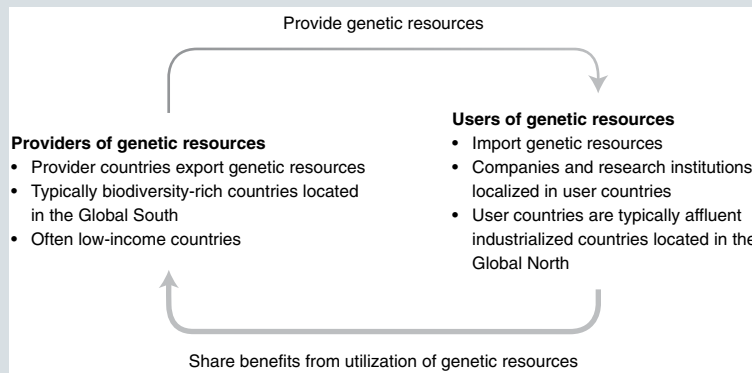
There is a long tradition of exchange in our scientific community between researchers in provider and user countries. In such situations, we perceive a rigorous implementation of strict ABS regulations as being more hindering than promoting research collaboration. We argue that it is of key importance to pay more attention to the consequences of the NP for non-commercial research, not only to protect important scientific projects as argued by others^{1–6}, but also for reasons of global

Box 1 | ABS partners in NP

The NP is a supplementary agreement to the Convention on Biological Diversity, which entered into force in October 2014. It implements the third objective of the Convention on Biological Diversity requesting fair and equitable

ABS for the utilization of genetic resources.

ABS with respect to genetic resources takes place between providers and users. The figure characterizes these two parties following a simplified dichotomy.



justice. We propose specific suggestions on how different players can contribute to preventing the NP from backfiring on the Global South (Table 1).

The difficulties for collaboration introduced by the NP cannot deny the responsibility of researchers to enter mutually fair scientific exchange — neither in user nor in provider countries. Equitable research on genetic resources involves scientists in provider as well as user countries. For reasons of fairness there should be more benefit-sharing

collaborations between more- and less-affluent countries, independent of whether genetic resources are exchanged or not, and independent of the direction of exchange. However, besides their moral responsibilities scientists also have economic and time constraints. The risk of additional costs, delays and uncertainties associated with formalities related to the NP are key factors that researchers will include in their decision-making process when considering scientific collaborations¹².

Global injustice

Most utilization of genetic resources concerns non-commercial rather than commercial research as, for instance, suggested by the published numbers of research permits issued in Australia and Brazil^{5,8}. Non-monetary benefits resulting from such non-commercial research have a central role in ABS as requested by the NP. On the basis of our experience and observation, we are concerned that the NP could lead to hesitant attitudes and a reduction in collaboration rather than to an increase in collaboration between users and providers of genetic resources, which is ethically most alarming, because it would reduce the sharing of scientific benefits between user and provider countries and thus increase global injustice. These consequences would be highly paradoxical, as they would be caused by legislation developed to increase fairness and equitability when using genetic resources.

The inequality between the Global North and South, with poverty, authoritarian regimes, war and other humanitarian catastrophes accumulating in the South, is one of the biggest ethical challenges of our times^{13,14}. We expect academic research to act simultaneously as an indicator for this inequality and as a driver towards it. On the one hand, more academic research is a positive indicator for the well-being of a country, because a well-functioning research system depends on the availability of financial resources, political stability and the freedom of opinion and expression. On the other hand, academic research is likely to be a driver towards higher

Box 2 | Observations and experience indicating that the NP may hinder research collaboration

Concerns about a negative effect of the NP on research collaboration are based on the indications or evidence of the authors:

Personal experience with past negative effects of ABS regulation or present uncertainty may cause hesitation to enter future collaborations.

- Past experience with a project assessing effects of naturally low phosphorus levels in soils. Originally experiments were planned in Colombia. However, because of overly restrictive legislation and difficulties with exporting samples, the project was moved to Madagascar, where less restrictive rules apply.
- Past experience involving a three-year funded collaboration with researchers

in India. Administrative issues including ABS negotiations took so long that the samples were finally shipped one year before the project ended.

- Current experience involving exchange of environmental DNA in a collaboration with Thai researchers. It is not clear whether environmental DNA qualifies as a genetic resource in this context and may therefore be subject to ABS as outlined in the NP.

Various observations support concerns about increasing hesitation to enter research collaborations.

- Some collaboration started from requests for sample analysis by researchers in low-income countries

with little access to rapidly evolving and expensive analytical infrastructure. We observe an increased hesitation to accept such requests since the NP has entered into force, because it remains uncertain what kind of permissions are required to exchange samples across borders.

- Observation of a general trend to work with samples already archived in existing collections or to stick to continued collaborations with countries that have well-established and efficient NP administrative processes.
- A survey among Malaysian researchers indicated that in less-affluent countries, there are also scientists who expect a negative impact from ABS regulations on scientific collaboration¹⁵.

Table 1 | Measures to prevent the NP from backfiring on the Global South

	Different actors in provider countries	Different actors in user countries
Government	<p>Introduce simplified procedures for non-commercial research in the domestic ABS legislation, for example, referring to article 8a of the NP.</p> <p>Provide transparent and efficient procedures to deal with requests for access to genetic resources.</p>	<p>Provide information about the NP and its implication to researchers, and advise on how to implement ABS procedures.</p> <p>Provide a (funded) framework in which research institutions can support scientists during ABS negotiations.</p>
Scientific institution	<p>Provide education introducing key elements and procedures of the NP to optimally prepare researchers for international collaborations.</p> <p>Provide education on and awareness for the particular challenges of trans-boundary research collaborations.</p> <p>Support scientists in international research collaborations⁹.</p>	<p>Provide education introducing key elements and procedures of the NP, and fostering understanding of the situation in provider countries, including the reasoning why the NP has been developed.</p> <p>Provide education on and awareness for the particular challenges of trans-boundary research collaborations⁹.</p> <p>Support scientists in international research collaborations, including a helpdesk and legal support for setting up ABS procedures.</p>
Researcher	<p>Consider differences in interests and requirements between collaboration partners.</p> <p>Be aware of the challenges the NP may present for collaborators in user countries.</p> <p>Support collaborators in user countries with procedures in provider countries.</p>	<p>Consider differences in interests and requirements between collaboration partners.</p> <p>Be aware of the NP and its requests.</p> <p>Remain open for new research collaborations also in cases that involve exchange of biological material.</p>

Measures to prevent the NP from backfiring on the Global South can be implemented at different levels. Suggestions for governments, scientific institutions and researchers in typical provider and user countries (as outlined in Box 1) are listed.

quality of life, because it brings innovation and technological progress, as well as an understanding of natural, political and cultural development. This goes along with more education and opportunities for citizens as well as more power and influence of the respective country. It is the responsibility of all involved players, including academics and policy-makers, to prevent the implementation of the NP from leading to a further increase in global inequality. We therefore strongly advise mitigation efforts by acting along our proposed measures (see Table 1).

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Competing interests

The authors declare no competing interests.