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1 **The Nagoya Protocol could backfire on the Global South**
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24 The Nagoya Protocol could backfire on the Global South

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

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

47 This comment addresses the complex interplay between scientific, economic,
48 social, and ethical factors from the point of view of an interdisciplinary group of
49 researchers studying the impact of global change drivers on biodiversity and ecosystem
50 services. We initiated collaborations involving exchange of genetic resources with
51 researchers in various provider countries, and experienced that the NP has a strong
52 effect on non-commercial research as noted previously¹⁻⁶. We are concerned that
53 consequences of the NP can have further effects that go far beyond the administrative
54 burden for researchers in user countries. We argue that provider countries will also be
55 affected, because the NP unintentionally impedes collaboration between researchers in
56 provider and user countries. Consequently, researchers from many provider countries,
57 typically located in the Global South, will have increasing difficulties to connect to

58 researchers in the user countries, usually located in the Global North. Such an impeding
59 effect of the NP would not only be worrisome for scientific researchers but also from an
60 ethics perspective because it increases global injustice between academic institutions. In
61 addition to being unethical it also contradicts the purpose of the NP to increase global
62 fairness and equitability.

63

64 **Motivation behind the NP**

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

72

73 **The NP may impede North–South research collaboration**

74 During negotiation and implementation of the NP, different authors commented on the
75 fact that the NP — although drafted with a focus on commercial utilization of genetic
76 resources — strongly affects non-commercial research¹⁻⁶. In only one of the NP's 36
77 articles — namely article 8a — it is mentioned that a distinction between non-
78 commercial and commercial research should be made. The rationale to introduce this
79 distinction in article 8a is to promote and encourage research that contributes to the
80 conservation and sustainable use of biological diversity. However, the list of suggested
81 non-monetary benefits in the NP Annex clearly shows that non-commercial research is
82 just as much a target of this protocol as commercial use. Whether — and to what extent
83 — researchers working with genetic resources across countries need to enter ABS
84 negotiations depends on the regulatory framework in the provider country. Some
85 countries, such as Brazil or Australia, have introduced simplified measures for non-
86 commercial research in their ABS legislation^{8,9}.

87 Some authors expected that the NP will encourage collaboration between
88 research groups in user and provider countries of genetic resources^{7,10}. However, based
89 on experiences and observations in our scientific environment (Box 2), we argue that
90 the contrary is the case, and that the NP is likely to cause unintended negative effects
91 and to impede such collaborations. International collaborative research is essential in

92 global change and biodiversity sciences. We consider it a question of good scientific
93 practice that the needs of all collaboration partners are taken into account, including
94 particular interests of less affluent provider countries¹¹. Therefore, sharing “non-
95 monetary benefits” (NP, Annex) should be part of scientific routine, even when no
96 genetic resources are involved.

97 There is a long tradition of exchange in our scientific community between
98 researchers in provider and user countries. In such situations we perceive a rigorous
99 implementation of strict ABS regulations as being more hindering than promoting
100 research collaboration. We argue that it is of key importance to pay more attention to
101 the consequences of the NP for non-commercial research, not only to protect important
102 scientific projects as argued by others¹⁻⁶, but also for reasons of global justice. We
103 propose specific suggestions on how different players can contribute to prevent that the
104 NP backfires on the Global South (Box 3).

105 The difficulties for collaboration introduced by the NP cannot deny the
106 responsibility of researchers to enter mutually fair scientific exchange — neither in user
107 nor in provider countries. Equitable research on genetic resources involves scientists in
108 provider as well as user countries. For reasons of fairness there should be more benefit-
109 sharing collaborations between more and less affluent countries, independent of
110 whether genetic resources are exchanged or not, and independent of the direction of
111 exchange. However, besides their moral responsibilities scientists also have economic
112 and time constraints. The risk of additional costs, delays and uncertainties associated
113 with formalities related to the NP are key factors researchers will include in their
114 decision making process when considering scientific collaborations¹².

115

116 **Global injustice as a consequence of the NP?**

117 Most utilization of genetic resources concerns non-commercial rather than
118 commercial research as, for instance, suggested by published numbers of research
119 permits issued in Australia and Brazil^{5,8}. Non-monetary benefits resulting from such
120 non-commercial research play a central role in ABS as requested by the NP. Based on
121 our experience and observation, we are concerned that the NP could lead to hesitant
122 attitudes and a reduction of collaboration rather than to an increase between users and
123 providers of genetic resources, which is ethically most alarming, because it would
124 reduce the sharing of scientific benefits between user and provider countries and thus
125 increase global injustice. These consequences would be highly paradox, as they would be

126 caused by legislation developed to *increase* fairness and equitability when using genetic
127 resources.

128 The inequality between the Global North and South, with poverty, authoritarian
129 regimes, war, and other humanitarian catastrophes accumulating in the South, is one of
130 the biggest ethical challenges of our times^{13,14}. We expect academic research acting
131 simultaneously as an indicator for this inequality as well as a driver towards it. On the
132 one hand, more academic research is a positive indicator for the well-being of a country,
133 because a well-functioning research system depends on the availability of financial
134 resources, political stability, and freedom of opinion and expression. On the other hand,
135 academic research likely is a driver towards high quality of life because it brings
136 innovation and technological progress, as well as an understanding of natural, political
137 and cultural development. This goes along with more education and opportunities for
138 citizens as well as more power and influence of the respective country. It is the
139 responsibility of all involved players, including academics and policy makers, to prevent
140 that the implementation of the NP leads to a further increase in global inequality. We
141 therefore strongly propose mitigation efforts by acting along our proposed measures
142 (see Box 3).

143

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185 **Competing interests**

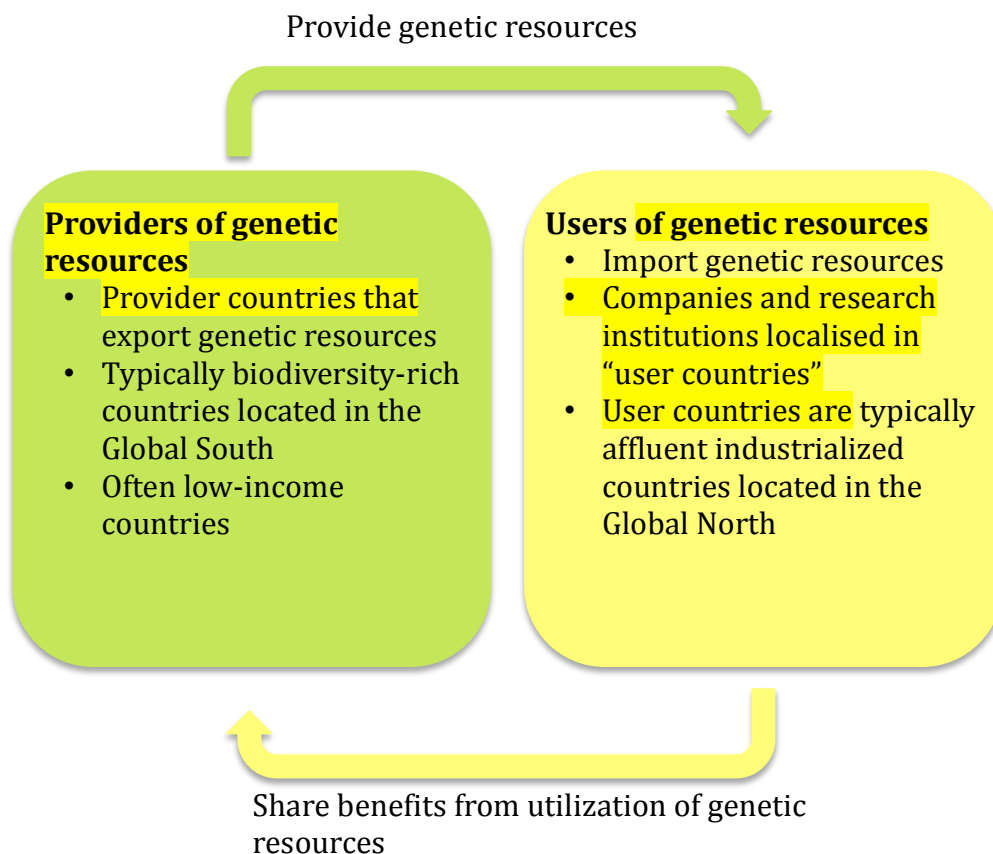
186 The authors declare that they have no competing financial interests.

187

188 **Boxes**

189 **Box 1: Access and Benefit Sharing (ABS) partners in the Nagoya Protocol (NP)**

- 190 • The NP is a protocol to the CBD (Convention on Biological Diversity), which
 191 entered into force in October 2014. It implements the third objective of the CBD
 192 requesting fair and equitable ABS for the utilization of genetic resources.
 193 • ABS with respect to genetic resources takes place between providers and users.
 194 The scheme below characterizes these two parties following a simplified
 195 dichotomy:
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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 author's indication or evidence:

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

- **Evidence 1: Past experience** with a project assessing effects of naturally low phosphorus levels in soils. Originally experiments were planned in Colombia. However, due to overly restrictive legislation and difficulties to export samples, the project was moved to Madagascar, where less restrictive rules apply.
- **Evidence 2: Past experience** involving a three year funded collaboration with researchers in India. Administrative issues including ABS negotiations took so long that samples were finally shipped one year before the project ended.
- **Evidence 3: Current experience** involving exchange of environmental DNA (eDNA) in a collaboration with Thai researchers. It is not clear whether eDNA qualifies as genetic resource in this context and may therefore be subject to ABS as outlined in the NP.

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

- **Evidence 4:** 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.
- **Evidence 5: Observation** of a general trend to work with samples already archived in existing collections or to stick to ongoing collaborations with countries that have well-established and efficient NP administrative processes.
- **Evidence 6:** A **survey** amongst Malaysian researchers indicated that in less affluent countries there are also scientists who expect a negative impact from ABS regulations on scientific collaboration¹⁵.

237 **Box 3**

238 **Measures to prevent the Nagoya Protocol (NP) from backfiring on the Global South**

239 Measures to prevent the NP from backfiring on the Global South can be implemented at
 240 different levels. Suggestions for governments, scientific institutions and researchers in
 241 typical provider and user countries (as outlined in Box 1) are listed below.
 242

	Different actors in provider countries	Different actors in user countries
Government	<ul style="list-style-type: none"> • Introduce simplified procedures for non-commercial research in the domestic ABS legislation, e.g. referring to article 8a of the NP. • Provide transparent and efficient procedures to deal with requests for access to genetic resources. 	<ul style="list-style-type: none"> • Provide information about the NP and its implication to researchers, and advise on how to implement ABS procedures. • Provide a (funded) framework in which research institutions can support scientists during ABS negotiations.
Scientific institution	<ul style="list-style-type: none"> • Provide education introducing key elements and procedures of the NP to optimally prepare international collaborations. • Provide education on and awareness for the particular challenges of trans-boundary research-collaborations. • Support scientists in international research collaborations⁹. 	<ul style="list-style-type: none"> • 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. • Provide education on and awareness for the particular challenges of trans-boundary research-collaborations.⁹ • Support scientists in international research collaborations, including a helpdesk and legal support for setting up ABS procedures.
Researcher	<ul style="list-style-type: none"> • Consider differences in interests and requirements between collaboration partners. • Be aware of the challenge the NP may present for collaborators in user countries. • Support collaborators in user countries with procedures in provider countries. 	<ul style="list-style-type: none"> • Consider differences in interests and requirements between collaboration partners. • Be aware of the NP and its requests. • Remain open for new research collaborations also in cases that involve exchange of biological material.

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