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# Brazil's implementation of access and benefit-sharing and the Nagoya Protocol: Analyzing some trends and positions in the ongoing debate

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**Abstract:** Access and benefit-sharing (ABS) arising from the utilization of biodiversity's genetic resources and traditional knowledge is the third objective of the Convention on Biological Diversity (CBD). Since its inception, some of the parties to the CBD have enacted ABS-national legislation and in 2014, the Nagoya Protocol came into force, providing a global standard among ABS systems. Given this, Brazil has been working to implement ABS since 2001, especially after the enactment of the national Biodiversity Law (Law 13.123/2015), which is the domestic law for the Nagoya Protocol implementation. This paper examines how the implementation of ABS and the Nagoya Protocol is viewed, discussed and debated by some stakeholders. Based on qualitative semi-structured interviews, press releases, public declarations, legislation and grey literature, the paper reveals that although ABS has faced strong criticism and delivered modest results, most stakeholders consider it strategic and important, especially in the face of the bioeconomy–biodiversity nexus. In general, positions on the implementation of ABS policies and the Nagoya Protocol in Brazil can be devised in the following categories: 1) acceptance and optimistic appreciation of ABS, 2) acceptance of ABS mechanisms but impending need for adjustments, 3) acceptance of ABS mechanisms as a 'bad with it, worse without it' scenario, and 4) rejection of ABS. Our research also shows that when it comes to ABS and providers of genetic resources, debates centred on the topic of biopiracy have declined, while debates characterized by compromise, institutionalization and the steering of ABS via the implementation process are on the rise.

**Keywords:** ABS, Nagoya Protocol, biodiversity, implementation, Brazil, CBD, bioeconomy

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## Introduction: Access and benefit-sharing and Brazil

Brazil is a global environmental superpower, and how this megadiverse nation implements its policy on access and benefit-sharing (ABS), along with the Nagoya Protocol (NP), has far-reaching implications for the entire world. As both a major user and provider of genetic resources, Brazil's ABS landscape is shaped by a dynamic industrial and agricultural sector, a vibrant academic community, and strong leadership from Indigenous and local communities. Few countries offer such a comprehensive microcosm of the challenges and opportunities surrounding the future of the Nagoya Protocol and domestic ABS systems.

Access and benefit-sharing has been a pivotal concept that marks the transition from an age in which biological and genetic resources (GR) were regarded as a common heritage of mankind toward an international system based on the sovereignty of national states. Emboldened by the Convention on Biological Diversity (CBD) (UNEP, 1992), opened for signature during the Earth Summit in Rio de Janeiro in 1992 (entered into force in 1993), parties have started to formulate ABS systems aiming to tackle different goals in the face of global inequalities. Especially in the so-called Global South, this included safeguarding genetic biodiversity by adopting CBD's "mandate of justice (distributional, procedural, and

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recognitional)" (Suiseeya, 2014) in the face of unequal technological capacities between poor and rich countries as well as the establishment of ABS-procedures for the compensation of Indigenous peoples and traditional communities' knowledge. Last but not least, ABS was to curb potential and actual biopiracy (Rabitz, 2015). In fact, since the 1980s, researchers and activists have used the term 'biopiracy' to criticize the misappropriation and commodification of Indigenous peoples and local communities' (IPLC) knowledge of seeds or plants by biotechnology companies, mainly from the Global North (RAFI, HSCA, 1998; Shiva, 2007; Robinson, 2010). The principle of national sovereignty over GR was enshrined in Article 3 and Article 15 of the CBD and was also extended to GR (excluding human genetics) (UNEP, 1992).

Access and benefit-sharing is based on Article 15 of the CBD. The latter was reinforced by the legally binding NP which was agreed in 2010 (CBD, 2011) and came into force in 2014. The NP provides the framework for national ABS regulations to be respected by third parties, especially in the event that GR are utilized outside the provider country. Broadly speaking, this is the most encompassing global ABS mechanism that applies to GR of biodiversity.

However, the ABS concept was criticized from the outset. Environmental activists, scientists and Indigenous peoples feared that private forms of ownership would be imposed on IPLC and that expropriation dynamics would be accelerated (Shiva, 2004). Contrary to the high expectations of megadiverse countries and of the NP architects, on the one hand, and consistent with the concerns and hopes of activists and IPLC, on the other, the NP has not led to significant compensation payments (Laird *et al*, 2020). The reasons for this are manifold, and both users and providers of GR have reasons to complain: a lack of global sanction mechanisms and the possibility of circumvention (Rabitz, 2015; Halewood *et al*, 2023); legal uncertainties on concepts such as access to and use of GR at the national level (Vogel *et al*, 2018) which have resulted in limitations to international trade and research (Braun, 2024); unresolved questions regarding transboundary traditional knowledge (TK) associated with GR as well as procedures to facilitate traceability (Dutfield, 2015); structural conflicts and lack of trust between IPLC and state institutions (Hayden, 2003); the ambiguity of the concept of GR, both at the global and national levels (Aubertin and Filoche, 2011; Müller, 2018). On the private sector side, non-harmonized implementation of the NP tend to expose companies to high risks (Michiels *et al*, 2022) and, last but not least, biotechnological innovations such as the new genomics tools, artificial intelligence and digital sequence information on genetic resources (DSI) pose further challenges to the successful implementation of the NP as well as of the national ABS policies (FDCL, GeN, 2022).

In Brazil, the discussion on ABS and NP covers multifaceted aspects. In general, questions of justice and political constellations (Dallagnol *et al*, 2016; Feres *et al*, 2019), descriptive aspects of legislation (Silva and Oliveira, 2018), sectorial analysis (ABIHPEC, 2017; Costa, 2017; Marinello, 2020), state transformations (Eimer and Donadelli, 2022), and comparative analyses of the legal situation (CNI, 2017) have framed the debate. The private sector, consultancies, and third-sector organizations have been especially vocal in producing guidance for ABS implementation. Likewise, influential academics such as the brothers Carlos and Ismael Nobre (Nobre and Nobre, 2019) and Ricardo Abramovay (Abramovay, 2020) have urged for the implementation of ABS in the Amazon, seeing it as having the potential to represent a major breakthrough in promoting the Brazilian bioeconomy.

The topic of implementation in particular has very recently gained momentum as the expectation of the ratification of the NP and its promulgation mounted and these then finally took place in 2021 and 2023, respectively. On the other hand, the implementation of national ABS policies and the NP were hampered by COVID-19 pandemics and unfavourable political conditions during Jair Bolsonaro's presidential (2019–2023) term (Eimer and Donadelli, 2022).

Worldwide, the literature on the implementation of ABS systems has become more and more abundant as countries, blocs (e.g. the EU), scholars, scientists and activists have increasingly published their experiences and views (Coolsaet, 2015; Vanheusden and Van Den Berghe, 2017; Greiber, 2019; Kamau, 2019; Friso *et al*, 2020; Kamau, 2022). In Brazil, scientific interest in the implementation of ABS policies mostly emerged in light of the ratification of the NP (Silva, 2019; Ferreira, 2020; Mozini, 2020; Silva *et al*, 2021; Eimer and Donadelli, 2022). Previous studies do exist, but they are either highly technical (Rabitz, 2015; Davis *et al*, 2016) or present purely national perspectives (Segundo *et al*, 2018). Furthermore, the research conducted on the Brazilian case has also been dominated by legal analyses (Ferreira and Moraes, 2013; Davis *et al*, 2016; Ferreira, 2020; Mozini, 2020).

In this paper, I explore Brazil's effort to implement ABS. Brazil is particularly well-suited for this qualitative case study because it is one of the most passionate advocates of the NP and a megadiverse nation, being both a provider and user of GR. Moreover, the country has been regulating its genetic heritage since 2001 (Brasil, 2001) and did not wait for the NP (ratification of the NP by Brazil did not occur until 2021 (Brasil, 2021b)) and promulgation only late 2023 (Brasil, 2023c) to develop its own ABS system. In addition to this, Brazilian national legislation in the spirit of the NP was enacted in 2015-2016 and the Ministry of the Environment has increasingly incorporated an institutional framework for ABS. As one of the first examples of ABS implementation, Brazil has attracted considerable international attention. Finally, Brazil has become an important player in the

emerging bioeconomy (Backhouse *et al*, 2021) with direct influence on how ABS and NP are currently understood (Queiroz-Stein *et al*, 2024).

The aim of this paper is to reconstruct the implementation process from 2015 to 2023 from the perspective of selected involved stakeholders. By analyzing their key positions in the debate, we will cluster and explore positions in depth that highlight current trends with potential to influence the implementation of Brazil's ABS system and the NP. Given that Brazil has a long experience with ABS, its implementation hurdles, opportunities and shortcomings may reflect the challenges or even the limitations for the global implementation of ABS policies.

The paper is structured as follows: after a short introduction to our research methods and data, I summarize the ABS mechanism, implementation process and governance in Brazil. Research on the national implementation of ABS systems has largely overlooked the interaction between these systems, public policy and public debate. Most studies have focused on implementation as a purely legal or procedural process, neglecting the complex sociological dynamics involved (Matland, 1995). Siebenhüner and Suplie (2005) made an early attempt to bridge this gap by linking ABS implementation, prior to the NP, with the concept of "institutional learning". They challenged the assumption of rationally bounded actors and extended the understanding of institutions beyond their formal structures. In the context of ABS implementation, learning occurs within a network of actors historically shaped by "strong user interests", "process facilitators", and "provider interests" (Siebenhüner and Suplie, 2005). Thus, implementation is a fluid process where trust, influence, expertise, and social capital play crucial roles in the realm of policy implementation (Montgomery, 2000). According to this literature, implementation is largely processual and happens beyond purely managerial decisions; positions and trends on ABS and the NP thereby play a major role in the implementation and shall be taken into account especially due to collegiate governance of these issues in Brazil.

Empirically, the topic of ABS and NP is managed in Brazil by a relatively small community which spans activists, Indigenous leaders, bureaucrats, (natural and social) scientists, attorneys, consultants and high-skilled employees of companies that engage with the use of biodiversity (more details in the next section). In the Brazilian case, many of them have seats at the Conselho de Patrimônio Genético Nacional (CGEN). CGEN is the national committee in charge of the management of ABS and the NP; within CGEN, experts represent their own organizations, sectors and communities. Public servants who are also experts on ABS and the NP represent their ministries and secretaries at CGEN. As said before, the community is small and lack of expertise within some groups may blur divisions and organized interests, as members of determined sectorial chambers may be instated to represent others for the sake of the quorum required for the CGEN sessions. This diffused knowledge and multi-sited aspects of representation bring additional hurdles for the investigation, corroborating the fluidity of the implementation process. Given this, interviews became the privileged tool for research. Due to the specific expertise that the topic requires and given the reduced size of the ABS community in Brazil, we consider the expert interviews method the most adequate approach; according to Meuser and Nagel (2016), expert interviews reflect a tendency for institutionalization and a position in society that permits "free spaces for the construction of reality". Originally conceived upon the realities of an industrialized society (Germany), and drawing on the topic of ABS, whose interactions with TK and IPLC are self-evident, one should ask whether such categorization is convenient in this case; we nevertheless deemed the expertise and experience of IPLC of uttermost importance and drawing on Kaiser (2012), IPLC were considered full-right experts.

To address these questions and following an intensive desk phase (analysis of grey literature such as public-ministerial and sectorial reports, Indigenous public declarations, internet homepages, legislation and current state of research we selected 12 expert interviews[1] – carried out between August 2021 and March 2023 – with key representatives of different groups of the ABS landscape in Brazil (Table 1). The interviews ranged from online sessions via Zoom (Zoom Video Communications, Inc) to in-person meetings in different Brazilian cities. Some interviews were also carried out in Montreal, Canada, during the UN Biodiversity Conference (COP15, December 2022). Following Meuser and Nagel (2016), some experts hold a dominant role (in the form of social capital) in their fields, and the selection of interviewees for this paper was mostly based on this criterion. These dominant roles are established within specific contexts in the ABS arena, and can be observed among both GR providers and stakeholders in the industrial and academic sectors (users of GR). Consultants are part of this expert landscape, too. Overall, a list of experts on ABS was created by using the 'snowball method' (based on recommendations or approaching potential interviewees via existing ones and other contacts). Recognition of ABS expertise by the interviewees led us to a shortlist in which experts were categorized according to Siebenhüner and Suplie (2005) network of actors on ABS ("strong user interests," "process facilitators," and "provider interests"). Then we selected the interviewees for this paper according to the following criteria: they represent different interest groups at CGEN and actively participate in the implementation process both of the NP and the national ABS system; in addition,

[1] The interviews were held in Brazilian Portuguese and transcribed by a native speaker, Ms. Adriana Mastrangelo Ebecken. Email: dri.mastrangelo@gmail.com. The author is also a Brazilian Portuguese native speaker and translated excerpts of the interviews into English. The text and the excerpts were subsequently proofread by an English native speaker.

they may also either observe or facilitate implementation.

We developed the interview guideline based on a set of questions with which we sought to emphasize the interviewees' positionality, expertise, awareness and sensitivity regarding ABS. The questions included the following: "Concerning ABS, where do you stand professionally?"; "What are the biggest challenges and opportunities in the implementation of ABS and the Nagoya Protocol in Brazil and worldwide?"; and "What are the most important conflicts between users and providers of GR?".

The interviews, ranging in length from 30 to 90 minutes, were transcribed and then open-coded using the MAXQDA program (Rädiker, 2023). In the second phase of the analysis, thematic clusters were formed by comparing the positions on ABS articulated both in the interviews and the desk phase. The positions and clusters discussed here are not intended to exhaustively represent all perspectives; some also reflect historical arguments that have long been part of the controversies surrounding GR and ABS. Importantly, these clustered positions serve as tools to organize and deepen the analysis of certain qualitative trends within the broader debate. They can be understood as specific frameworks (concerning ABS and the NP) within the ongoing discussions on the biodiversity–bioeconomy nexus, as highlighted by Lima (2021), Lima and Palme (2022) and Queiroz-Stein *et al* (2024), which consider the contentious landscape surrounding the use of biodiversity in Brazil, as well as its distributive, political and ecological aspects. In this context, we emphasize the textual nature of the interviews and will explore their qualitative implications, with a particular focus on the logic of ABS.

## Context: ABS implementation and governance in Brazil

The regulatory framework in which the ABS mechanism is implemented in Brazil is set down by the Lei da Biodiversidade (Law 13.123/2015, LB) (Brasil, 2015) and the subsequent national decree 8.772/2016 (Brasil, 2016) which revoked the former provisional measure Medida Provisória 2.186-16/2001 (MP). The latter was the very first national-level attempt to regulate the issue of GR in Brazil (Bensusan, 2003). Prior to the issue of the MP in 2001, the Amazonian states of Acre and Amapá had created their own state laws on ABS (Santilli, 2004) (Santilli, 2005). Irrespective of regional efforts, the MP, the LB and the national decree 8.7772/2016 nationalized ABS in the early 21st century. Interestingly enough, the Federal Constitution of Brazil (Brasil, 1988) established in article 225 the protection of genetic heritage without regulating access to it. In addition, Brazil's constitution uses the concept of genetic heritage instead of genetic resources – as proposed by the CBD in 1992. The former is defined in article 225, caput, as a "common good for the use of the people" (Brasil, 1988) and Law 13.123/2015 says in article 2 (I) "information of genetic origin" (Brasil, 2015). Regulation by public law was only established after the ratification of the CBD (Brasil, 1998), paving the way for the developments described above (Segundo *et al*, 2018).

The LB and the national decree inherited parts of the organizational structures of the former MP by reinstating and strengthening the role of the CGEN, which falls under the Ministry of the Environment and Climate Change. This body manages the National System of Genetic Resource Management and Associated Traditional Knowledge (SisGen, https://sisgen.gov.br/) digital platform in which the whole process of access, prior informed consent (PIC), mutually agreed terms (MAT), research and development (R&D), notification of products, shipments of samples, auxiliary intellectual property procedures, and other elements of compliance shall be registered. The SisGen platform is primarily an instrument for declaring access (substituting the previous mandatory authorizations issued by the Genetic Heritage Management Council, CGEN, under the MP) and management of Brazilian GR dynamics. Access to SisGen is only permitted to Brazilian researchers and institutions; foreign entities or researchers are obliged to sign a partnership agreement with Brazilian institutions (Silva, 2019).

The CGEN is a collegiate board whose administration consists of four bodies: 1) a central plenary formed by twenty counsellors (11 are members of the federal administration and the remaining nine seats are allocated to civil society representatives) (Brasil, 2016), 2) thematic councils are created by the plenary to assist in decision-making, 3) sectoral councils are established as a platform for the positions of organized groups such as scientists (Câmara Setorial da Academia), IPLC (Câmara Setorial das das Guardiãs e Guardiões da Biodiversidade) and companies (Câmara Setorial das Empresas), and 4) an executive board (led by the Secretary of Biodiversity, Forests and Animal Rights) which is in charge of managing the activities of CGEN, ensuring SisGen operates smoothly, setting the agenda for further discussions, etc.

The financial body of the LB is the Fundo Nacional de Repartição de Benefícios (Brasil, 2016) (FNRB) and like CGEN also falls under the Ministry of the Environment and Climate Change. Funds originate from the annual budget of the ministry, donations, fines charged for illegal access and use of GR, benefit-sharing, etc. The FNRB funds are used exclusively for actions and activities that benefit holders of traditional knowledge and environmental conservation. Analogous to CGEN, the FNRB is also a collegiate instance with a similar structure to CGEN. The internal regulations of the FNRB were only developed in 2022 with the Manual de Operação do Fundo Nacional para a Repartição de Benefícios (Brasil, 2022) outlining the procedures for benefit-sharing being completed in October 2023. At the time of writing (early 2024), this fund remains

**Table 1.** List of 12 expert interviews carried out from August 2021 to March 2023 with key representatives of different groups in the ABS landscape in Brazil

| Interviewees | Occupation | Date | Place |
|---|---|---|---|
| I1 | Employee at a cosmetics company | 3 Mar 2023 | Belém do Pará, Brazil |
| I2 | Biologist and former member of CGEN | 1 Dec 2021 | Brasília (online), Brazil |
| I3 | Environmental analyst working in the branch of cosmetics | 14 Mar 2022 | São Paulo (online), Brazil |
| I4 | Representative of a national association of industries | 10 Mar 2022 | São Paulo (online), Brazil |
| I5 | Leading natural scientist | 22 Feb 2022 | Rio de Janeiro, Brazil |
| I6 | Leading layer and consultant | 14 Mar 2022 | Curitiba, Brazil |
| I7 | Academic | 14 Dec 2021 | Juiz de Fora (online), Brazil |
| I8 | CGEN member and representative of traditional community | 18 Dec 2022 | Montreal, Canada |
| I9 | CGEN member and representative of an indigenous group | 13 Dec 2022 | Montreal, Canada |
| I10 | Activist and member of an organization that defends indigenous rights | 17 Mar 2022 | Brasília, Brazil |
| I11 | Indigenous lawyer and activist | 28 Jan 2023 | Porto Alegre (online), Brazil |
| I12 | Legal scholar and activist | 27 Jan 2023 | Curitiba (online), Brazil |

non-operational, that is, implementation has not yet occurred.

After the ratification of the NP by means of legislative decree n. 136/2020 and the ratification letter of 4 March 2021 (Brasil, 2021b), Brazil declared the LB as its domestic law for the implementation of the NP. On 27 December 2023, the NP was finally officially promulgated (Brasil, 2023c). However, Silva *et al* (2021) emphasize the urgent need for the NP and LB to be harmonized, given that Brazil is now obliged to comply with ABS legislation from other NP parties and the LB itself contradicts many of the dispositions of the NP. Questions arising from the retroactivity and temporal validity of the LB, cross-border GR, and the use of foreign GR opened a new chapter in the implementation of ABS policies in the country, posing further challenges for policymakers and society (de Souza Dias, 2022).

In terms of institutional strategies, there have been multiple sets of regulatory frameworks and national and regional strategies targeting ABS. The national strategy for intellectual property (Brasil, 2021a), the national strategy and action plan for biodiversity (Brasil, 2017a), the national strategy on science, technology, and innovation (2016–2022) Brasil (2017b), and regional initiatives such as the Plano Estadual de Bioeconomia championed by the state of Pará (Governo do Estado do Pará, 2022) and the Diretrizes para a Construção Conceitual da Bioeconomia no Amazonas are prime examples in this regard (Governo do Estado do Amazonas, 2021).

Non-governmental organizations and state-sponsored institutions are also intertwined with the launch of ABS especially in the Amazon. Institutions like the Polo Digital de Manaus (https://polodigitaldemanaus.com/), the Hub de Bioeconomia Amazônica (https://fas-amazonia.org/hub-de-bioeconomia-amazonica/), and the technological innovation clusters Arranjo Amoci (https://arranjoamoci.org/) and Arranjo Namor (https://arranjonamor.org/) in Manaus and Belém do Pará, respectively, both funded through the dispositions of the Law of Innovation (Brasil, 2004) and linked to the Federal Ministry of Science, Technology, and Innovation, are supposed to facilitate and speed up the implementation of ABS and fostering the expansion of industrial intellectual property rights (IPRs) in the Amazon.

The implementation of ABS in Brazil has gradually become part of the overarching discussion on the bioeconomy and the mainstreaming of biodiversity in national development strategies (Whitehorn *et al*, 2019). The bioeconomy and ABS generally form part of the "biotechnological vision" (Bugge *et al*, 2016; Lopes and Chiavari, 2022) in the international debate on the bioeconomy. Brazil's IPLC have however challenged such a definition by proposing the concept of "socio-bioeconomy" (Queiroz-Stein *et al*, 2024) as outlined in the Letter from the Amazon (Amazon Socio-Biodiversity Meeting, 2021), written on 20 October 2021, as part of the position taken by the Forest Peoples Alliance (https://cnsbrasil.org/alianca-dos-povos-da-floresta/) and other organizations at COP26 in Glasgow. There are ongoing disputes on the "bioeconomy–biodiversity nexus" (Lima and Palme, 2022) in Brazil, however, the specific role of GR, the national ABS system, and the NP are clearly subordinate to the more generalist approaches on the bioeconomy, forest conservation issues, etc.

Particularly since Lula da Silva began his third presidential term, ABS has also gained momentum in mainstream politics. With Marina Silva as Minister of the Environment, the new National Secretariat for the Bioeconomy issued by Federal Decree N. 11.349/2023 (Brasil, 2023a) with a specific Department for Genetic Heritage (Brasil (2023a), Chapter II, Art. 2., II, d), 3) was established. Referring to the prospects of the bioeconomy in Brazil, Silva stressed that "reindustrialization will come from the environment and ancestral knowledge" (Relly, 2023b). In a similar

vein, the government has also fostered Brazil's research capabilities on biodiversity prospecting (bioprospecting) in the Amazon region with the reorganization of the Centro de Biotecnologia da Amazônia (Melo, 2023), a research institution in charge of promoting biotechnology and thereby accelerating ABS throughout the Amazon basin. Very recently, the federal government announced the plan Nova Indústria Brasil (Brasil, 2024) with the aim of increasing the technological and sustainable use of biodiversity by 1% per year until 2033.

The country's IPLC seem also to have shifted their position on ABS in recent years, following the possibilities of the bioeconomy and adding their own perspectives. Their fears of biopiracy dominated stances on GR and TK in the early 2000s (Relly, 2023a). Open letters and declarations such as the Carta de São Luís do Maranhão paved the way for a national ABS regulation (the MP in 2001). This helped to politicize the issue, and IPLC took a firm stand regarding their demands on the protection of TK coupled with the promotion of Indigenous territorial rights. Today, CGEN has established its legitimacy among key stakeholders and has genuinely become the national forum for the issue (Castro *et al*, 2022). Critical voices do exist, especially targeting the weak dispositions for prior informed consent (PIC) of the LB. Sharp criticism or rejection of the ongoing implementation process is more commonly found on the side of IPLC, activists and their supporters. In addition, overall criticism of the ABS architecture has commonly been incorporated into the overarching topic of the bioeconomy, as indicated by the positions taken by the critical group Carta de Belém (Carta de Belém, 2022).

Nevertheless, risks to the outcomes of implementation also affect more powerful stakeholders. Due to Brazil's position as an agricultural powerhouse, whose dependence on foreign (agro)genetic resources is huge (soybean, cattle genetics, fish, etc.) and not entirely covered by Annex 1 of the FAO's International Treaty on Plant Genetic Resources for Food and Agriculture (FAO, 2009), representatives of the agrobusiness sector tend to be more skeptical about the implementation or at least are more cautious about engaging with the whole process. The delay in the ratification of the NP might also be seen as a symptom of such reluctance (Eimer and Donadelli, 2022).

As Brazil has had national ABS legislation since 2001 and recently ratified and promulged the NP, the global discussions on DSI and the corresponding dematerialization of GR have placed Brazil's ABS system and experiences in the spotlight. The literature and our findings suggest that Brazil's legal concept of GR as genetic heritage (contrary to the "material" notion agreed in the CBD) has hampered discussions on this very issue since the topic has long been covered by Lei da Biodiversidade and previous regulation (Silva and Oliveira, 2018) Aside from the definition of the Lei da Biodiversidade, actors continue to associate genetic heritage with material entities, especially plants. This understanding is dominated among IPLC, in particular, since all five biocultural protocols drafted and published in Brazil are based on plants (Andrade, 2022).

The results of the implementation are nevertheless disappointing. As stated above, the Brazilian state has not yet paid any benefits to IPLC via the FNRB. Since the state has not yet begun to implement the FNRB, we cannot attest to the full-fledged implementation of ABS in Brazil. Despite those shortcomings, we will see in the following pages that there is widespread acceptance of ABS policies, and the NP and many actors feel that it is time to seize the moment and drive the implementation processes.

## Results and discussion: facts and positions on the implementation of ABS in Brazil

Exact facts and figures on the implementation of the NP and ABS in Brazil are hard to obtain inasmuch as most ABS contracts are confidential and only headers including related terms like "changes and regularization", "terms of commitment", and "non-monetary benefits" are published by CGEN online (Brasil, 2023b). A side event organized by CGEN at the COP15 in Montreal (December 2022) did, however, provide an opportunity to verify some figures. The data presented here are for the period 2001–2022 and do not differentiate the period after the LB.

### SisGen registration figures

Up to December 2022, a total of 68,764 access registrations were carried out by SisGen. Of these, 56,909 (83%) referred to research on Brazilian genetic heritage. A total of 3,203 registrations only involved acccessing TK and 8,652 entries stated that both GR and TK were accessed. Thus, TK accounted for approximately 17% of the net registrations. Interestingly enough, CGEN individualized the registration of access to DSI – since DSI is covered by the Brazilian ABS legislation. Of the 68,764 net registrations at SisGen, 1,411 entries declared in silico access, of which, 336 registrations stated commercial purposes, with 1,075 registrations declaring "access activities for commercial and non-commercial use of DSI on GR". Shipping figures were also published: GR were mostly shipped to the United States (35.90%), France (14.91%), the United Kingdom (12.56%), and Germany (7.07%). Biodiversity samples or DSI were shipped from all Brazilian ecological regions, but forested biomes predominated: the Atlantic Forest (39.73%) and the Amazon (39.27%) led the statistics.

### Benefit-sharing

As of 2001, 3,116 users had declared products under the modality of non-monetary benefits, while 1,789 users selected monetary benefits. The overwhelming majority, 8,859 administrative declarations of products (the trigger for benefit-sharing under LB) were exempted

due to the legal specifications of the LB – presumably related to agricultural research/product development which are exempted from benefit-sharing. Whether monetary benefits were paid or not is hard to assess due to the confidentiality of ABS agreements. However, when it comes to non-monetary benefit-sharing, CGEN has published (Brasil, 2023b) recent agreements. As of early 2024, in total, CGEN registered 28 non-monetary agreements involving seven companies including the cosmetics giants Natura & Co (Avon), L'Oréal™, and O Boticário™. Of the 28 non-monetary benefits agreements, 20 addressed traditional communities such as Quilombolas, riverine communities, and other traditional communities, but no Indigenous groups appear on the list. These ABS agreements are worth around R$1,000,000 each (approx. US$200,000).

At the FNRB, CGEN amassed around US$1,250,000 to safeguard biodiversity via the payment of monetary benefits (E. Relly, personal observation). As already mentioned, the Brazilian state has not yet paid any benefits to IPLC. Notwithstanding this fact, benefits in Brazil are only billed via the GR associated with TK modality, by which IPLC and users of GR establish contractual obligations according to which the state receives a 0.5% share of the net commercialization revenues. This means that ABS only occurs between private companies and providers of GR. Companies such as Natura & Co have led the way in this regard and have therefore been seen as an efficient ABS implementor. One outstanding example in this matter is the Fundo Médio Juruá (https://institutojurua.org.br/en) established in 2017 between Natura & Co and associations of communities living along the Juruá river in the western Amazon. An employee at Natura & Co (interviewee 1, I1) told us in early March 2023 that the modality of 'GR associated with TK' is the only possibility for effective benefit-sharing in Brazil inasmuch as "we [the company] have to meet the condition that benefits will be directly transferred to the community".

Moreover, most benefits that are currently being paid to IPLC (monetary benefit-sharing) were agreed on under the previous MP and not under the current and valid LB. Even under the old MP, benefits for IPLC were very scarce. Souza *et al* (2017) estimated that between 2004 and 2013, just one ABS contract was concluded with Indigenous peoples and 61 with traditional communities. Overall, 86.4% of the total ABS contracts in this period were a result of the state's sovereignty over GR. Nor do the figures provided by CGEN in Montreal during COP15 allow us to individualize ABS under the new and valid regulation. However, as the figures collected by Souza *et al* (2017) indicate, most benefits were paid to the state.

## Stakeholder positions

Given the multifaceted debate on ABS, our research has clustered some positions on the ongoing implementation of and future scenarios for ABS. In so doing, I do not claim to have covered all positions of all stakeholders. Consequently, the positions presented here acquire a normative character inasmuch as they are intended to provide a general insight into and characterize the process of implementation. They may reflect both local and global constellations, since views on nature, work, property, justice and distribution vary enormously. In general, the political economy of the CBD era is still quite relevant. Siebenhüner and Suplie (2005) seek to order the institutional learning regarding implementation and Görg (2002) idea of a "field of conflicts" on GR still applies today. Most positions reflect user, facilitator and provider interests, but topics such as biodiversity loss, IPRs, national development, far-right anti-environmentalism, and the prospect of bioeconomic transitions have produced a more blurred landscape and "convivial conversations" (Lima and Palme, 2022) between former antagonists seem to be occurring continuously.

Thus, positions can be clustered in the following categories: 1) acceptance and optimistic appreciation of ABS, 2) acceptance of ABS mechanisms but impending need for adjustments, 3) acceptance of ABS mechanisms as a 'bad with it, worse without it' scenario, and 4) rejection of ABS (Figure 1). Positions here were extracted from the transcriptions of 12 interviews and clustered qualitatively according to scholarship on contemporary biodiversity debates in Brazil provided by Lima (2021), Lima and Palme (2022) and Queiroz-Stein *et al* (2023). According to these, terminologies like "territorial rights and social objectives" and "economic growth" frame biodiversity discussions in Brazil and our research will move within this established scholarship.

### Acceptance and optimistic appreciation of ABS

This cluster is mainly represented by natural scientists working both at universities and national research institutions (e.g. germplasm banks and crop genebanks) and sectorial organizations (e.g. industry, bioeconomy). This cluster can be seen as the group where users' interests dominate.

Scientists working with genetic germplasm, for instance, may see themselves as bearers of a national mission to bring TK and GR from the "public domain as collecting sites" (Hayden, 2003) and as legitimizing ABS scenarios and practices vis-à-vis the idea of enfranchisement of IPLC. A former CGEN member and biologist working in this field (I2) stated that most IPLC "neither know, nor even grasp how to value what they have". Others in industry tend to fully accept ABS mechanisms, perceiving them as a tool for harmoniously reconciling nature conservation and economic development for IPLC. Interviewee I3, who works for a major cosmetics corporation in Brazil, emphasized that:

"ABS conserves because he [an IPLC individual] collects the fruit, the leaf, he's not using it for timber. Because he could be selling that wood, you know? But instead of selling the wood, what does he sell? He sells

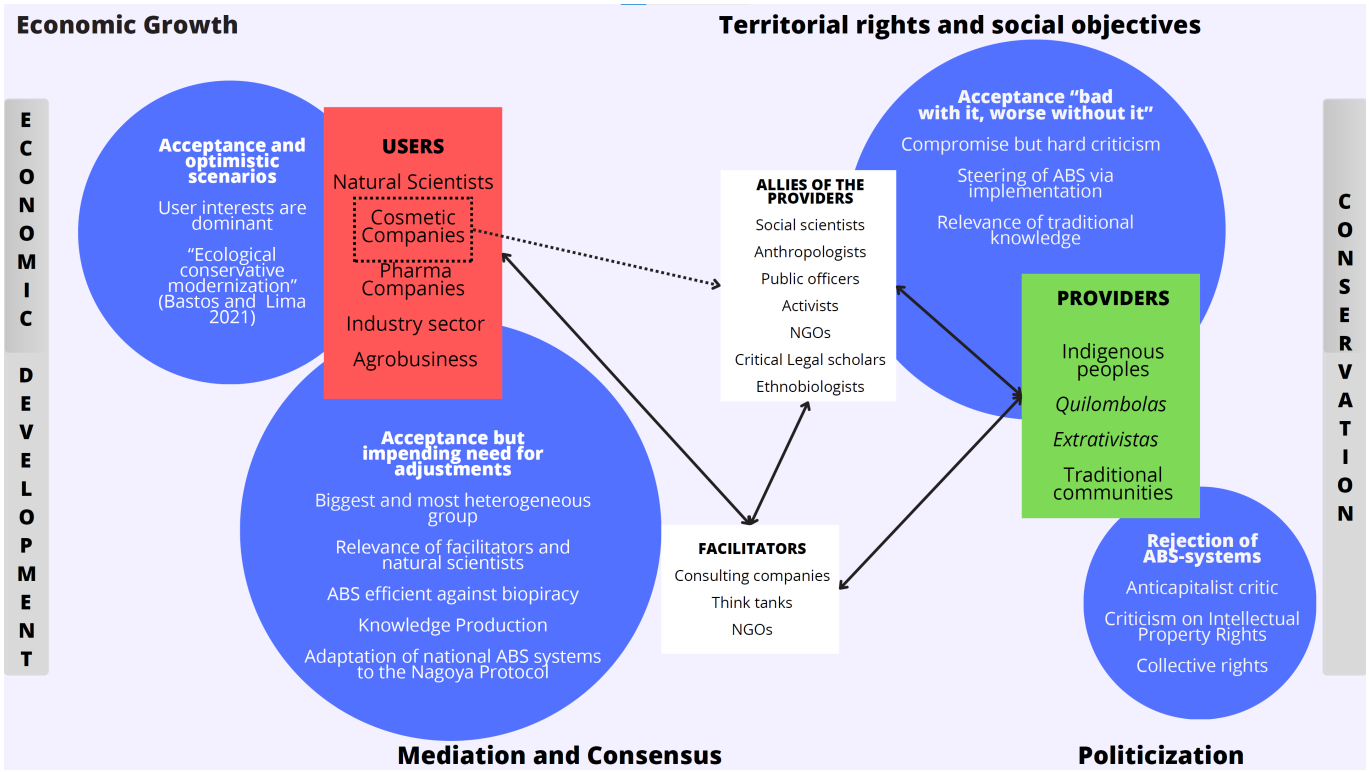


**Figure 1.** Clustered groups, relationships and positions among stakeholders of the Brazilian access and benefit-sharing landscape. Terminologies were developed with the help of Lima and Palme (2022) and Queiroz-Stein *et al* (2023).

the fruit, the leaf, the flower, which has a higher added value for the cosmetics industry and, in some way, he conserves it. So, for example, how much fruit do you take from the environment so that you don't have a negative impact in the sense that you manage to keep a certain amount of seeds for other trees to grow. That's management: "Oh, you need to hire a professional to do this management"; with what money? So, do through ABS!"

Positions emerging from this field tend also to be influenced by the prospects of bioinnovation and the biotechnological bioeconomy. In this realm, GR and TK are seen as a pool of resources for national development, a comparative advantage, and last but not least, a strategic asset (Nogueira, 2022). Cultural diversity seems somehow separated from biological diversity in this cluster. Another interviewee (I4), a representative of a relevant Brazilian association that fosters corporate use of national biodiversity, stressed his optimism:

"(. . .) first of all, I'm quite optimistic, okay? (. . .) Yeah, since Brazil has the greatest biodiversity in the world, right? (. . .) No country has the number of biomes that we have, right, with the reach that we have. (. . .) we do have the greatest biodiversity and (. . .) this amount of biodiversity, makes this diversity strategic for the country, right? So, the development of legislation that allows biodiversity to be exploited in a sustainable way, and that adds value to the country, is fundamental for economic development. It's a wealth that the country possesses, right?"

Positions within this group tend to minimize the conflicting issues concerning PIC and MAT or even impacts on IPLC livelihoods and cultural systems. There is a firm belief that ABS is there for good and is thus, through its market-based logic, likely to achieve the goals of national and international ABS mechanisms with regard to the utilization of biodiversity and ecological conservation. Unlike natural scientists who typically work under the umbrella of state funding, actors from industry and representatives of powerful associations in the field of agriculture and industry deplore the poor performance of the state and blame it for the inefficiency and difficulties of the whole implementation process. This cluster does not argue that existing ABS systems are flawless either, but the depiction of a win-win scenario prevails. Last but not least, this position resembles Lima (2021) "conservative ecological modernization" concept which he applied to the analysis of projects surrounding the bioeconomy in Brazil.

## Acceptance of ABS mechanisms but impending need for adjustments

According to our interview record, this group is the most heterogeneous and the largest. This cluster encompasses the largest number of experts on the issue. Natural scientists, CGEN members, lawyers, compliance firms, even members of industries, agroecologists and IPLC fall into this group. People in this field can be seen mostly as facilitators who attempt to build bridges

among diverging interests and possess relationships both with users and providers of genetic resources but strong user interests are also present in this group of positions. Indigenous peoples and local communities in this cluster deviate from a more critical stance toward ABS mechanisms and they are keen to identify advantages within the process of implementation.

This cluster tends to reflect on the distinctions between the LB and the NP and plead for further development of the national law, either by means of a new specific piece of legislation to address the integration of the NP into the national ABS system or by adapting implementation through guidelines created by CGEN. Another core issue for this cluster revolves around the view that ABS systems are a better outcome than the previous principle of common heritage of mankind. In general, ABS systems are deemed a game changer that represents a significant obstacle to biopiracy. That being said, scientists within this group complained about the hurdles created by the LB and the NP, and articulated the more general view that science is a common benefit to all (Bockmann *et al*, 2018). A common criticism of the LB is centred on the difficulties foreign and national scientists experience in conducting research on Brazilian biodiversity. Some within this cluster also postulated that conflicts between users and providers of GR have gradually diminished and commended the maturity and stability of the Brazilian debate on the issue. This has led to institutionalization and the effective management of the conflicts, leaving behind the more politicized discussions on biopiracy, for instance.

This last factor has significant positive consequences for the processes of implementation. Looking back at Brazil's experience with ABS so far, a leading scientist we interviewed (I5), who is an active participant in international networks, remarked:

"If we consider 2001 until now (. . . ) there's been a huge maturing process, and then the new legislation [LB] came along, which has a lot of problems, but is still much better than the other one (. . . ) So, I think all this has (. . . ) helped reduce conflicts. Conflicts, most of the time, are not between the academy and industry, they are between the providers and industry, and even with us [scientists]. So, on this point, I'm even proud to say that in the MP we were often on the opposite side and now we're together [with IPLC] (. . . ) Perhaps at the beginning there was some estrangement, I agree, but today we are very much together, defending the same things."

Knowledge production and the role of facilitators are also pivotal within this position. At the COP15 in Montreal, for example, Natura & Co, Croda International Plc and GSS Sustentabilidade e Bioinovação (a leading compliance firm in Brazil) launched the 2022 version of the Project Brogota, an outstanding piece of work, written in English, comparing the Brazilian ABS system with other national regulations around the world (GSS Sustentabilidade e Bioinovação Ltda, Croda International Plc, Natura & Co, 2022). Despite the alleged progressiveness of the ABS mechanisms (in terms of addressing justice issues), there is still a constant need for adjustments (whether that be harmonization between the NP and the LB, or working out how to meet the expectations of providers), making them very much a work in progress. Interviewee I6 who works in the compliance field also referred to these problems, affirming the many shortcomings of the implementation of ABS worldwide, the CBD's mandate of justice (Suiseeya, 2014) in addressing global disparities, and last but not least, the necessity of impending changes with the aim of creating a multilateral system for benefit-sharing:

"Now, thinking about Nagoya (. . . ), not just about Brazil, about Brazilian legislation, the big issues [to be solved], whether it's Brazilian legislation or Nagoya, we have some structural problems, some conceptual problems. Because ideologically, the legislation is wonderful, the intention of the Nagoya Protocol is wonderful, the fact that the CBD, back in 1992, brought in sovereignty for countries, is also fantastic, because at that time countries needed to have sovereignty over their genetic resources, not least because of the historical legacy of colonization. So, it was absolutely necessary. The big problem we face today is that soon there will be, in a way, a war over the availability of genetic resources. Because some countries are stricter in the use of their genetic resources, others will see this as an opportunity to give away their genetic resources and facilitate access. And more than that, and this is one of the points that I'm fighting the most in relation to the Nagoya Protocol, is the overlapping of access. (. . . ) so this, for me, is one of the big bottlenecks of the Nagoya Protocol, the fact that we need a multilateral mechanism, a benefit-sharing fund that facilitates or makes it possible for this to happen in a more homogeneous way and for the countries to agree to it, right?

Indigenous peoples and local communities as well as agroecologists are in a minority in this cluster. However, their positions tend to point out the double-edged nature of ABS mechanisms which range from the social valorization of TK to the dangers of cultural exploitation (Dutfield, 2015). Changes must be carried out at the state level and should address providers' interests. Natural scientists deplore the bureaucratic hurdles and their positions express the need for a more clearly defined role of basic science or for the participation of foreign scientists who wish to use Brazilian biodiversity.

Topics like PIC and MAT are more relevant and should form part of the discussion, inasmuch as they provide more legitimacy to the stabilization and management of conflicts between providers and users. In this position, we also observe "convivial conversations" with providers of GR, which do not preclude "market opportunities that may be reaped but to be open to the full spectrum

of possibilities, acknowledging and accepting multiple forms of social existence" (Lima and Palme, 2022).

## Acceptance of ABS mechanisms as representing a "bad with it, worse without it" scenario

In the words of a distinguished scholar of the natural sciences (I7) based in the state of Minas Gerais: "In today's context, it is bad with it [ABS], but worse without it." This "bad with it, worse without it" position has been adopted by a number of individuals predominantly from the fields of agroecology activism, environmental protection, science (especially anthropology, ethnobiology and the social sciences), law (including legal scholars), and members of governmental bodies and agencies who support or even promote the rights of IPLC and public policies. This position clearly reflects the interests of the providers of GR and builds up the other interface for "convivial conversations" (Lima and Palme, 2022), a common aspect within this position.

Members of this cluster may express strong criticism of the current ABS mechanisms and in the Brazilian case, there is a common trend of addressing sharper critics of the national ABS system due to its weaker stance on PIC (vis-à-vis the Nagoya Protocol) and IPLC's lack of political representation both in the creation of the LB (2014–2016) and in ongoing implementation in general (Guetta and Bensusan, 2018). The proximities between specific sectors of academia and IPLC' demands in Brazil was already noted by Eimer and Donadelli (2022).

Overall, the "bad with it, worse without it" position is a structural stance adopted by IPLC and their supporters in relation to ABS. It is indeed an utterly ambiguous position on the general concept of ABS, and such ambiguity has accompanied the implementation process. In Brazil at least, IPLC, NGOs and numerous grassroots organizations have nurtured a well-considered viewpoint – in the sense of the role of IPRs among IPLC as described by Ido and Valentini (2018) – on the possibilities of ABS to address or instrumentalize IPLC demands. Although "bad with it, worse without it" may imply a lack of alternatives, limited room for manoeuvre, or even rejection, this position seems to nevertheless entail a predisposition to critical compromise and the creation of institutional spaces. This position was clearly taken by the signatories subscribers (many of them from IPLC associations) of the Carta Aberta de Recomendações da Sociedade Civil Brasileira na 15ªConferência das partes da Convenção da Diversidade Biológica e seus Protocolos Terra de Direitos (2023), who stressed that: "despite all the criticism that the Biodiversity Law deserves, it also brings advances, such as the establishment of community biocultural protocols, the result of joint (...) struggle by peasants, Indigenous peoples, traditional and quilombola communities."

Ambiguity marks the complex position of Indigenous peoples in the face of the prospect of the commodification of TK and the rapprochement of market relations. In this sense, Bonifácio José Baniwa's argument, an Indigenous scholar from the Baniwa people from northern Brazil, still resonates and it is quoted as an authorized and actual perspective on TK and its relationship to markets (Alencar *et al*, 2003):

"We work with crafts that have traditional values, traditional knowledge, and traditional meanings (...) when we try to valorize these through sales, the market has its own requirements and rules. We will have to accept these rules if we want to improve the community's income, but at the same time, we may end up breaking the law of traditional knowledge. It seems that one side is stronger than the other. We're trying to work on the market understanding our way and not our knowledge having to fit the market. This is the main challenge for traditional knowledge."

In this cluster, the LB is seen as an unjust piece of legislation, a law that enabled access to instead of protection of TK. Nevertheless, implementation of the LB by means of the national decree and the establishment of the new CGEN provided IPLC with some opportunities. Our research was conducted at a rather difficult time, since Jair Bolsonaro's presidential term and the COVID-19 pandemic prevented or hindered direct participation, leaving IPLC with fewer tools to influence decisions at CGEN level, inasmuch as health and security (conflicts on land) worries became a priority. Irrespective of this, IPLC participation at CGEN is of utmost importance to tackle the unfavourable rules of the LB. Interviewee I8, CGEN member and representative of a traditional community in central-eastern Brazil stated:

"The implementation makes it possible for us to have an impact in some way. I think it's an opportunity in the sense that we can influence the agenda (...); we couldn't do this for the last four years because of Bolsonaro's term, but now, with the new government [reference to the victory of Lula da Silva in the 2022 presidential election], we have this great opportunity to make implementation really go to the grassroots."

The fact that the LB allowed the development of biocultural protocols as valid documents for trade, access and benefit-sharing is seen as a reason why the law has not been rejected outright. Interviewee I9, an Indigenous woman from northern Brazil who is also a CGEN member, stated that these protocols are "our dream (...) especially because they [the federal government of Brazil] need to foster the biocultural protocols and respect the opinion of the peoples."

The "bad with it, worse without it" position predominates in our interviews with IPLC. In this cluster, inequality, power relations, but also IPLC's leading role in the implementation and "biocultural jurisprudence" (Bavikatte and Robinson, 2011) are key. Biopiracy is still a risk for some. However, we observed a structural shift toward institutionalization with a view to changing the ABS mechanism from the inside, given that the complexity of the issue means it constantly takes on new forms, is reframed, and poses new challenges, such as DSI, transborder GR and overall harmonization

with the NP. There are, however, several issues that remain unresolved by legislation. These include weak PIC dispositions, the question of unidentified TK, and the digital system enabling access through SisGen. Last but not least, ABS is seemingly expected to be a tool for territorial claims and IPLC rights. This link between ABS and territorial rights is illustrated by interviewee I10, an activist working at Conselho Indigenista Missionário and an advocate of Indigenous territorial rights, who told us that "from the moment you highlight people's coexistence with biodiversity [referring to TK] (. . . ) you need to have a territory of your own."

## Rejection of ABS

In Brazil, the outright rejection of ABS systems only plays a minor role in the debate. The people who argue for the rejection of the concepts underlying the implementation of ABS have long-standing critical expertise on the topic as well as excellent moral reputations. Some are seen as intellectual authorities on TK and IPLC rights. This cluster comprises Indigenous peoples and legal scholars. Their main argumentation against ABS is rooted in the issue of individual IPRs (against the background of Indigenous collective forms of property) and the encroachment of capitalist logics on IPLC's collective social structures. In addition, questions regarding PIC quickly come to the fore in this cluster.

Those positioning themselves against ABS systems generally claim that CBD-based solutions are not suited to resolving the issues concerning TK and IPLC rights. Prior informed consent has been a structural argument in this regard and discussions on how the representation of Indigenous peoples works tend to disregard ABS mechanisms. In the Brazilian debate, this position can be traced back to 2003 when the notorious Brazilian anthropologist Eduardo Viveiros de Castro questioned whether it was "the community that produces the consent or the consent that produces the community?" (Alencar *et al*, 2003). Rejecting any possibility of a stable PIC concerning access to TK, Viveiros de Castro insisted on the structural nature of unsuccessful consent, given that Indigenous communities do not operate according to the political models of liberal/Western collective representativeness. Casting doubt on the legitimacy of IPRs emanating from GR associated with TK, this view clearly prevails among those who reject ABS mechanisms. This is illustrated by interviewee I11, an Indigenous lawyer and activist from southern Brazil, who asked: "Who is the juridical person who represents my people? This person does not exist", making the case for the impossibility of a legitimate PIC under Brazilian Biodiversity Law. The issues concerning PIC in this cluster are centred on the limitations of the liberal legal tradition and criticism of capitalism. Interviewee I12, legal scholar, lawyer and long-standing activist for Indigenous rights in Brazil, noted that "the discussion on property (. . . ) is an essential discussion. If you introduce private property within a system in which private property does not exist, you will destroy this system." Drawing on his own remarks, I12 went on to state his position on ABS mechanisms more clearly:

"(. . . ) in any case, between not having any legislation and having legislation that regulates access, that is, that opens another door to usurpation, I would say the following: we have three forms of usurpation, right? Free usurpation: everyone goes there and does what they want, a mess; legal usurpation; and illegal usurpation, which is against the law and may be punished. Free usurpation ceases to exist when there is regulation, leaving just the other two. So, if this regulation opens up too much space for legal access, it's better not to have it. I think the regulations we have in Brazil open up a lot of space."

## Conclusion

With Brazil being both a major provider and user of GR, it is one of the few countries in the world that can illustrate the true complexity of the situation to help comprehend the challenges, opportunities and perhaps even limits of the ABS mechanisms that were agreed upon at the CBD and in subsequent agreements (in our case, the NP). In this regard, Brazil can be seen as a microcosm of the (future) global ABS landscape. Notwithstanding this, ABS has not unleashed its global potential and has frustrated some expectations, especially with regard to benefits, legal uncertainties and administrative failures (here reported in the case of the Brazilian State). In this regard, Brazil has also contributed to the alleged problems implementors and COP negotiators frequently express (Silva *et al*, 2021).

Nevertheless, ABS in Brazil is robust. CGEN has gained legitimacy among stakeholders and the majority adhere to its premises, notwithstanding the justified criticism of weak PIC, high transaction costs, unequal power relations, and a lack of proper instruments of IPRs that reflect Indigenous sensitivities regarding the collective nature of their societies. We observe that the discussion on ABS mechanisms has also changed considerably and has incorporated other transversal axes such as the bioeconomy and the mainstreaming of biodiversity in national strategies (within the bioeconomy–biodiversity nexus). Politics have also shaped the spaces for debate and participation. Having undergone massive political change in the last ten years, the role of biodiversity in Brazil has been in the spotlight in a very different way. Between the tug-of-war among powerful agrarian interests and the transition to a low-carbon economy, our research revealed that the ABS and NP topics, which predate the discussions on the bioeconomy, have also been increasingly appropriated by the latter. The topic of biopiracy, for instance, which characterized the debate (especially among IPLC) during the early CBD years and the first regulation provided by the provisory measure n. 2186/2001 (2001-2015) (Brasil, 2001), for instance, have been superseded by the negotiated participation of IPLC in the national economy. In this regard, we observe increased entanglement of ABS with

the prospects of a particular version of the bioeconomy, especially the biotechnological, bioecological and so-called bioeconomy of sociobiodiversity. These prospects provide opportunities but also pose risks to the actors involved. Drawing on the literature on legal anthropology, and by crossing this with the interviews, we see a trend toward compromise via the multifaceted terms of implementation, enabled by the collegiate governance of CGEN. The fact that the position that pleas for the outright rejection of ABS systems is the least relevant in the debate suggests this trend. CGEN's authority and its position as a national forum indicate that too.

Although implementation has been disappointing, that has not prevented actors from attempting to influence the course of things. Creating future scenarios and the possibility of shaping the course of implementation through CGEN governance continue to offer actors an arena for adapting national legal provisions produced by the LB as well as guiding the contingencies of the NP at the national level. In this particular regard and based on IPLC's positions on the issue of ABS, we see a major shift toward the stabilization and institutionalization of the issue. The heated debates of the past are still relevant, but IPLC are now acting pragmatically and programmatically, having even built alliances with some users and facilitators. The structural nature of the CBD arena, centred on users', facilitators' and providers' interests, still holds true but the situation has become more blurred, inasmuch as actors are compromising more. On the side of IPLC, compromise on ABS tends to address another structural claim of the post-CBD era: territorial rights as the underlying basis of an effective ABS system.

The positions raised in our study represent only a fragment of a broader and more complex implementation process. Due to the collegiate governance of ABS in Brazil, these positions tend to influence implementation. Aligning to national development and reflecting more clearly users' interests and the upper hand of natural sciences in the process, we clustered the position "acceptance and optimistic appreciation of ABS". The position "acceptance of ABS mechanisms but impending need for adjustments" seems to encompass a wider range of stakeholders with diverse backgrounds and perspectives, from those advocating prioritizing users' interests to those arguing for better protection of traditional knowledge. A more critical perspective, which leans toward providers' interests while still seeking compromise with users and facilitators (such as the State and consulting companies), is captured in the position "acceptance of ABS mechanisms as a 'bad with it, worse without it' scenario". Finally, the "rejection of ABS" position, although less influential in the debate, is rooted in historical arguments about the inadequacy of TK to be accessed through ABS. Despite ongoing debates, trends toward implementation, institutionalization and governance of GR and TK in Brazil, ABS remain highly contested.

## Conflict of interest

The author declares that he has no competing interests or relationships that might have influenced the work reported in this paper.

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