



# COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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## **THE IMPACT OF ACCESS AND BENEFIT-SHARING MEASURES ON USE AND EXCHANGE OF GENETIC RESOURCES FOR FOOD AND AGRICULTURE AND ASSOCIATED TRADITIONAL KNOWLEDGE – DRAFT REPORT–**

The Commission on Genetic Resources for Food and Agriculture (Commission), at its Nineteenth Regular Session, requested the Secretariat to prepare, based on responses to a questionnaire and other sources of information, a report on the implications of the implementation of access and benefit-sharing country measures for the use and exchange of genetic resources for food and agriculture, associated traditional knowledge and the fair and equitable sharing of benefits, for review by the Team of Technical and Legal Experts on Access and Benefit-sharing (ABS Expert Team).<sup>1</sup> The report was commissioned to The University of Queensland. The draft Report, as reviewed in light of comments and inputs received from the ABS Expert Team<sup>2</sup> and its members, is contained in this document for information of the Commission.

<sup>1</sup> CGRFA-19/23/Report, paragraph 24.

<sup>2</sup> CGRFA-20/25/3.1.

# **The impact of access and benefit-sharing measures on the use and exchange of genetic resources for food and agriculture and associated traditional knowledge**

Draft Report

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This report has been prepared at the request of the Secretariat of the FAO Commission on Genetic Resources for Food and Agriculture. The views expressed in the draft report are those of the authors and do not necessarily reflect the views or policies of FAO.

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## Abbreviations

ABS	access and benefit-sharing
BBNJ Agreement	Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction
Benefit-sharing Fund	Benefit-sharing Fund of the International Treaty on Plant Genetic Resources for Food and Agriculture
Biodiversity Framework	Kunming-Montreal Global Biodiversity Framework
CBD	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
Commission	FAO Commission on Genetic Resources for Food and Agriculture
DSI	digital sequence information
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GRFA	genetic resources for food and agriculture
INBio	National Institute of Biodiversity of Costa Rica
International Treaty	International Treaty on Plant Genetic Resources for Food and Agriculture
IRCC	internationally recognized certificate of compliance
Multilateral System	The Multilateral System of access and benefit-sharing of the International Treaty on Plant Genetic Resources for Food and Agriculture
Nagoya Protocol/Nagoya	Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity
PGRFA	plant genetic resources for food and agriculture
SMTA	standard material transfer agreement
USD	United States Dollars

## Executive summary

This Report looks at:

- the impact of access and benefit-sharing (ABS) measures on the exchange and utilization of genetic resources for food and agriculture (GRFA) and associated traditional knowledge, and
- the generation and sharing of benefits arising from the utilization of GRFA and associated traditional knowledge.

ABS for GRFA is governed by three international agreements: the 1993 Convention on Biological Diversity (CBD), the 2010 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (Nagoya Protocol), and the 2004 International Treaty on Plant Genetic Resources for Food and Agriculture (International Treaty). A fourth international agreement governing ABS for GRFA has been adopted – the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement) – but as this is not yet in force it was not considered in this report. The report does not consider options going forward or proposed solutions. The report also does not consider the implications of digital sequence information (DSI) on the utilization of GRFA and associated traditional knowledge as it is outside the scope of the request of the Commission on Genetic Resources for Food and Agriculture (Commission).

### Sources of information/methodology of the report

This report relied on primary and secondary sources of information. Primary information was collected via surveys. Secondary information was obtained from interviews and a review of the literature.

For the primary information, two surveys were sent to participants for completion between July and September 2024. The first survey was sent to the Commission's National Focal Points for plant, forest, microorganism and invertebrate, and aquatic genetic resources and to National Coordinators for animal genetic resources (National Focal Point Survey). This survey received 118 responses from 70 countries. Of these, 76 percent of the respondents were from countries that were parties to the Nagoya Protocol.

The National Focal Point Survey provided useful information in a range of areas, including the way that different countries have designed and implemented ABS in national laws and their experiences with GRFA and ABS measures. Focal Points from than half of the countries participating in the survey (38 of 70 countries) indicated that their country had ABS measures in place, i.e. measures according to which access to genetic resources for their utilization is subject to prior informed consent (PIC) and mutually agreed terms (MAT). Twenty-two National Focal Points (from 17 out of 38 countries) reported that their ABS measures provided for special provisions applying to GRFA, e.g specific exemptions or special (such as fast-track) procedures for GRFA. National Focal Points were also asked about their experiences with ABS permits, the number of permits granted and the types of GRFA covered. The survey showed that 18 out of 34 countries (53 percent) ) had granted ABS permits for the utilization of GRFA (15 respondents could not answer the question).

The second survey was sent to providers and users of GRFA (User and Provider Survey). This survey received 22 responses from people in 16 countries. The respondents came from a variety of professional backgrounds including the private sector, public institutions (including government, research and academia), genebanks and local communities. Ninety-one percent of the respondents were from countries that were parties to the Nagoya Protocol. The sample size of 22 was too small to conduct any valuable analysis. The utility of the survey was further reduced by the fact that only 15 respondents reported that either they or their institution provided or received GRFA. Within these 15 respondents, the majority focused on plant genetic resources for food and agriculture (PGRFA) (12 out of the 15 said that they were most familiar with PGRFA). Despite these limitations, the User and Provider Survey contained useful anecdotal evidence that aligned with the statistical trends and descriptive responses found in the National Focal Point Survey.

Overall, the surveys provided important insights into the ABS experiences and issues faced by parties involved with GRFA. Nonetheless the surveys suffered from limitations: a number of respondents had no experience with the exchange of GRFA and were unable to answer numerous questions; most of the respondents only had experience with plant genetic resources; and both surveys received incomplete responses and inconsistent information that reduced their utility.

For secondary sources of information, a review was undertaken of literature published between 2014 and 2024 that looked at ABS for GRFA. 2014 was chosen as the starting point to coincide with the year the Nagoya Protocol came into force. There were a number of notable things about the voluminous and growing body of literature on ABS for GRFA. The first was that, even in the most critical accounts of ABS, there was no disagreement about the value of the goals of ABS, which were described as “noble” and “laudable”. The bulk of the literature was also concerned with (bilateral) ABS under the CBD and the Nagoya Protocol rather than (multilateral) ABS under the International Treaty. In relation to the type of GRFA considered, most of the literature focused on plants. There was also very little written on the effects of ABS measures on access to traditional knowledge associated with GRFA and the generation and sharing of resulting benefits. The ABS literature has changed considerably since 2014. Initially the bulk of the literature was concerned with explaining the mechanics of the ABS systems and how they might be (or had been) implemented in Member Nations. Since then, there have been a growing number of more critical accounts of ABS.

### **Impact of ABS measures on the utilization of genetic resources for food and agriculture and associated traditional knowledge**

Overall, the views of National Focal Points and users and providers of genetic resources as well as the literature about the impact of bilateral ABS measures on the utilization of GRFA were mixed. There was very little information about the impact of ABS measures in relation to the utilization of traditional knowledge held by Indigenous Peoples or local communities.

The majority of respondents to the National Focal Point Survey reported that during the last 5 years access was “always” or “in most cases” obtained/provided in accordance with ABS measures. Only 8 out of 54 respondents indicated that within the last five years ABS measures had prevented them (or their institution) from obtaining access to GRFA (64 did not know or did not reply) and only 10 out of 59 respondents indicated that ABS measures had caused them (or their institution) to deny access to GRFA (59 did not know or did not reply).

An important albeit indirect positive effect of ABS on the use of GRFA is that ABS has provided a home for dialogue on the “ethics and equity in research, ownership, and control of genetic resources and traditional knowledge, capacity building, technology transfer, and other issues” with the principles of benefit-sharing extending into a number of areas such as those pertaining to Indigenous Peoples and local communities, and helping with positive public discourse in the area. However, while there were exceptions, much of the literature was critical of the impact of bilateral ABS measures on the utilization of GRFA. This was because of a range of factors that spanned from problems with national ABS laws, procedures and institutions through to difficulties in negotiating ABS contracts.

For the most part the surveys and the literature suggested that the multilateral ABS measures under the International Treaty’s Multilateral System were having a positive impact on the utilization of GRFA. One reason for this is that there is a large amount of PGRFA that is easy to access. There also seems to be widespread support for the Standard Material Transfer Agreement (SMTA) primarily because as they are non-negotiable they reduce transaction costs. There are however complaints that there is not as much material in the system as there could or should be. Some commentators and respondents also complain that access is sometimes slow and time-consuming and that information about the PGRFA available in the Multilateral System is difficult to find or not available.

### **Impact of access and benefit-sharing measures on the generation and sharing of benefits**

Analysing the impact of ABS measures on the generation and sharing of benefits faces two challenges. The first is how to measure benefits. The second challenge is created by the use of confidentiality clauses in ABS agreements. Insofar as confidentiality claims obstruct access to the terms and conditions

of ABS agreements, they make it difficult “to accurately assess the degree to which fairness or equitability are realized.”

Overall, the surveys and the literature were mixed about the impact of ABS measures on the generation and sharing of benefits derived from the utilization of GRFA. The National Focal Point Survey showed that 60 percent of respondents (from 17 countries) had provided benefits in return for providing access to GRFA and that 45 percent of respondents (from 19 countries) had received benefits. The responses also showed that the majority of the benefits shared were non-monetary (including capacity development and training, transfer of or access to technology, the sharing of research results and the development of GRFA exchanged).

While the literature offered some evidence of the positive impact of ABS on benefit-sharing generally (most examples were for non-GRFA), there are a growing number of accounts that are highly sceptical of the ability of bilateral ABS measures to generate significant benefits. There were also concerns that although benefits may have been shared, the sharing had either not been fair and equitable, or shared with the right people. This is particularly an issue with Indigenous Peoples where resources are shared across communities.

The success of the International Treaty’s ABS system in the generation and sharing of benefits has also been mixed. Mandatory user-based benefits have been negligible: as of July 2023 there have only been five payments made under the mandatory scheme totalling USD 391 721, which is 1.11 percent of the total contributions made to the Benefit-sharing Fund. However, the International Treaty has been successful in raising voluntary monetary contributions, having generated almost USD 35 million. There is widespread agreement that the International Treaty’s multilateral approach to ABS has delivered non-monetary benefits (particularly by way of the Consultative Group on International Agricultural Research [CGIAR]) including by facilitating the exchange of PGRFA (which is reflected in the fact that over 110 000 SMTAs had been reported to the International Treaty system as of 5 November 2024, making it possible for farmers, plant breeders and researchers, in both the public and private sectors, to access a wide range of PGRFA). The International Treaty has also had a positive impact on the sharing of other non-monetary benefits including capacity building, information exchange, collaborative research, knowledge creation, and access to and transfer of technology.

## **Conclusion**

Analysing the implications of ABS measures for the use and exchange of GRFA, associated traditional knowledge, and the fair and equitable sharing of benefits faces a number of challenges. One of these is that there is very little information about the impact of ABS on non-plant GRFA. With PGRFA, while there has been consideration given to the impact of ABS on genebanks, breeders, seed companies and researchers working with PGRFA, there has been much less attention given to the impact of ABS on farmers, local communities, and Indigenous Peoples.

While descriptive accounts of ABS laws and procedures play an important role in improving the understanding and operation of ABS, it is encouraging that there is growing interest in research that addresses the discord between how ABS is written and how it operates in practice. While there are numerous anecdotal accounts about impact and a smaller number of targeted surveys, to analyse the implications of ABS measures there is an urgent need for further empirical research.



## Part I: Background

### [1] Introduction

#### [1.1] Commission request

At its Nineteenth Regular Session, the Commission on Genetic Resources for Food and Agriculture (Commission) requested a report on the implications of the implementation of access and benefit-sharing (ABS) measures for the use and exchange of genetic resources for food and agriculture, associated traditional knowledge, and the fair and equitable sharing of benefits. It requested that the report be based on responses received to a questionnaire and other sources of information. The report therefore pays particular attention to the evidence that is available about the impact of access and benefit-sharing (ABS) on the exchange and use of genetic resources for food and agriculture (GRFA) and the consequential sharing of benefits.

The report is a commentary on the current and historical landscape of ABS measures as they relate to the exchange and use of GRFA and associated traditional knowledge as well as any resultant sharing of benefits; it does not consider options going forward or solutions for problems that exist. The report also does not consider the implications of digital sequence information (DSI) on the utilization of GRFA and associated traditional knowledge as this was beyond the scope of the Commission request.

#### [1.2] Access and benefit-sharing measures for plant genetic resources for food and agriculture

For the purposes of this report, “ABS measures” are taken to include any mechanism that is used to implement, support or enhance ABS including international and national laws, procedures and administrative measures such as the ABS Clearing-House and National Focal Points.

At the international level, access and benefit sharing of GRFA is governed by three agreements: the 1993 Convention on Biological Diversity (CBD), the 2010 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (Nagoya Protocol) and the 2004 International Treaty on Plant Genetic Resources for Food and Agriculture (the International Treaty). A fourth international agreement has been adopted: the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement). Given that the BBNJ Agreement is not yet in force, it is not considered in this report.

##### [1.2.1] The 1993 Convention on Biological Diversity

The CBD is an international agreement that governs the conservation and sustainable use of biological diversity, and the sharing of benefits accrued from the use of genetic resources, including through appropriate access. One of the aims of the CBD is the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The CBD was adopted on 22 May 1992 and entered into force on 29 December 1993. As of 8 November 2024, the CBD had 196 Contracting Parties.

The CBD reaffirms that states have sovereign rights over their own biological resources. Recognizing the sovereign rights of states over their natural resources, the CBD recognizes that the authority to determine access to genetic resources rests with national governments and is subject to national legislation.

Contracting Parties are expected to take legislative, administrative or policy measures to ensure that the results of research and development and the benefits arising from the use of genetic resources are fairly and equitably shared with the Parties that provide resources. Unless otherwise determined by a

Contracting Party, access to genetic resources shall be subject to prior informed consent of the Contracting Party providing the resources. The CBD recognizes that access to, use of, and the sharing of benefits arising from the utilization of genetic resources should be based on mutually agreed terms. The establishment of mutually agreed terms of access, use and benefit-sharing should be between the Party providing and the Party receiving the resources. Benefits can be monetary, non-monetary, or both.

The CBD applies to genetic resources from plants, animals or microorganisms but not human genetic resources.<sup>6</sup> The genetic resources covered by the CBD are those provided by Contracting Parties that are countries of origin of the resources, or the resources that Contracting Parties have acquired in accordance with the CBD. The CBD does not cover genetic resources accessed and used prior to its entry into force in 1993, such as the pre-1993 genetic resources stored in the Consultative Group on International Agricultural Research (CGIAR) *ex situ* collections or other international institutions.

The CBD covers traditional knowledge associated with genetic resources of plants, animals and microorganisms. The CBD requires Contracting Parties to promote wider usage of traditional knowledge with the involvement and consent of the relevant Indigenous Peoples as well as local communities. The CBD also requires Contracting Parties to encourage the equitable sharing of the benefits arising from the utilization of traditional knowledge associated with genetic resources.

### **[1.2.2] The 2010 Nagoya Protocol**

The Nagoya Protocol is a supplementary agreement to the CBD that was adopted by the Conference of the Parties to the CBD in October 2010. The Nagoya Protocol addresses the CBD objective of fair and equitable sharing of the benefits arising from the utilization of genetic resources. The Protocol came into force on 12 October 2014. As of 1 November 2024, the Protocol had 142 Contracting Parties.

The Nagoya Protocol requires Contracting Parties to take appropriate, effective and proportionate legislative, administrative or policy measures to provide that “genetic resources”<sup>7</sup> “utilized”<sup>8</sup> within their jurisdiction are accessed in accordance with prior informed consent and that mutually agreed terms have been established. Contracting Parties are also required to “take measures, as appropriate, with the aim of ensuring that the prior informed consent or approval and involvement of [I]ndigenous and local communities is obtained for access to genetic resources where they have the established right to grant access to such resources.”

While the Nagoya Protocol does not specify the format that national ABS laws or measures should take, it does require Parties to take the necessary legislative, administrative, or policy measures to provide for legal certainty, clarity and transparency of domestic ABS legislation or regulatory requirements. The Protocol requires Contracting Parties, in the development and implementation of ABS measures, to create conditions to promote and encourage research that contributes to the conservation and sustainable use of biological diversity, including through simplified ABS measures for non-commercial research, and to consider the importance of GRFA and their special role for food security. In its Preamble, the Protocol recognizes the interdependence of all countries with regard to GRFA as well as their special nature and importance for achieving food security worldwide and for sustainable development of agriculture in the context of poverty alleviation and climate change. It also acknowledges the fundamental role of the Commission and the International Treaty in this regard.

The Annex to the Nagoya Protocol contains an indicative list of monetary and non-monetary benefits. Monetary benefits include access fees/fee per sample collected, up-front payments, milestone and royalty payments. Non-monetary benefits include the sharing of research and development results, collaboration, cooperation and contribution in scientific research and development programmes, institutional capacity building, and collaboration, cooperation and contribution in education and

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<sup>6</sup> *Access to Genetic Resources*, COP 2 Decision II/11, 4.

<sup>7</sup> To overcome confusion about whether genetic materials such as biochemical compounds that do not contain functional units of heredity were covered by the CBD’s ABS framework “derivative” is defined herein to mean: a naturally occurring biochemical compound resulting from the genetic expression or metabolism of biological or genetic resources, even if it does not contain functional units of heredity.

<sup>8</sup> Utilization of genetic resources is defined herein as: to conduct research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology.

training. The Nagoya Protocol does not provide guidance as to how Parties should measure the implementation and success of ABS measures. As can be seen below, the Kunming-Montreal Global Biodiversity Framework seeks to address this.

To gather the information needed to track and monitor the implementation of national ABS measures, the Nagoya Protocol established the Access and Benefit-Sharing Clearing-House (ABS Clearing-House). As an online platform, the ABS Clearing-House provides a mechanism to share information that Contracting Parties have made available to demonstrate how they are implementing ABS measures, including:

- Legislative, administrative and policy measures on ABS.
- National Focal Point and competent national authority or authorities.
- Additional information, such as:
  - relevant competent authorities of Indigenous Peoples and local communities;
  - model contractual clauses;
  - methods and tools developed to monitor genetic resources;
  - codes of conduct and best practices.

The Nagoya Protocol requires Parties to issue permits (or equivalent) as evidence that prior informed consent has been obtained and that mutually-agreed ABS terms were agreed to. The Protocol requires Parties to notify the ABS Clearing-House of the permits they issue. Where Parties do so, it constitutes an internationally recognized certificate of compliance (IRCC). Unless deemed confidential, certificates of compliance include information about: who issued the certificate; the date issued; the provider of the genetic resources; the person or entity to whom prior informed consent was granted; the subject matter or genetic resource covered by the certificate; whether mutually-agreed terms were established and prior informed consent obtained; and whether the agreement was for commercial and/or non-commercial use.

To support ABS implementation and compliance, Contracting Parties are required to designate a National Focal Point on ABS, one or more competent national authorities on ABS, and to take measures such as the designation of one or more checkpoints to collect or receive relevant information about prior informed consent, the source and utilization of the genetic resource and the establishment of mutually agreed terms.

Where a specialized international ABS instrument applies that is consistent with and does not run counter to the objectives of the CBD and the Protocol, the Nagoya Protocol does not apply in respect of the specific genetic resource covered by the specialized instrument. In countries that are Parties to the Nagoya Protocol and the International Treaty, this is usually taken to mean that the Nagoya Protocol does not apply to plant genetic resources of the 64 species of crops and forage plants that are listed in Annex I of the International Treaty when used for research, breeding and training.

### **[1.2.3] The International Treaty on Plant Genetic Resources for Food and Agriculture**

The International Treaty regulates the conservation and sustainable use of plant genetic resources for food and agriculture (PGRFA), and the sharing of benefits arising from the use of these resources. The International Treaty's objectives are "the conservation and sustainable use of and the fair and equitable sharing of the benefits arising out of their use, in harmony with the [CBD], for sustainable agriculture and food security". The International Treaty was adopted on 3 November 2001 and entered into force on 29 June 2004. As of 16 January 2025, the International Treaty had 154 Contracting Parties.

Unlike the CBD and the Nagoya Protocol that govern ABS for genetic resources of plants, animals and microorganisms, the International Treaty only regulates PGRFA. Importantly, the Treaty includes a set of CBD-compatible ABS rules that form an ABS system called the "Multilateral System of Access and Benefit-Sharing".

The Multilateral System consists of a pool of plant genetic resources that are drawn from different sources. These include the 64 crop and forage species listed in Annex 1 of the International Treaty that:

- are under the management and control of the Contracting Parties and are in the public domain;
- natural and legal persons voluntarily include in the Multilateral System; or
- are held in the *ex situ* collections of the International Agricultural Research Centres of the CGIAR and in other international institutions.

The Multilateral System also includes non-Annex 1 PGRFA. Information about the resources that are part of the Multilateral System can be found in the Global Information System (FAO, 2024).

For users to obtain access to resources in the Multilateral System, they need to conclude a Standard Material Transfer Agreement (SMTA) with the provider of the resources.<sup>9</sup> The SMTA sets out non-negotiable conditions governing the access and use of resources. The key terms of the SMTA are:

- (i) The recipient undertakes that the resources shall be used or conserved only for the purposes of research, breeding and training for food and agriculture. Such purposes shall not include chemical, pharmaceutical and/or other non-food/feed industrial uses.
- (ii) Access to resources in the Multilateral System is meant to be done expeditiously. In doing so, there will be no requirement to track individual accessions.
- (iii) Access to resources in the Multilateral System must be free of charge or, when a fee is charged, the fee should not exceed the minimal cost involved.
- (iv) Users are not allowed to claim intellectual property or other rights over the resources and their genetic parts or components in the form received from the Multilateral System.
- (v) In cases where users commercialize a PGRFA product that incorporates material received from the Multilateral System, and where the product is not available without restriction to others for further research and breeding, users must pay a fixed percentage of the sales of the commercialized product into the International Treaty's International Benefit-sharing Fund.
- (vi) Access to resources under development, including resources being developed by farmers, is at the discretion of their developers.<sup>10</sup>
- (vii) Resources under development are excluded from the scope of commercialization, meaning that the transfer of resources under development will not be considered as a sale for monetary consideration or commercialization. Where resources under development are commercialized as a product, they are no longer treated as resources under development.
- (viii) For reporting about monetary benefit-sharing users, contractors, licensees and lessees are required to submit an annual report to the Governing Body stating:
  - the sales of the product or products;
  - the amount of the payment due; and
  - information that allows for the identification of any restrictions that have given rise to the payment to the International Benefit-sharing Fund.

Benefits for use of PGRFA from the Multilateral System can be monetary and/or non-monetary. There are three forms of monetary benefit-sharing under the Treaty. The trigger for the first two is where recipients use PGRFA that they have received under an SMTA to develop a product that is commercialized. In this context, the benefits that recipients need to pay depend on whether the commercialized product is available without restriction for further research and breeding. Where research and breeding are unrestricted, monetary benefits are shared voluntarily. However, where limits are placed on the ability of third parties to use the commercialized product for subsequent research and breeding, the recipient is required to pay an equitable share of the benefits arising from the commercialization of that product. A third form of monetary sharing occurs where money is voluntarily

<sup>9</sup> Some countries also apply the SMTA to additional crops.

<sup>10</sup> If the developer decides to grant access, the SMTA must be used and the developer may require additional terms and conditions in an agreement separate from the SMTA.

transferred to the Benefit-sharing Fund. In all three situations, the monies are paid into the Benefit-sharing Fund, which is meant to be distributed “primarily, directly and indirectly, to farmers in all countries, especially in developing countries and countries with economies in transition, who conserve and sustainably utilize plant genetic resources for food and agriculture” (FAO, 2009).

Non-monetary benefits shared under the International Treaty take a number of forms including access to the PGRFA available through the Multilateral System, the exchange of information, access to and transfer of technology, and capacity building.

### **[1.2.5] Growing importance of non-state ABS initiatives**

While not addressed in this report in any detail, non-state ABS initiatives play an increasingly important role for research and development, including in the private sector. Over the last decade there has been a proliferation of measures initiated by non-state actors. While the Nagoya Protocol encourages states to support the development and use of voluntary norms such as codes of conduct and best practices guidelines in relation to ABS (Oliva, 2015),<sup>11</sup> many of these initiatives have been driven by non-state actors, often in response to the Nagoya Protocol or national ABS measures. Non-state initiatives relevant to GRFA take a number of forms including best practice guides (Mason *et al.*, 2018), labels, principles<sup>12</sup> and protocols. Scientific journals and grant-funding agencies are also playing a role in enforcing standards reflecting key principles of the Nagoya Protocol by asking, for example, prospective authors or applicants if genetic resources or associated traditional knowledge have been acquired in compliance with applicable ABS measures or principles.<sup>13</sup> Given that users of genetic resources “play a fundamental role in putting ABS in practice” (Oliva, 2015) it is not surprising that non-state initiatives are increasingly being seen as “positive drivers for benefit-sharing” (Schebesta, 2021).

Several explanations have been given for the growth in non-state ABS initiatives. For example, it has been said that under “the contractual approach established by the CBD, users of genetic resources are responsible for jointly establishing and implementing the conditions for access and the arrangements for sharing the resulting benefits”. As a result, “the effective implementation of ABS cannot rely solely on government measures, but also on the active involvement of the users of genetic resources, including the private sector” (Oliva, 2015).

Non-state initiatives play a number of different roles. For example, best practice guides interpret the laws, fill in gaps and help to resolve ambiguities to make laws more meaningful to users.<sup>14</sup> Non-state initiatives such as the Traditional Knowledge and Biocultural Labels<sup>15</sup> and the CARE Principles for

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<sup>11</sup> Nagoya Protocol Art 20. Art 19 supports the development and use of model contractual clauses for mutually-agreed terms on ABS.

<sup>12</sup> For discussion see McCartney *et al.* (2023). The CGIAR Intellectual Assets Principles allow CGIAR centres to restrict access to an intellectual asset if necessary for the further development or dissemination of that asset in furtherance of the CGIAR mission. However, even where such restrictions are justified, the policy specifies that the asset must be freely available to public organizations in developing countries for research and breeding. See Halewood *et al.* (2018).

<sup>13</sup> The journals *Molecular Ecology* and *Molecular Ecology Resources* revised their Data Accessibility Statement in 2020 to incorporate the Nagoya Protocol (<https://onlinelibrary.wiley.com/page/journal/1365294x/homepage/forauthors.html>). The journal *PLoS*'s policy on Inclusivity in Global Research requires authors to disclose whether an agreement on access and benefit-sharing was achieved in accordance with any “field specific regulations, for example the [CBD] and the associated Nagoya Protocol” for research on non-human subjects using specimens or animals (<https://journals.plos.org/plosone/s-best-practices-in-research-reporting>).

<sup>14</sup> In 2024, the Australian Research Council Centre of Excellence in Plant Success and the Australian Research Council Centre of Excellence on Synthetic Biology established public benefit-sharing declarations and best practice guides that allows researchers to access historical genetic resources of uncertain provenance, to respect Indigenous stewardship, and to share benefits. Guides are at <https://www.plantsuccess.org/best-practice-guidelines-for-the-collection-and-transfer-of-genetic-resources/> and <https://www.coesb.com.au/research/nagoya-protocol-best-practice-guidelines/>.

<sup>15</sup> As part of the localcontexts.org initiative researchers are encouraged to make use of Traditional Knowledge and biocultural labels. Traditional Knowledge Labels are designed to be customized by Indigenous Peoples to reflect ongoing relationships and authority including proper use, guidelines for action or responsible stewardship, while biocultural labels are digital markers that focus on accurate provenance, transparency and integrity in research engagements around indigenous data. See Liggins, Hudson and Anderson, 2021; Rakotondrabe and Girard, 2021; Montenegro, 2019; Anderson and Christen, 2013; Christen, 2015; Anderson and Montenegro, 2017.

Indigenous Data Governance<sup>16</sup> provide information needed for users who want to do the right thing to do so (Anderson *et al.*, 2024). Non-state initiatives also increase awareness and facilitate the implementation of ABS requirements. In particular, they “excel at producing and disseminating knowledge and information, including on legal and regulatory requirements” (Oliva, 2015).

### **[1.3] Bilateral and multilateral approaches to access and benefit-sharing**

There are two dominant approaches to ABS that impact on the utilization of GRFA and the consequential sharing of benefits.

The first is the ABS approach established under the CBD and the Nagoya Protocol. One of the features of this ABS approach is that users and providers are directly connected. In return for allowing a user to access genetic resources, the user shares benefits with the provider. To avoid confusion, following common practice, this ABS approach established in many countries in the follow-up to the CBD/Nagoya Protocol is referred to as “bilateral ABS”. These measures should not be confused with what is often referred to as “user country compliance measures” even though bilateral ABS measures and user-country compliance measures will often form part of the same piece of legislation. Through user-country compliance measures, a country aims to ensure that genetic resources are used within its jurisdiction in compliance with applicable ABS measures of another country.

The second ABS approach, which is established under the International Treaty, mainly differs from the bilateral ABS approach of the CBD/Nagoya in two ways. The first is that while access and benefit-sharing are directly linked under the CBD/Nagoya Protocol, they are decoupled under the International Treaty (Manzella, 2018). The second difference is in terms of the parties who are involved in the “exchange”. With bilateral ABS, there are two parties: the provider (who provides the user with access to the GRFA) and the user (who compensates the provider for that access by giving them monetary and/or non-monetary benefits). Under the International Treaty there are a number of parties involved. In relation to the exchange of PGRFA there are two parties (the provider and the user) who are contractually linked by the SMTA. The key difference to the International Treaty’s ABS system is in terms of how benefits are shared. While in some situations under the International Treaty ABS system the user will generate the benefits, in some cases the benefits will be generated by a third party.<sup>17</sup> Another difference is that while under the CBD/Nagoya Protocol benefits are shared with the specific provider, under the International Treaty ABS system the benefits are shared with a diffuse audience. Specifically, monetary benefits are contributed to the Benefit-sharing Fund where they are subsequently shared on a project basis to support small-scale farmers in developing countries to improve their livelihoods and to promote food security and sustainable agriculture through the conservation and sustainable use of plant genetic diversity. While there is a bilateral dimension to ABS under the International Treaty, following common practice, the ABS scheme established under International Treaty is referred to in this report as “multilateral ABS”.

### **[1.4] Distinctive features of genetic resources for food and agriculture**

One of the notable features of the international regimes that regulate access to and use of genetic resources is that they have consistently recognized, in the words of the Nagoya Protocol, “the special nature of agricultural biodiversity, its distinctive features and problems needing distinctive solutions”. As the National Focal Point Survey shows, 38 percent of respondents from 17 countries with ABS measures in place indicate that the ABS measures provide for special provisions for GRFA, such as special authorization procedures of exemptions from scope (Figure 1). Since 2011, the Commission has been working to assist ABS policymakers in taking into account the importance of GRFA and the distinct features of (the different subsectors of) GRFA (Leskien, 2018). In many ways this report builds on this legacy in the sense that the Commission wanted the report to look at the impact of ABS in the

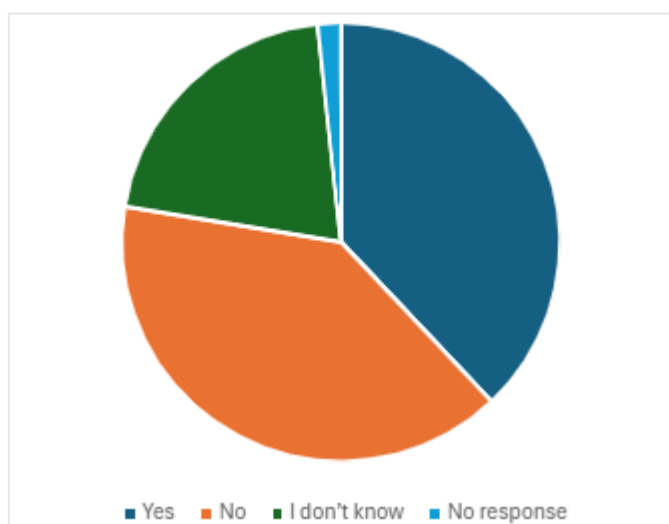
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<sup>16</sup> The *CARE Principles for Indigenous Data Governance* focus on Collective benefit, Authority to control, Responsibility and Ethics in the use and sharing of Indigenous data. The Principles also highlight Indigenous rights and interests in data governance (Russo Carroll, *et al.*, 2020).

<sup>17</sup> For example, clause 6.3 of the SMTA provides that if the recipient conserves the material, he/she shall transfer it with the SMTA.

different sectors of GRFA: namely plant, animal, forest, aquatic, invertebrate and microorganism genetic resources. As seen below, this was not possible: the vast bulk of the responses to the surveys and the ABS literature focus on plant genetic resources – other subsectors are not well represented, if at all.<sup>18</sup> In addition, there was much less of a focus on associated traditional knowledge. These findings were also reflected in our analysis of the IRCCs issued by the ABS Clearing-House and in the surveys conducted at the request of the Commission.

**Figure 1: Do the ABS measures of your country provide for any special provisions applying to GRFA?**



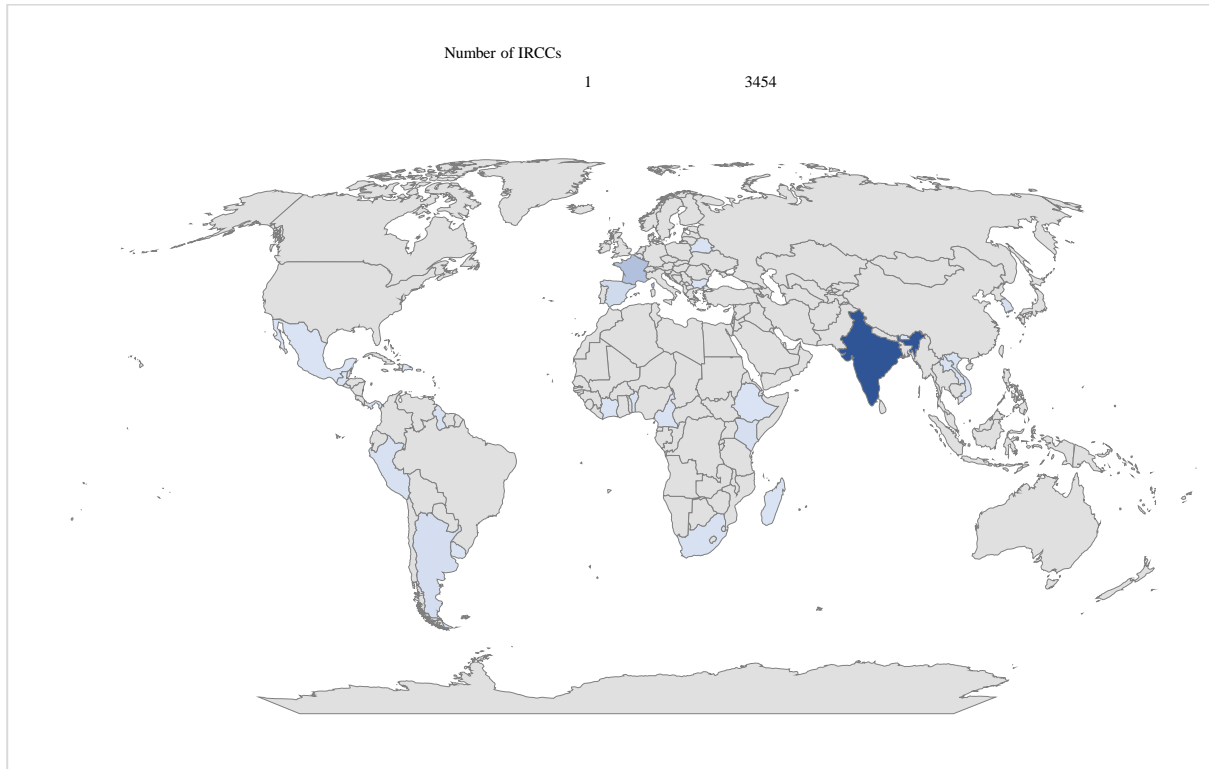
Source: Based on the National Focal Point Survey.

As of 8 November 2024, 5 244 IRCCs from 29 countries have been published on the ABS Clearing-House Website of the CBD (CBD, 2024). About 68.7 percent of the total number of IRCCs published are for India. The geographical distribution of the IRCCs can be seen in Figure 2 and in the Appendix. About 54 percent of the IRCCs are for plant genetic resources, 13 percent for animals, 15 percent for microorganisms, 2 percent for fungi and less than 1 percent for marine genetic resources and associated traditional knowledge (Figure 3).<sup>19</sup> As of 8 November 2024, only ten of the 5 244 IRCCs relate to traditional knowledge associated with genetic resources (CBD, 2024). The type of genetic resource that the traditional knowledge is associated with varies: three are related to plants, one to animals, one to fungi, three were for traditional knowledge not directly related to genetic resources, and the subject matter of two were confidential.

<sup>18</sup> As a Philippine-based respondent to the National Focal Point Survey reported: “No national framework in place yet on the management of Animal Genetic Resources. There are however continuing implementation of programs, projects and activities by national government research and development institutions on its conservation, development and utilization, and ongoing related legislative bills on the Philippine Native Animals.”

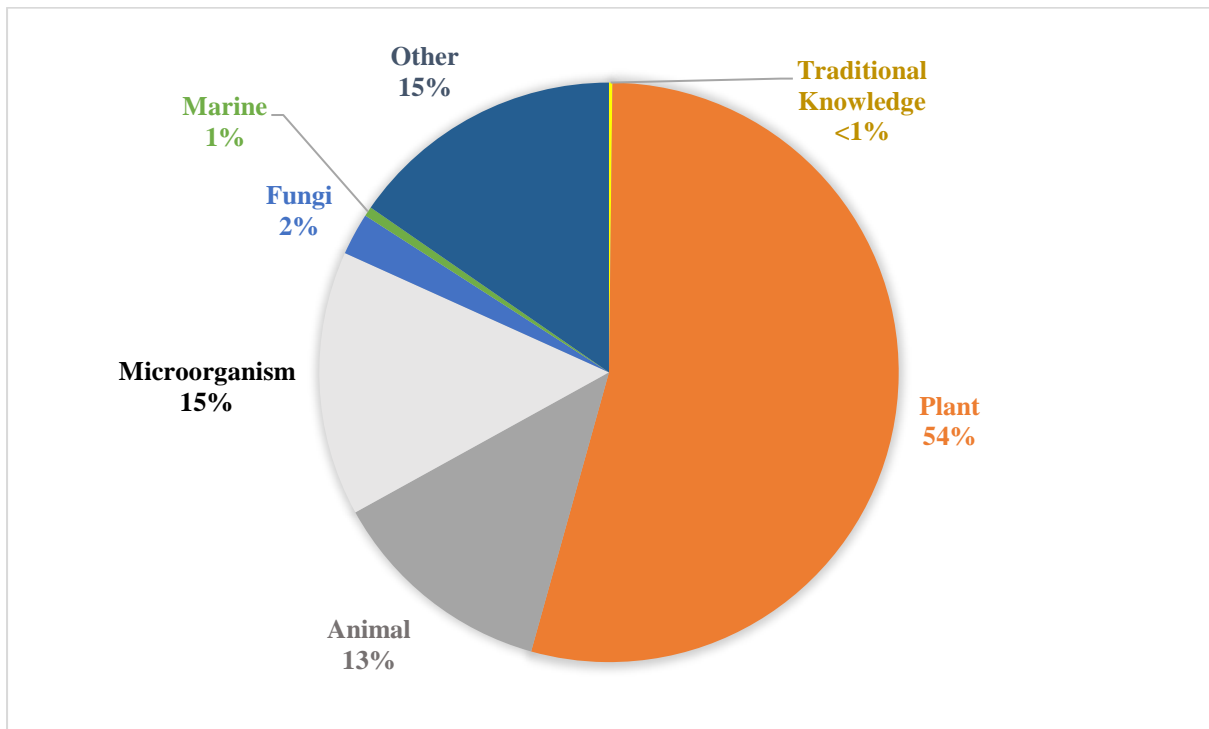
<sup>19</sup> The ABS Clearing-House does not have a category for marine genetic resources by which to sort IRCCs. Accordingly, this figure includes IRCCs where the subject matter was obtained from marine and coastal areas.

**Figure 2: Geographical distribution of internationally recognized certificates of compliance**



Source: Based on data from the ABS Clearing-House.

**Figure 3: Distribution of internationally recognized certificates of compliance by type of genetic resource**



Source: Based on data from the ABS Clearing-House.



### **[1.5] Current debates on indicators for measuring monetary and non-monetary benefits**

To determine whether the goals of ABS instruments are being met, it is necessary to have a sense of the benefits that are being shared as a result of ABS measures. While some benefits are easy to measure, others are not. For some time now, discussions have been underway about how to measure and audit the benefits shared as a result of ABS. This process was formalized at the international level (at least in relation to the CBD/Nagoya Protocol) when the monitoring framework for the Kunming-Montreal Global Biodiversity Framework was adopted in December 2022.

As part of the Kunming-Montreal Global Biodiversity Framework, the Contract Parties set long-term<sup>20</sup>- and short-term<sup>21</sup> objectives in relation to the fair and equitable sharing of the monetary and non-monetary benefits arising from the utilization of genetic resources, digital sequence information on genetic resources and traditional knowledge associated with genetic resources. To “facilitate the monitoring and review of progress at all levels in a more transparent and responsible manner”, a monitoring framework was adopted to measure progress towards the goals and targets of the Biodiversity Framework.<sup>22</sup> It was thought that with more information about the benefits received that countries could “measure the effectiveness of their ABS systems and mobilize political will and resources for implementing” the ABS targets and goals of the Kunming-Montreal Global Biodiversity Framework<sup>7</sup> (Muñoz-García, Lago and Scholz, 2024). One of the problems is that neither the CBD nor the Nagoya Protocol require countries to monitor and report on benefits provided or received under ABS agreements. This is compounded by the fact there was also no agreed way to measure benefits (Muñoz-García, Lago and Scholz, 2024).

Auditing the progress of ABS goals poses a number of challenges. The first is deciding what criteria should be used to quantify benefit. While this is not an issue in relation to monetary benefits, it is a live issue for non-monetary benefits. Given that there is no obvious way of quantifying non-monetary benefit, the question becomes: what proxies or indicators should stand in for benefit?

Once it has been decided what the criteria are that will be used to measure benefits, the next question to be determined is where and how this information will be found. Again, this is not an easy task. There are a number of reasons for this, not least that there is no requirement for parties who receive or provide GRFA under an ABS agreement to report on what has happened once a project is completed (including the benefits that have been shared). As a study on ABS indicators found, determining levels of monetary payment is difficult. One reason for this is that with the notable exception of Brazil, India and South Africa most countries do not collect information about monetary benefits paid.<sup>23</sup>

Collecting information about benefits through decentralized and disconnected ABS agencies is complicated by the fact that there is often a time lag between when GRFA are accessed and when benefits are shared, and because benefits might be managed by non-ABS agencies.<sup>24</sup> These difficulties are compounded by confidentiality clauses in ABS agreements. As a commentator noted, “confidentiality clauses in the contractual ABS agreements make it difficult both to provide an accurate

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<sup>20</sup> Goal C: The monetary and non-monetary benefits from the utilization of genetic resources and digital sequence information on genetic resources and of traditional knowledge associated with genetic resources, as applicable, are shared fairly and equitably, including, as appropriate with Indigenous Peoples and local communities, and substantially increased by 2050, while ensuring traditional knowledge associated with genetic resources is appropriately protected, thereby contributing to the conservation and sustainable use of biodiversity, in accordance with internationally agreed access and benefit-sharing instruments.

<sup>21</sup> Target 13: Take effective legal, policy, administrative and capacity-building measures at all levels, as appropriate, to ensure the fair and equitable sharing of benefits that arise from the utilization of genetic resources and from digital sequence information on genetic resources, as well as traditional knowledge associated with genetic resources, and facilitating appropriate access to genetic resources, and, by 2030, facilitating a significant increase of the benefits shared, in accordance with applicable international access and benefit-sharing instruments.

<sup>22</sup> CBD/COP/DEC/15/5. As many of the targets were new, without established indicators or had no systematic process for measurement, the Ad Hoc Technical Expert Group on Indicators was established to operationalize the Monitoring Framework.

<sup>23</sup> CBD/COP/16/L.26 is expected to be formally adopted at the second resumed Session of the Sixteenth meeting of the CBD COP.

<sup>24</sup> For metadata on Target 13 headline and binary indicators see *Revised guidance on using the indicators of the monitoring framework of the Kunming-Montreal Global Biodiversity Framework*, CBD/COP/16/INF/3/Rev.1

empirical assessment of ABS practices, and to assess whether the actual content of agreements is indeed fair and equitable” (Schebesta, 2021).

The monitoring framework as adopted in 2022 includes headline and binary indicators which are recommended for national, regional and global monitoring, and more detailed component and complementary indicators. The headline and binary indicators aim to capture the main elements of each goal and target of the Kunming-Montreal Global Biodiversity Framework. The component indicators aim to capture key elements of the goals and targets that are not as well captured by the headline indicators. The complementary indicators provide a resource of available indicators that could be used to track specific aspects of the goals and targets.

For Target 13, the CBD COP reached agreement on two headline indicators: (C.1) Monetary benefits received in accordance with internationally agreed ABS instruments and (C.2) non-monetary benefits arising from applicable international ABS instruments. Few countries have the information on these indicators readily available. For them the monitoring framework offers a binary indicator: (C.b) Number of countries that have taken effective legal, policy, administrative and capacity-building measures to ensure the fair and equitable sharing of benefits from the utilization of genetic resources and from digital sequence information on genetic resources, as well as traditional knowledge associated with genetic resources.<sup>25</sup> While this indicator tracks Parties’ progress towards implementing ABS measures, it does not measure the benefits generated by them.<sup>26</sup>

### **[1.6] Empirical data on the impact of access and benefit-sharing measures on the use and exchange of genetic resources for food and agriculture and the sharing of benefits**

Overall, there has been little consideration given to the empirical data on the impact of ABS measures on the use and exchange of GRFA and the consequential sharing of benefits. To the extent that it has been considered, the responses have been united in their belief that there are no reliable empirical assessments of the effect of ABS measures (Schebesta, 2021). As commentators have noted “there is a distinct lack of empirical evidence about the positive or negative effects of the measures accommodating directly or indirectly the distinctive features of GRFA on GRFA users, the conservation and sustainable use of genetic resources for food and agriculture, the sharing of benefits derived from them and food security. There is also a distinct lack of empirical evidence about how the specific measures have been implemented in practice and of publicly available examples of GRFA/[traditional knowledge] related to GRFA-specific benefit-sharing agreements” (Humphries *et al.*, 2023).

Much of the literature that looks at the impact of ABS measures on the use of GRFA and the sharing of benefits is desk-based and speculative. In many ways this is to be expected when dealing with prospective or new laws. There is however a growing body of ABS literature that is based on empirical evidence.

While there is overlap, the empirical evidence tends to take three forms. The first is the information collected and distributed by ABS agencies (such as the number of countries with ABS measures or the number of IRCCs that have been issued). The second are surveys and structured interviews that target particular issues, locations or groups of stakeholders. On the whole, these were helpful in understanding the impact of ABS measures. The third and most common type of empirical evidence in the literature are anecdotal stories (both personal and hearsay) about the consequences and impact of ABS. While such evidence is often maligned, many of the arguments were compelling, not least because similar issues were repeated several times. This was reinforced by the fact that the anecdotal stories were not only consistent with each other but also consistent with the findings of the surveys and structured interviews. This consistency increased the persuasiveness of the evidence.

A number of challenges arose in reviewing the literature. One challenge in using the IRCCs to draw conclusions about benefit and use is that the certificates are based on what was planned or promised,

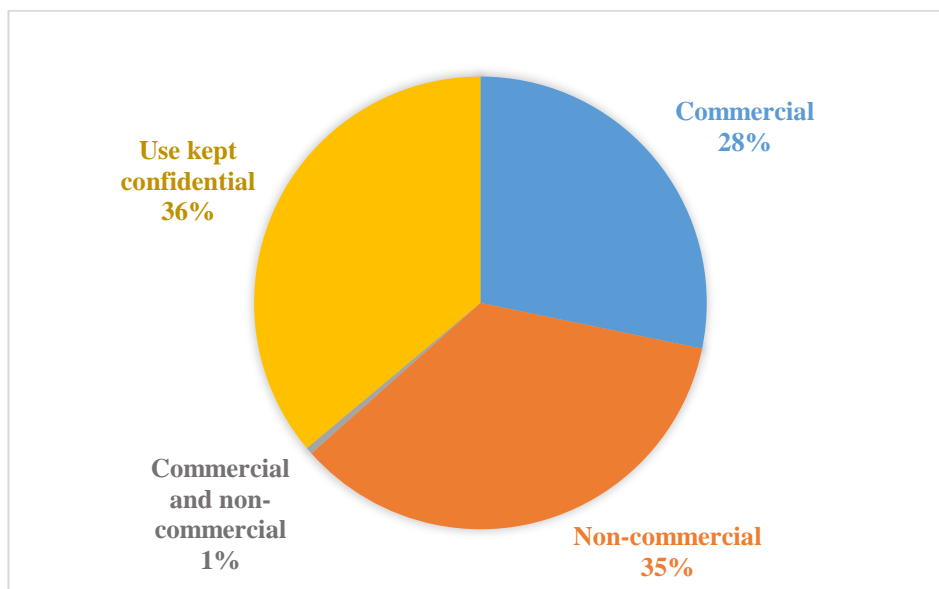
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<sup>25</sup> Ibid 24.

<sup>26</sup> Ibid 24-25.

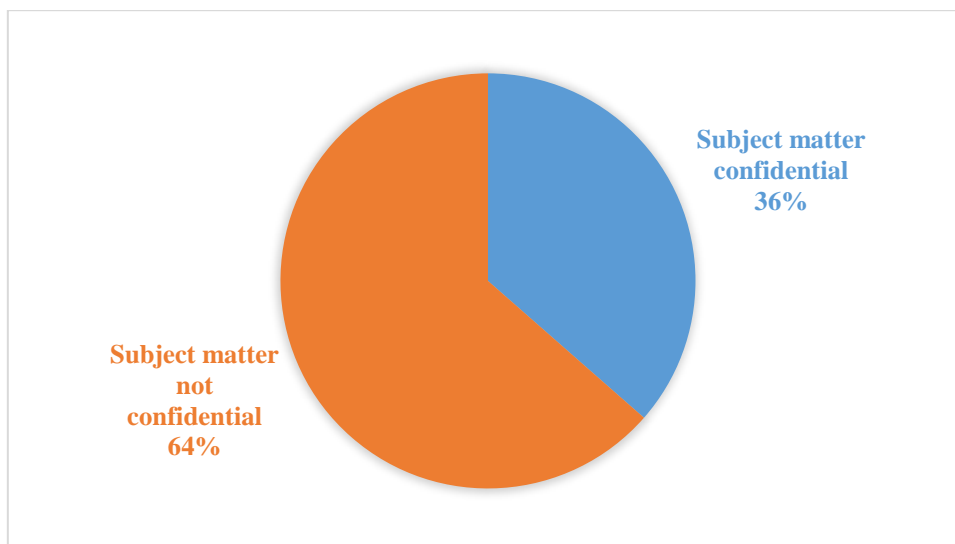
not on what was delivered. The value of the IRCCs was further undermined by the fact that 36 percent of the IRCCs in the ABS Clearing-House deemed the subject matter to be confidential (CBD, 2024). Although 28 percent of the IRCCs reported their usage as commercial and 35 percent as non-commercial, 36 percent deemed the use of the resource confidential (Figure 4) and 36 percent deemed the subject matter confidential (Figure 5).<sup>27</sup> The non-disclosure of this information limits what can be learned from IRCCs.

**Figure 4: Distribution of internationally recognized certificates of compliance by use**



Source: Based on data from the ABS Clearing-House (as of 8 November 2024).

**Figure 5: Confidentiality of internationally recognized certificates of compliance in relation to subject matter**



Source: Based on data from the ABS Clearing-House (as of 8 November 2024).

<sup>27</sup> A small number of IRCCs that declared use as both commercial and non-commercial were not included.

## **[2] Sources of information/methodology of the report**

This report relied on primary and secondary sources of information. Primary information was collected via surveys. Secondary information was obtained from a review of the literature, including books, book chapters, journal articles, policy papers, technical and scientific reports, international and national laws, UN reports and publications, industry and research reports.

### **[2.1] Surveys**

In preparation for this report, two surveys were circulated to participants for completion between July and September 2024. One survey was sent to National Focal Points; the other was sent to users and providers of GRFA. Although the two surveys varied slightly in content (the National Focal Point Survey had 83 questions compared to 67 in the User and Provider Survey), both surveys addressed the same goal: namely, to gather information from participants about (i) ABS measures both within their own country and in countries in which they exchanged genetic resources and (ii) their experiences with the practical implementation of these measures. To this end, participants were asked about their involvement in the exchange of GRFA, their compliance with ABS measures either as provider or user, any benefits that flowed from the transaction, and any difficulties they encountered in the exchange of resources due to ABS measures. The survey also included higher-level questions such as the details of ABS measures implemented domestically, the number of ABS permits granted, and steps taken to inform and educate stakeholders on ABS measures. The results of the surveys should be interpreted with caution as some replies may be based on different interpretations of questions or terms used in the survey questions. In addition, the responses provided have not been independently verified.

The first survey was sent to the Commission's National Focal Points for plant, forest, microbial and invertebrate, and aquatic genetic resources and National Coordinators for animal genetic resources (National Focal Point Survey). This survey received 118 responses from National Focal Points in 70 countries. Of these, more than 70 percent of the respondents were from countries that were parties to the Nagoya Protocol. The National Focal Point Survey provided useful information in a range of areas including the way that different countries have implemented ABS in national laws, experiences with ABS measures, the number and type of samples accessed, and the impact of ABS measures on the use and exchange of GRFA.

Focal Points from than half of the countries participating in the survey (38 of 70 countries) indicated that their country had ABS measures in place, i.e. measures according to which access to genetic resources for their utilization is subject to prior informed consent (PIC) and mutually agreed terms (MAT). Twenty-two National Focal Points (from 17 out of 38 countries) reported that their ABS measures provided for special provisions applying to GRFA, e.g specific exemptions or special (such as fast-track) procedures for GRFA.

The survey showed that 62 percent of respondents (or their institutions) from 51 countries exchanged (provided or received) GRFA for their utilization. Respondents also indicated the types of GRFA they exchange and the original source of the GRFA exchanged (see Figures 6 and 7). The survey also showed that the majority of the transactions were "always" or "in most cases" carried out in compliance with ABS requirements. The survey also provided important information on the respondents' experience in relation to the impact of ABS measures on the use of GRFA: Only 8 out of 54 respondents indicated that within the last five years ABS measures had prevented them (or their institution) from obtaining access to GRFA. However, a total of 64 respondents did not know or did not reply to the question. Similarly, only 10 of out 59 respondents indicated that ABS measures had caused them (or their institution) to deny access to GRFA (59 did not know or did not reply).

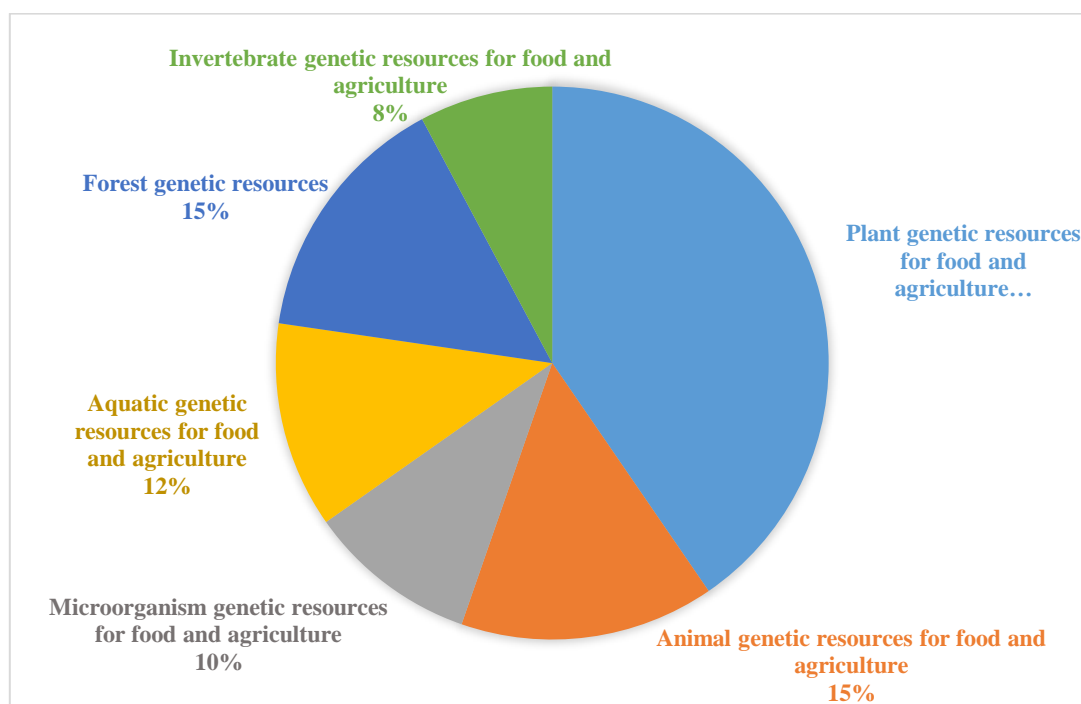
National Focal Points were asked about their experiences with ABS permits, the number of permits granted and the types of GRFA covered. The National Focal Point Survey showed that 25 of the 70 countries (36 percent) had granted ABS permits for the utilization of GRFA. It also revealed that five countries had granted more than 50 permits, five countries had granted between 11 and 50 permits, and eight countries had granted ten or fewer ABS permits for GRFA. It is worth noting that almost 80 percent of the countries granting ABS permits were from the global South.

There were a number of limitations to the National Focal Point Survey and the data it produced. While there were 118 responses to the survey, only 58 (49 percent) of the respondents were from countries with ABS measures in place; i.e. measures according to which access to genetic resources for their utilization shall be subject to prior informed consent (PIC) and mutually agreed terms (MAT). In addition, only 73 respondents (62 percent) from 50 participant countries said that they were involved in the use or exchange of GRFA.

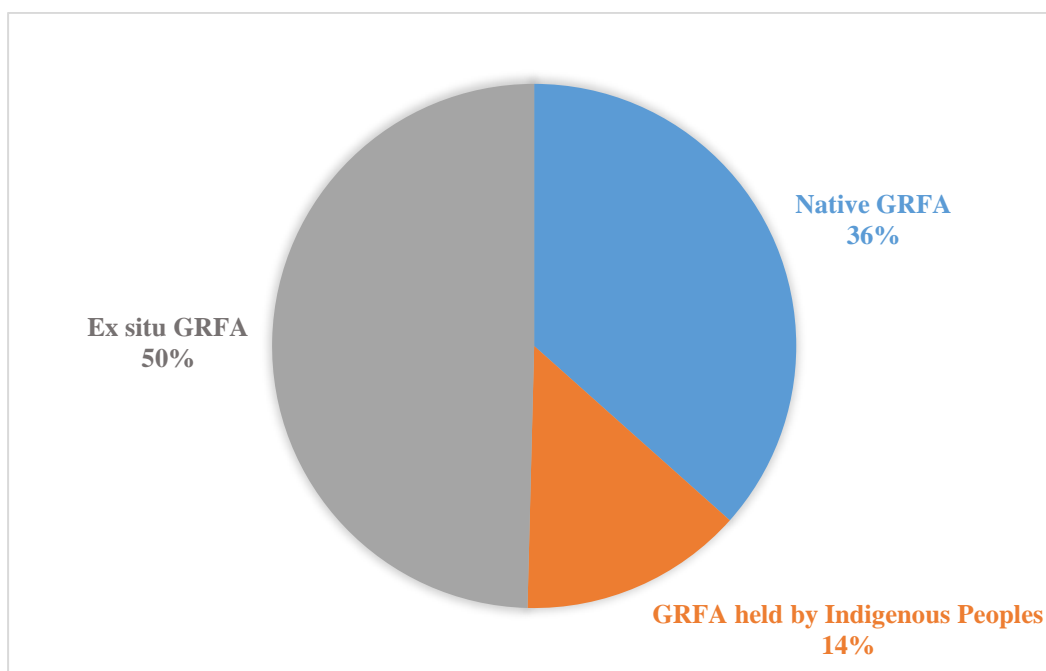
Another issue that arose with the survey related to the way that respondents understood what was meant by ABS measures. There were also issues in relation to how respondents estimated the number of samples exchanged or permits granted. As a result, the numbers provided have not been used to draw conclusions about behaviour. Rather they have been used to identify peculiarities or commonalities.

A further limitation with the National Focal Point Survey is that while it provides useful information on ABS in relation to plant genetic resources, there was limited information about other subsectors of GRFA. From a sample of 72 respondents, more than 60 percent indicated that they were most knowledgeable about or familiar with PGRFA. The focus on plants was reinforced by the fact that they form the largest group of GRFA for which respondents reported that ABS permit had been granted by their country (Figure 8). It was unclear from the survey responses whether the ABS permits were exchanged under bilateral ABS agreements or SMTAs. Another problem with the National Focal Point Survey was that respondents from the same country sometimes provided different answers to the same question. In such cases the decision was made to use the response provided by the majority of representatives of a country.

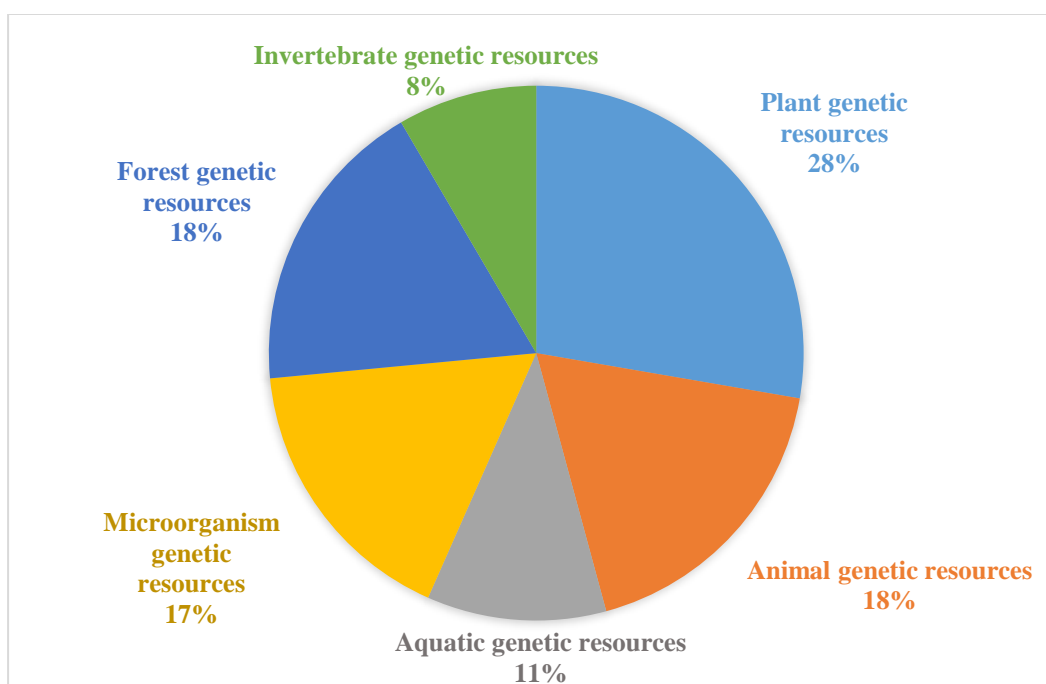
**Figure 6: Type of GRFA exchanged (provided or received) by respondents**



Source: Based on the National Focal Point Survey.

**Figure 7: Original status/source of GRFA exchanged (provided or received)**

Source: Based on the National Focal Point Survey.

**Figure 8: Access and benefit-sharing permits granted by type of GRFA**

Source: Based on the National Focal Point Survey

The second survey was addressed to providers and users of GRFA (the User and Provider Survey). This survey only received 22 responses from people in 16 countries. The respondents came from a variety of professional backgrounds including the private sector, public institutions including government, research and academia, genebanks, Indigenous Peoples and local communities. Ninety-one percent of the respondents were from countries that are parties to the Nagoya Protocol.

The sample size of 22 was too small to conduct any valuable analysis. The utility of the survey was further reduced by the fact that only 15 respondents reported that they or their institution provided or received GRFA. Although 15 respondents noted that they or their institution exchanged a variety of types of GRFA, the vast majority of respondents focused on PGRFA (12 out of the 15 said that they were most familiar with PGRFA). The survey also suffered from many of the limitations discussed in relation to the National Focal Point Survey including incomplete surveys, inconsistent information and a focus on PGRFA. Despite this, the User and Provider Survey contained useful anecdotal evidence that largely aligned with the trends and responses found in the National Focal Point Survey. The survey also provided important insights into the ABS issues experienced by parties actively involved with GRFA. If it is decided to repeat the survey, the survey should focus on experiences with bilateral ABS measures as applied to GRFA other than PGRFA.

## [2.2] Literature

The review was undertaken on literature published between 2014 and 2024 that looked directly or indirectly at ABS for GRFA. 2014 was chosen as the starting point to coincide with the year when the Nagoya Protocol came into force. In exceptional cases, reference is also made to literature that predates the entry into force of the Nagoya Protocol. While the primary focus was on literature that looked at ABS for GRFA, the report also looked at ABS in other domains (such as pharmaceuticals). When doing so, the focus was on general claims made about ABS.

Across the voluminous and growing body of literature on ABS for GRFA, even in the most critical of accounts there was no disagreement about the value of the goals of ABS which were described as “noble” (Tsioumani, 2018; Silvestri *et al.*, 2020; Silvestri and Mason, 2023) and “laudable” (Divakaran Prathapan *et al.*, 2018; Halewood *et al.*, 2023). The bulk of the literature was concerned with (bilateral) ABS under the CBD and the Nagoya Protocol rather than multilateral ABS or the International Treaty. In relation to the type of GRFA considered, the majority of the literature focused on plants. There was very little written on the other subsectors of GRFA. In this sense, these findings confirm the two surveys conducted for this report as well as a recent survey on ABS literature that found that there “was a very strong overall bias towards plants (32 percent of publications). In contrast publications on aquaculture (5 percent) (Humphries, Benzie and Morrison, 2019) animal (5 percent), microbial (2 percent), and fungal (0.1 percent) genetic resources form a very small component of the overall ABS literature”<sup>28</sup> (Morrison, Humphries and Lawson, 2021). There was also very little written on traditional knowledge associated with GRFA.

The literature on ABS has changed considerably since 2014. Initially the bulk of the literature was concerned with explaining the mechanics of the ABS systems and how they might be or had been implemented in countries. Since then, there have been a growing number of more critical accounts of ABS. Generally speaking, the literature tended to take one (or more) of the following approaches:

- Descriptive accounts of the key features of ABS.<sup>29</sup>
- Positive accounts of ABS.
- Identification of problems with ABS that were explained as teething problems that would be worked out over time.
- Identification of problems with ABS caused by systemic issues but optimistic about the possibility of reform.
- Identification of problems with ABS but sceptical of the possibility of reform – calling for a radical rethink (but still agreeing with the basic goals of ABS).

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<sup>28</sup> The remaining 55.9 percent of articles were of a general nature.

<sup>29</sup> A large proportion of the literature aims to fulfil the important role of describing the key features of ABS laws and policies (either at international or national level). While this becomes less important as people come to understand the laws, it is regularly renewed by changes in the law or by the development of new problems (the latest being DSI and how to measure benefits). For a detailed comparative account of national ABS laws see Humphries *et al* (2023).

One of the notable features of the literature, particularly in recent years, is that it is critical of bilateral ABS. While this is a clear indication of some of the problems with ABS, it has been suggested that this might be skewed by the fact that commentators tend to write about problems with ABS rather than positive features.



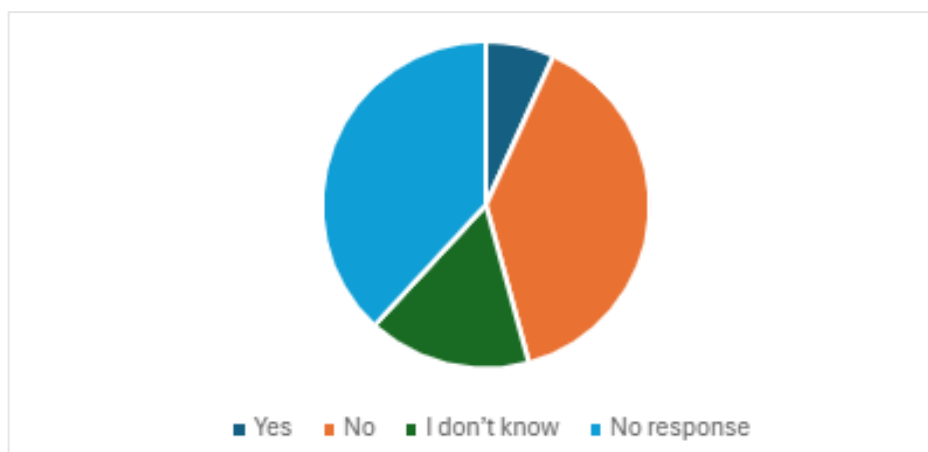
## Part II: Impact of Bilateral ABS

### [3] Impact of bilateral access and benefit-sharing on the utilization of genetic resources for food and agriculture and associated traditional knowledge

#### [3.1] Positive impact of bilateral access and benefit-sharing

The National Focal Point Survey provides useful data about the positive impact of ABS measures on the utilization of GRFA (it provided much less information about the use of associated traditional knowledge). In particular, the National Focal Point Survey showed that over the last five years the majority of samples were “always” or “in most cases” exchanged in accordance with ABS measures.<sup>30</sup> Only 8 out of 54 respondents indicated that within the last five years ABS measures had prevented them (or their institution) from obtaining access to GRFA (64 did not know or did not reply) and only 10 of out 59 respondents indicated that ABS measures had caused them (or their institution) to deny access to GRFA (59 did not know or did not reply) (Figures 9 and 10).

**Figure 9: During the last five years, have ABS measures ever prevented you or your institution from obtaining access to GRFA?**



**Figure 10: During the last five years have ABS measures ever caused you or your institution to deny access to GRFA?**



<sup>30</sup> It is unclear from the survey results whether this was for PGRFA provided under bilateral ABS or under SMTAs.

The National Focal Point Survey also showed that there are a range of parties involved in the exchange of GRFA ranging from individual researchers, Indigenous Peoples and local communities through to public and private genebanks, research institutes (both public and private), national parks and intergovernmental organizations.

The literature on ABS includes many accounts of the positive impact of ABS schemes under the CBD and Nagoya Protocol. Most of these success stories focus on pharmaceuticals (Rourke, 2018).<sup>31</sup> There is also evidence of bilateral ABS measures that operate well. For example, a study on the impact of ABS in the field of biological control found that in South Africa ABS “requirements and procedures were simple and easily understood, management of the processes required for use and export of biological control agents remained consistent, assistance provided focused on the intent of the N[agoya P[rotocol], decision making was consolidated in a single national entity, and there was sufficient institutional capacity to efficiently manage access to potential biological control agents” (Mason *et al.*, 2023a. See also Silvestri *et al.*, 2018).

While there may be little conclusive evidence that bilateral ABS has impacted positively on the use of GRFA, a number of benefits have been identified.<sup>32</sup> For example, it has been said that for “decades, ABS has provided an invaluable home for important and otherwise orphaned dialogues on ethics and equity in research, ownership, and control of genetic resources and traditional knowledge, capacity building, technology transfer, and other issues” (Laird *et al.*, 2020. See also, Winter, 2021; Laird and Wynberg, 2016).

It has also been suggested that ABS has played an important role in changing the way genetic resources are accessed and used. For example, it has been claimed that “[a]ccess and benefit-sharing, while fraught, irreconcilable and fractured today, could well catalyse just the kind of forum needed to turn perceived challenges into opportunities for growth, redress and a reconceptualization of the rooibos industry” (Wynberg, 2017). Benefit-sharing has also said to have helped to:

- facilitate political compromise about access to and use of genetic resources (Ten Kate and Laird, 1999);
- raise awareness of the respective rights of countries, Indigenous Peoples and local communities as appropriate in relation to GRFA;
- incentivize global cooperation and collaboration of research organizations and researchers;
- encourage “public research organizations and companies to engage in responsible sourcing of genetic resources” (Halewood *et al.*, 2023); and
- increase awareness of the potential value of GRFA that has been used as a lever to ensure better protection and conservation of genetic resources.<sup>33</sup>

### **[3.2] Negative impact of bilateral access and benefit-sharing**

This section discusses the ways in which ABS is reported to have negatively impacted the exchange and utilization of GRFA and associated traditional knowledge. As can be seen, there are a growing number of accounts that highlight the negative impact that bilateral ABS is having on the utilization of

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<sup>31</sup> For examples of positive ABS see Collings (2023); Robinson (2014).

<sup>32</sup> The Nagoya Protocol “is a success in terms of its relatively rapid entry into force” (NordGen, 2023).

<sup>33</sup> One of the benefits of the (failed) ABS Agreement between Ethiopia and a Dutch company was that it “increased recognition at the Dutch Embassy in Ethiopia of the role of international agreements on conserving crop genetic resources, and greater interest in cooperating in projects related to the conservation and sustainable use of these resources in Ethiopia. Such projects were initiated some years ago and are now underway” (Andersen and Winge, 2012).

GRFA.<sup>34</sup> As commentators noted in 2020, in “recent years, concerns associated with ABS policy have expanded and grown more urgent” (Laird *et al.*, 2020).<sup>35</sup>

In looking at the ways in which ABS has impacted on the way GRFA are utilised we have broken the section into two parts. The first section [3.2.1] summarises the different *problems* that commentators have identified in the scope and operation of bilateral ABS. In the following section [3.2.2] we look at the consequences of these problems in terms of the way they *impact* on the utilization of GRFA and associated traditional knowledge (paying particular attention to the evidence used to support such claims).

One of the reasons why we have separated ‘problem’ and ‘consequence/impact’ in this way is because problems are not equal: people, organizations, and countries will respond differently to problems depending on a range of factors (Fusi *et al.*, 2018). As a result, caution is needed about assuming that a problem necessarily has a consequence (and an impact), or that the degree of impact will always be the same. While in some situations a problem may lead to a change in the way GRFA are exchanged or utilized, in other cases it may not. For example, in some situations a problem such as ABS adding additional cost to research may not impact on the way that GRFA are used (this might be the case with large firms or well-funded researchers). In other cases, however, the imposition of an additional cost may mean that research does not proceed.

There are a number of exacerbating factors that influence the impact that a problem has on the utilization of GRFA and associated traditional knowledge including:

- The size of the organization (small organizations may be more vulnerable).
- Experience with ABS (repeat players, bad/good experiences).
- The nature of the use (simultaneous use of multiple genetic resources exacerbates problems).
- The scale of the use (working across jurisdictions exacerbates problems).
- Where the access occurs (a problem for a Queenslander working in Queensland is different to a Norwegian working in Queensland).
- Whether it is possible to access the GRFA from another source.
- Cumulative effect of problems.
- The consequences of non-compliance (fines, loss of patents, etc.).
- Whether research has clear commercial pathways or goals.
- The strength of the policy-science interface and scientific institutions within a country (Divakaran Prathapan *et al.*, 2018)

### **[3.2.1] Problems with the scope and operation of bilateral ABS**

#### **(i) ABS laws and procedures are complex and confusing**

One complaint repeatedly raised in the literature is that ABS laws and procedures are different in different countries (and sometimes within countries) and as a result the laws are complex and difficult to navigate. As a commentator noted, “[u]sers are currently often confronted with unclear and/or inconsistent access and user compliance rules which do not provide the necessary legal certainty, with difficulties in obtaining reliable information on such rules, as well as with challenging ABS processes and procedures.”<sup>36</sup>

<sup>34</sup> For example, see Laird *et al.*, 2020; Michiels *et al.*, 2022; ICC, 2020; Rourke *et al.*, 2020; Sara *et al.*, 2022; Bourdy *et al.*, 2017; Milieu Law and Policy Consulting, 2020; Manheim, 2019; Watanabe, 2017.

<sup>35</sup> This has included discussions about “whether the ABS legal framework in its current form is suited to delivering its objectives of facilitated access to genetic resources and the fair and equitable sharing of benefits from their use” (NordGen, 2023).

<sup>36</sup> ICC, 2017, 2. See generally Louafi and Welch, 2021.

While Article 6(3)(a) of the Nagoya Protocol requires parties to provide for legal certainty, clarity and transparency in their domestic laws this does not apply to “certainty, clarity and transparency” *between* different legal systems. Instead, countries are free to create their own “ABS system and can choose, inter alia, what type of biodiversity is regulated, what benefits must be shared, and how permits are granted” (Halewood *et al.*, 2023). As a number of reports have shown (Humphries *et al.*, 2021), countries have taken up this opportunity and tailored their ABS systems to suit their own needs.<sup>37</sup> The result is (sometimes markedly) different laws and procedures in different countries and sometimes even within countries. This has led to a “large variety across the globe in the scope of ABS laws as well as in the procedures to secure ABS compliance” (Leskien, 2023). The diversity is compounded by the fact that “the Protocol, like many international agreements, is filled with broad and ambiguous language. In the absence of clear legal standards, countries are adopting different — if not entirely conflicting — regulatory requirements to implement the agreement” (Manheim, 2019; Michiels *et al.*, 2022).<sup>38</sup>

A number of differences have been identified between different national ABS laws and procedures. These include differences in terms of the type of genetic resources regulated,<sup>39</sup> whether materials collected before the law came into effect are covered (temporal scope),<sup>40</sup> when the ABS obligations are triggered,<sup>41</sup> the types of activities covered (Morgera and Geelhoed, 2016), the geographical scope of the laws, and where the resources come from (Sirakaya, 2019). Differences of this nature have led commentators to conclude that “the emerging [ABS] legal system is not the transparent and cohesive legal mechanism envisaged under the agreement. Rather, it is said to more closely resemble a global hodgepodge of amorphous, disparate, and inconsistent national legal requirements” (Manheim, 2019).

Nearly all of the literature looking at the different laws and measures does so from the perspective of researchers and organizations working across or between countries and the problems that these differences pose for users. There is much less of a concern with the potential benefits that this flexibility offers in allowing users to forum-shop and for countries to develop laws and procedures suited to their local needs and expectations, such as the needs and expectations of Indigenous Peoples or local communities.

As well as highlighting problems in working between the laws of different countries, commentators have also raised concerns about ABS laws in particular countries – which were described as incomplete, unclear, uncertain, ambiguous, complex and unwieldy.<sup>42</sup> The problems raised about national laws were wide-ranging. Unsurprisingly, the problems were also not consistent between countries. The problems raised ranged from general concerns about the validity of the law and its relation to other domestic laws

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<sup>37</sup> See Michiels *et al.*, 2022.

<sup>38</sup> As a National Focal Point said in their Survey response: the “international landscape of ABS measures is very complex, therefore stakeholders of our sector face huge challenges in complying with national ABS legislations and establishing PIC and MAT in other countries. Reasons range between language challenges and long processing times up to capacity problems or staff turnover in provider countries. Facilitated access to AqGR does not seem to exist in many countries. There are also problems, for example, in carrying out research in the context of food safety, especially in the case of aquatic resources, where it is often not possible to identify the country of origin, and which in some cases may not even exist if the fish originates from areas beyond national jurisdiction.”

<sup>39</sup> “Current ABS systems have left many genetic resources and types of use ‘out of scope’ for historical and legal reasons, for example, GRs in most developed countries, which have generated over half of the DSI in public databases” (Halewood *et al.*, 2023). As a respondent to the National Focal Point Survey said: “In some cases, material was accessed prior to the enactment of ABS legislation and as such much of the information required thereby was not obtained at the time of accession. In these situations, we are forced to abandon the material /resource and are thus unable to utilise the same due to a fear of repercussions based on ABS legislation.”

<sup>40</sup> In most countries, genetic resources that have been accessed and used prior to the entry into force of the Nagoya Protocol (or the CBD) fall outside the scope of the ABS measure. But there are countries where benefit-sharing obligations may apply to such genetic resources, for example if they are marketed for newly discovered uses (Leskien, 2023. See also Silvestri *et al.*, 2020; Winter and Kamau, 2022).

<sup>41</sup> “The biological control community faces a number of specific problems with the reality of ABS. For various activities that typically form part of research and development in biocontrol agents, it is often not clear if or under which circumstances they trigger ABS obligations. It may be unclear, for example, whether the collection, export or taxonomic identification of the pest or of the natural enemies, by morphological or molecular analysis, qualify as ‘utilization’ and therefore trigger ABS obligations, i.e., the requirement to obtain prior informed consent of the country the organism originates from and to share eventual benefits with that country” (Leskien, 2023. See also Silvestri *et al.*, 2020).

<sup>42</sup> “Perhaps the most frequent complaint of many user communities, including the biological control community, is the lack of legal certainty” (Leskien, 2023; Silvestri, *et al.*, 2020).

through to more specific concerns such as the meaning of traditional knowledge and the standing of DSI within ABS laws (Ebert *et al.*, 2023, Michiels *et al.*, 2022; Eaton and Visser, 2007; Mahop, 2022; Shouche, 2019). These problems have been compounded by vague definitions,<sup>43</sup> legal loopholes, overlapping laws,<sup>44</sup> uncertainty about standards and onus of proof, and avenues for appeal and review (Schloen, 2019).

One of the explanations given for the complexity of the ABS systems is that many countries have embraced highly granular individual transaction-based approaches to ABS.<sup>45</sup> This is said to require “complex systems to, for example, evaluate access applications, track and trace uses of accessed materials in [research and development] and commercialization of derived products, and create formulas for calculating payments for products derived from multiple [genetic resources]” (Halewood *et al.*, 2023). This complexity is particularly problematic where the measures are fragmented and scattered (Mason *et al.*, 2023a; Silvestri *et al.*, 2020; Silvestri *et al.*, 2018). “This is especially true in Federations (Argentina [and Australia]), and where ABS powers are delegated to provinces or counties (South Africa, Argentina, Kenya)” (Kamau, 2022a). As a commentator said of South African ABS laws: “there are many scattered bits of statutes which make it burdensome for one/an applicant to search, analyse, understand and make a conclusion with certainty of the right approach to take” (Kamau, 2022b).<sup>46</sup> The complexity is also said to be particularly acute when users are working in multiple countries. It has been said, for example, that many “seed companies need to keep themselves up to date with the complexity created by up to 200 different national ABS frameworks, which keep changing and evolving over time. Moreover, there are further differences at provincial or local levels within a given country” (Ebert *et al.*, 2023; Michiels *et al.*, 2022; Eaton and Visser, 2007).<sup>47</sup>

Another concern raised about national ABS laws is that “[p]rovider countries may be tempted to dictate strict access requirements to leverage advantageous benefit-sharing arrangements and some developing countries have introduced measures that are highly protectionist; which act as a deterrent to potential user parties because of the burden of regulation” (Rourke, 2018, Divakaran Prathapan *et al.*, 2018). In line with this it has been said that “[n]arrow interpretations of CBD principles under the [Nagoya Protocol] have created difficulties in conducting biological control programmes, including the export of organisms for taxonomic research and the export of potential biocontrol agents (McKay, Sosa and Cabrera Walsh, 2023); and that “there are warning signs” in the context of biological control research and practice “that projects and activities could be at risk as a result of too restrictive ... ABS national regulatory requirements” (Mason *et al.*, 2023a; Cock *et al.*, 2020; Silvestri *et al.*, 2020). While users may see a law as being strict, providers may see it as necessary to protect their genetic resources and to ensure the fair and equitable sharing of benefits. This is reflected in the comment that while “user countries press for narrow legal requirements that do not impede research ... provider countries take a much more expansive view to ensure that they share in any benefits arising from biological resources” (Manheim, 2019).

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<sup>43</sup> “In the absence of a clear definition in the Nagoya Protocol and the EU ABS Regulation of Traditional Knowledge associated with genetic resources, the interviewees differ in their understanding of what Traditional Knowledge relevant for the purposes of complying with the Nagoya Protocol entails” (Morgera and Geelhoed, 2016); “it seems unclear where to draw the line between a “new” and an “old” utilization. This, in turn, creates legal uncertainty” (Michiels *et al.*, 2022).

<sup>44</sup> Silvestri *et al.* (2020) reviews the experiences of Argentina, Brazil, South Africa, the United States of America, Canada and CABI in implementing access and benefit-sharing regulations and the implications these measures have on the effective and efficient access, exchange and utilization of biological control agents.

<sup>45</sup> “The CBD and its [Nagoya Protocol] embrace a “bilateral” approach to ABS, in which a user and a provider conclude an individualized agreement that must be approved by a national authority” (Halewood *et al.*, 2023).

<sup>46</sup> “The guidelines which should ease the situation are outdated and have been overtaken by revisions of the Act of 2013 and the BABS Regulations of 2015. In addition, they either contradict the legislation or the latter is obscure concerning permit requirements for research other than bioprospecting. Whilst the guidelines state that research other than bioprospecting must obtain research and collection permits there is no hint in the legislation that it needs such permits”; “disconnected multilevel decision-making processes also add to the problem” (Silvestri *et al.*, 2020).

<sup>47</sup> The International Organization for Biological Control Global Commission on Access and Benefit-sharing conducted a survey of biological control workers in 2021–2022 to gain a perspective on the impacts of ABS measures on the access and use of biological control genetic resources. The complaints on differences at different levels of administration within a country were reinforced by survey results that said that the “procedures are complex and not straightforward”. The key reason for this was that the requirements were scattered or redundant (e.g. different agencies must be contacted; different requirements at the local, state/province, and national levels) (Mason *et al.*, 2023b).

## **(ii) Problems with national ABS institutions**

Another area of concern raised in the literature is in relation to national ABS institutions. A key concern is that despite having introduced ABS laws and procedures, many countries have not yet established the administrative organizations needed to put ABS into practice (Silvestri *et al.*, 2020). A 2021 study found “while 89 percent of countries, Parties to the CBD, have established their ABS National Focal Points, only 72 governments (55%) have established Competent National Authority/ies” (Martyniuk and Haska, 2021). As a result, while there has been gradual progress,<sup>48</sup> many countries are yet to establish infrastructure to execute the ABS processes outlined in their domestic legislation.<sup>49</sup>

A number of problems also exist in countries that already have established administrative agencies. These range from empty bureaucracies (that exist in theory but are unstaffed), through to issues such as departmental name changes, language barriers, staff turnover, incorrect phone numbers and email addresses (Rourke, 2018). While seemingly trivial, problems of this nature create very real problems for users. These problems are not unique to developing countries but are also a problem in developed countries.

Another complaint about national ABS institutions is that “[p]rovider countries must process each inquiry from users, often with very limited capacity and resources” (Halewood *et al.*, 2023). For example, it has been said that a “lack of adequate human administrative capacity and experience to deal with often complex and dynamic issues, may also overshadow the effectiveness and efficiency of the ABS regime” (Silvestri and Mason, 2023). These problems are compounded by the fact that decision-makers often have limited relevant experience (Michiels *et al.*, 2022) and may be “reluctant to take decisions on matters for which there is no precedent” (Leskien, 2023; Silvestri *et al.*, 2020).

## **(iii) The model of innovation used in bilateral ABS is not suited to the utilization of GRFA**

One of the critiques made of the bilateral ABS approach is that it is based on a “simplistic” model of innovation (Laird *et al.*, 2020; Winter and Kamau, 2022) that does not fit well with the way GRFA are used. Under this theory of innovation, it is presumed that “one genetic resource is accessed, that only one ABS agreement will be required, and that benefit-sharing will only need to be performed with one provider country” (Michiels *et al.*, 2022). It is also presumed “that providers and users negotiate agreements and exchange physical material with clear provenance, ownership, and value and that this material can be tracked through the research process, culminating in something of value” (NordGen, 2023). Under this model, “benefit-sharing under the Nagoya Protocol is based on a bi-lateral model in which a genetic resource links directly, in a relatively short amount of time, within a simple institutional framework, with identified providers and users, to a commercial product” (Laird and Wynberg, 2018).

While this model may resonate with the archetypal ABS example where a rare plant is harnessed to develop a blockbuster drug, under a single benefit-sharing agreement between the providing country and a biotech company (Michiels *et al.*, 2022; Halewood *et al.*, 2023) many commentators have complained that it does not map well onto to plant breeding or biotechnological innovations.<sup>50</sup> While similar problems potentially arise with non-plant GRFA, the primary focus of the literature has been on agricultural plant breeding in developed countries.

The application of a simplistic model of innovation to plant breeding is said to give rise to a number of problems.<sup>51</sup> The “non-linear realities of plant development make it extremely challenging for [plant] companies to follow the legislative developments and, even more so, to secure compliance with all

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<sup>48</sup> In April 2020, ‘95 country parties (77 percent) have now established some form of ABS measures of varying degrees of specificity and comprehensiveness (and of which a large part was adopted prior to the adoption of the [Nagoya Protocol]). 59 countries are currently revising existing ABS measures or developing new ones to implement the [Nagoya Protocol]’ (NordGen, 2023).

<sup>49</sup> See Rourke, 2018; Michiels *et al.*, 2022; NordGen, 2023; Martyniuk and Haska, 2021; Mardiasuti, 2019; Smith *et al.*, 2018. “Broadly, the major flaws are found to be in the incompleteness and unclarity and the lack of implementation” (Schebesta, 2021).

<sup>50</sup> Also with non-commercial research and Traditional Knowledge discussed below. See also, Laird *et al.*, 2020; Scholz *et al.*, 2020; NordGen, 2023.

<sup>51</sup> ABS is said to create “complexity at several points in the core breeding workflow and the combination of the above issues has more than an additive effect” (Michiels *et al.*, 2022).

applicable ABS laws” (Michiels *et al.*, 2022). As new breeding programmes require substantial amounts of genetic diversity as starting material, ABS requirements are a major challenge to establish a relevant collection of starting materials, and ABS laws create an entry barrier (Michiels *et al.*, 2022). These problems are compounded as the breeding process continues. This is because plant breeding is a “complex use case” that requires access to multiple genetic resources, often from multiple countries, which are then intermingled and crossed (often over several or multiple breeding cycles) (Schloen, 2019). Breeders then select plants with desired characteristics that are worth commercializing. The commercial material may then be used as a starting point for new breeding campaigns (Michiels *et al.*, 2022). As interviewees in an EU survey noted: “there is never an end point working in the plant breeding and food and agriculture sectors as the process of using genetic resources in food is one of continuous genetic improvement” (Milieu Law and Policy Consulting, 2020).

The fact that in developing new varieties, organizations rely on a range of genetic inputs that are frequently exchanged and mixed with other genetic resources creates a number of ABS-related problems (Schloen, 2019). Of particular concern is that breeders are required to enter into multiple ABS agreements, potentially from “several suppliers with different levels of understanding of relevant ABS provisions, and the choice of suppliers will also change over time” (Michiels *et al.*, 2022). If several genetic resources under respective ABS contracts are incorporated in the breeding process, all the different contractual obligations would apply to the resulting breeding pool and the products developed thereof.<sup>52</sup>

While the negative impact of the bilateral approach is minimized by the use of the International Treaty SMTA, problems remain for material that falls outside the scope of the Multilateral System. As a commentator noted, “[a]ccess to other food and particularly vegetable crops, including a wide range of underutilised genera with current or potential value as food plants, is governed instead by CBD/Nagoya Protocol-based diverse national regulations, and each single resource exchange needs to be negotiated on a case-by-case basis” (Ebert *et al.*, 2023). The problem here is that “[n]egotiating and securing [prior informed consent] and [mutually agreed terms] for each germplasm source via bilateral agreements is a complex and time-consuming process. Differing national and even local ABS laws and regulations create a significant entry barrier and represent a major challenge for seed companies to establish a relevant collection of starting materials for breeding” (Ebert *et al.*, 2023).

The fact that the cumulative nature of the breeding process extends the length of the value chain is also a cause of concern for other users. Of particular concern is that the ABS contractual obligations that are attached to the original genetic resource operate like *de facto* intellectual property rights which “move on together with the genetic material and continue to be applied to subsequent innovation cycles and the products developed thereof. This onward movement of the genetic resource and the attached contractual obligations from one breeding cycle to another, from one breeder to another and from one product to another will eventually continue indefinitely in time” (Schloen, 2019). This is because while other third-party rights (notably intellectual property rights) usually expire or exhaust at some point, “ABS obligations are often perpetual” (Michiels *et al.*, 2022; Watanabe, 2017).

#### **(iv) Information about ABS measures is insufficient, unclear and inaccessible**

One of the problems users of GRFA commonly face is the lack of easy-to-access information on what they need to do to comply with relevant ABS laws and procedures. Users often struggle to find relevant, clear and accessible information (ICC, 2017; NordGen, 2023).<sup>53</sup> As one commentator complained, “[g]iven the intrinsic complexities and ambiguities in ABS legislation, remaining informed of all new ABS laws is a significant challenge, even for large companies, but is a daunting if not prohibitive endeavour for small to medium-sized enterprises” (Michiels *et al.*, 2022).

The lack of accessible information about ABS was confirmed in the National Focal Point Survey, which showed that only 28 of the 117 respondents reported that they attempted to inform stakeholders who utilize GRFA about ABS measures: only 25 respondents noted efforts to inform stakeholders of ABS

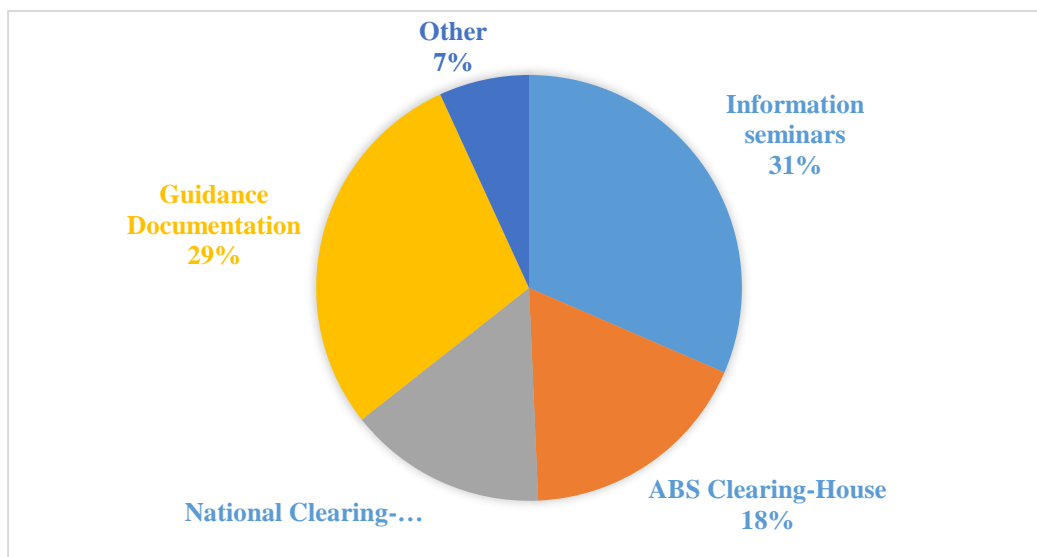
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<sup>52</sup> See Schloen, 2019; Ebert *et al.*, 2023; Eaton and Visser, 2007; Morgera and Geelhoed, 2016; Marden *et al.*, 2023.

<sup>53</sup> The German Nagoya Protocol Hub has been discussed as a useful role model for accessible ABS guides: <https://www.nagoyaprotocol-hub.de/>

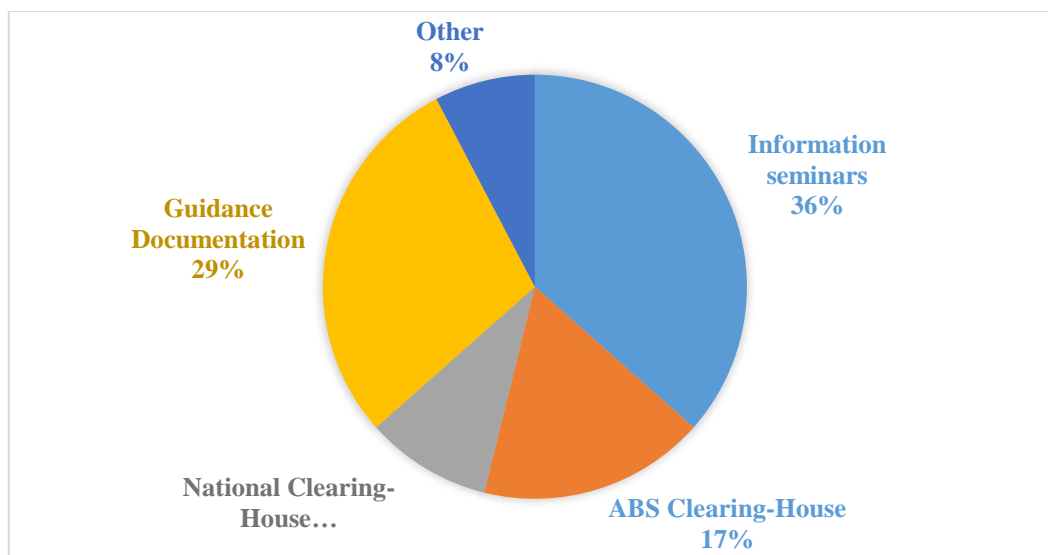
measures in relation to traditional knowledge, and 23 respondents noted efforts to inform stakeholders of the need to consult or seek approval of Indigenous Peoples and local communities (IPLCs) prior to accessing their genetic resources. The methods used to inform stakeholders are shown in Figures 11 to 13.

**Figure 11: How stakeholders are informed of access and benefit-sharing measures for genetic resources for food and agriculture**



Source: Based on the National Focal Point Survey.

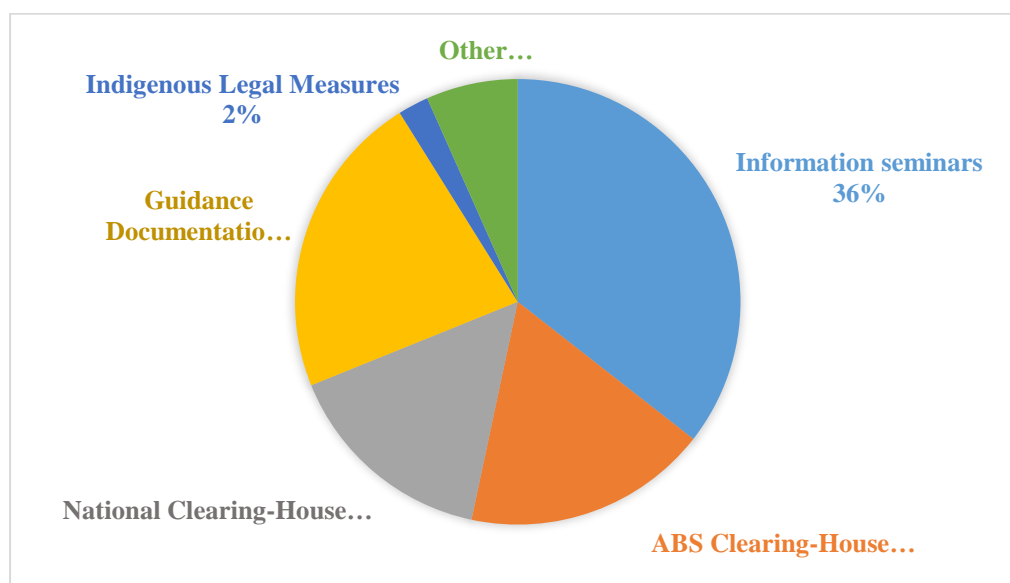
**Figure 12: How stakeholders are informed of access and benefit-sharing measures for traditional knowledge**



Source: Based on the National Focal Point Survey.



**Figure 13: How stakeholders are informed of involvement of Indigenous Peoples and local communities**



Source: Based on the National Focal Point Survey.

While the ABS Clearing-House seeks to provide information about national ABS laws and procedures, many commentators have noted that the “ABS Clearing-House is not the “one stop shop” for ABS information that was originally envisaged” (Rourke, 2018).<sup>54</sup> There are a number of reasons for this. As one commentator states, the “information available on the Clearing-House website is incomplete and, for a number of countries, not up to date” or in some other cases the information is absent (ICC, 2017; Smith *et al.*, 2018). A related concern is that the information often “does not provide all the details required to access [plant genetic resources] in a particular country. Addresses of National Focal Points are often not indicated, the [competent national authorities] are not clearly defined, and clear ABS instructions are often missing. Moreover, legal documents are often only available in the local language” (Ebert *et al.*, 2023).<sup>55</sup> Another problem is that the “ABS Clearing-House assumes a level of familiarity with the particulars and jargon of ABS, making the database near-impenetrable to the uninitiated” (Rourke, 2018). Even “for countries where the ABS Clearing-House information is current and relatively transparent, there is often insufficient information to initiate access procedures” (Rourke, 2018).

Given that “[i]nformation is often difficult to access and not always available on the [ABS Clearing-House]” (Smith *et al.*, 2018) potential users of genetic resources are often left to contact the appropriate National Focal Point or competent national authority to find out what they need to do to receive relevant information (Smith *et al.*, 2018; Rourke, 2018). While many competent national authorities and National Focal Points provide helpful and useful information, others do not. Instead, they are unresponsive or provide contradictory and sometimes conflicting interpretations of the scope of their laws. While larger organizations can tap into local and international networks or obtain ad hoc legal support to find relevant and accurate information, even if at a non-negligible cost, smaller organizations do not have this luxury (Milieu Law and Policy Consulting, 2020). As a result, users complain that they often find it “difficult to receive accurate information on the applicable law and procedures and often wait extended periods of time for administrative decisions” (Leskien, 2023). In doing so, users (particularly new or infrequent users) are confronted with the challenge that the ‘field of ABS is strewn

<sup>54</sup> On limits of the information in the ABS Clearing-House, see Martyniuk and Haska (2021).

<sup>55</sup> “We also encourage Parties to provide an English translation of the applicable laws as well as an English summary of the most relevant information relating to such rules and procedures. This would enable (prospective) global users to overcome any language barriers and obtain a quick overview of the key provisions, thereby significantly facilitating compliance” (ICC Task Force on Access and Benefit-sharing, 2017).

with obscure legal language so even knowing the appropriate terms to input to search engines can be problematic for the uninitiated' (Rourke, 2018).

### **(v) Problems with traditional knowledge associated with GRFA**

While a number of problems have been raised about ABS measures as they apply to the utilization of traditional knowledge associated with GRFA, two stand out. The first arises because in many countries Indigenous Peoples do not have the requisite legal standing to negotiate ABS agreements (Adhikari *et al.*, 2024). The second problem arises because the “ABS framework of the CBD presumes that providers and users negotiate agreements and exchange physical material with clear provenance and ownership” (NordGen, 2023). It also presumes that single “providers” and “users” exist who will negotiate ABS agreements based on terms that are “mutually acceptable” to all (Wynberg, Ives and Bam, 2023). As commentators discussing ABS in South Africa noted, “[i]dentifying Traditional Knowledge holders and finding representative communities with whom to negotiate agreements have been especially challenging” (Wynberg, Ives and Bam, 2023). Another related concern with many ABS measures is that they “homogenise ... different and distinct groups under a single Indigenous banner, represented by legal entities that may or may not fully represent their interests, identities or affiliations. Here, identity converges with a contested, politicised landscape that increasingly formalises traditional leadership through statutory instruments and institutions that are linked directly to transnational capitalist investment, in the case of rooibos, the natural products industry” (Wynberg, Ives and Bam, 2023). These problems are compounded by uncertainty over what is meant by “traditional knowledge associated with genetic resources.”<sup>56</sup>

### **(vi) Problems in negotiating ABS contracts**

Another set of problems bilateral ABS measures may cause is related to the need to negotiate contracts. There are two problems that potentially arise when negotiating an ABS contract. The first is that there may be costly delays in the negotiating process. The second is that the negotiating process may fail. Both of these are said to impact on if and how GRFA are utilized. It has been suggested that obtaining prior informed consent and negotiating a benefit-sharing agreement often entails protracted negotiations with local authorities, which can lead to long delays in obtaining permits (Milieu Law and Policy Consulting, 2020). Such delays represent a hidden cost for research projects, which need to be on hold while negotiations continue, with the risk of being discontinued if an agreement is not reached in the required time frame (Milieu Law and Policy Consulting, 2020). In some cases, long delays and unreasonable demands from GRFA providers have led to situations where companies have been forced to abandon projects entirely, effectively stopping certain genetic resources from being used (Milieu Law and Policy Consulting, 2020). It has also been said that negotiating a benefit-sharing agreement in a foreign country poses a number of problems that make it a protracted and expensive process.

One of the factors that is said to influence how efficient the negotiating process is, and how “difficult and complex contract negotiations” (Schebesta, 2021) are, is how knowledgeable the parties are about ABS. Given that a number of studies have reported that diverse groups of stakeholders from universities (Milieu Law and Policy Consulting, 2020) and industry through to landowners and researchers (Kamau, 2022b) in a range of jurisdictions from Bhutan (Wang *et al.*, 2020) to the Nordic countries (NordGen, 2023) have low levels of awareness about ABS, this is a very real issue that confronts both providers and users. Another important factor is the size of the entities involved. As an EU study found, “[o]verall, larger organizations (either research institutions or private companies) have a better awareness of the compliance obligations of the EU ABS Regulation and of their impacts on everyday activities. This is also related to the larger volumes of genetic resources and/or associated Traditional Knowledge they process (from a few hundred to 30,000 per year). Smaller organizations ‘struggle with grasping the full extent of the obligations on their activities and take longer to adapt’ (Milieu Law and Policy Consulting, 2020). Doubts have also been raised about whether “bilateral ABS arrangements can be successfully

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<sup>56</sup> “Few actors [in the EU] are very actively involved in the use of traditional knowledge associated with genetic resources, although the majority of interviewees do use traditional knowledge on an occasional, non-systematic basis” (Morgera and Geelhoed, 2016).

applied to non-commercial operators who do not necessarily have the expertise to navigate the legal terrain of the countries from which they require specimens” (Rourke, 2018).

One of the reasons why negotiating an ABS agreement is sometimes difficult is because the parties have very different expectations particularly about the value of the GRFA. As a commentator noted, “establishing the level of monetary benefits that is reasonable as part of any benefit-sharing agreement is tricky and often a major point of disagreement between parties. This issue has been a hurdle to successful ABS agreements in the past, often because of misunderstandings and different interpretations of what can be expected realistically” (Heinrich *et al.*, 2020). One of the reasons for this is that parties (typically but not exclusively providers) have unrealistic expectations about the benefits that will flow from use of the genetic resources. An explanation for this offered by one commentator is that the “CBD inspired many biodiversity-rich nations to entertain unrealistic expectations regarding the commercial value of their native species” (Divakaran Prathapan *et al.*, 2018). Unrealistic expectations are also attributed to the fact that ‘provider countries, regulators and [traditional knowledge] holders alike often do not have sufficient understanding of the complexity of supply chains, cost of transactions, value creation processes, need for large amount of capital, or return on investment, etc. This can lead to oversimplistic and unrealistic demand scenarios of proposed benefit-sharing” (Michiels *et al.*, 2022).

While complaints about unrealistic expectations are usually levelled at access providers, in some situations it is the user who has unrealistic expectations about the benefits that will flow from exploitation. For example, it has been said of the (failed) Teff benefit-sharing agreement between Ethiopian authorities and a Dutch company that one of the reasons for the implementation difficulties associated with the Teff Agreement may have been that the users “overestimated the market potential for teff and were overly optimistic about potential profits.” In reality they were unable to fulfil the monetary obligations of the agreement (Andersen and Winge, 2012). In this situation the user had overestimated the market potential for teff and committed itself to benefit-sharing arrangements it could not meet.

Another factor that is said to influence how complicated ABS negotiations are relates to the level of trust between the parties. While this will depend on a myriad of factors, a number of commentators have suggested that there are growing levels of mistrust between users and providers that are impacting on how GRFA are utilized (Mason *et al.*, 2023b). For example, it has been said that ‘[d]issatisfaction with monetary benefit-sharing has perpetuated distrust from many countries that consider themselves to be access providers, leading some countries to further restrict access to [genetic resources]’ (Halewood *et al.*, 2020; Rohden and Scholz, 2021). As we will see, these problems have been magnified by concerns over DSI that have impacted on the operation of ABS.

A number of issues have been raised by users about the process of negotiating ABS agreements with Indigenous Peoples. Here, one of the key areas of “complexity is finding the “rightful” [traditional knowledge] holder or provider community. It can be a major challenge and a moving target. Various communities may claim to be “the” “[traditional knowledge] holder, leading to protracted processes to establish the legitimacy of these claims. It can happen that a new [traditional knowledge] holder is designated by the authorities and ABS negotiations have to start from scratch” (Michiels *et al.*, 2022).

Beyond these specific concerns there have also been more systemic complaints about the ABS negotiation process. In particular, concerns have been raised about the need to agree to terms and conditions at the early stages of research. The problem here is that “at such an early point in time, it is often impossible or at least very difficult to estimate the commercial value of a potential innovation” (Michiels *et al.*, 2022). Conversely, users have also complained about countries that ask them “to return at the end of development to agree on benefit sharing obligations for commercial use” (Michiels *et al.*, 2022). This is said to be a problem for investors who want to reduce risks and know in advance the potential obligations when investing in research and development. “Spending significant time and financial resources for [research and development] without certain knowledge of whether the benefit-sharing negotiations for commercial use will at all be successful or may still allow a viable business case is not an attractive prospect for investors and innovators” (Michiels *et al.*, 2022).

### [3.2.2] Consequences of the problems with bilateral ABS

In the previous section the problems raised in the surveys and the literature about the scope and operation of bilateral ABS were summarized. This section draws upon the survey results and the literature to look at the different ways in which these problems are said to *impact* on the utilization of GRFA and associated traditional knowledge (paying particular attention to the evidence used to support such claims).<sup>57</sup>

While there are exceptions, most of the discussions about the impact of ABS on the utilization of GRFA focus on users. To the extent that providers are discussed, it is usually in terms of the way in which problems with ABS undermine the opportunity for providers to receive benefit from the use of their GRFA.

A considerable amount of the literature that was reviewed is concerned with the impact of ABS on non-commercial/academic research. As one commentator put it, “there is evidence that unfortunate ABS national policies have overcomplicated, if not impeded, access to genetic resources for non-commercial research” (Silvestri and Mason, 2023; see also Neumann *et al.*, 2017; Divakaran Prathapan *et al.*, 2018; Deplazes-Zemp *et al.*, 2018). Within this context, special consideration is given to the impact ABS has on areas of research with no clear pathway to or interest in commercialization, along with research that is poorly funded (and thus more vulnerable). This includes researchers working in biological control, conservation, taxonomy, ecology, biodiversity and related fields.

There has also been a focus on the impact of bilateral ABS on commercial users (such as seed companies and commercial plant breeders). One of the key concerns for these stakeholders are the costs of ABS and the way that it impacts on research and development pathways. While there are exceptions, there has been little sustained attention given to the impact of ABS on Indigenous Peoples or local communities. To the extent that this is discussed, the analysis is mainly speculative.

Most of the literature that looks at the impact of bilateral ABS measures on the use of GRFA and associated traditional knowledge focuses on plants, with some interest in the impact on biological control. There were also studies on animal genetic resources, which found that “commercial trade of livestock genetic resources has not been adversely affected by the implementation of the Nagoya Protocol and continues to develop, as expected, due to high demand for animal origin products in developing countries” (Martyniuk and Haska, 2021). However, there were concerns that “ABS requirements are adding costs and complexity to already extensive [regulatory] requirements ... Even researchers from the provider country are not convinced that ABS measures will positively impact research collaboration, or conservation of domestic genetic resources” (Martyniuk and Haska, 2021).

#### (i) Bilateral ABS measures increase the cost of dealing with GRFA

A common complaint made about bilateral ABS measures is that they increase the cost of accessing and using genetic resources for research and development. Increased cost can be caused by multiple factors including:

- (a) “transaction costs associated with access (potential administrative barriers, negotiation of bilateral ABS contracts, involvement of lawyers for clarification of uncertainties regarding legal and regulatory requirements)”;
- (b) “the costs due to benefit-sharing obligations, including the costs of mandatory or voluntary tracking of GRFA through the value chain”;
- (c) “compliance costs after accessing the genetic resource, including monitoring costs to follow the utilization of accessed materials throughout the value chain and to provide documentary evidence of utilization in accordance with the applicable ABS laws and regulations” (Ebert *et al.*, 2023); and

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<sup>57</sup> Another way in which ABS is said to impact on the way GRFA are used is by diverting resources. For example, it has been suggested that it is “quite possible that the substantial funding allocated for ABS implementation has had the unintended consequence in many countries of diverting government attention away from biodiversity conservation” (Laird *et al.*, 2020).

(d) “costs caused by *ad infinitum* (or protracted) provider rights which lead to an accumulation of ABS obligations and fees from one breeding cycle to another” (Schloen, 2019).

ABS-related costs may be particularly acute when research is undertaken in multiple countries. In this situation researchers “will have a massive task of understanding the varying laws, requirements and procedures. Alternatively, he/she would be subjected to consultancies by lawyers and experts, which can raise the research budget exponentially, at times to levels which e.g. basic biodiversity research cannot afford” (Kamau, 2022a).

The impact that increased costs may have on the use of GRFA varies considerably. In some cases, evidence suggests that increased costs are unwanted but can be absorbed within existing budgets. In other cases, evidence indicates that excessive administrative burdens that impose high transaction costs and/or a high level of bureaucratization “discourages potential users of genetic resources” (Liebig *et al.*, 2002). In other cases, high costs can hinder or sometimes lead to the cancellation of research. For example, it has been said that a “benefit-sharing cap of 1 percent of annual net revenue—as foreseen under the Brazilian ABS legislation—might already ruin a business case for some products with low profit margins derived from a single genetic resource, but rapidly become a serious issue in the case of cumulative benefit-sharing obligations for products derived from multiple genetic resources” (Michiels *et al.*, 2022). It has also been said that bilateral ABS measures often “entail[s] protracted negotiations with local authorities, which can lead to long delays in obtaining permits” (Milieu Law and Policy Consulting, 2020). Such “delays represent a hidden cost for research projects, which need to be on hold while negotiations continue, with the risk of being discontinued, if an agreement is not reached in the required time frame” (Milieu Law and Policy Consulting, 2020).

### **(ii) Bilateral ABS changes that control GRFA**

One of the subtle but potentially important changes that bilateral ABS measures bring about in the way GRFA are used is in terms of who controls access within an institution. Historically, the people who worked with and used the genetic resources (such as researchers and breeders) were often responsible for organizing access to the resources. This has changed with the imposition of new ABS laws and regulations. As a commentator noted, “Policies that regulate access to materials and other inputs to research may shift the locus of control over resources from individual researchers to institutions that represent stakeholder interests addressing equity, security and safety of material exchange and use” (Welch *et al.*, 2017). In line with this, a survey of public institutions and universities in Malaysia found that “[l]oss of control of material held by researchers is the main direct impact perceived by researchers of any regulation of access to [genetic resources]” (Nijar, Louafi and Welch, 2017).<sup>58</sup>

Similar concerns have been raised about the impact of ABS on the way Indigenous GRFA are used. One of the consequences of the shift away from an approach in which agrobiodiversity is considered to belong to the common heritage of humankind towards an ownership model in which countries assert sovereign rights over their biological and genetic resources is that control of GRFA is now determined by the state rather than by Indigenous Peoples (Wynberg *et al.*, 2021).

### **(iii) Bilateral ABS encourages parties to seek GRFA from alternate sources**

There is a growing body of evidence that suggests that, when confronted with problems associated with bilateral ABS measures, users are looking to find alternative providers or alternative materials to replace problematic GRFA, which leads to lost opportunities for benefit-sharing.<sup>59</sup> It has been reported that a lack of legal certainty is “contributing to altering [research and development] strategies, which, if continued, could in the long-term influence relocation to countries where the regulatory environment is more favourable”. Importantly this “includes users working in the plant breeding and food and agriculture sectors who appear to experience the most ambiguity and legal uncertainty due to the difficulty in tracing genetic resources from widely available products back to a single country of origin”

<sup>58</sup> The survey was based on 30 Malaysian institutions and responses from 327 researchers in the various sectors of use of genetic resources (57 percent were in food and agriculture).

<sup>59</sup> The “complexity of ABS, which imposes unsustainable demands and transaction costs on users, providers, and public authorities frequently results in a lack of implementation, legal uncertainty, avoidance, and lost opportunities for benefit-sharing” (Halewood *et al.*, 2023).

(Milieu Law and Policy Consulting, 2020).<sup>60</sup> A 2020 study that explored the consequences of applying ABS measures to public research institutions and industry noted that most of the companies interviewed agreed with the finding that “long delays and unreasonable demands have led to situations where companies are forced to abandon projects entirely, effectively stopping certain genetic resources from being used.” Some of these companies “do not even consider doing business in these countries, preferring instead to acquire genetic resources from countries with simpler or no access rules.” (Milieu Law and Policy Consulting, 2020; NordGen, 2023) In line with this, 20.3 percent of respondents to a study of biological control research replied that faced with an “inability to obtain permits in a preferred source country” they had relocated their projects to a different source country “where the ABS measures were more straightforward or to countries without ABS measures” (Mason *et al.*, 2023a). As a respondent to the User and Provider Survey said, the complexities of bilateral ABS laws in one country have led researchers to access genetic resources in a genebank of the CGIAR system where they could be accessed under the SMTA.

As well as encouraging users seeking to access GRFA to forum shop between countries, problems with bilateral ABS measures are also said to have encouraged organizations “to establish their own genebanks at the turn of the 21st century ... to ensure their in-house breeders have permanent access to the genetic resources they need for developing new varieties” (Engels, Ebert and van Hintum, 2024). Problems with bilateral ABS measures are also said to have led farmers to change where they obtain seed. In particular it has been reported that “[u]nder Ugandan regulations, in situ materials in farmers’ fields are exchanged through the Nagoya Protocol, and regulations pertaining to this are outlined in the 2007 guidelines on ABS. For the exchange of seed between two communities, prior informed consent from the communities is mandatory as a requirement for the negotiations that culminate in the signing of a material transfer agreement and, eventually, payments being made to the communities. This process is complicated, long and tedious for farmers, and consequently they prefer to work with the central authorities on PGRFA, i.e. the national genebanks, who negotiate on behalf of the two communities” (Otieno *et al.*, 2017).

As well as encouraging users to change the location where they obtain their GRFA, it has also been reported that as current “ABS mechanisms do not provide the legal certainty and clarity necessary for use and exchange of genetic resources” that businesses have been led “to seek alternative materials” (ICC, 2020). This includes synthetic or digital versions of the GRFA. As a respondent to the User and Provider Survey said, one of the reasons why they found DSI attractive was because it did not require them to engage with the ABS system.

#### **(iv) Bilateral ABS measures hamper, restrict or delay the use of genetic resources**

There is a growing body of evidence that suggests that bilateral ABS measures hamper, restrict and delay the way genetic resources are used. As one report concluded there are “strong indications that the current implementation of ABS ... is hindering rather than supporting the process of value creation from genetic resources”<sup>61</sup> (Mason *et al.*, 2023a). This is supported by the results to the surveys that suggest that bilateral ABS was slowing down and delaying use of genetic resources in a number of areas. As a respondent to the User and Provider Survey said, “[m]uch time and manpower has been dedicated to understanding these Regulations and attempting to put them into practice in the business, as well as educating stakeholders who do not have a legal background. This has caused delays in the intended use of the materials to be transferred.”

The impact of bilateral ABS measures on the way GRFA are used can be seen from a study that correlated historical trends in genebank acquisitions and changes in germplasm exchange over time, with changes in national and global policy environments for seven crops (sorghum, cowpea, pearl millet, beans, maize, rice and wheat) (Mekonnen and Spielman, 2021). The study found that being a party to the CBD is significantly correlated with a reduction in germplasm flows from origin countries. Specifically, the study found that a “country’s membership in the CBD is associated with a 17, 18, 80, 92, and 89 percent decline in the annual number of genebank accessions originating from that country

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<sup>60</sup> The text was changed to correct an error in the original publication: “certainty” was changed to “uncertainty”.

<sup>61</sup> It has also been said that problems with ABS have forced researchers to adjust work programs in order to not create problems, resulting in a project strategy that was not straightforward (See Mason *et al.*, 2023; Silvestri *et al.*, 2018; ICC, 2020).

for rice, wheat, sorghum, cowpeas, and pearl millet, respectively, compared to countries that are not CBD members in a given year” (Mekonnen and Spielman, 2021). Based on these results the authors concluded “that a country’s membership in the CBD is closely associated with reductions in the flow of genetic resources and that the Nagoya Protocol may affect global PGRFA flows in a potentially negative and unintended manner” (Mekonnen and Spielman, 2021).<sup>62</sup> Similar declines have also been reported for botanical collections and international seed exchange (Bertioli *et al.*, 2021; Sara *et al.*, 2022) and for CGIAR centres that “have been facing increasing difficulties in their efforts to acquire and conserve PGR in the past decades, for a large part due to ABS issues” (Brink and van Hintum, 2020; Halewood, López Noriega and Louafi, 2012; Ebert *et al.*, 2023). Reports of this nature have led authors to conclude that the CBD and Nagoya Protocol have “not substantially increased access to [genetic resources], if at all” (Laird *et al.*, 2020; see also Humphries *et al.*, 2021).<sup>63</sup>

In line with this there is growing evidence (most of it anecdotal) that ABS is hindering the way companies and commercial organizations use GRFA. For example, it has been reported that “[e]xperience in companies and organizations of all sizes over the last few years indicates that many of the regulations and processes currently in place to implement ABS in different jurisdictions have a serious, negative impact on scientific research and collaboration, and on development and production” (ICC, 2020) It has also been argued that “[u]nclar national ABS legislations and a high level of bureaucratization with concomitant high transaction costs and compliance risks are ... a disincentive for commercial exploration of biodiversity” (Ebert *et al.*, 2023).

There is also “a growing body of evidence demonstrating that the [CBD and the Nagoya Protocol] are hindering scientific research” (Rourke, 2018). There is also evidence that “ABS measures in practice often require significant changes in the way researchers access and exchange genetic materials, including cumbersome contractual negotiations over the modalities of benefit-sharing” (Leskien, 2023). This is particularly the case for “non-commercial research on genetic resources” that “has been hindered by non-strategic and poorly planned ABS national regimes” (Smith *et al.*, 2018; Divakaran Prathapan *et al.*, 2018; Cock *et al.*, 2020; Sara *et al.*, 2022). As commentators have noted, there is evidence that ABS national policies have “overcomplicated, if not impeded, access to genetic resources for non-commercial research” (Divakaran Prathapan *et al.*, 2018; Silvestri and Mason, 2023; Neumann *et al.*, 2017), and that “burdensome ABS regimes create a clear bottleneck for collaboration, research, and development, and thereby neither facilitate access enabling sustainable use nor the sharing of benefits” (Sara *et al.*, 2022; Bertioli *et al.*, 2021; Mekonnen and Spielman, 2021). Long delays in negotiating ABS agreements – such as nine years to negotiate a rooibos benefit-sharing agreement in South Africa (Michiels *et al.*, 2022) and a decade to negotiate an ABS agreement to collect native rice in Queensland – are also said to be a disincentive for the utilization of genetic resources.

There is growing evidence that ABS is hampering the use of genetic resources in the field of biological control. As a recent survey found there are “accumulating examples where biological control has been greatly reduced, slowed down because of ABS” (Mason *et al.*, 2023b; Barratt, 2009; Hinz *et al.*, 2018; Silvestri *et al.*, 2020). This finding was reinforced by a survey of biological control workers that “indicated that while some countries have facilitated access to biological control genetic resources, requirements in other countries have impeded biological control implementation” (Mason *et al.*, 2023a; Silvestri *et al.*, 2018). This finding was supported by another study that found that ABS led to delays of projects (35.6 percent of 29 respondents) and the release of biological control agents (15.3 percent) (Mason *et al.*, 2023a; Silvestri *et al.*, 2018). These results were reinforced by a “review of the cases of Argentina, Brazil and South Africa, three major source countries of biological control agents” that found that “their respective national ABS regulations, adopted pursuant to the CBD and the [Nagoya] [Protocol], have negative effects on ... research and practice. Furthermore, the experiences of the USA, Canada and CABI as users of biological control agents accessed from other countries, including Argentina, Brazil and South Africa, highlight that ABS legal requirements of source countries that are in force have had adverse impacts on [biological control] programs” (Silvestri *et al.*, 2020).

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<sup>62</sup> See also Ebert *et al.* (2023); Michiels *et al.* (2022).

<sup>63</sup> “[M]useums may be wary of risks of loaning specimens to scientists in developing countries” (Divakaran Prathapan *et al.*, 2018).

There is also a growing body of evidence that suggests that the ABS regimes “have negatively impacted research on biodiversity by genebanks and research institutions” (Silvestri and Mason, 2023; Pauchard, 2017; Ebert *et al.*, 2023). For example, it has been reported that “[t]oo restrictive and unclear legal frameworks have ... created obstacles for the export and import of genetic material, resulting in difficulties, delays, or even cancellation of international scientific collaboration projects targeting biodiversity conservation” (Silvestri and Mason, 2023). In line with this it has also been reported that as a result of “poorly designed national ABS regulations...national scientific communities in Argentina and Brazil have found themselves unable to study or continue the study of local biodiversity, even if such research did not imply the export of genetic resources or the involvement of any foreign party” (Silvestri and Mason, 2023; McKay, Sosa and Cabrera Walsh, 2023; Ebert *et al.*, 2023).<sup>64</sup>

There was comparatively little information in the surveys or the literature about the impact of ABS measures on traditional knowledge associated with GRFA. One notable exception was a comment by a respondent to the National Focal Point Survey who said that difficulties with local languages and dialects sometimes made access difficult.

#### **(v) ABS has a chilling impact on use**

One of the claims commonly made about bilateral ABS measures is that they may have a chilling effect on the use of GRFA.<sup>65</sup> As one study noted, the barriers created by ABS “renders some biological research untenable and can result in the abandonment of research projects before they even commence” (Rourke, 2018). While many of these claims speculate about the possible impact of ABS,<sup>66</sup> there is a growing body of evidence that shows that bilateral ABS measures have shut down use. This was supported by the National Focal Point Survey in which 18 respondents noted that ABS measures had prevented them from exchanging GRFA (see Figure 11). The reasons for the failure are set out in Figure 13.

In relation to commercial research, it has been said that long delays and unreasonable demands have led companies to “abandon projects entirely, effectively stopping certain genetic resources from being used” (Milieu Law and Policy Consulting, 2020), obstructed “[research and development] investments by the public and private sector into horticultural innovations” (Ebert *et al.*, 2023) and “forced companies to abandon projects entirely, effectively stopping certain genetic resources from being used” (Milieu Law and Policy Consulting, 2020). As has been noted, many commercial companies “have reduced or abandoned their interest in natural products, because of the legal uncertainty and other hurdles in accessing genetic resources” (NordGen, 2023).<sup>67</sup>

It has also been reported that “even if a company applies best efforts in securing ABS compliance, it still runs a considerable risk of missing out on new legislative developments, misinterpreting legislation, or lacking the relevant inputs from its suppliers. Taken together, this creates a strong incentive to stay away from the current ABS jumble and thereby to protect the company’s reputation, rather than to embark on a risky ABS journey, trying to comply, but suddenly being exposed, despite best efforts, to an ABS non-compliance case” (Michiels *et al.*, 2022; MoAD, 2017).

There is also “evidence that non-strategic national ABS regulations have threatened or even impeded access to genetic resources for non-commercial research” (Morgera and Geelhoed, 2016; Neumann *et al.*, 2017; Divakaran Prathapan *et al.*, 2018). For example, it has been reported that newly implemented national ABS regulations in Argentina and Brazil “prevented domestic research organizations from studying local biodiversity, even if such research did not involve international partners or the export of

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<sup>64</sup> Ebert *et al.* (2023): “the abundance of diverse ABS regulations established by individual countries, based on the Nagoya Protocol, combined with legal uncertainties regarding their interpretation and implementation may hamper conservation and the exchange of biodiversity.”

<sup>65</sup> Manheim (2019): “as countries adopt conflicting rules, researchers increasingly find themselves in compliance with a user country’s measures and, at the same time, out of compliance with the requirements of the provider nation’. This has had a dampening—if not chilling—effect on research and development.”

<sup>66</sup> The associated costs and bureaucratic burden of “ABS procedures requiring extensive tracking and tracing will obstruct rather than facilitate research and development (including research into the conservation of biodiversity) and will disincentivize the high throughput natural product screening programs” (Michiels *et al.*, 2022).

<sup>67</sup> See also Ebert *et al.* (2023).



local genetic resources” (Ebert *et al.*, 2023). This was supported by a comment from a respondent to the surveys that “[s]ome institutions are not sending material due to our national ABS, particularly when we want to receive native biological material (repatriation process)” and in a comment by a user that “[d]ue to negative experiences on length and outcome of procedures we are avoiding access to GR where PIC & MAT negotiations are required.” As a respondent to the User and Provider Survey from a public research organization said, because of delays, non-responses, and cumbersome regulations the organization “decided to stop cooperating with some countries and to look for alternatives. This is to the detriment of research and development in these countries, not for us”. In line with this, a respondent to the National Focal Point Survey reported that: “Generally, the national collections do not bother attempting to obtain genetic material from countries that have restrictive ABS regulations or completely lack ABS regulations. Therefore, it is not that ABS measures (or the lack thereof) directly block access to genetic resources, but rather that attempts to obtain the material are not even initiated.” Similar impacts were reported in another study that found that the Nagoya Protocol “brought about an almost complete stop to natural enemy exploration programmes, whereas introduction of non-native pests is continuing, resulting in eradication projects with a frequent input of chemical pesticides causing negative effects on biodiversity, the environment and human health” (Van Lentern, 2021). Similar findings were reported in a study on the impact of ABS on research and practice on biocontrol of weeds and pest arthropods, which found that one of the consequences of poorly implemented ABS measures was that “biological control and the resultant public good” was “greatly reduced, slowed down, and in some cases stopped altogether” (Mason *et al.*, 2023b). This was confirmed in a study of 29 biocontrol researchers that found that ABS had led to project cancellation (16.9 percent) and to a loss of project funding (11.9 percent) (Mason *et al.*, 2023a).<sup>68</sup>

It has also been reported that ABS is having a chilling effect on the use of traditional knowledge associated with GRFA and on the use of GRFA under Indigenous control and stewardship. For example, it has been reported that there is “a climate of distrust relating to the transmission of traditional knowledge outside the communities, which results in an attitude of “closure” of Indigenous Peoples for not seeing benefits from the commercial exploitation of their traditional knowledge” (Heinrich *et al.*, 2020). It has also been reported that research projects between Indigenous Peoples and researchers to explore the nutritional value of an Australian native fruit (the Burdekin plum) failed because of ABS-related problems. There are similar anecdotal examples of research failing in Australia because of ABS-related problems in relation to native wattle seed, rice and other Australian plants and bushfoods (Adhikari *et al.*, 2024).

#### **[4] Generation and sharing of benefits through bilateral access and benefit-sharing measures**

Analysing the generation and sharing of benefits effected by bilateral ABS measures faces two challenges. The first is how to measure benefits. As a number of reports have noted (most recently in the context of the Kunming-Montreal Global Biodiversity Framework) it is not possible to “provide any conclusive data on the amount of monetary or non-monetary benefits triggered because of ABS transactions regulated by the [Nagoya Protocol]” (CBD, 2018, NordGen, 2023). In part this is because other than Brazil, India and South Africa (that report information on monetary benefits received by way of the national funds that receive monetary benefits), there is very little data on monetary benefits.<sup>69</sup> The same holds true for non-monetary benefits. According to a recent report that relied on surveys and interviews with ABS National Focal Points, competent national authorities and ABS experts “few countries that regulate access to [genetic resources] and/or associated [traditional knowledge] have systematic information on the non-monetary benefits they receive from their ABS agreements” (Muñoz-García, Lago and Scholz, 2024). These problems are compounded by the fact that there is no consensus about proxies that might be used to measure benefits. And while IRCCs may provide valuable information about ABS agreements, the existence of an IRCC is evidence of access, not necessarily of

<sup>68</sup> See also Silvestri and Mason (2023); Silvestri *et al.* (2018); Barratt (2009); Hinz *et al.* (2018).

<sup>69</sup> “Only 12 countries (24 percent) indicated that either aggregate or partial information was available on monetary benefits received” (Muñoz-García, Lago and Scholz, 2024).

the generation or sharing of benefits. As can be seen, there are a number of reasons why not many benefits seem to have been generated and shared.

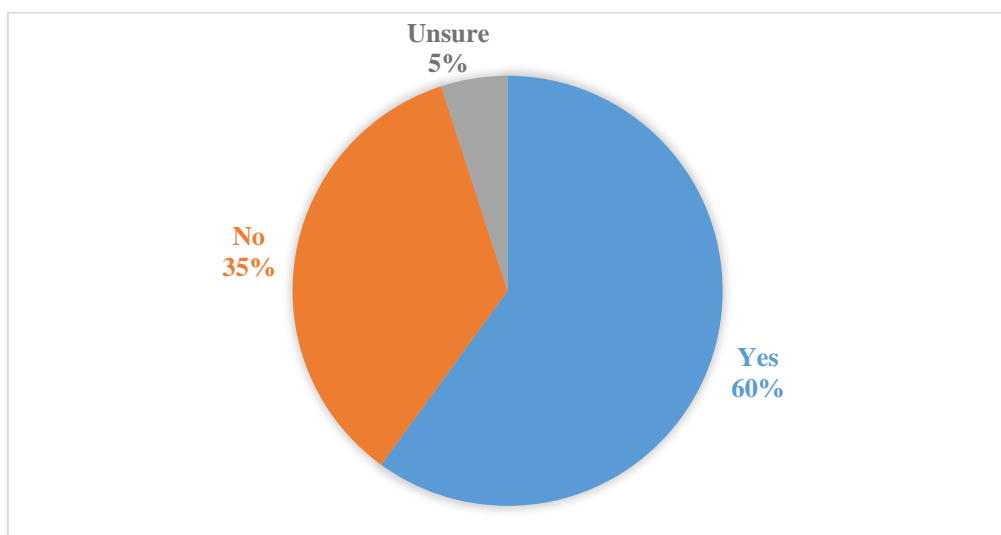
The second challenge to be faced in assessing the impact of ABS measures on benefit-sharing relates to the difficulty created by the use of confidentiality clauses in ABS agreements (Ruiz Muller, 2018). Insofar as confidentiality claims obstruct access to the terms and conditions of ABS agreements, they make it difficult “to accurately assess the degree to which fairness or equitability are realized” (Kloppenburg, Calderón and Ané, 2024).

#### [4.1] Evidence of the generation and sharing of benefits

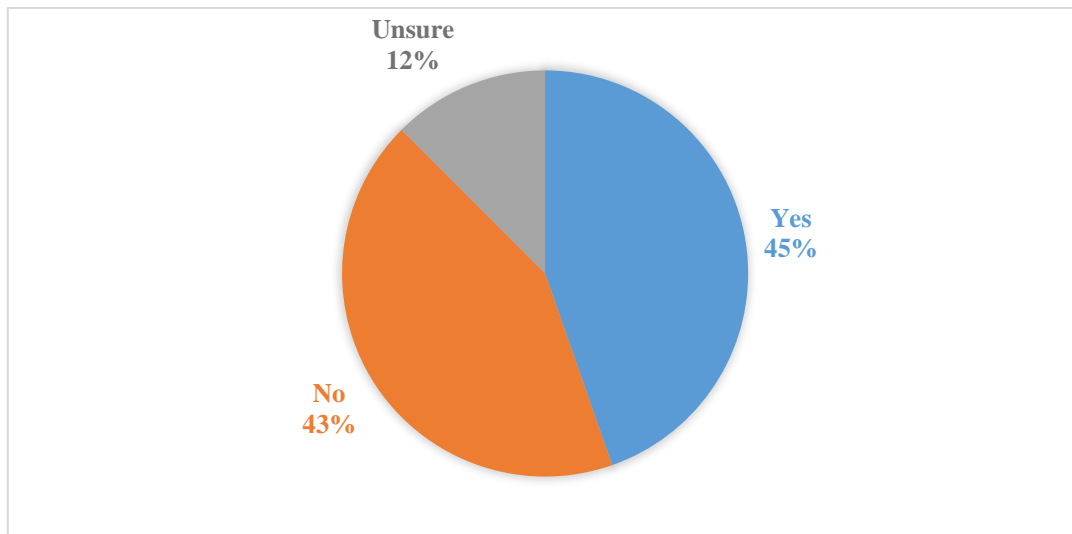
There are a number of accounts that highlight the monetary and non-monetary benefits that have been generated and shared as a result of bilateral ABS measures. As a recent report noted, ABS agreements in relation to biocontrol research have provided a number of monetary benefits to provider countries “in the form of provision of funding to support local student bursaries, post-graduate degrees, post-doctoral researchers, international conference attendance and capacity building (laboratory upgrades, purchase of laboratory equipment and supplies), financial support to conduct the research, collection and shipment of potential agents (i.e. monetary but direct support to researchers” (Mason *et al.*, 2023a; Silvestri *et al.*, 2018). In line with this, another study found that biocontrol research has delivered a number of non-monetary benefits including “assistance to build capacity in provider countries, train personnel, build scientific partnerships and the free exchange of biological control agents” (Mason *et al.*, 2023a; Silvestri *et al.*, 2018). Similar success stories exist in other areas. As one respondent to the National Focal Point Survey pointed out, “[w]hile no tangible benefits (money) have been received, [the Forestry Service] has benefited in terms of access to knowledge generated by the research work”.

A total of 40 respondents to the National Focal Point Survey indicated that they had received samples of GRFA. Of the respondents who reported that they had been provided access to GRFA, 60 percent reported that benefits had been provided in return (Figures 14). Of the 56 respondents who reported that their country had provided GRFA, 25 (45 percent) reported that benefits had been received in return (Figure 15). The majority of the benefits provided and received were non-monetary and took a range of different forms (Figures 16 and 17).

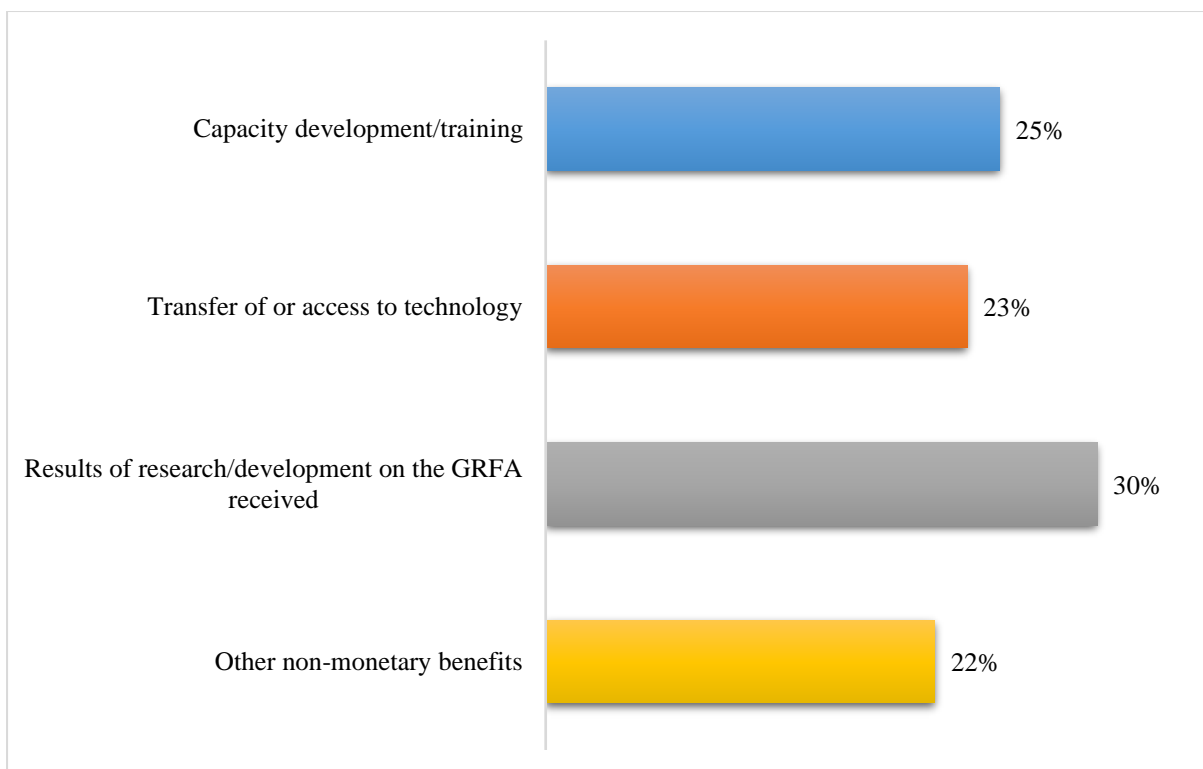
**Figure 14: Recipients of GRFA that *provided* benefits**



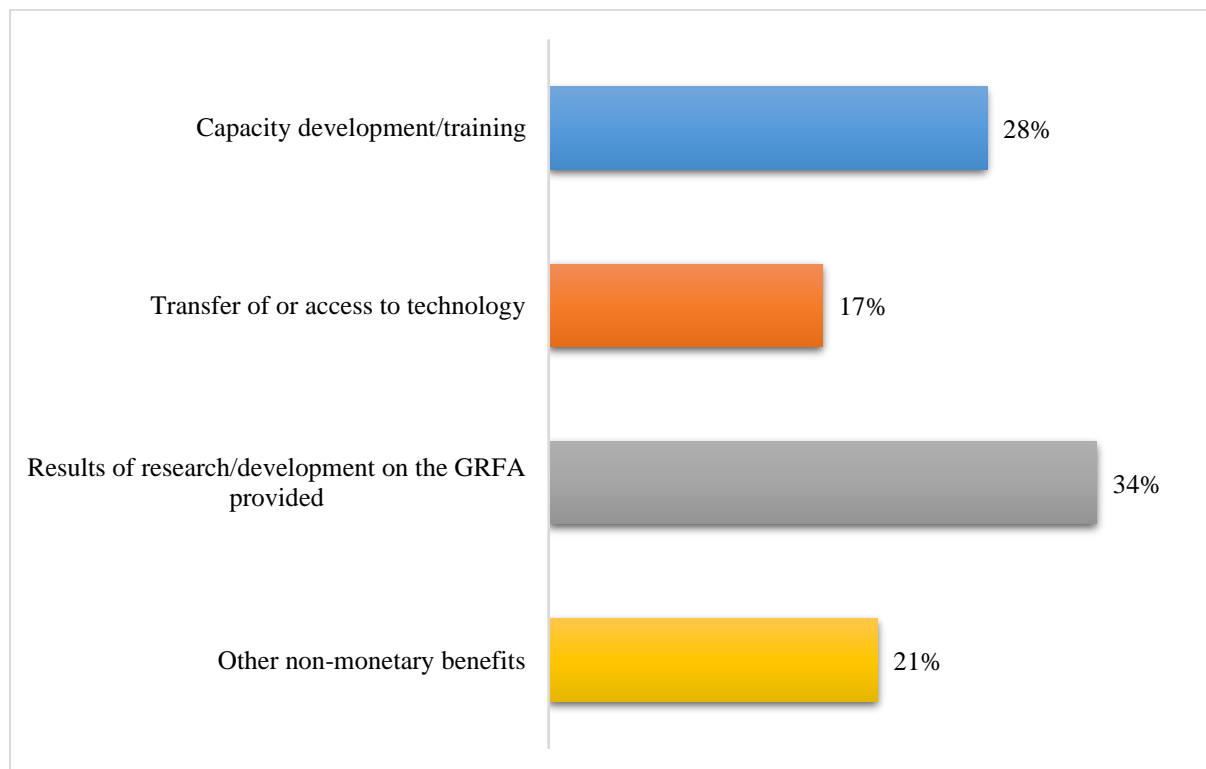
Source: Based on the National Focal Point Survey.

**Figure 15: GRFA providers that *received* benefits**

Source: Based on the National Focal Point Survey.

**Figure 16: Types of non-monetary benefits *provided* by GRFA recipients**

Source: Based on the National Focal Point Survey.

**Figure 17: Types of non-monetary benefits received by providers of GRFA**

Source: Based on the National Focal Point Survey.

There is little evidence about the impact of ABS measures on the sharing of benefits in relation to traditional knowledge. While the sample size in the National Focal Point Survey was small (only 17 respondents said they had obtained access to traditional knowledge in the previous five years), 12 respondents did report that they had provided benefits in return for access to traditional knowledge (this was despite the fact that only five of the 17 responses “always” obtained access in accordance with ABS measures). Notably, the benefits provided were all non-monetary including capacity development, the dissemination of research results and technology transfer. Most often the traditional knowledge was obtained from Indigenous Peoples or local communities, but there were also instances where farmers, seed savers, researchers, museums and foresters were the source of the knowledge.

While the majority of respondents to the National Focal Point survey reported that benefits, in particular non-monetary benefits, had been shared as a result of ABS agreements, the literature shows a more mixed picture. On the one hand there are a number of reports highlighting the success of bilateral ABS measures in the generation and sharing of benefits (although most examples are for non-GRFAs).<sup>70</sup> On the other hand there are a growing number of accounts that are highly sceptical of the success of bilateral ABS measures in terms of their ability to generate and deliver substantial benefits. As one commentator said the “current system of exchange of [genetic resources] and [associated Traditional Knowledge] and sharing of benefits is ... performing dismally’ ... the ‘monetary benefit-sharing project in particular, which is consequential for conservation and sustainable use of biodiversity, has been poorly realized and is considered by some authors as having failed” (Kamau, 2022a; Ruiz Muller *et al.*, 2019; Winter, 2021).

In relation to non-monetary benefits, it has been said that even “after almost 30 years, innumerable national ABS measures, and tens of millions of dollars spent discussing and developing these policies—there is relatively little to show in the way of conservation, technology transfer, capacity-building, or other monetary or nonmonetary benefits” (Laird *et al.*, 2020). In part this is because “[f]ew of the arrangements in this varied patchwork of ABS arrangements have been found to have functioned as intended or to have provided an effective sharing of benefits with either states or communities”

<sup>70</sup> For an account of the early positive impact of ABS on benefit-sharing generally see Robinson, 2014.

(Kloppenborg, Calderón and Ané, 2024). It has also been said that “[r]esearch has revealed that the benefits envisioned by the CBD and the [Nagoya Protocol] have remained largely unfulfilled for states, indigenous peoples, and local communities - also in states with well-developed ABS measures in place” (NordGen, 2023). A “telling symbol” of the lack of success is “the fact that an ABS icon, the National Institute of Biodiversity (INBio) of Costa Rica, has now ceased to undertake bioprospecting due to limited successes. In 1991, a deal between INBio and the pharmaceutical giant Merck gained international fame for its apparent win-win-win for pharmacy, nature conservation, and income for Costa Rica. The deal was seen as a model case for the later ABS regime in the CBD” (NordGen, 2023; Halewood *et al.*, 2023; Brink and van Hintum, 2022; Divakaran Prathapan *et al.*, 2018; Nakanyete, Matengu and Diez, 2024; Wynberg, Ives and Bam, 2023; Berlin and Berlin, 2004; Wynberg and Chennells, 2009; Morris, 2016; Wynberg, 2023; Chancel *et al.*, 2022; Laird *et al.*, 2020; Humphries *et al.*, 2021; Ebert *et al.*, 2023).

### **(i) Explanations for the lack of benefit-sharing**

A number of explanations have been given for the lack of benefit-sharing. One common reason given is that potential users are opting out of the ABS system. For example, faced with legal uncertainty and burdensome administrative obligations some scientists “for example, plant breeders, molecular biologists, and geneticists—may choose to limit the scope of their collaboration to only those colleagues who can effectively deal with regulatory requirements. Scientists may slow their research down as they wait patiently for PGRFA requests to wind their way through layers of complex regulatory requirements and uncertainty around approval of their requests” or “scientists may simply abandon entire lines of research and focus their minds elsewhere” (Mekonnen and Spielman, 2021). Similar claims have been made about other areas of science and about commercial organizations.

Another explanation given for the lack of benefits is that national ABS measures are too weak to generate benefits. For example, the temporal scope of national laws “has been criticised for applying to ABS transactions only after the entry into force of the [Nagoya Protocol], thereby not supporting compliance with access legislation enacted on the basis of the CBD” (NordGen, 2023). Another complaint (that was made about the EU user country compliance ABS Regulation),<sup>71</sup> is that for the transactions actually covered by the regulation, the trigger is the time of access, not utilization, thereby excluding large amounts of genetic resources and traditional knowledge acquired prior to the Nagoya Protocol, but which has still yet to be utilized (Natural Justice, 2013; Rabitz, 2015; Godt, 2015; NordGen, 2023).

Another explanation given for why benefits have not been shared is because projects fail. This is particularly problematic for providers where benefits are not shared at the time of access. A related reason for a lack of sharing (and also potentially a reason why a project may fail) is that users have unrealistic expectations about the value of their research and on this basis promise too much to the provider.<sup>72</sup>

A number of other reasons have been given for why benefit-sharing has not lived up to expectations. For example, a lack of payment by users can be caused by the way the obligations are worded, by “unclear trigger-points, lack of remedies against breach of contract and limited enforcement mechanisms” (Tvedt, 2021). Another reason for a lack of immediate benefit-sharing may be the time-lag between access to the genetic resources and the generation of benefits where ABS Agreements require benefit-sharing upon generation of benefits, rather than up-front (Tvedt, 2021; NordGen, 2023). It is also often difficult for providers to track how and where their genetic resources are being used and to monitor benefit-sharing (Godt, 2015; NordGen, 2023). Providers may also face problems where the user is in a foreign country, including problems with language, difficulties in understanding a different

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<sup>71</sup> Regulation (EU) No 511/2014 of the European Parliament and of the Council of 16 April 2014 on compliance measures for users from the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization in the Union. <https://faolex.fao.org/docs/pdf/eur148587.pdf>

<sup>72</sup> “An important factor in explaining the failure of the Teff Agreement was the fact that the Dutch company had originally overestimated the market potential for teff and was overly optimistic about potential profits. These miscalculations, combined with the company’s lack of knowledge and experience on the subject of ABS, resulted in benefit-sharing provisions which the company later found itself largely unable to fulfil” (Andersen and Winge, 2012).

legal system and legal costs (Andersen and Winge, 2012). Providers of genetic resources may also be confronted by the limitations of contractual obligations when the user is declared bankrupt or ceases to trade.<sup>73</sup> Another reason for a lack of benefit-sharing may be that few countries have adopted or implemented user-country compliance measures, i.e. measures to ensure that users within their jurisdiction comply with any access rules established in provider countries.<sup>74</sup>

### **(ii) Benefits are not being shared fairly and equitably**

Another issue that has been raised in the literature is that although benefits may have been shared, the sharing has not been fair and equitable (De Jonge, 2011; Morgera, Switzer and Tsioumani, 2018). There are two issues in relation to fair and equitable benefit-sharing. The first is whether on its face the ABS agreement is fair and equitable. The second is whether what has been promised in the agreement has been delivered. One of the concerns that has been raised in this context is that it is often difficult to judge whether sharing is fair and equitable. A key reason for this is that while the “Nagoya Protocol was created in part to impede biopiracy by providing a framework for acquiring and using biodiversity in a “fair and equitable” way ... the Nagoya Protocol’s provisions are ambiguous and allow for confidentiality clauses that favor the acquisition of genetic materials in ways that we do not consider fair and equitable” (Kloppenburger, Calderón and Ané, 2024). It has also been said that sharing will never be fair nor equitable as long as “ABS remains disconnected from, and structurally ignorant of, the wider political and economic struggles faced by marginalised communities” (Wynberg, Ives and Bam, 2023). More specifically it has been argued that the “ABS model appears to entrench – and even falsely legitimise – existing power structures of state and capital by failing to incorporate fair and equitable sharing of information, knowledge and economic power that would take into account the deep, layered and entangled cultural histories” (Wynberg, Ives and Bam, 2023). Yet another explanation given is that most bilateral ABS measures leave it to the parties of ABS agreements to decide on the benefit-sharing modalities (Silvestri *et al.*, 2020).

### **(iii) Beneficiaries of benefit-sharing**

Another concern that has been raised in the literature is that while benefits are being shared, they are not being shared with the right people. This is particularly an issue with Indigenous Peoples where resources are found in different communities. While a user may comply with the relevant ABS laws and enter into and execute an ABS agreement with a particular community, this may create a problem insofar as “there is no provision that they also flow to other communities with legitimate claims of having developed and stewarded” the PGRFA (Kloppenburger, Calderón and Ané, 2024). While Article 11 of the Nagoya Protocol encourages transboundary cooperation where genetic resources are found *in situ* within the territory of more than one Party, or where traditional knowledge associated with genetic resources is shared by one or more Indigenous Peoples or local communities, it seems that in many situations this has either not been implemented or is difficult to operationalize in national laws.

### **(iv) Adequacy of benefits**

Some commentators have complained about the inadequacy of the benefits that have been shared. It has been suggested, for example, that ABS agreements tend “to take a narrow, transactional approach to benefit-sharing” that the system prioritizes “financial benefits over other possibilities, such as technology transfer, training or knowledge sharing” (Kloppenburger, Calderón and Ané, 2024; Laird *et al.*, 2020; Wynberg, Ives and Bam, 2023). In support of this it has also been said of the experience in South Africa that “although some exceptions exist, in practice there is little evidence of ABS leading to the leverage of significant conservation benefits, either globally or in its 15 years of implementation in South Africa” (Wynberg, 2023). This has been caused by “political pressures to prioritize economic benefits, particularly in developing economies such as South Africa where basic needs are pressing”

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<sup>73</sup> There were great expectations as to the benefits that Ethiopia could obtain from the agreement. However, these expectations failed to materialize. When the company was declared bankrupt in August 2009, the sole benefits to have reached Ethiopia were a payment of only EUR 4000 and a small research project that was discontinued early on (Andersen and Winge, 2012).

<sup>74</sup> An example of legislation that addresses exclusively this aspect of the Nagoya Protocol (Articles 15 and 16) is Regulation (EU) No 511/2014.

(Wynberg, 2023). It should be noted, however, that one of the findings of the National Focal Point survey was that non-monetary benefit-sharing was much more common than monetary benefit-sharing.

## Part III: Impact of Multilateral ABS

### [5] Impact of multilateral access and benefit-sharing on the utilization of genetic resources for food and agriculture and associated traditional knowledge

#### [5.1] Positive impact of multilateral access and benefit-sharing

The vast bulk of the literature and the survey results were positive about the Multilateral System of ABS under the International Treaty and the way that it impacts on the use of PGRFA. User organizations (such as seed and breeding companies) have said that the Multilateral System is their preferred ABS mechanism not least because it addresses “the relatively bounded field of food and agriculture” and has “a more clearly identified constituency, relatively actively involved in policy-making” (Laird *et al.*, 2020). This section looks at the positive features of the ABS system established under the International Treaty.

There is ample evidence in the literature and the survey results that suggest that the Multilateral System of ABS is having a positive impact on the utilization of PGRFA. The clearest example of this is in terms of the impact of the International Treaty in facilitating the exchange of PGRFA. While it is important to keep in mind that increases in acquisitions can be attributed to a number of factors,<sup>75</sup> there are a number of studies and numerous anecdotal accounts that highlight the positive impact the International Treaty’s Multilateral System has had in facilitating access to and the exchange of PGRFA generally (Mekonnen, and Spielman, 2021; NordGen, 2023) and within the CGIAR system more specifically (López Noriega *et al.*, 2019; Galluzzi *et al.*, 2016; Mekonnen and Spielman, 2021).<sup>76</sup> This is reflected in the fact that as of November 2024, “more than 6.9 million samples had been distributed (of which 6.5 million (95 percent) were Annex I crops) under about 110,000 SMTAs” (ITPGRFA, 2024). Similar findings were reported in a recent study that found a “positive association between [International Treaty] membership and PGRFA transfers is statistically significant for rice, sorghum, and cowpeas, but not for wheat and pearl millet” (Mekonnen, and Spielman, 2021). Specifically, the study found that International Treaty membership “is associated with a 30, 70 and 133 percent increase in the number of genebank accession from a country for rice, sorghum, and cowpeas, respectively. This suggests that ... the [International Treaty] is associated with improvements in the global movement of PGRFA” (Mekonnen, and Spielman, 2021).

It has also been said that “there is evidence that the Plant Treaty’s Multilateral System of access and benefit-sharing is contributing positively to the willingness of many countries, national genebanks, and other providers to make PGRFA available and to safety-duplicate material in the CGIAR Center-hosted international collections. Perhaps the most significant evidence (which is so obvious it is often overlooked) is that all of the material in the international collections ultimately came from countries and, to date, 146 countries and the EU have voluntarily ratified the Plant Treaty, which invites the Centers to manage those collections under the Plant Treaty framework, and to make those materials available under the SMTA” (Halewood *et al.*, 2020).

There are a number of reasons given for why the Multilateral System of access and benefit-sharing under the International Treaty is having a positive impact on the utilization of PGRFA. These include:

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<sup>75</sup> These include “improvements in genebank capacity; investments in collaborative projects between and among the CGIAR centers, national genebanks and research systems, and the GCDT [Global Crop Diversity Trust]; and the granting of permissions by contributing countries that allowed material” (Mekonnen, and Spielman, 2021).

<sup>76</sup> Halewood *et al.* (2020) suggest that “the CGIAR genebanks’ patterns of international acquisition and distribution of PGRFA over time are potentially significant proxies for the overall status and functioning of the global system in general, and institutions governing access to genetic resources and benefit-sharing in particular”.



**(i) Material is easy to access**

One of the facts commonly noted about the International Treaty is that it covers a vast amount of valuable plant genetic resources that are easy to access. This was particularly the case where people or organizations are familiar with the International Treaty processes.

**(ii) The SMTA is easy to use**

There was widespread and consistent support for the SMTA in the surveys and the literature. Several reasons are usually given for this support. The SMTA is widely used to transfer germplasm listed in Annex I (particularly by CGIAR breeding programmes and genebanks) (Engels, Ebert and van Hintum, 2024). It has also been reported that “an increasing number of countries are using the SMTA also for germplasm materials not listed in Annex I, e.g., the Netherlands, Germany, and most Nordic countries” (Engels, Ebert and van Hintum, 2024; Brink and van Hintum, 2020). In 2023, it was reported that “[s]ince 2006, more than 100,000 SMTAs have certified the transfer of over 6.6 million [plant genetic resource] samples worldwide. Most of the recipients are public sector research organizations in developing countries. Eighty-six percent of those materials were transferred from CGIAR breeding programs and genebanks” (Gullotta, Engels and Halewood, 2023; ITPGRFA, 2024). One of the consequences of this widespread use is that it increases familiarity with the SMTA, which reinforces and entrenches its use.<sup>77</sup>

One of the positive features of the SMTA consistently highlighted in the literature is that it is non-negotiable. The familiarity of many users with the SMTA and its widespread use keep the transaction costs (administrative and legal) low. As commentators noted, the SMTA “reduces transaction costs by eliminating the need for ad hoc negotiations between users and providers of GR” (Chiarolla, Louafi and Schloen, 2013; Chiarolla, 2011). In doing so, the SMTA increases legal certainty, decreases complexity of transferring and using PGRFA (Michiels *et al.*, 2022), and contributes “stability and a sound legal basis for providing and receiving germplasm” (Michiels *et al.*, 2022; Otieno *et al.*, 2017). As another commentator noted “the existence of the SMTA (because it is standard) made it possible for the [CGIAR] Centers to process agreements to receive and manage those same materials. It would have been impossible for the Centers to negotiate unique transfer agreements with sui generis benefit-sharing, dispute resolution, scope of use, and other conditions in each case, and then to put systems in place to manage materials under a plethora of different conditions” (Halewood *et al.*, 2020).

Another positive comment made about the Multilateral System is that it is well-suited to the needs of agriculture and plant breeding (Chiarolla, Louafi and Schloen, 2013; Chiarolla, 2011). In part this is because, as the International Treaty adopts “a research-oriented approach: access to resources is ... facilitated for research purposes, plant breeding and conservation” (Brogiato *et al.*, 2015). In contrast to many bilateral ABS measures, the International Treaty accommodates different models of innovation (or at least situations where research is cumulative and involves a number of providers and resources). As commentators put it, the International Treaty is profoundly influenced by the collective and incremental nature of the innovation process. As the International Treaty decouples the sharing of benefits from individual providers, it recognizes that the commutative or merit-based approach to equity is not relevant – that is, defining the value of each individual exchange and contribution – and rather focuses on collective aim/interest and benefits of public nature that need to be jointly produced through cooperation (Louafi and Manzella, 2018).

**[5.2] Negative impact of multilateral access and benefit-sharing**

While the literature and the surveys were positive about the impact of the International Treaty’s ABS system on the exchange and use of PGRFA, nonetheless a number of problems were raised. Section [5.2.1] looks at the problems raised in the surveys and the literature about the multilateral ABS system of the International Treaty. Section [5.2.2]. looks at the consequences these problems have had on the

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<sup>77</sup> There was widespread support for the SMTA from the respondents to the surveys. For example, in response the request to ‘share additional information about factors that have affected your or your institution’s ability to obtain access to GRFA’ a respondent from Ireland replied that: ‘Not an issue due to only dealing with GRFA and clearly defined procedure of using SMTA’. A number of similar responses were received from other respondents.

utilization of PGRFA. It should be noted that many of the problems with the International Treaty ABS system are being addressed in the ongoing negotiations aiming at enhancing the functioning of the Multilateral System of ABS of the International Treaty.

### **[5.2.1] Problems with multilateral access and benefit-sharing**

#### **(i) Scope of the Multilateral System**

One of the complaints about the International Treaty is that there is not as much material available in the Multilateral System as there could or should be. This complaint is related to the fact that the Multilateral System does not cover major crops such as soybean, sugar cane, tomato, coffee (Tsioumani, 2018),<sup>78</sup> cotton, and most vegetable species (Michiels *et al.*, 2022). This argument primarily comes from stakeholders (users) in developed countries who “generally view the International Plant Treaty as a success and have been seeking to extend the scope of the [Multilateral System] through an expansion of the Annex 1 list with more taxa” (NordGen, 2023).

#### **(ii) Availability of material from the Multilateral System**

Another complaint about the International Treaty and its Multilateral System is that some Contracting Parties to the Treaty do not make available material under the system that others consider to fall under the Multilateral System. This may be due to technical reasons. As a commentator noted “[a]lthough the amount of material distributed to date through the Multilateral System is impressive, it is only a small proportion of what it could be if more stakeholders had the technical capacity, for example, to identify plant genetic resources that are potentially adapted to changing climate conditions in their local areas, and to request, evaluate, and breed with those materials in local settings” (López Noriega *et al.*, 2019).

A more common explanation given for why there is not as much material available under the Multilateral System as there should be is because of non-compliance with the International Treaty. As has been noted, “there is ... evidence that a number of International Treaty contracting parties continue to be reluctant to implement the Multilateral System. Overall, national level implementation of the Multilateral System is still relatively low: only 44 out of 152 countries that are contracting parties have confirmed what PGRFA within their borders are actually included in the Multilateral System”.<sup>79</sup> This led one commentator to remark that “[c]ompliance is feeble and many Parties have yet to place their PGRFA in the [Multilateral System]” (NordGen, 2023). It should be noted, however, that the International Treaty “does not include an effective legal obligation for Contracting Parties and Article 15 organizations to confirm and publish lists of materials they will make available to recipients under the Plant Treaty framework” (Gullotta, Engels and Halewood, 2023).<sup>80</sup>

Another reason why Multilateral System materials are said to be difficult or impossible to access is the “relatively slow rate of national level implementation by a number of countries” (Halewood *et al.*, 2020). Commentators have identified various reasons for this slow implementation including that “developing country contracting parties are dissatisfied with the lack of monetary payments made to the International Treaty Benefit-sharing Fund by commercial users of materials from the Multilateral System” (Halewood *et al.*, 2020; Sirakaya, 2019). This has been compounded by concerns that have arisen about the way that monies from the International Treaty Benefit-sharing Fund are distributed. Specifically, some countries have made repeated bids without ever being selected, leading to their reluctance to make materials available (Halewood *et al.*, 2022; Sirakaya, 2019). These concerns about

<sup>78</sup> It should be noted that there are some exceptions. For example, “CATIE has its coffee collection in the System, through an Article 15 agreement. Same with Trinidad (University of West Indies) and cacao” (Tsioumani, 2018).

<sup>79</sup> <http://www.fao.org/plant-treaty/areas-of-work/the-multilateral-system/collections/en>

<sup>80</sup> Art 13.2 of the International Treaty states: “Contracting Parties agree to make available information which shall, inter alia, encompass catalogues and inventories, information on technologies, results of technical, scientific and socio-economic research, including characterization, evaluation and utilization, regarding those plant genetic resources for food and agriculture under the Multilateral System.” “However, the legal weight of this “agreement” is watered-down by the qualification that “such information shall be made available, where non-confidential, subject to applicable law and in accordance with national capabilities”... [e]xperience over the last five years has demonstrated that there are significant barriers to entry for using the GLIS by Contracting Parties, international organizations and natural or legal persons who are willing and ready to share such information” (Gullotta, Engels and Halewood, 2023).

monetary benefits have been compounded by “unresolved disputes concerning the enhancement of the International Treaty’s Multilateral System of access and benefit-sharing, and digital sequence information (DSI) in particular” (Halewood *et al.*, 2020), which has kept “some countries (and providers within countries) from making more PGRFA available through the Multilateral System.”<sup>81</sup>

While some of the problems with the International Treaty Multilateral System are gradually being overcome, there has been a growing reluctance to engage with the International Treaty Multilateral System among some countries. As commentators noted there is “growing distrust among actors in the international community engaged in the conservation, use, and exchange of genetic resources, coupled with questions about who was authorized to exchange genetic resources and what procedures applied to such exchanges” (Mekonnen and Spielman, 2021).

### **(iii) Lack of information available about the PGRFA in the Multilateral System**

Another complaint made about the Multilateral System is that information about the PGRFA that are available under the Multilateral System and how they might be obtained is either not clear or accessible. This is often the case where “Contracting Parties have not shared any information, through any means, concerning PGRFA within their boundaries that is available under the International Treaty framework” (Gullotta, Engels and Halewood, 2023). Obviously, this is “making it hard for potential users to know which PGR are available” (Brink and van Hintum, 2020) and also “making this material inaccessible to users due to lack of awareness” (Tsioumani, 2018). These problems are compounded by the fact there “is much ambiguity about the status of [plant genetic resources] not included in *ex situ* collections but occurring under *in situ* conditions” (Brink and van Hintum, 2020).

Similar problems occur in attempting to ascertain the PGRFA that are included under the International Treaty Multilateral System. Although there are “very useful information systems that provide accession-level information, but given their different original objectives, histories, institutional affiliations and levels of buy-in from organizations hosting PGRFA, they provide very different overall information about the amount and sources of PGRFA that are available under the Plant Treaty framework” (Gullotta, Engels, and Halewood, 2023). Problems of this nature led researchers who set out to understand what PGRFA were available under the mechanisms created by the International Treaty’s Multilateral System to conclude that “a comprehensive and consistent overview of the PGRFA available under the Plant Treaty’s ABS conditions is not available” (Gullotta, Engels, and Halewood, 2023).

Other information related problems have been raised about the Multilateral System. For example, it has been said that “[d]espite repeated requests for information from recipients concerning their evaluation of germplasm received through the Multilateral System, CGIAR centers rarely get information back, including when national research organizations register and release, as cultivars, improved lines they received from CGIAR centers” (López Noriega *et al.*, 2019). It has also been said that “research organizations only rarely publish or share research data vis-à-vis materials they received under the SMTA” (López Noriega *et al.*, 2019). Under the SMTA, recipients are required to make all non-confidential information that results from research and development carried out on the material received available to the Multilateral System.

This lack of information leads to a number of problems. One is that “the international community is losing opportunities to accumulate and add value to the plant genetic resources in the Multilateral System through information sharing” (López Noriega *et al.*, 2019). The lack of information also means that providers (in this case CGIAR centres) “transferring germplasm to organizations through the Multilateral System often cannot ascertain how that material is being used (this is more a concern for the centers with respect to germplasm they have improved), and whether those organizations are using the SMTA when they transfer that germplasm (or derived material) to third-party users” (López Noriega *et al.*, 2019).

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<sup>81</sup> “[S]ome parties who are not content with levels of monetary benefit-sharing from the use of PGRFA and/or genomic sequence information may be reluctant to make more materials available through the Multilateral System by depositing them in the international collections hosted by the CGIAR Centers until there is some resolution to the DSI and ABS issue” (Halewood *et al.*, 2020).

#### **(iv) Problems with facilitated access**

Another concern that has been raised is that while plant material may be in the Multilateral System, the system of facilitated access is not always working effectively and as a result access is being denied or delayed. In 2013, a study was undertaken to test how well the system of “multilateral facilitated access” works. To do this, seed requests were sent to 121 countries that are Contracting Parties to the International Treaty. Seeds “were received from 44 countries, 54 countries did not respond, while for 23 countries contacts stopped for various reasons: loss of communication, the accessions ... requested did not exist or were not in the Multilateral System, or conditions or standard material transfer agreements were different from those specified in the Treaty”. As a result, the authors concluded that facilitated access was “not straightforward” (Bjørnstad, Tekle and Göransson, 2013). It has also been said that access was slow and that the process of obtaining ‘germplasm was quite time consuming’ (Bjørnstad, Tekle and Göransson, 2013). Some of our interviewees suggested that the relative ease by which materials were obtained greatly improved when users were repeat players.

#### **(v) Problems with the operation of the SMTA**

While the SMTA is often held up as one of the successes of the Multilateral System, a number of complaints have been made about it, particularly by commercial users. There is anecdotal evidence that some commercial enterprises have avoided varieties developed by researchers when SMTA obligations apply. Of particular concern is “the absence of a material threshold, the absence of a time limit to the trigger of monetary benefit-sharing, [and the] amorphous definitions of “commercialization” and “plant genetic resources under development” in the non-negotiable SMTA” (Louafi and Manzella, 2018). These concerns were confirmed in an interview with a sorghum breeder who said that commercial companies were reluctant to purchase new varieties from them if they were based on material protected by an SMTA: the key problem being the onerous record keeping requirement that come with the new variety. In line with this it has been suggested that the monetary benefit-sharing formula under the International Treaty’s multilateral ABS system, which requires tracking and tracing the use of accessed genetic materials from research and development to commercialization of individual products and as a result imposes high transaction costs on users to prove or disprove when payments are due, has “driven away commercial users who can (legally) avoid using the multilateral system” (Halewood *et al.*, 2023).

While most of the respondents to the surveys were positive about the SMTA, a number of concerns were raised. For example, it was said that “[s]ome countries where we collected PGRFA did not agree with us distributing the material under the SMTA of the [International Treaty]. This meant we could not include this material in our regular collection and could not further distribute it.” It was also said that “[s]ometimes we receive material from Providers under an MTA with clauses that prevent transfer to 3<sup>rd</sup> Parties. In such cases it was not ABS measures that cause us to deny access but the clauses in the MTA.”

### **[5.2.2] Consequences of the problems with multilateral access and benefit-sharing**

This section summarizes the ways in which the problems with the multilateral ABS system impact negatively on the utilization of GRFA.

#### **(i) Changes in where PGRFA are sourced from**

One of the consequences of the fact that a number of countries have either not signed on to or fully implemented the International Treaty is that many plant genetic resources are available outside the scope of the International Treaty Multilateral System. Faced with problems with the International Treaty Multilateral System (such as concerns about the terms of the SMTA), anecdotal evidence suggests that some users have chosen to source their material from outside the scope of the International Treaty (Halewood *et al.*, 2012).

#### **(ii) Lack of coverage “imposes” the CBD on users of non-Annex 1 PGRFA**

As noted above, one of the complaints made about the International Treaty Multilateral System is that it does not cover certain and most vegetable species (Tsioumani, 2018; Michiels *et al.*, 2022). PGRFA not falling under the Multilateral System fall by default under the CBD/Nagoya Protocol, which means

that breeders of such PGRFA will often have to negotiate ABS agreements in line with national ABS measures, with all the concomitant problems this may create. As a result, it has been said that vegetable breeders “from the public and private sectors face considerable difficulties in accessing and using the required genetic diversity for breeding elite, nutrient-dense and resilient vegetable crop varieties” (Ebert *et al.*, 2023). The lack of coverage is said to have “motivated breeding companies to establish their own genebanks and to acquire a wide range of potentially useful genetic resources of company-specific target crops from public genebanks or through collecting missions” (Engels, Ebert and van Hintum, 2024).

### **(iii) Multilateral ABS hampers, restricts, or delays the use of genetic resources**

One of the ways in which the problems with the International Treaty Multilateral System impact on the way genetic resources are utilized is that they reduce the amount of PGRFA that is shared. The exchange of PGRFA is limited by a range of factors ranging from a lack of information about the PGRFA in the Multilateral System through to the fact that the system of facilitated access is sometimes not working effectively (Michiels *et al.*, 2022; Bjørnstad, Tekle and Göransson, 2013; MoAD, 2017).

## **[6] Generation and sharing of benefits through multilateral access and benefit-sharing**

The views of the respondents to the surveys and in the ABS literature about the impact of the International Treaty Multilateral System on the sharing of benefits are mixed. While mandatory user-based benefits have been negligible, the International Treaty has been more successful in the generation and sharing of voluntary monetary and non-monetary benefits.

### **[6.1] Failure to generate user-based monetary benefits under the Standard Material Transfer Agreement**

The trigger for the activation of the International Treaty monetary benefit-sharing scheme occurs when recipients use PGRFA to develop a product that is commercialized as a PGRFA product. In this situation, the monetary benefits that recipients need to share will depend on whether the commercialized PGRFA product is available without restriction for further research and breeding. Where research and breeding are unrestricted, the sharing of monetary benefits is voluntary. Where limits are placed on the ability of third parties to use the commercialized product for subsequent research and breeding, the recipient is required to pay a fixed portion of the benefits arising from the commercialization of the product. The SMTA provides that recipients have two alternative options for monetary benefit-sharing. The first is to pay 0.77 percent of the gross sales of the commercialized (and restricted) product for a period corresponding to the duration of such restriction (for instance, 20 years in the case of intellectual property rights-based restrictions). The second option is to pay 0.5 percent of the gross sales of all PGRFA products of the same crop to which the accessed material belongs. In the latter case, the recipient pays regardless of the restrictions for further research and breeding on the products for a period of ten years, which is renewable.

One of the most consistent things said in the literature about the International Treaty Multilateral System is that the mandatory sharing of monetary benefits has not been very successful (Engels, Ebert and van Hintum, 2024; NordGen, 2023). As of July 2023, there have only been five payments made under the mandatory scheme totalling USD 391 721, which is 1.11 percent of the total contributions made to the Benefit-sharing Fund (Table 1) (FAO, 2023a).

Table 1: User-based contributions to the Benefit-sharing Fund

Contributing party	Amount (USD)	Percentage of total contributions
Canadian Seed Company	3 187	0.009
Nunhems Netherlands BV	356 273	1.01
Beja Zaden BV	31 688	0.09
Uniquist Pty Ltd	218	0.001
Zollinger Bio	355	0.001
<b>Subtotal for user-based contributions</b>	<b>391 721</b>	<b>1.11</b>
<b>Total contributions</b>	<b>35 140 685</b>	<b>100</b>

Source: FAO, 2023a.

A number of explanations have been given for the lack of success of the International Treaty's mandatory user-based benefit-sharing scheme. For example, it has been said that one of the consequences is the fact that the SMTA only imposes payment obligations on those engaged in commercial research and development, meaning that the International Treaty misses "out on benefit-sharing from a broad range of downstream industries that generate revenue by using technologies developed upstream. Under the International Treaty, for example, seed companies are required to make payments, but not international grain merchants or food companies" (Halewood *et al.*, 2023).<sup>82</sup> It has also been said that the "fact that mandatory monetary benefits are only triggered by patents, partly explain the current low level of user-based monetary benefits generated by the standard Material Transfer Agreement" (NordGen, 2023).

Another reason given for why the "[Multilateral System] has hardly been able to generate any monetary benefits based on the use of the SMTA" is "due to the considerable time that elapses between access to PGRFA and the commercialization of products based on these PGRFA" (Brink and van Hintum, 2020; NordGen, 2023). Another explanation given for the lack of funds generated by mandatory benefit-sharing is the availability of plant genetic resources outside the scope of the International Treaty. Where this is the case, users may have the choice to use plant genetic resources that come with no obligations (Marden *et al.*, 2023).

It has also been suggested that a reason why mandatory benefit-sharing has generated so little income is that the coverage of the "[Multilateral System] is not comprehensive. It does not cover major crops such as soybean, sugarcane, tomato and coffee. Notably, some of these crops attracted significant research effort resulting in patented material, and their inclusion could result in mandatory benefit-sharing payments according to SMTA obligations. It is however precisely because of the high commercial interest that some countries opposed the inclusion of these crops into the Multilateral System, aiming for higher gains through bilateral transactions under the CBD terms" (Tsioumani, 2018. See also Brink and van Hintum, 2020).

Another explanation given for why the mandatory benefit-sharing has failed to generate funds is because while the SMTA only makes benefit-sharing payments mandatory when further use of the improved material is restricted, in practice "users of material from the [Multilateral System] do not generally restrict access for research and breeding, and therefore are not subject to mandatory sharing of monetary benefits" (Brink and van Hintum, 2020). As a commentator explained, "in practice most

<sup>82</sup> See Rosendal and Andresen (2016). This situation has led to the complaint that it is "problematic that the multinational seed corporations enjoy full access without providing benefit-sharing. These corporations generate large sums of money that are not returned to farmers."

of the organizations that choose to take material from the Multilateral System and incorporate it in new products do not restrict access to the improved material for further research and breeding purposes and are thus not obliged to share monetary benefits. Commercial users who would be more likely to trigger monetary benefit-sharing requirements have consistently chosen to access material from other sources, not the [Multilateral System]" (Tsioumani, 2018). This practice is in line with the breeder's exception, as foreseen in most plant variety protection laws.

## [6.2] Success in generating benefits

### (i) Success in generating monetary benefits by way of voluntary contributions

While mandatory benefit-sharing may not have generated much income, voluntary benefit-sharing has been more successful.<sup>83</sup> As of July 2023 the voluntary contributions have amounted to almost USD 35 million, which is 99 percent of the total of the funds that have been contributed to the Benefit-sharing Fund (FAO, 2023a). The voluntary contributions have been made from governments such as the EU, Norway, Italy, Australia and other donors such as the International Fund for Agricultural Development and the seed sector (both ad hoc and by way of annual contributions) (NordGen, 2023).

Table 2: Voluntary contributions made to the Benefit-sharing Fund

Contributors	Amount (USD)	Percentage of total contributions
Contracting Nations	31 863 991	90.68
Private Sector	1 377 565	3.92
International Mechanisms and Funds	1 500 000	4.27
Non-Governmental organizations and Others	992	0.003
Innovative Initiatives from International Treaty Stakeholders	6 416	0.02
<b>Subtotal for voluntary contributions</b>	<b>34 748 964</b>	<b>98.89</b>
<b>Total contributions</b>	<b>35 140 685</b>	<b>100</b>

Source: FAO, 2023a.

### (ii) Success in encouraging the sharing of monetary benefits

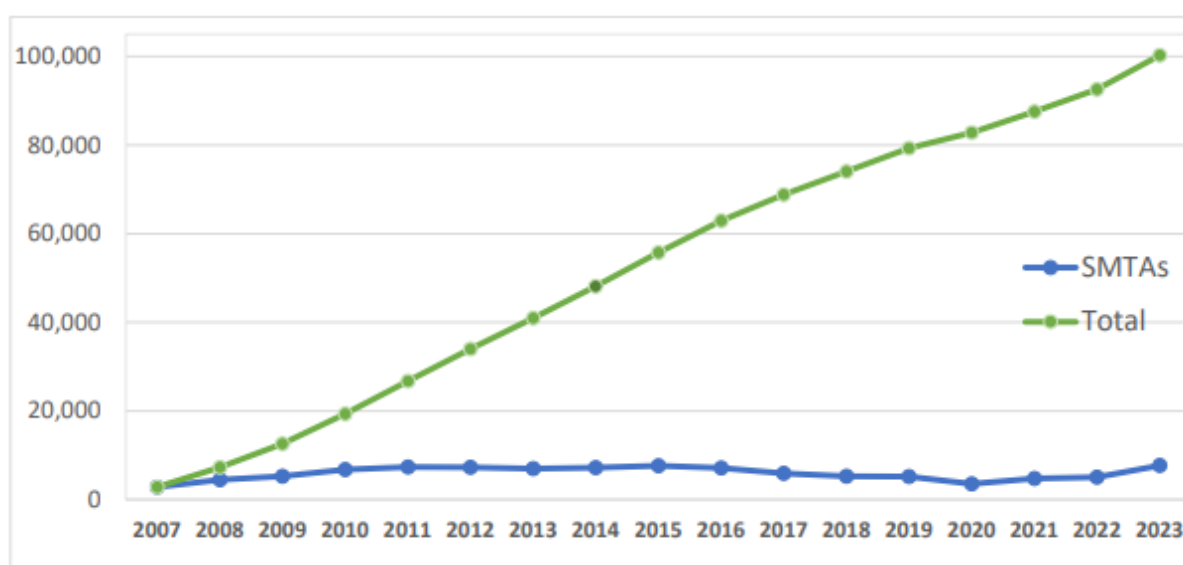
The International Treaty Multilateral System is widely seen to have been successful in encouraging the sharing of monetary benefits. Funds are distributed from the International Treaty's Benefit-sharing Fund through a system of open competitive bids. To date five project cycles have been supported by the Benefit-sharing Fund. "Since its establishment in 2009, the ITPGRFA Benefit-sharing Fund has invested 26 million USD in 81 projects in 67 developing countries" (Muñoz-García, Lago and Scholz, 2024).

<sup>83</sup> It has been suggested that "the existing benefit provision mechanisms do not fully address the high heterogeneity of actors and resources revolving around the Treaty commons" (Louafi and Manzella, 2018).

### (iii) Success in encouraging the generation and sharing of non-monetary benefits

The International Treaty ABS system is widely seen to have had a positive impact on the generation and sharing on non-monetary benefits arising from the utilization of PGRFA. One of the most important is the success the International Treaty Multilateral System has had in facilitating the exchange of PGRFA (NordGen, 2023; Halewood *et al.*, 2020). The success of the International Treaty Multilateral System in facilitating the exchange of PGRFA is reflected in the fact that over 110 000 SMTAs had been reported to the International Treaty system as of 5 November 2024. Ninety-five percent of these SMTAs were for Annex 1 crops, 5 percent were for non-Annex 1 crops, and 11.5 percent of the recipients were non-contracting parties to the International Treaty (FAO, 2023b). The facilitated access to PGRFA provided by the International Treaty is seen as “a major benefit, making it possible for farmers, plant breeders and researchers, in both the public and private sectors, to have access to the widest possible range of PGRFA” (Manzella, 2012).<sup>84</sup>

**Figure 18: Trends in Standard Material Transfer Agreement reporting to the International Treaty from its conception to the latest publicly available numbers**



Source: FAO, 2023b.

Note: Figure 18 has been generated using the annual and total number of SMTAs reported since 2007. The bottom (blue) line represents the annual number of SMTA reports each year from 2007 to 2023. The top (green) line is the cumulative number of SMTAs over the same period.

The International Treaty has also had a positive impact on the sharing of other non-monetary benefits including capacity building, information exchange, collaborative research, knowledge creation, and access to and transfer of technology (Brink and van Hintum, 2020; López Noriega *et al.*, 2019). It should be noted that these forms of benefit-sharing are based on general obligations of state governments under the International Treaty (Manzella *et al.*, 2023) rather than on the ABS Multilateral System per se. The sharing of non-monetary benefits is reinforced by the activities of the CGIAR centres, which play an important role in the sharing of non-monetary benefits. Indeed, it has been suggested that “CGIAR centers pursue their mission primarily through generation of what are described as nonmonetary benefits in the lexicon of the [International Treaty] (Article 13), such as through the provision of germplasm, technology transfer, capacity strengthening, and information exchange” (López Noriega *et al.*, 2019; Engels, Ebert, and van Hintum, 2024).

<sup>84</sup>“The main (perceived) contribution of the breeding industry to farmers and growers is the added value that is comprised of the release of new varieties that they develop, combined with professional growing advice, that helps farmers achieve a better income” (Engels, Ebert and van Hintum, 2024).



## Part IV: Conclusion

Analysing the implications of ABS measures for the use and exchange of GRFA, associated traditional knowledge, and the fair and equitable sharing of benefits is a difficult task that faces a number of challenges. One of which is that there is very little information about the impact of ABS on non-plant GRFA. There are also shortfalls in relation to the information that is available in relation to PGRFA. While there has been consideration given to the impact of ABS on genebanks, breeders, seed companies and researchers working with PGRFA, there has been much less attention given to the impact of ABS on farmers, Indigenous Peoples and local communities. Another challenge arises because while “ABS is a complex and dynamic issue that involves different stakeholders who may have conflicting interests and may pertain to different cultural, social and economic backgrounds” (Halewood *et al.*, 2020; Leskien, 2023; Silvestri *et al.*, 2020), there is little to no information about the way many stakeholder groups are impacted by ABS.

While descriptive accounts of ABS laws and procedures play an important role in improving the understanding and operation of ABS, there is a growing amount of research that addresses the discord between how ABS is written and how it operates in practice (Rourke, 2018). While there is a vast amount of anecdotal evidence about impact and a smaller number of targeted surveys, to analyse the implications of ABS measures there is an urgent need for further empirical research (Humphries *et al.*, 2023). To this end, to get a clearer understanding of the impact of ABS measures on the utilization of GRFA and associated traditional knowledge and the consequential generation and sharing of benefits, it would be helpful if there were:

**Impact studies in the different subsectors of GRFA:** While there has been much written about PGRFA (at least from certain stakeholder perspectives), the other subsectors of GRFA have largely been ignored. To obtain a better picture of the impact of ABS on GRFA, it is important that this oversight is rectified. The biological control community, which has taken the initiative and undertaken a number of systematic reviews of ABS that provide highly valuable information, offers an important model of what this additional research might look like. Importantly these studies should look at the impact of ABS on stakeholders across the subsectors.

**Impact studies that focus on the impact of ABS measures on access to traditional knowledge associated with GRFA held by Indigenous Peoples and local communities:** There has been comparatively little written on the impact of ABS on Indigenous Peoples and the generation and sharing of benefits from the utilization of their traditional knowledge. To rectify this, consideration should be given to looking at the impact that ABS measures, including non-state measures such as the Local Contexts initiative and the Global Indigenous Data Alliance, have had on the exchange of traditional knowledge associated with GRFA and the generation and fair and equitable sharing of benefits arising from the utilization of such knowledge.

**In depth case studies:** Detailed in-depth case studies that look in detail at aspects of ABS (including stories of success and failure) such as the report on the ABS agreement for teff genetic resources in Ethiopia (Andersen and Winge, 2012) provide important context to ABS agreements and insights into where and why problems arise. Similar studies in other areas would be invaluable.

**Longitudinal studies:** A small number of longitudinal studies have been undertaken in the ABS field that provide important reference points that make it possible to track the impact of ABS over time.<sup>85</sup> They also provide a basis to draw conclusions about the effectiveness of policy change and reform. More studies that look at issues over a long period of time would be welcomed. Ideally these would be repeated regularly.

**Stakeholder ABS wiki:** To overcome the challenge of collecting information from a diverse field from around the world, consideration should be given to establishing a stakeholder-driven website that is able to collaboratively capture information from different stakeholders from different GRFA subsectors about the impact of ABS measures on the utilization of GRFA, associated traditional knowledge and

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<sup>85</sup> For example, see Halewood *et al.* (2012); López Noriega *et al.* (2019).

the consequential sharing of benefits. Allowing stakeholders to add and edit content on the impact of ABS would help to capture the diversity of the impact and to deal with the speed of change in the area.

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**APPENDIX 1**  
**INTERNATIONALLY RECOGNIZED CERTIFICATES OF COMPLIANCE BY COUNTRY,**  
**SUBJECT-MATTER (CONFIDENTIAL/NON-CONFIDENTIAL) AND USE**  
**(COMMERCIAL/NON-COMMERCIAL/CONFIDENTIAL)**

<b>Country</b>	<b>Number of IRCCs</b>
India	3454
France	830
Spain	213
Argentina	121
Kenya	107
Republic of Korea	68
Peru	61
South Africa	60
Dominican Republic	57
Panama	47
Guyana	39
Lao People's Democratic Republic	37
Viet Nam	37
Benin	20
Cameroon	19
Belarus	16
Malta	14
Antigua and Barbuda	8
Mexico	8
Uruguay	8
Ethiopia	6
Bulgaria	3
Madagascar	3
Belgium	2
Saint Kitts and Nevis	2
Bhutan	1
Comoros	1
Côte d'Ivoire	1
Guatemala	1
<b>Total</b>	<b>5 244</b>

Source: ABS Clearing-House (as of 8 November 2024).

Country	Subject matter Confidential	Subject matter not confidential	Commercial use	Non – Commercial use	Use Confidential
Antigua and Barbuda	0	8	0	8	0
Argentina	0	121	3	118	0
Belarus	0	16	1	15	0
Belgium	2	0	0	0	2
Benin	1	19	0	20	0
Bhutan	0	1	1	0	0
Bulgaria	0	3	0	2	1
Cameroon	8	11	4	8	0
Comoros	0	1	1	0	0
Côte d'Ivoire	0	1	0	1	0
Dominican Republic	2	55	51	6	0
Ethiopia	2	4	6	0	0
France	19	811	11	817	1
Guatemala	0	1	0	1	0
Guyana	0	39	3	36	0
India	1 811	1 643	1 212	363	1 865
Kenya	0	107	107	0	0
Lao People's Democratic Republic	3	34	0	28	7
Madagascar	3	0	2	0	1
Malta	3	11	2	10	2
Mexico	1	7	0	6	0
Panama	1	46	1	46	0
Peru	0	61	5	56	0
Republic of Korea	50	18	3	55	10
Saint Kitts and Nevis	0	2	0	2	0
South Africa	0	60	60	0	0
Spain	3	210	2	208	3
Uruguay	0	8	0	8	0
Viet Nam	0	37	6	31	0
<b>Totals</b>	<b>1 909</b>	<b>3 327</b>	<b>1 481</b>	<b>1 845</b>	<b>1 892</b>
<b>Percentages</b>	<b>36.40 percent</b>	<b>63.44 percent</b>	<b>28.24 percent</b>	<b>35.18 percent</b>	<b>36.08 percent</b>

Source: ABS Clearing-House (as of 8 November 2024).