LL.M. Final Thesis
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Access and Benefit-Sharing
Key Concepts, Legal Principles and Implementation Challenges

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For my wife

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My special thanks to professor Aðalheiður Jóhannsdóttir

Abstract

This thesis is set up to analyse the key assumptions and legal principles underlying the concept of access and benefit-sharing (ABS) under the Nagoya Protocol and the Convention on Biological Diversity (CBD) in order to highlight the key legal issues and difficulties that may arise during the implementation of the ABS mechanism.

The implementation of ABS into national laws has been unsatisfactory. Very few States have adopted ABS measures into domestic laws. The causes could be that the core concepts of ABS remain complex and uncertain to legislators. A better understanding of the key assumptions underlying the ABS concepts, therefore, is necessary for the Parties to adopt adequate measures to implement ABS.

To this end, the thesis will outline the key ABS rules and their core underlying assumptions. More importantly, the validity of the principles underlying the ABS concept will be tested against their legal compatibility with the core legal principles of international laws, namely, the principle of State sovereignty over natural resources, principle of common but differentiated responsibilities of States, and principle of sustainable use of biodiversity. The essential task of theses comparisons is to highlight some of the critical implications for the implementation of ABS into national laws.

In brief, the idea of sharing benefits with the providers of valuable genetic resources is desirable from a variety of perspectives. However, the implementation of the ABS rules is far from being straightforward. Because of the novelties and complexities of genetic utilizations, defining the scope of national ABS measures alone could be a challenging task. Moreover, though the core legal principles of international laws are in large supportive to the concepts of ABS, this does not mean that there are no conflicts between these principles and the ABS mechanism. A diversity of aspects to the ABS concepts and the tensions between ABS rules and other legal principles under international laws must be recognized and duly taken into account in order to adequately implement ABS in national legislations.

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List of Abbreviations

ABS	Access and Benefit-Sharing
CBD	Convention on Biological Diversity (1992)
CBDR	Common But Differentiated Responsibilities of States
COP	Conference of the Parties to the Convention on Biological Diversity
DNA	Deoxyribonucleic Acid
FAO	Food and Agriculture Organisation of the United Nations
FNI	Fridtjof Nansen Institute
GHGs	Greenhouse Gases
GMOs	Genetically Modified Organisms
IPRs	Intellectual Property Rights
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture (2001)
IUCN	International Union for Conservation of Nature and Natural Resources
MATs	Mutually Agreed Terms
PIC	Prior Informed Consent
TEEB	The Economics of Ecosystems & Biodiversity
TRIPS Agreement	Trade-Related Aspects of Intellectual Property Rights (1994)
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea (1982)
UNDRIP	United Nations Declaration on the Rights of Indigenous People (2007)
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change (1992)
UNTS	United Nations Treaty Series
UPOV	International Convention for the Protection of New Varieties

	of Plants (1961)
WTO	World Trade Organisation
art	Article
cf	Confer
e.g.	For example
ed(s)	Editor(s)
ibid	*ibidem*
n	Footnote
para	Paragraph
s	Section
vol	Volume

1 Introduction

1.1 The contextual background

The 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 (which will henceforth be referred to as the Nagoya Protocol or the Protocol)[1] was adopted at the tenth meeting of the Conference of the Parties (COP) on 29 October 2010 in Nagoya, Japan. The Protocol's core mandate[2] is to elaborate further on the two key provisions of the Convention on Biological Diversity (hereafter the CBD or the Convention),[3] which: (i) ensure access and benefit-sharing from the utilization of genetic resources[4] and (ii) address issues relating to the traditional knowledge associated with genetic resources and the fair and equitable sharing of benefits arising from the utilization of such knowledge.[5]

The Nagoya Protocol assumes that the fair and equitable sharing of the benefits arising from the utilization of genetic resources will be enabled by (i) appropriate access to genetic resources, (ii) appropriate transfer of relevant technologies, and (iii) appropriate funding.[6]

The access and benefit-sharing (ABS) mechanism was first introduced to the field of international law by the CBD. It was subjected to at least twenty years of on-the-ground application before the Nagoya Protocol expanded the concept further. That said, very few States have adopted national legislation to implement the ABS.[7] In part, this introduction will explore the reasons for such an unsatisfactory result.

1.2 The conceptual problems

There could be a variety of explanations why only a few States have adopted ABS legislation. One might assume it is because the concept of ABS is not desirable to the

[1] Nagoya Protocol (Nagoya, 29 October 2010, in force 12 October 2014) United Nations Treaty Series (UNTS) A–30619.
[2] COP 9 Decision IX/12, *Access and Benefit-Sharing*, para 3.
[3] Convention on Biological Diversity (Rio de Janeiro, 5 June 1992, in force 29 December 1993) UNTS I–30619.
[4] CBD, art 15.
[5] ibid, art 8(j).
[6] Nagoya Protocol, art 1.
[7] Access and Benefit-Sharing Clearing-House, *National Records: Legislative, Administrative or Policy Measures* <https://absch.cbd.int/search/MSR> accessed 22 April 2015.

views of the majority of the Contracting Parties to the CBD. As there are now up to 194 Parties to the CBD,[8] it seems unlikely that every one of them has an antagonistic view to ABS. Thus, there must be some conceptual problems with ABS since the Parties to the CBD have not proactively taken legislative or administrative measures to implement the ABS system.

This thesis is designed to explore the complexities, novelties, and uncertainties in the concept of ABS as expanded under the Nagoya Protocol, with the view to draw forward and discuss the difficulties in the implementation of ABS and to highlight some of the conceptual problems inherited in the concept of ABS. To this end, the author will, throughout the thesis, address the key assumptions and legal principles underlying the ABS mechanism to examine whether or not these assumptions are valid and to determine their possible implications for the implementation of ABS into national laws.

The key assumption of this thesis is that the implementation of ABS will encounter inevitable resistances from private actors at stake until the concept of ABS is sufficiently understood. Therefore, sufficient understandings of the concept of ABS and its inherent principles are necessary in order for the Parties to be able to implement the necessary national legislation.

The validity of the principles underlying the concept of ABS could be tested against its compatibility with other principles of international laws, such as the principle of State sovereignty over natural resources, the principle of the common but differentiated responsibility of the States, the principle of sustainable use of biodiversity, and a new notion of the rights of indigenous and local communities. These are the core legal principles that could have significant impacts on the implementation of ABS on factual grounds.

1.3 Method

The thesis applies the legal dogmatic method, also called the analytical study of law.[9] It will describe and analyse the legal rules and legal principles related to the ABS mechanism as necessary.

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[8] CBD, 'List of Parties' <http://www.cbd.int/information/parties.shtml> accessed 22 April 2015.
[9] Enrico Pattaro (ed), *A Treatise of Legal Philosophy and General Jurisprudence*, vol 4 (Springer 2005) ch 1, 814–42.

1.4 Chapter map and methodology

The introduction (Chapter 1) has provided a brief summary of the issue and method, and also describes the topic of each chapter.

Chapter 2 outlines and describes the key legal principles of ABS. It addresses the basic ABS rules, the relationship between prior informed consent and mutually agreed terms, and the wide range of benefits that may be shared. Furthermore, it will outline some of the key conceptual problems of ABS, including what constitutes utilization of genetic resources, what constitutes a fair and equitable sharing, and how to understand the concept of genetic resources and the nature of the utilization of these resources. The goal of this chapter is to set phrases for further in-depth analysis in the chapters that follow.

Chapter 3 addresses the principle of State sovereignty over natural resources as the backbone for the legitimacy of ABS. It also outlines the key motivations for the recognition of State sovereignty over natural resources in the context of ABS, including the increased expectation that genetic resources have value and the expansion of the protection of intellectual property rights over living organisms. The chapter further clarifies the nature of State sovereignty in the context of ABS. It will be demonstrated that, while the principle of State sovereignty is a firmly established legal principle under international law, ABS implementation faces a variety of challenges both from inside and outside. From inside, State sovereignty could be eroded by the national regime on property rights, claims on intellectual property rights, and the rights of indigenous and local communities. From outside, States have to consider the access and benefit-sharing mechanism with respect to the genetic resources of plants and to international regimes that treat genetic resources as the common heritage of humankind.

Chapter 4 explores the principle of sustainable use for biological diversity. It describes the socio-economic approach of the CBD to the conservation of biodiversity with an aim to highlight the assumptions that ABS could sufficiently accommodate the costs of conserving an area's biodiversity. It also addresses the concept of environmentally sound use and the obligation of States to facilitate access for such use. The direct and indirect effects of the genetic utilization of biodiversity is also addressed,

for the purpose of testing the compatibility of ABS rules with the principle of sustainable use in the broader context of biodiversity conservation.

Chapter 5 analyses the principle of common but differentiated responsibilities of the States to highlight the possible implications of the principle for the implementation of ABS. To do so, it will address the legal content and status of the principle under international laws. The analysis will compare the nature of the developed States' differentiated responsibilities toward biodiversity conservation against the differentiated responsibilities toward climate change in order to provide a critical analysis of the nature of the responsibilities of States in the context of the ABS mechanism. It demonstrates that ABS is rarely a reflection or an extension of the principle of common but differentiated responsibilities of States, because ABS operates on different legal grounds.

Chapter 6 addresses the key legal issues relating to ABS with respect to traditional knowledge. The discussion shows that the concepts of traditional knowledge and its utilization could be far more complex than those of genetic resources. The functionality of the ABS mechanism might be significantly undermined by the complexities and uncertainty of the whole idea of 'rights to traditional knowledge'. Therefore, the chapter will describe and summarize the core characteristics of traditional knowledge in order to assist national legislators to sufficiently define the scope of traditional knowledge subject to national ABS rules. Furthermore, it will highlight the necessity and difficulty of clarifying ownership over traditional knowledge under the related ABS mechanism. It describes and analyses some of the notable methods for recognising who owns or holds traditional knowledge and the shortcomings of these methods.

Chapter 7 provides the conclusion, and recommendations for future practice and research.

2 The Key Legal Principles of ABS

This chapter will introduce the core content of the ABS system and its relevant legal principles. In addition, the underlying rationales of the ABS mechanism will also be analysed in the light of the CBD's overall legal approaches, whereby the concept of ABS was first introduced into the field of international law. To this end, the author will introduce the basic ABS rules, the ABS's key conceptual problems, and the underlying rationales of the ABS mechanism. This will set phrases for further detailed analyses, which will be made in Chapters 3, 4, 5, and 6 of the thesis.

2.1 ABS mechanism under the CBD and the Nagoya Protocol

This section outlines the basic rules of the ABS system, including the access rules for genetic resources and the same rules for ABS with respect to traditional knowledge. It also addresses the other side of ABS: benefit-sharing rules. In addition, it will also briefly introduce some key conceptual problems of ABS, including what constitutes a utilization of genetic resources, how a sharing of benefits could be regarded as fair and equitable, and the nature of prior informed consent and mutually agreed terms. These will be the basis for later in-depth analysis in other relevant chapters of the thesis.

According to the COP 10 Decision X/1,[10] the international legal regime on access to and benefit-sharing of genetic resources includes the CBD, the Nagoya Protocol, and the other complementary instruments, including the International Treaty on Plant Genetic Resources for Food and Agriculture (hereafter, ITPGRFA)[11] and the Bonn Guidelines.[12] The ABS system under the CBD and the Nagoya Protocol is distinctive from the benefit-sharing mechanism under the ITPGRFA because plant genetic resources are subject to the multilateral benefit-sharing mechanism under the ITPGRFA rather than the bilateral mechanism under the CBD and the Nagoya Protocol. The author will elaborate on this matter in Chapter 3, in the context of State sovereignty.

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[10] COP 10 Decision X/1, *Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization*, preambular 6.
[11] ITPGRFA (Rome, 03 November 2001, in force 29 June 2004) UNTS I–43345.
[12] COP 6 Decision VI/24, *Access and Benefit-Sharing as Related to Genetic Resources*, Annex (*Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of Their Utilization*).

2.1.1 ABS rules

One of the core objectives of the CBD is to insure fair and equitable benefit-sharing from the utilization of genetic resources, by appropriate access to genetic resources, through appropriate transfer of technologies, and with correct funding.[13] This is also the core objective of the Nagoya Protocol.[14] Note that there are two sides to the ABS mechanism: the rules on access to genetic resources and the rules on fair and equitable benefit-sharing.

The key provisions of the CBD and the Nagoya Protocol outline relatively straight-forward legal contents for the ABS regime. They affirm that, on the basis of States sovereignty over their natural resources, States have the rights to regulate access to genetic resources.[15] During the exercise of such sovereign rights,[16] access to genetic resources for their utilization shall be subject to the prior informed consent (PIC) of the country providing such resources.[17] Such provider countries could be the origin countries of these resources or countries that have acquired the genetic resources in accordance with the CBD.[18]

In addition, States have the obligation to facilitate access to genetic resources for environmentally sound uses.[19] They also must ensure that the prior informed consent (hereafter, community PIC), or approval and involvement of indigenous and local communities, shall be obtained for access to genetic resources if these communities have the established rights to grant such access.[20]

As for the access rules with respect to traditional knowledge associated with genetic resources,[21] those who want to utilize such knowledge have to seek community

[13] See CBD, art 1.
[14] Nagoya Protocol, art 1.
[15] CBD, art 15(1).
[16] Nagoya Protocol, art 6(1).
[17] CBD, art 15(5); Nagoya Protocol, art 6(1).
[18] CBD, art 15(3); Nagoya Protocol, art 6(1).
[19] CBD, art 15(2).
[20] Nagoya Protocol, art 6(2).
[21] cf CBD, preambular 12, art 8(j); Nagoya Protocol, art 7 Note that, while the Nagoya Protocol uses the term 'traditional knowledge associated with genetic resources', the CBD originally uses the term 'traditional knowledge, innovations and practices relevant to the conservation of biodiversity and the sustainable use of its components'.

PIC or approval and involvement of the relevant indigenous and local communities.[22] The CBD encourages the wider uses of traditional knowledge.[23]

With regards to the benefit-sharing rules, benefit-sharing for the utilization of genetic resources and the utilization of traditional knowledge associated with genetic resources shall be upon mutually agreed terms (MATs).[24] These MATs should discuss the terms of benefit-sharing. The benefits arising from the subsequent applications and commercialization of genetic resources should also be shared in a fair and equitable manner.[25]

Finally, the benefits to be shared will include both the monetary benefits and the non-monetary ones.[26] Sharing the results of research and development and ensuring full participation in scientific research are among the many non-monetary benefits indicated by the CBD.[27]

The next section will provide further commentary on the basic rules of the ABS system, including the nature of PIC and MATs, types of benefits, and what will constitute a fair and equitable sharing, as well as what will constitute genetic resources and utilization of such.

2.1.2 PIC and MATs

The grounds mentioned above may indicate that PIC and MATs are the backbones of the ABS system. Generally speaking, PIC and MATs are interrelated, and yet have different instrumental natures.

PIC is by nature an administrative instrument that enables the provider countries of genetic resources to control the access and uses of such resources. PIC, when granted, can be in a form of a written decision by a competent national authority; that document then would be consistent with an internationally recognized certificate of compliance to serve as evidence of the fulfilment of PIC and MATs, as stipulated in Article 3(d) and 17(3) of the Nagoya Protocol.

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[22] CBD, art 8(j); Nagoya Protocol, art 7.
[23] CBD, art 8(j).
[24] ibid, art 15(4); Nagoya Protocol, art 5(1), 5(2), 5(5), 7.
[25] Nagoya Protocol, art 5(1).
[26] See, Bonn Guidelines, Appendix II; Nagoya Protocol, Annex.
[27] CBD, art 15(6), 15(7).

The phrases 'where granted'[28] and 'unless otherwise determined by that Party'[29] indicate that States can in principle decline a request for access to genetic resources. One might also argue that States can decide to restrict all accesses, and reserve all genetic resources for domestic use.[30] On the other hand, theoretically, they can also decide not to require that users of genetic resources to obtain a PIC.

MATs are the agreements between the providers and users of genetic resources on the conditions of access and the terms of benefit-sharing.[31] MATs, therefore, are contractual agreements that result from the negotiation processes between the providers and users of genetic resources.

PIC and MATs are also closely related. In cases where the terms on benefit-sharing have not been agreed upon, the providers of genetic resources are not likely to grant access. The opposite is also true: the users of genetic resources would not find themselves in long, sometimes cumbersome negotiations if they knew they could not expect a granting of access to such resources and rights to utilize them.

That said, the relationship between PIC and MATs could be unclear in many instances. For example, a concern has been raised relating to several situations where States decide not to require PIC. In such a case, it is not clear whether organisations wishing to use the resources are still required to share the benefits of the genetic resources.[32] In addition, it would also be unclear whether PIC and MATs shall still be required in the case that a State has not yet adopted ABS regulation on this matter.

2.1.3 Users and providers of genetic resources

As an international treaty, the CBD only directly addresses the rights and obligations of the States, hence the Parties will have to transpose the relevant provisions of the CBD into national laws so that they might take effect on private actors, if applicable.[33]

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[28] ibid, art 15(4).
[29] ibid, art 15(5); Nagoya Protocol, art 6(1).
[30] See CBD, art 15(2) Note the potential conflicts with the obligations of the Parties to facilitate accesses for environmentally sound uses.
[31] Nagoya Protocol, art 6(3)(g).
[32] UNEP, *Report of the Expert Meeting on Article 10 of the Nagoya Protocol on Access and Benefit-Sharing* (Korea 2013) (UNEP/CBD/ICNP/3/5) para 23(d), (e).
[33] Rebecca MM Wallace and Olga Martin-Ortega, *International Law* (7th edn, Sweet & Maxwell 2013) 39, 61 They note the different approaches of States to international law. The monastic approach automatically accepts international laws into national legislation, whereas the dualistic approach requires legal transpositions.

But, once transposed, the interactions between the stakeholders of ABS transactions (private providers and users of genetic resources) could be the core factors that would shape the effectiveness of the ABS system at the international level. Users and providers of genetic resources need not be only States. According to the Secretariat of the CBD, some of the notable users of genetic resources are botanical gardens, cosmetic industry businesses, pharmaceutical researchers, and research institutes, among others.[34] On the other hand, the providers of genetic resources could be indigenous and local communities[35] and other holders of genetic resources, such as ex-situ collectors like seed banks, botanical gardens, and plant collections would be among the notable providers.[36]

In the same vein, the users of genetic resources could be domestic or foreign. The cross-border transfers of biological resources could fall under the regime of trade laws. Chapter 3 will provide more information on the relationship between ABS and trade rules with respect to the transfers of biological resources.

With regard to the issue of who has the authority to grant access, it is important to note that the Nagoya Protocol does not require the competent national authority to be the only authority who could grant PIC. Quite to the contrary, the Nagoya Protocol actually required States to recognize the rights of indigenous and local communities to grant access to their genetic resources.[37] These groups could form community-based organisations to negotiate MATs on behalf of the people.[38] The group that has the right to grant PIC depends on the legal arrangements of the domestic legislations of the Parties. This fact is consistent with the principle of State sovereignty under Article 15(1) of the CBD, which grants States the rights to regulate the authority to grant access. States can regulate who has the rights to grant PIC in accordance with their legislations and policies.

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[34] The Secretariat of the Convention on Biological Diversity, 'Convention on Biological Diversity: ABS, Introduction to Access and Benefit-Sharing' <https://www.cbd.int/abs/infokit/brochure-en.pdf> accessed 15 April 2015.

[35] Nagoya Protocol, art 5(2), 6(2).

[36] See Botanic Gardens Conservation International, 'Ex–situ conservation' <https://www.bgci.org/ourwork/ex_situ/> accessed 15 April 2015.

[37] See Nagoya Protocol, art 6(2).

[38] Peter Munyi and Harry Jonas, 'Implementing the Nagoya Protocol in Africa: Opportunities and Challenges for African Indigenous Peoples and Local Communities' in Elisa Morgera, Matthias Buck and Elsa Tsioumani (eds), *The 2010 Nagoya Protocol on Access and Benefit-Sharing in Perspective: Implications for International Law and Implementation Challenges* (Martinus Nijhoff Publishers 2013) 224–28 The work provides some the introductions to the San–Hoodia Case and the South African San Council as examples of how indigenous and local communities can form community-based organisations to negotiate MATs on their behalf.

The notes above are critical because the insights on the implications for the implementation of the ABS could only be appropriately draw out in the light of the conflicts of interests between users and providers of genetic resources, either domestic or foreign, in the context of the private legal system.

2.1.4 Benefits and the equitable sharing

A wide range of monetary and non-monetary benefits that needs to be shared have evolved from being suggested as such by the CBD, recommended on a voluntary basis by the Bonn Guidelines, and reaffirmed by the Nagoya Protocol as a legally binding provision.[39] This section will outline the key issues relating to the types of benefits that need to be shared, the rationales for such non-monetary benefits, and the factors that constitute fair and equitable sharing.

2.1.4.1 Types of benefits

According to the annex of the Nagoya Protocol, non-monetary benefits may include, but may not be limited to: sharing of research and development results; cooperation in biotechnological activities; participation in product development, education, and training; institutional capacity-building; and joint ownership of relevant intellectual property rights, among others.[40] The term 'but not be limited to' indicates that the list of benefits is by nature not exhaustive.[41] The terms on benefit-sharing shall be decided by MATs,[42] and so the parties to these MATs negotiate the appropriate types of benefits to share depending on the nature of the relevant projects.

According to Article 8(a) of the Nagoya Protocol, simplified measures should be applied to access genetic resources for non-commercial research purposes. Gurdial Singh Nijiar rightly notes that the term 'simplified measure on access' indicates that PIC and MATs exist for non-commercial utilization, but are usually simpler.[43] The distinctions between commercial and non-commercial uses of genetic resources, from the point of view of the author, is not only important with regard to whether simplified measures

[39] cf CBD, art 15(7); Bonn Guidelines, Appendix II; Nagoya Protocol, Annex.
[40] Nagoya Protocol, Annex.
[41] ibid.
[42] ibid, art 6(3)(g)(iii).
[43] Gurdial Singh Nijiar, *The Nagoya Protocol on Access and Benefit Sharing of Genetic Resources: Analysis and Implementation Options for Developing Countries* Research Paper No. 36 (South Center 2011) 30.

should be applicable, but also with regard to what kinds of benefits the parties to the MATs could expect. For example, the commercialization of products from the utilization of genetic resources would be more likely to generate economic profits in immediate terms. On the other hand, purely scientific research of genetic resources (e.g., by research institutions or universities) would improve the knowledge in the field; whether such knowledge could be later translated into useful products remains uncertain.

The Nagoya Protocol requires sharing the benefits arising from not only initial uses of genetic resources but also from subsequent applications and commercialization of useful products that originated from such resources.[44] While the Protocol encourages simpler access procedures for scientific research uses, national ABS measures should take into account the change of intent for such research.[45] Change of intent happens when genetic resources are first accessed for research purposes but latter used in commercialized products. The Nagoya Protocol anticipates the needs to share benefits arising from commercialisation of products originated from genetic resources as well as subsequent third-party uses.[46]

The terms should outline alterations to the agreement following changes of intent because, as Gerd Winter rightly observes, benefits do not arise from the activities of sampling biological resources or coding genetic information. Instead, profits are generated only when the deoxyribonucleic acid (DNA) fragments or genes are attracted and transferred into another organism, or result in the commercialization of useful products.[47] If changes of intents were not appropriately managed, the real benefits arising from the utilization of genetic resources would not be fully captured. The obligations of benefit-sharing seem to continue when biological resources are transferred, so long as the MATs state that they will, or in the case that there are no more benefits to be further generated. This will be discussed in further detail in Section 2.2, in the context of the utilization of genetic resources.

[44] Nagoya Protocol, art 5(1).
[45] ibid, art 8(a).
[46] ibid, art 5(1), 6(3)(g)(iii), (iv).
[47] Gerd Winter, 'Towards Regional Common Pools of GRs—Improving the Effectiveness and Justice of ABS' in Evanson C. Kamau and Gerd Winter (eds), *Genetic Resources, Traditional Knowledge & the Law*: *Solutions for Access & Benefit Sharing* (Earthscan 2013) 22.

The list of benefits defined under the annex of the Nagoya Protocol indicates that some types of benefits, or at least their notions, can provide both monetary and non-monetary value, such as joint ownership of intellectual rights.[48] This makes sense; if, for example, patents could generate profits when being commercialized, whereas non-commercialized patents could still be regarded as some kind of social recognition.

The rationales for sharing the non-monetary benefits of resource utilization could be the need of the providers of genetic resources in developing countries to develop their own capacities for the utilization of genetic resources.

The COP 5 Decision V/26 points out that development of inventory of biological resources, contract negotiation skills, legal drafting skills, and the capacity to economically evaluate genetic resources, among others, are the key capacity-building needs of developing countries.[49] The non-monetary benefits under the Nagoya Protocol shall support the capacity-building in developing countries as outlined in the above decision. In the long run, non-monetary benefits can translate into economic benefits. For example, stronger capacities could further enhance wider utilization of genetic resources, and economic benefits would follow.

From a legal point of view, the value of non-monetary benefits might reflect the CBDR principle that developed countries should assist developing countries in pursuing the common goal of the conservation of biodiversity. More on this will be discussed in Chapter 4.

The provisions under the Nagoya Protocol clearly state that both monetary and non-monetary benefits should be shared with the providers of genetic resources. However, the Protocol does not clarify what will constitute a fair and equitable sharing of such benefits.

2.1.4.2 Fair and equitable sharing

The CBD and the Nagoya Protocol provide no definition for the term 'fair and equitable' with respect to benefit-sharing. However, the Bonn Guidelines recognizes that, because of the diversity of the circumstances and the stakeholders, what can be regarded as a fair

[48] Nagoya Protocol, Annex.
[49] COP 5 Decision V/26, *Access to Genetic Resources*, para 14. See further, COP 4 Decision IV/8, *Access and Benefit-Sharing*, para 4(c).

and equitable sharing depends on the circumstances and will be decided by MATs on a case-by-case basis.[50]

Thus, negotiating benefit-sharing is the main basis to decide not only what the appropriate types of benefits are, but also how they should be shared. Unfortunately, the outcomes of an ABS negotiation are not necessarily fair, as Elisa Morgera and others have rightly noted. The disparity in the bargaining powers between States is considerable.[51] The unequal bargaining powers stem from unequal access to information (e.g., the values of genetic resources and their uses), from different negotiating skills (e.g. familiarity with legal contracts and knowing what to ask and look for),[52] and from the pressure on providers in developing countries to gain short-term profits.

Many international treaties use similar phrases to 'fair and equitable', but the core elements of what it means to be fair and equitable are far from established.[53] However, the 1997 Watercourse Convention provides an interesting clue on this matter. According to the convention, shared utilization of water sources could be regarded as 'equitable' if it takes into account the social and economic needs of States and the conservation of the water, among other considerations.[54]

This is not to say that such factors could have any implications for the ABS regime. However, the author would like to point out that it is possible to identify the factors that make for a fair and equitable sharing of the benefits arising from the utilization of genetic resources. For example, such sharing should take into account the economic values of related genetic resources, the conservation needs of and costs to the providers of such resources, and the contributions of such genetic resources in proportion to the total value of commercialized products which utilize such resources, among other factors.

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[50] Bonn Guidelines, para 45.
[51] Elisa Morgera, Elsa Tsioumani and Matthias Buck, *Unravelling the Nagoya Protocol: A Commentary on the Nagoya Protocol on Access and Benefit-Sharing to the Convention on Biological Diversity* (Brill/Martinus Nijhoff 2014) 23.
[52] COP 4 Decision IV/8, *Access and Benefit-Sharing*, para 4(c). See also, COP 5 Decision V/26, *Access to Genetic Resources*, para 14 addresses the key capacity–building needs of developing countries.
[53] See UNEP, *Interpretation of the Words and Phrases 'Fair and Favourable', 'Fair and Most Favourable', 'Equitable', 'Preferential and Non–Commercial', 'Non–Commercial' and 'Concessional'* (Geneva 1991) (UNEP/Bio.Div/N5–INC.3/3) para 13, 14, 15.
[54] United Nations Convention on the Law of the Non–Navigational Uses of International Watercourses (New York, 21 May 1997, in force 17 August 2014) UNTS I–52106, art 6.

The circumstances for each ABS contract are too diverse to set reliable criteria for fair and equitable sharing in every case. For example, if national regulation required the sharing of twenty per cent of profits from any commercialized products originating from the use of the related genetic resources, this could actually do more harm than good in certain circumstances. Such regulations could scare off potential users of genetic resources. Furthermore, it is unlikely that such a regulation would fully recognize the contribution of the relevant genetic resources to the final products, as each product will necessarily use genetic resources in different proportions. For example, the plant bio-compounds used in a perfume product could be as high as eighty per cent of the total product—the regulation that the country would receive twenty per cent of the total value of the final product might be too low, in this case.

2.1.4.3 Channelling the benefits

States may take different approaches with regard to the financial mechanism of benefit-sharing. For example, the European Union notes that benefits shared are, in most cases, distributed through direct contact with recipients.[55] However, the State of Thailand requires that all shared economic benefits must be deposited into the plant protection fund. In this case, the fund will decide how to share the benefits with the communities that conserve such plants and species.[56] The State of Costa Rica takes up a similar approach, as it suggests that, in principle, all genetic and biochemical components belong in the public domain.[57]

The notion of the 'custodians of biodiversity'[58] outlined under the Nagoya Protocol could suggest that profits and other kinds of benefits from the utilization of genetic resources should, in principle, go to the hands of those who conserve such resources. The central fund mechanism would, to some extent, limit the autonomy of the providers of genetic resources to negotiate for themselves the terms of benefit-sharing. That said, a central funds mechanism would not necessarily undermine the goal of channelling back the benefits to the custodians of biodiversity, so long as the States could

[55] UNEP, *Compilation of Submissions by Parties on Experiences in Developing and Implementing Article 15 of the Convention at the National Level and Measures Taken to Support Compliance with Prior Informed Consent and Mutually Agreed Terms* (Montreal 2007) (UNEP/CBD/WG–ABS/5/INF/2) 40.
[56] ibid 78.
[57] ibid 35.
[58] Nagoya Protocol, preambular 6.

ensure the approval and involvement of indigenous and local communities to the negotiation of MATs as required by the Nagoya Protocol.[59]

2.2 The concept of utilization of genetic resources

The concept of genetic resources and their utilization is the backbone of the ABS mechanism. Under the ABS rules, genetic resources are the subject matter of interest and the utilization of genetic resources is the precondition for the applicability of the core obligations of PIC and MATs, as regulated under the ABS mechanism. Accordingly, if there were no utilization of genetic resources, there would be no requirements for benefit-sharing or seeking for PIC. Therefore, this section will outline the key elements of the above-mentioned concepts, with the view to set phrases for later in-depth analysis throughout the thesis.

2.2.1 Utilization of genetic resources

The Nagoya Protocol stipulates that 'access to genetic resources for their utilization shall be subject to the prior informed consent of the Party providing such resources'.[60] Note that the phrase 'access to genetic resources for their utilization' indicates that the transfers of biological resources for purposes unrelated to the utilization of these genetic resources would not fall under the scope of the ABS regime.

Several Parties have implemented the ABS rules with this interpretation in mind.[61] For example, the Czech Republic regulates that transfers of live animals are subject to free trade, while access to farm animal genetic resources are subject to ABS.[62] The State of Australia has more examples of transfers of biological resources that fall outside the scope of ABS, including the transfers of such resources for commercial fishing, agriculture, and forestry, among other industries.[63]

As noted earlier in section 2.1.2, MATs must discuss changes of intent in the utilization of genetic resources. Furthermore, benefit-sharing obligations do not end upon the transfer of related biological resources. It is critical to clarify that the phrase 'changes of intent' under Article 6(3)(g)(iv) of the Nagoya Protocol is likely to refer to changes

[59] ibid, art 6(2), 6(3).
[60] ibid, art 6(1).
[61] UNEP, *Compilation of Submissions by Parties* (n 55) 9, 10, 61.
[62] ibid 61.
[63] ibid 9.

from a non-commercial utilization of genetic resources (e.g., bio-technological research on plants) to a commercialization of useful products that make use of the results of such research (e.g., the production of a perfume).[64]

'Changes of intent' does not refer to situations where biological resources were first transferred for bulk consumption (e.g., transfer of timbers for constructions upon a sale contract), and later the resources were put to use for genetic research (e.g., to extract the genetic information from such timbers). This is because access to biological resources for bulk consumption needs not be subject to PIC and MATs in the first place. Therefore, no negotiation could have been made on the original terms concerning changes of intent. This aspect of the ABS will play a critical role in the discussion on the principle of sustainable use of biodiversity in Chapter 4.

One might observe that defining the term 'genetic resources' would be critical to distinguish the transfers of biological resources for the purposes of utilizing the genetic resources extracted therefrom and other transfers that are subject to trade laws. Peter Johan Schei and Morten Walloe Tvedt further note that defining genetic resources and the utilization of such are critical tasks to the end of creating legal certainty within ABS rules. If legal certainty is established, then the actors under the regime will know exactly their rights and obligations under the regime.[65]

2.2.2 Definition of 'genetic resources'

The definition of 'genetic resources', however, is technically complex. The CBD provides that the term means genetic material of actual or potential value,[66] and that 'genetic material' can refer to any material of plant, animal, microbial, or other origin containing functional units of heredity.[67] Further genetic resources are a subset of biological resources as stipulated by the CBD.[68]

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[64] See Nagoya Protocol, art 5(1), 6(3)(g)(iv), 8(a).
[65] Peter Johan Schei and Morten Walloe Tvedt, '"Genetic resources" in the CBD: The Wording, the Past, the Present and the Future' [2010] Fridtjof Nansen Institute–FNI Report No. 4/2010 <http://www.fni.no/doc&pdf/FNI-R0410.pdf> accessed 17 April 2015, 2.
[66] CBD, art 2(10).
[67] ibid, art 2(9).
[68] ibid, art 2(2).

According to Peter Johan Schei and Morten Walloe Tvedt, genetic resources can therefore be any material from any source so long as the source's units of heredity have a function, and have actual or potential value.[69]

Some praise the definition for its appropriate balance between the need for legal certainty and the need for capturing the development of biotechnology.[70] On the other hand, some States have raised concerns about the shortcomings of the definition, because it does not provide regulation for some critical aspects of genetic resources, including biochemical composition,[71] the uses of derivatives, and the application of synthetic biological technology.[72] The definitions provided by the Nagoya Protocol describe the new notions of biochemical compositions and derivatives,[73] but leave the issues of synthetic biological technology untouched.

The author is not in a position to comment on the appropriateness of the definition of genetic resources and the applications of biotechnology. However, it needs be said that the utilization of genetic resources is significantly different from the traditional exploitation of living resources. First, the economic values that might be generated from utilization of genetic resources could be greater than that from the traditional exploitation of biological resources (e.g., the market value of prescription drugs originated from biological compounds in tea leaves could be much greater than that of tea bags as final products). Second, utilization of genetic resources is inseparable from the applications of biotechnology (e.g., one can cut down a tree with a hand saw, but to extract genetic information and bio-compounds contained in that tree, he or she might need a laboratory equipped with high-end biotechnologies). This could explain why it is necessary to share with the providers of genetic resources both the outcomes and processes of genetic utilization (e.g., cooperation in biotechnological activities and participation in product development) as mentioned in Section 2.1.4.1. Third, utilization of genetic resources is not likely to degrade the place of biological resources (e.g., taking samples of seeds does not require cutting down the whole forest and extracting bio-compound from animals

[69] Schei and Tvedt (n 65) 2–4.
[70] ibid 22.
[71] UNEP, *Compilation of Submissions by Parties* (n 55) 9.
[72] COP 10 Decision X/13, *New and Emerging Issues*, para 4; UNEP, *New and Emerging Issues Relating to the Conservation and Sustainable Use of Biodiversity* (Montreal 2012) (UNEP/CBD/SBSTTA/16/13) 1.
[73] Nagoya Protocol, art 2(c), (d), (e).

does not need the killing of millions of animal as for food productions). Chapter 4 will discuss the implications of these differences in further detail.

The substantive scope of the CBD is extremely broad. The Convention regulates genetic resources from all living organisms except humans,[74] including both natural and cultivated species,[75] as well as genetically modified organisms (GMOs).[76] It does not single out the protection of specific species; rather, it addresses all species on the planet. In addition, it is not limited to sectorial activities, such as the pharmaceutical or agricultural industries, but rather regulates use in all sectors.[77] This legal fact is important because GMOs and plant variety are protected under the IPRs system. Hence, the principle of State sovereignty over natural resources could be challenged on this ground. More on this conflict will be discussed in Chapter 3.

The jurisdictional scope of the CBD is also significantly broad. The Convention covers all components of biological diversity in areas within *and* beyond the limits of the national jurisdiction of the Parties.[78] Thus, it is not clear whether States can assert their sovereignty over the genetic resources found in areas that are subject to the regime of the common heritage of humankind (e.g., the Area). This will also be further discussed in Chapter 3.

Overall, the concepts of what genetic resources are counter-intuitive to those who lack scientific backgrounds. That said, the definition is too crucial to gaining understanding of the ABS rules and rationales to be ignored. Imaginably, States would have to undertake significant regulatory burdens to set up workable ABS frameworks that capture the scope and nature of genetic utilization.

2.3 The underlying assumptions under ABS

This section will discuss the key underlying assumptions under ABS. Although ABS could have been motivated by a variety of factors, in principle it must be consistent with the existing legal principles of international laws. Furthermore, the implementation of

[74] COP 2 Decision II/11, *Access to Genetic Resources*, para 2; COP 10 Decision X/1, *Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization*, para 5.
[75] See CBD, art 2 on the definition of 'biological diversity' and 'domesticated or cultivated species'.
[76] CBD, art 2(3); Nagoya Protocol, art 2(d).
[77] CBD, art 4(b) Stipulates that the CBD covers all process and activities, regardless of where their effects occur, carried out within or beyond national jurisdiction of the Parties.
[78] ibid, art 4.

ABS should consider the key legal principles within the context of the conservation of biodiversity under the CBD.

Therefore this section will address the general motivations for ABS, and then use analysis flows to describe the key legal principles that may be helpful for understanding the core rules and functionality of the ABS mechanism.

Bram De Jonge and Niels Louwaars have rightly pointed out that the ABS concept is complex, because it can be viewed in light of a variety of perspectives.[79] Consequently, there could be more than enough rationales for the ABS regime. It has been noted that studies on ABS could focus on practical problems of ABS and evaluating its desirability and functionality.[80]

The thesis will focus on the legitimacy of the ABS rules by comparing the core ABS rules with the existing legal principles of international law. The process of so doing might illuminate some useful legal insights into the ABS system and allow for a deeper understanding of the implications and key challenges of the implementation of ABS rules into the national legal system.

2.3.1 Key motivations for ABS

Some of the key assumptions underlying the ABS rules are present in the text of the CBD and the Nagoya Protocol. However, spelling out these assumptions is, to a large extent, subjective. The key underlying assumptions of the ABS system differ depending on what aspects of the ABS system at which one is looking. For the large part, those rationales are inter-related.

ABS could be seen as a private funding mechanism for the conservation of biodiversity, a supplement to the central funding mechanism under Articles 20 and 21 of the CBD. The CBD stresses the importance of appropriate funding as a mean to realize the goals of the conservation of biodiversity,[81] while the Nagoya Protocol recognizes that the sharing of the economic value of ecosystems and biodiversity, including genetic

[79] Bram De Jonge and Niels Louwaars, 'The Diversity of Principles Underlying the Concept of Benefit Sharing' in Evanson C. Kamau and Gerd Winter (eds), *Genetic Resources, Traditional Knowledge & the Law*: *Solutions for Access & Benefit Sharing* (Earthscan 2013) 37–38, 53–54.
[80] ibid 37.
[81] CBD, art 1.

diversity, are the key incentives for the custodians of biodiversity to further conserve it.[82] Benefits from the utilization of genetic resources thus could be viewed both as financial mechanisms to accommodate the costs of conservation and the incentive for such conservation.

Though ABS could be seen as an incentive mechanism for the conservation and sustainable uses of biodiversity, the functioning of this mechanism could be problematic. For example, one of the key preconditions for the functioning of the incentive mechanism is that benefits should be shared in a fair and equitable manner; otherwise, the mutual trust between the providers and the users of genetic resources could be harmed. On the other hand, stakeholders might need to perceive that there will be very big benefits in order to feel incentivised to take desirable actions to protect biodiversity. Chapter 4 discusses this in greater detail.

From the perspective of the inter-state relationship, ABS could be seen as the reflection of the principle of CBDR. The differentiated responsibilities of States could originate from two premises: (i) biological diversity is unequally distributed around the world and developing countries are the holders of the most biodiversity and (ii) there is an unequal distribution of resources for the conservation of biodiversity.[83] In the preparatory texts of the CBD, the term 'gene-rich developing countries' and 'technology-rich developed countries' could best describe these tensions.[84] Chapter 5 will later discuss how ABS rules reflect the notion of the CBDR principle.

'Bio-piracy' is often referred to as a utilization of genetic resources or traditional knowledge without the prior consent of the provider, or without providing compensation to the provider of such resources. The key legal basis for deciding whether such uses could be regarded as bio-piracy, however, is complex. It goes back to the basic question of who has the rights to grant PIC, with whom benefits should be shared and, more importantly, whether such uses should be subject to ABS rules. More on this will be discussed in Chapter 6 of the thesis on traditional knowledge.

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[82] Nagoya Protocol, preambular 6.
[83] UNEP, *Biological Diversity: Global Conservation Needs and Costs* (Geneva 1990) (UNEP/Bio.Div.3/3) para 16.
[84] UNEP, *Report of the Ad hoc Working Group on the Work of Its Second Session in Preparation for a Legal Instrument on Biological Diversity of the Planet* (Geneva 1990) (UNEP/Bio.Div.2/3) para 22.

On the grounds mentioned above, one may observe that ABS and its notions could be interpreted in many ways. With regard to the implementation of ABS, the Australian government further notes that there are number of legitimate ways to transpose ABS rules onto national legislation.[85] However, the diversity of the approaches to the interpretation of ABS does not necessarily undermine the concrete rules of the system. After all, ABS is simple: it merely states that benefits from the use of genetic resources should be shared appropriately.

It is not the rules of the ABS that are complex, but the application of these rules to real-life situations, which are far too diversified to follow a set policy. Because of the broad scope of the CBD, no universal rules or approaches could be applicable to all ABS circumstances.

2.3.2 The key underlying legal principles of ABS

The CBD explicitly affirmed the principle of State sovereignty and the notion of the principle of causing no trans-boundary harms is among the principles of the Convention.[86] There are other legal principles of international laws that are relevant for the interpretation of the ABS rules, as well.

The preamble clauses are integral part of any treaty. They provide the context to resolve potential conflicting interpretations of the treaty provisions.[87] As has been noted by Thomas Greiber and others, the preambles of a treaty could indicate the overall motivations and consensus during the negotiation of the treaty.[88] On this ground, it is sufficient to look into both the provisions and the preambles of the CBD and the Nagoya Protocol in order to understand the motivations underlying the concept of ABS.

Additional legal principles could be relevant for the interpretation of the ABS rules as well. The most likely relevant principles are as follows: (i) the principle of the conservation of biological diversity as a common concern of humankind and the priority

[85] UNEP, *Compilation of Submissions by Parties* (n 55) 9.
[86] CBD, art 3.
[87] Vienna Convention on the Law of Treaties (Vienna Convention) (Vienna, 23 May 1969, in force 27 January 1980) UNTS I–18232, art 31(2) It specifies that the preamble are integral part of a treaty.
[88] Thomas Greiber and others, *An Explanatory Guide to the Nagoya Protocol on Access and Benefit-Sharing* (Environmental Policy and Law Paper No. 83, International Union for Conservation of Nature and Natural Resources–IUCN 2012) 47.

of in-situ conservation,[89] (ii) the principle of the sustainable use of biological resources,[90] (iii) the precautionary principle,[91] (iv) the principle of cooperation in international relations,[92] (v) the principle that due consideration should be paid to the special needs of developing countries in regard to their economic and social development and poverty eradication,[93] and (vi) the principle that benefits should be shared with indigenous and local communities[94], among other legal principles. That said, not all of the above-mentioned legal principles have equal relevance for the purpose of understanding of the ABS concept.

The author believes that the ABS rules under the CBD and the Nagoya Protocol might have a better chance of evolving and attaining a firm legal status under the field of international laws if they were consistent with the existing legal principles in other relevant legal instruments. Mutual supportiveness among the ABS rules, other legal principles, and related regimes could be one of many factors that help ensure the realization of benefit-sharing at an international level.

On this ground, the thesis should primarily focus on possible insights into the ABS concept and its rules by evaluating how the ABS regime could support and conflict with other legal principles of international laws. The ultimate goal of this thesis is to attain a better understanding of the concept of ABS and its legitimacy, rather than to assess its legal status. The following are the key legal principles that will be discussed throughout the thesis in order to achieve the above stated goal: (i) the principle of State sovereignty over natural resources, (ii) the principle of sustainable use of biodiversity, (iii) the principle of common but differentiated responsibilities of States, and (iv) the relevant legal principles of the protection of traditional knowledge associated with genetic resources and the rights of indigenous and local communities.

[89] CBD, preambular 3, 10, 11.
[90] ibid, preambular 5, art 1, 2(16).
[91] ibid, preambular 9.
[92] ibid, preamble clause 14.
[93] ibid, preambular 16, 17, 18, 19.
[94] ibid, preambular 12.

3 The Principle of State Sovereignty

This chapter addresses the principle of State sovereignty over natural resources, as it is the backbone principle of all ABS concepts. It outlines the key motivations for recognising State sovereignty over natural resources in the context of ABS, including the expectation that genetic resources will continue to have value and the expansion of the protection of intellectual property rights over living organisms.

The chapter further clarifies the nature of State sovereignty in the context of ABS. It demonstrates that exercises of State sovereignty could be limited by a variety of other legitimate interests within and without the national legal system. From inside, State sovereignty could be eroded by the national regime on property rights, claims on intellectual property rights, and the rights of indigenous and local communities. From the outside, States have to consider the ABS mechanism with respect to plant genetic resources and other international regimes that treat genetic resources as the common heritage of humankind.

As discussed in Chapter 2, Section 2.1.3 and 2.3.2, the principle of State sovereignty over the State's natural resources is the founding legal principle under the ABS regime. It is the legal basis for the rights of States to legislate who has authority to grant access to genetic resources, how genetic resources can be used, and what benefit-sharing features will be included in MATs.

Capturing the benefits from such genetic resources comes at a cost. For a State to manage the flows of the benefits from the utilization of genetic resources imposes costly regulatory burdens upon the State.[95] Such regulation involves having suitable ABS legal frameworks in domestic laws. Because the authority to grant PIC needs not to be States,[96] the key challenge to implementing domestic ABS legislation could be that of identifying the rightful owner of genetic resources and establishing effective benefit-sharing mechanisms.

The other side of the problem is that the State sovereignty upheld by ABS could be challenged by a variety of other legal principles of national and international laws. For

[95] text of chp 2, s 2.2.2.
[96] text of chp 2, s 2.1.3.

example, the private ownership regime could limit the scenario of treating all genetic resources as public goods in the public domain. Furthermore, the rights of indigenous people and local communities to their genetic resources could also imply certain limitations to the exercising of State sovereignty.

Furthermore, States might forgo their sovereignty in order to undertake related international obligations. In the context of ABS and the exploitation of genetic resources, such erosion from outside pressure could include the States' responsibility to implement sustainable use of biodiversity,[97] their obligation to subject their plant genetic resources to a multilateral system of benefit-sharing under the ITPGRFA,[98] and the necessity of facilitating access to genetic resources for environmentally sound uses[99] and causing no trans-boundary harms,[100] to name a few.

This chapter will first introduce the key motivations for the recognition of State sovereignty over its genetic resources. It will then outline the key challenges against the exercising of State sovereignty over its genetic resources, with a view to provide insights into the implications of the State sovereignty principle in the context of ABS.

3.1 State sovereignty over genetic resources

As was mentioned in Chapter 2, Section 2.1.1, State sovereignty is the base authority that regulates the domestic ABS regime, including who has the right to grant PIC and what mechanisms will guide benefit sharing, according to the State's existing environmental policies.

According to Article 3 of the CBD, States have the sovereign right to exploit their own resources pursuant to their environmental policies. The right to exploit valuable natural resources could reflect the notions of the rights to self-determination of States;[101] in the context of the ABS, this right is translated into the authority to regulate access to and benefit sharing of the utilization of genetic resources.

Under Article 15(1) of the CBD, States shall control access to genetic resources through their legislation and policies: 'Recognising the sovereign rights of States over

[97] CBD, preambular 5, art 6.
[98] ITPGRFA, art 11(2).
[99] CBD, art 15(2); Nagoya Protocol, art 8(a).
[100] CBD, art 3.
[101] United Nations Resolution No. 1803 (XVII), *Permanent Sovereignty over Natural Resources* (14 December 1962) para 1.

their *natural resources*, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation'.[102]

The Nagoya Protocol further clarifies the right to regulate access to genetic resources as an exercise of State sovereign rights over natural resources.

> In the exercise of sovereign rights over natural resources, and subject to domestic access and benefit-sharing legislation or regulatory requirements, access to genetic resources for their utilization shall be subject to the prior informed consent of the Party providing such resources.[103]

Note that the phrase 'State sovereignty over genetic resources' is never exactly used in the Nagoya Protocol and the CBD.[104] However, genetic resources are a subset of biological resources, which include all species (plant and animal),[105] and access to genetic resources is indispensable from access to biological resources. Therefore, if States can assert control over their wildlife resources within their territories, then States shall also have sovereignty over their genetic resources. That said, the methods States use to exercise their rights over the utilization of genetic resources could be far more complex than those used to exercise their rights over general biological resources. Section 3.4 of this chapter will discuss this further.

As has been noted earlier, the recognition of State sovereignty over its natural resources does not mean granting State ownership of such resources.[106] Rather, it provides States the right to regulate in accordance with their own legal systems.[107] According to the submissions of the Australian government, the CBD does not set up a detailed system for ABS. Rather, it provides only the framework for legislating ABS as pertains to genetic resources.[108] It opens a variety of legitimate ways to implement ABS rules into the domestic legal system of the States. Therefore, ABS rules under the CBD

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[102] Emphasis added.
[103] Nagoya Protocol, art 6(1).
[104] CBD, preambular 4 It confirms that States have sovereign rights over their own biological resources.
[105] text of chp 2, s 2.2.2.
[106] Shawn N. Sullivan, 'Plant Genetic Resources and the Law: Past, Present, and Future' (2004) *Plant Physiology* vol 135(1) <http://www.plantphysiol.org/content/135/1/10.full.pdf+html> accessed 19 April 2015, 12.
[107] Nagoya Protocol, art 6(1).
[108] UNEP, *Compilation of Submissions by Parties* (n 55) 9.

could be seen as flexible, and adaptive to different situations.[109] On the other hand, the variety of implementation options also leads to inevitable conflicts of rights within the domestic legal system. Genetic resources could be under the control of a multitude of private actors, like land-owners, ex-situ collectors, and local communities. The Section 3.4 of this chapter will discuss this further.

3.2 Motivations for State sovereignty over genetic resources

Although one may only speculate on the motivations for certain rules of international law, political drivers and the context of the specific negotiation of a treaty could play a significant role. The readings of the preparatory works show that certain debates and key concerns were present at the time of the conclusion of the treaty.

The author believes that recognition for the principle of State sovereignty over genetic resources could have been based on two premises: (i) States must be given the right to reap the benefits from their valuable resources and (ii) the expansion of intellectual property rights (IPRs) over living-organism and genetic resources therein makes common heritage unjust. The sections below therefore will discuss the value of genetic resources and the implications of the expansion of IPRs' protection to the functioning of ABS.

3.2.1 Values of genetic resources

From the readings of the key preparatory works of the conclusion of the CBD, the author observed a shift from the treatment of genetic resources as the 'common heritage of humankind' to resources that are subject to State sovereignty. However, the shift is subtle. Some delegations debated that the suggested term of 'common heritage' has legal implications,[110] as it might suggest the notion of free access to genetic resources.[111]

Opposing delegations emphasized that the obligations to facilitate access to genetic resources (the term 'free access' was used at that time) would not mean that access was granted free of charge. Rather, it would mean that access must be based on mutual agreement with full respect for the permanent sovereignty of States over their

[109] ibid.
[110] UNEP, *Report of the Ad hoc Working Group on the Work of Its Second Session* (n 84) para 11.
[111] ibid para 22.

natural resources.[112] These concerns were valid from the historical experience of many stakeholders; during the course of the 1980s, many developing countries were no longer willing to make their wild plants and local varieties available to users free of charge.[113]

The economic value of genetic resources was the key concern for the provider countries at the time of the negotiation. As Bram De Jonge and Niels Louwaars observe, developing countries no longer accept treatment for genetic resources as common heritage. They must be able to reap the benefits of such resources, as they can with other resources, such as oil and minerals.[114]

Genetic resources could be even more valuable than oil and minerals. They are particularly valued in the medical and food industries. More than ten years ago, one-fourth of all prescription drugs contained active ingredients derived from plants.[115] According to FAO, genetic resources contributed enormous value to food production. For example, the economic value of a single wild relative of the tomato has been worth 250 million USD a year in the State of California (United States) alone.[116] Biotechnology is said to be the core factor enabling the realization of genetic values, because it is possible to transfer any gene to any organism and thereby create many useful products.[117] In this sense, the value of genetic resources is not only incredible in immediate terms, but also in terms of their potential future use.[118]

3.2.2 Expansion of the protection of IPRs

Biotechnology is critical for the realization of the value of genetic resources by transposing genetic substance into useful products. The IPRs system aims to create incentives for private actors to invest in the development of useful products and processes by maintaining exclusivity of rights to genetic materials.

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[112] ibid.
[113] UNEP, *Relationship Between Intellectual Property Rights and Access to Genetic Resources and Biotechnology* (Geneva 1990) (UNEP/Bio.Div.3/Inf.4) para 29.
[114] Jonge and Louwaars (n 79) 39.
[115] UNEP, *Framework Legal Instrument on Biological Diversity: An Analysis of Possible Financial Mechanisms* (Geneva 1990) (UNEP/Bio.Div.3/5) para 2.
[116] Food and Agriculture Organisation of the United Nations (FAO), 'The Value of Plant Genetic Resources' in *Fact Sheet No. 2* <ftp://ftp.fao.org/ag/agp/planttreaty/factsheets/fs02_en.pdf> accessed 5 March 2015.
[117] UNEP, *Relationship Between Intellectual Property Rights and Access to Genetic Resources and Biotechnology* (Geneva 1990) (UNEP/Bio.Div.3/6) para 1.
[118] ibid.

Elisa Morgera and others rightly observed that the expansion of the IPRs system is one of the key rationales for the fundamental shift to sovereignty over genetic resources.[119] However, it is unclear how the expansion they describe could explain the assertion that States should have sovereignty over genetic resources. Therefore, in this section, the author will further elaborate on the key aspects of IPRs with respect to genetic resources, their patentability, and the link with State sovereignty.

Patents provide the owners exclusive rights that prevent others from using, making, or selling too-similar products or processes without consent, as stipulated under Article 28 of TRIPS Agreement.[120,] The owners of patents are free to refuse to authorize exploitation.[121]

Preparatory works have noted that the decision of the industrialized countries to make living matters (e.g., genes and other factors of living things) patentable expanded the exclusive rights to not only the invention, but also to the resources therein.[122] This means that genetic resources within patented living organisms cannot be used without the consent of the owner. Accordingly, patent law rejects all free access to genetic resources therein, even for the purposes of creation (such as dependent inventions, research, and improvements to the patented gene).[123] Royalty payments, therefore, are required in all cases.

According to the Ad Hoc Working Group of Experts on Biological Diversity, the U.S. Supreme Court in 1980 was the first to do away with the principle of non-patentability for living matters and natural processes.[124] This was followed by a European proposal that all aspects of living matter shall be patentable (e.g., genes, proteins, plasmids, DNA, tissues, and probes).[125]

The conclusion of the TRIPS Agreement under the WTO regime made the patentability of living matter a matter of fact. Accordingly, the TRIPS Agreement

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[119] Morgera, Tsioumani and Buck, *Unravelling the Nagoya Protocol* (n 51) 24.
[120] Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) Annex 1C of the Marrakesh Agreement Establishing the World Trade Organization (Morocco, 15 April 1994), art 28
[121] cf TRIPS Agreement, art 28; International Convention for the Protection of New Varieties of Plants (UPOV) (Paris, 02 December 1961, as revised 19 March 1991), art 14.
[122] UNEP, *Relationship Between Intellectual Property Rights and Access to Genetic Resources* (n 113) para 26.
[123] ibid.
[124] ibid para 22.
[125] ibid para 25.

expansively protects all inventions, in all fields of technology, provided that they are new, involve an inventive step, and are capable of an industrial application using non-biological and microbiological processes and plant varieties.[126] The TRIPS Agreement grants protection for most kinds of patent rights (with very few exceptions) and disregards the place of invention, the field of technology, and whether products are imported or locally produced.[127] As a consequence, genetic-based patents are protected worldwide and access to the genetic resources in those patents shall no longer be free of charge.

Gene-based inventions could not be possible without access to biological resources, which are mostly found in developing countries.[128] It would be unjust for corporations in industrialized countries to access genetic resources in developing countries for free and then return to the providers and try to sell them products or processes derived from the resource that was given freely. Because genetic resources provide enormous contributions to the value of many final products, it would be unfair to make the genetic material available without charge when the products derived from such biological patents always come with a price tag.

If access to genetic resources in the patented organisms could be restricted by exclusivity of patent owner rights, so could access to genetic resources in wildlife. With respect to economic profits from the utilization of genetic resources, if a patent requires a royalties payment, then it is reasonable to claim that access to natural organisms must also be paid.

Shawn Sullivan describes the notion of 'bio-piracy', which refers to a situation in which private companies gain protection for their IPRs (most commonly, patents) without sharing the profits with the providers of genetic resources in developing countries.[129] Because there are no recognitions for the economic value of the genetic resources provided, Sullivan sees such utilization without benefit sharing as a form of robbery.[130]

While there are a variety of potential approaches to understand the motivations underlying the recognition of State sovereignty over genetic resources, two notable

[126] TRIPS Agreement, art 27(1).
[127] ibid, art 27(1), 27(3)(b).
[128] UNEP, *Access to Genetic Resources and Biotechnology* (n 117) para 5.
[129] Sullivan (n 106) 10–11.
[130] ibid.

arguments for the desirability of the principle are as follows: (i) the increase in the expectation of the value of genetic resources and (ii) the negative effects of expanded IPRs that do not adequately recognise the economic value of genetic resources provided by developing countries.

3.3 Regulation of PIC

This section will discuss why the providers of genetic resources in developing countries use PIC to capture the benefits from genetic material usage. It explains why PIC, rather than a general sale contract, is crucial for ABS.

It was a key concern during the negotiation of the CBD that genetic resource providers in developing States capture the benefits from stakeholders' utilization of these genetic resources. However, the core of the debates was benefits from genetic utilization, rather than benefits from the trading of biological resources as goods.[131] The requirements of PIC could be seen as an administrative instrument to control or even restrict use of genetic resources.[132] On the other hand, PIC is essential for provider countries to distinguish the transfer of biological resources subject to trade laws and those subject to benefits-sharing requirements.

As mentioned in Chapter 2, Section 2.2, it is the common understanding of States that the CBD does not require that they regulate all access to biological resources, but rather only access that aims to utilize genetic resources. Transfers of live animals are still subject to free trade, while access to farm animal genetic resources are subject to ABS.[133] Furthermore, ABS does not regulate the transfers of such resources for purposes other than the utilization of genetic resources. For example, commercial fishing, agriculture, and forestry do not require PIC.[134]

The opposite side is also noteworthy. Transfers of animals and plants for the purposes of the utilization of genetic resources must in principle be subject to ABS requirements, and thus PIC is required. One may then be inspired to ask why the utilization of genetic resources must be subject to PIC. Are trade laws insufficient?

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[131] See generally, UNEP, *Access to Genetic Resources and Biotechnology* (n 117).
[132] text of chp 2, s 2.1.2.
[133] ibid.
[134] ibid.

Before the CBD, States could subject the transfers and exports of biological resources according to trade laws. They could surely earn economic benefits from the uses of animal and plants for the purposes of goods consumption. While trade laws are sufficient to ensure fair deals of biological resource transfers by basing these trades on market prices, they are insufficient to ensure fair and equitable sharing of benefits from the utilization of genetic resources. The market price of plants and animal might be trivial in comparison to the values of the genetic resources within them.[135] For example, the price for a ton of fish for food production should be different from the price of the genetic resources found in those fishes due to the potential use for such genetic resources.

According the Ad Hoc Working Group of Experts on Biological Diversity, biotechnology makes it difficult to identify objects of technical of interest.[136]Although biological resources contain genetic resources, the technical interest of the related transfer could be in the latter rather than the former. For example, if tealeaves are to be imported for making tea, the interest is in the tea (plant species) itself. On the other hand, if the tealeaves are imported in order to extract biological compounds to produce drugs, the interest is in the genetic substance or information contained in the tealeaves. The technical complexity of genetic use occasionally requires that the same biological resource be treated differently in two different contexts. The National Code of Renewable Natural Resources of the State of Columbia flexibly reflects precisely this notion, as shown in the rules:

> Genetic resources can be given independent legal treatment from that provided for biological resources, although the latter contain the former, and as long as they are within the same unit or are integrated, the ecological function's precedence over private property, combined with the national interest, guarantee public ownership thereof. Once separated, each resource is subject to its own legal regime.[137]

However, transfers of biological resources for commodity consumption and transfers for the genetic utilization of these biological resources are identical in terms of

[135] text of chp 3, s 3.2.1.
[136] UNEP, *Relationship Between Intellectual Property Rights and Access to Genetic Resources* (n 113) para 20.
[137] UNEP, *Compilation of Submissions by Parties* (n 55) 22.

what objects are being transferred. For example, importing tealeaves for making tea is exactly the same as importing it for genetic use; only the purpose of use is different. While the transfer of tealeaves will accompany the transfer of ownership over the item, it could not be true that ownership of the genetic resources therein will also be transferred. In other words, the importers of such tealeaves will not have the rights to utilize the genetic resources therein without PIC and MATs. However, hypothetically, if an Icelandic biotech company imported such tea leaves from China for genetic utilization without disclosing their intent, the providers of the tea leaves would have no way to know about its utilization.

On these grounds, it is crucial for providers of such resources to know about the user's interests in the transferred biological resources in order to claim the benefit sharing therefrom. Not only prior consent but prior *informed* consent[138] is required for the function of ABS. The same legal treatment for all transfers of biological resources (as normal buying and selling of commodities) would not accurately capture the core value of the genetic utilization.

The below sections will discuss the key challenges to the exercise of State sovereignty over genetic resources, starting from the possible internal erosions to external erosions of sovereignty. The issues herein addressed are not necessarily exhaustive.

3.4 Internal erosions of State sovereignty

This section will address the key internal challenges to the exercises of State sovereignty over genetic resources. These challenges are as follows: (i) the complexity in legal treatment for ownership of wildlife, which varies between different legal systems, (ii) legitimate claims over genetic resources contained in patented GMOs, and (iii) the indigenous and local communities' rights to genetic resources.

Chapter 2 noted that, by acknowledging the principle of State sovereignty, the CBD does not grant ownership right of States over genetic resources.[139] The sovereignty principle does not necessarily indicate that all natural resources should fall under State ownership (or even public ownership). The legal arrangements for ownership of natural

[138] CBD, art 15(5); Nagoya Protocol, art 6(1) See for the use of the term.
[139] See further, Sullivan (n 106) 12.

resources vary among different countries,[140] and States are expected to establish ABS in a way that does not conflict with their existing property rights law.

It is difficult enough to identify the rightful owners of wildlife (plants and animals). Identifying the rightful owners of genetic resources could be even more challenging. Note that, although genetic resources are contained in biological resources, they can also detach from that biological base.[141]

However, identifying the rightful owner of genetic resources is essential for the function of the ABS regime. In cases where the provider of the genetic resource is not clearly known, the negotiations of MATs could not be sustained, because PIC could not be obtained, and PIC is a necessary pre-condition for negotiating MATs.[142] Uncertainty about who can grant PIC could drive genetic users away from the provider, because of the possibility that a PIC granted by one group could later be challenged by others who have a claim to the related genetic resources.

In next section, the author will discuss the complexities of the identification of rightful owners of genetic resources in the context of the tensions between State sovereign rights to legislate and the other legitimate interests of private property rights to natural resources, the claims on IPRs and the claims on the rights of indigenous and local communities within national legal system.

3.4.1 Legal treatments for wildlife

Article 3 of the CBD confirms that States have the sovereign rights to exploit their own resources pursuant to their own environmental policies. This article would indicate that the task of identifying the appropriate owners for certain components of biodiversity (namely, genetic resources) is the responsibility of each State. Most of the time, however,

[140] Eric T. Freyfogle, 'Natural Resources Law' in *Berkshire Encyclopaedia of Sustainability*, vol 3 (Berkshire Publishing 2011) <http://www.berkshirepublishing.com/assets/pdf/natural_resources_law_freyfogle.pdf> accessed 25 April 2015, 397–98.
[141] text to n 137.
[142] See further, text of chp 2, s 2.1.2.

lack of such legislation causes most of the problems.[143] Until now, very few States have adopted national ABS legislation.[144]

The challenge of identifying the appropriate holders of genetic resources persists because there could be a variety of overlapping claims on such resources based on different legal bases of property law. Land-use entitlements and ownership of land could provide one legal basis for the ownership of the wildlife attached thereon.[145] Eric T. Freyfogle notes, however, that this arrangement is not universal. In the U.S., one cannot claim ownership over wildlife attached to lands, while in the U.K. system, one can.[146]

States could run into problems when adopting ABS to fit into the States' legal treatment of property rights over wildlife. Users of genetic resources should therefore not assume that the same legal treatment for the ownership of genetic resources could be found anywhere. It is critical for such users to study the legal system of the States in order to prevent litigations in future.

3.4.2 IPRs claims

The substantive scope of the CBD is extremely broad. It covers genetic resources from all living organisms, including cultivated species[147] and GMOs.[148] Because GMOs and plant varieties are likely to be protected under the IPRs system, the exercise of State sovereignty over genetic resources could be in tension with the protection of IPRs, especially in cases of foreign IPRs owners.

The Parties to the TRIPS Agreement must grant protection for most kinds of patents rights and must disregard the place of invention, the field of technology, and whether products originated from such patents are imported or locally produced.[149] The TRIPS Agreement protects inventions on living matters, as well.

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[143] Santiago Carrizosa, 'Scenarios of Policymaking Process' in Santiago Carrizosa and others (eds), *Accessing Biodiversity and Sharing the Benefits: Lessons from Implementing the Convention on Biological Diversity* (Environmental Policy and Law Paper No. 54, IUCN 2004) 52.
[144] Access and Benefit-Sharing Clearing-House, *National Records: Legislative, Administrative or Policy Measures* <https://absch.cbd.int/search/MSR> accessed 22 April 2015.
[145] See further, Freyfogle (n 140) 397–98.
[146] ibid.
[147] See CBD, art 2. See the definitions for 'biological diversity' and 'domesticated or cultivated species'.
[148] ibid, art 2(3); Nagoya Protocol, art 2(d).
[149] TRIPS Agreement, art 27(1), 27(3)(b).

One might argue that a State that has once ratified its TRIPS Agreement would not be able to simply say no to all patent rights over life forms.[150] On the other hand, once another State Party to the TRIPS Agreement has granted a patent, the commercial exploitation of that patent in the host country cannot be prevented or restricted without the strict satisfaction of certain justifications.[151]

Shawn Sullivan observes that States can have the authority to limit the exercise of such rights—sometimes in significant ways. However, States cannot claim ownership over a patented organism or place it in the public domain.[152] Perhaps domestic ABS should consider the rightful holders of related patents on living organisms that have been granted by other States. As for the on-going ABS contracts, according to the Nagoya Protocol, joint ownership of IPRs is a possibility.[153]

3.4.3 Indigenous and local communities claims

The State's authority to entitle the rightful owners or holders of genetic resources seems to be further challenged by the rights of indigenous and local communities over their genetic resources.[154] According to the Nagoya Protocol, States are under an obligation, in accordance with domestic law, to recognise the rights of the indigenous and local communities over genetic resources'.[155] These established rights would be the basis for community PIC, approval, or involvement of these communities to ABS contracts.[156]

While identifying the holders of genetic resources is the responsibility of the States, this authority can be limited by the requirements that indigenous and local communities should be in priority recognised as the holders of genetic resources found on their current or traditionally occupied lands. The rights of these communities to natural resources will be discussed in further detail in Chapter 6.

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[150] Sullivan (n 106) 10.
[151] TRIPS Agreement, art 27(2) Member States can prevent the exploitation of such patents in their territories to protect public order or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment.
[152] Sullivan (n 106) 10–12.
[153] Nagoya Protocol, art 6(3)(g)(ii), Annex.
[154] Annalisa Savaresi, 'The International Human Rights Law Implications of the Nagoya Protocol' in Elisa Morgera, Matthias Buck and Elsa Tsioumani (eds), *The 2010 Nagoya Protocol on Access and Benefit-Sharing in Perspective: Implications for International Law and Implementation Challenges* (Martinus Nijhoff Publishers 2013) 79–80.
[155] Nagoya Protocol, art 5(2).
[156] ibid, art 6(2).

3.5 External challenges to State sovereignty

The exercising of State sovereignty could be challenged by the obligations of States under a varied international regime. The benefit-sharing mechanism with regard to plant genetic resources for food and agriculture under the ITPGRFA could pose a direct challenge to State sovereignty over such plant genetic resources as outlined in ABS. Another source of tension comes from the regime of common heritage for humankind of the Area under the UNCLOS.[157] These key challenges will be further explained in the below sections.

3.5.1 ITPGRFA mechanism

According to the COP Decision X/1, the ITPGRFA, together with the CBD and the Nagoya Protocol, are the primary instruments for the international ABS regime.[158] The ABS system under the CBD and the Nagoya Protocol is distinctive from the benefit-sharing mechanism under the IPGRFA: the former adopts a bilateral approach to benefit sharing, while the latter adopts a multilateral mechanism.

Article 2(6) of the CBD defines 'domesticated or cultivated species' as species whose evolutionary processes have been influenced by humans to meet human needs. Cultivated plants and domesticated animals are often the achievement of a long history of cultivation, harvesting, and human selection. According to the ITPGRFA, plant genetic resources for food and agriculture are the results of the past, present, and future contributions of farmers in all regions of the world, particularly those in centres of origin and diversity. It is they who have conserved, improved, and made available these resources.[159]

Accordingly, it could be difficult or impossible to track the origins of certain domesticated species, not to mention the origins of the genetic resources contained in those species.[160] The State territories where cultivated plants are most widely used are not necessarily the place where such plants originated.

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[157] United Nations Convention on the Law of the Sea (UNCLOS) (Montego Bay, 10 December 1982, in force 16 November 1994) UNTS I–31363.
[158] COP Decision X/1, *Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization*, preambular 6.
[159] ITPGRFA, preambular 7, art 9(1).
[160] ibid, preambular 3.

The 1983 International Undertaking on Plant Genetic Resources originally assumed that plant genetic resources are the common heritage of mankind, to be freely available for use toward the benefit of present and future generations.[161] While the ITPGRFA later shifted to explicitly acknowledge State sovereignty over their plant genetic resources for food and agriculture,[162] it adopted a different path from the CBD when it comes to benefit sharing. Once Contracting Parties ratify the ITPGRFA, the Parties subject their plant genetic resources to a multilateral system of access and benefit sharing under part IV of the ITPGRFA. In essence, all genetic resources (as listed in annex I of the ITPRGFA) thereafter fall under the management and control of the Contracting Parties, and shall be treated as a public asset in the public domain.[163]

The Governing Body under the ITPGRFA will regulate a 'standard material transfer agreement'. Consequently, there would be no national PIC involved.[164] The benefit sharing from the utilisation of genetic resources for food and agriculture will also be performed through the multilateral system, as affirmed by the ITPGRFA.[165] Quite to the contrary of the ABS system, which emphasizes the need for prior informed consent and restricted uses, all access to plant genetic resources is said to be available free of charge or with only minimal costs involved under the ITPGRFA.[166]

That said, free access does not mean free of charge. The arrangement for benefit sharing is not subject to States' negotiation of MATs; instead, all benefits arising from the use of plant genetic resources for food and agriculture will be shared under the Multilateral System. Such benefits then shall flow primarily to farmers in all countries.[167] The providers of plant genetic resources would not decide the terms of benefit sharing; rather, the Multilateral System shall decide it.

States who implement ABS into their national laws may have to assign different treatments for plant genetic resources that fall under the scope of ITPGRFA. Sampling,

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[161] FAO, 'International Undertaking on Plant Genetic Resources' in Resolution 8/83 (1983), Annex <http://www.fao.org/docrep/x5563E/X5563e0a.htm#e.%20plant%20genetic%20resources%20(follow%20up%20of%20conference%20resolution%20681> accessed 25 April 2015, preambular 1(a).
[162] ITPGRFA, art 10(1).
[163] ibid, art 11(2), 12(3)(b).
[164] ibid, art 12(4).
[165] ibid, art 13.
[166] ibid, art 12(3)(b).
[167] ibid, art 13(3).

transfers of, and benefit sharing from the utilization of such plant genetic resources must comply with the regulations under the ITPGRFA. Although the ITPGRFA does recognise State sovereignty over plant genetic resources, such rights could have been forgone for the sake of a higher goal, such as food security[168] and the desirability of having a common pool for plant genetic resources of the world.

3.5.2 UNCLOS common heritage regime

Chapter 2 noted that the jurisdictional scope of the CBD is also significantly broad. The Convention covers all components of biological diversity in areas within and beyond the limits of the national jurisdiction of the Parties.[169] A concern could be raised with regard to whether States can assert their sovereignty over the genetic resources found in the Area that are subject to the regime of the common heritage of humankind.

According to Article 136 of the UNCLOS, the Area and its resources are the common heritage of humankind. Accordingly, no State can claim sovereignty over any part of the Area or its resources.[170] The UNCLOS explicitly affirms that no such claims or exercise of sovereignty or sovereign rights, nor such appropriation over the resources found in the Area, shall be recognised.[171]

Given this background, the definition of 'resources' under the UNCLOS does not seem to resolve whether 'genetic resources' are included, as the word 'resources' seems to refer exclusively to all solid, liquid, or gaseous mineral resources *in situ* in the Area or beneath the seabed.[172] Its wording, more likely than not, describes resources under the definition of the UNCLOS for the Area regime to include only non-living resources.

While no sovereignty may be established over mineral resources in the Area, States could control genetic resources in the Area through their control of fish stocks. According to Alexander Gillespie, there are two opposing views on this matter: (i) genetic resources in the Area should be subject to the regime of common heritage of humankind, and thus genetic resources should get the same legal treatment as minerals, and (ii) genetic resources are similar to fish stocks, and thus can be directly owned by

[168] ibid, preambular 1.
[169] CBD, art 4.
[170] UNCLOS, art 137.
[171] ibid.
[172] ibid, art 133.

States.[173] The CBD concerns itself with living organisms rather than non-living matter. On this ground, the author believes that the latter argument is more likely to sustain.

3.6 Concluding remarks on the principle of State sovereignty

The principle of State sovereignty over genetic resources is the backbone of ABS and its motivations are, for the most part, justifiable. However, to be able to assert the control of and capture the benefits from genetic resources, it would take more than merely recognition of the principle of State sovereignty. State sovereignty comes with the obligation to create and maintain a suitable ABS framework in domestic law, which is unquestionably a challenging task. A balance should be kept between ABS and other legal principles of national and international laws.

At the national level, States have to consider a multitude of rules on property rights over natural resources, legitimate claims on IPRs, and the rights of indigenous and local communities. At an international level, States have to balance their access rules against the principle of free access under the ITPGRFA and the regime of common heritage of humankind of natural resources found in the Area under the UNCLOS.

[173] Alexander Gillespie, *Conservation, Biodiversity and International Law* (Edward Elgar 2011) 502.

4 The Principle of Sustainable Use

This chapter addresses the principle of sustainable use of biological diversity. It describes the socio-economic approach of the CBD to the conservation of biodiversity with an aim to highlight the key assumptions underlying the ABS concept. The need to accommodate the costs of the conservation of biodiversity and the overall supportiveness of genetic utilization to the sustainable uses of biodiversity could be the two notable rationales for ABS.

The concept of sustainable use in the context of ABS will also be analysed to examine the potential impacts of biotechnology on biodiversity and to understand the related provisions on what constitutes sustainable use of biodiversity. ABS is broader than purely sharing economic values from the uses of genetic resources: the ABS mechanism also takes into account of a variety of social aspects, especially those related to the rights of indigenous and local communities. Section 4.4 of this chapter will briefly introduce the key social components of ABS to set phrases for further analysis in Chapter 6.

Sustainable use of the components of biodiversity is one of the core objectives of the CBD.[174] Accordingly, the Contracting Party shall integrate the conservation and sustainable use of biological resources into national decision-making.[175] In doing so, it should encourage customary use of biological resources in accordance with traditional practices for the purpose of sustainable use of biodiversity.[176] Further developing methods for sustainable uses of biodiversity is another core mean to this end.[177] Its consideration for the economic and social aspects of the perseverance of biodiversity make the CBD a notable treaty.

Utilization of genetic resources is one use of biodiversity. It has the potential to contribute to the sustainable use of biodiversity. In many ways, this high-technology utilization supports the overall objective of the sustainable use of biodiversity. Debatably,

[174] CBD, art 1.
[175] ibid, art 10(a).
[176] ibid, art 10(c).
[177] ibid, art 10(e).

however, advancement of biotechnology and its applications could pose urgent threats to biodiversity.

Within the context of ABS, promotion for the utilization of genetic resources is indispensable to ensure that benefit sharing occurs from such utilization. The sections that follow will first look into the socio-economic approach of the CBD and its implications for the ABS mechanism. The supportive relationship between ABS and the sustainable use of biodiversity will also be addressed.

4.1 Socio-economic approach of the CBD

According to Ulrich Beyerlin and Thilo Marauhn, the CBD is notable for its holistic approach to the conservation of natural resources. It addresses biological diversity as a whole and adopts a unique socio-economic approach with an emphasis on the sustainable use of the resources.[178]

The CBD could be seen as an important response of the international community to the threat of continuous loss of biodiversity at a global level.[179] As Michael Bowman and others have observed, the CBD is the first international treaty to explicitly address all aspects of biodiversity.[180] Its regulatory breadth is unlimited by territories, sectorial activities, and, to some extent, subject matters.[181] As a consequence, the concept of genetic resources is also significantly overarching. Except for human genetic resources, all genetic resources found in all living organisms on the Planet could fall under the scope of the ABS mechanism under the CBD.[182]

The CBD's socio-economic approaches also make it a unique instrument in the field of wildlife conservation. These approaches reflect the indispensable nature of human life, the economic conditions of local communities, and the traditional cultural and natural heritage to the diversity of life. To the context of ABS, socio-economic considerations could be the core rationales for the requirements of benefit sharing.[183] On the other hand, preservation of biodiversity would be no longer a purely environmental

[178] Ulrich Beyerlin and Thilo Marauhn, *International Environmental Law* (Hart Publishing 2011) 177–84, 192–95.
[179] CBD, 'History of the Convention' <http://www.cbd.int/history/> accessed 20 April 2015.
[180] Michael Bowman, Peter Davies and Catherine Redgwell, *Lyster´s International Wildlife Law* (2nd edn, Cambridge University Press 2010) 587.
[181] ibid.
[182] text of chp 2, s 2.2.2.
[183] text of chp 3, s 3.2.1 on the values of genetic resources.

issue but also an economic and social problem given that local populations are often those who manage local biodiversity and depend on it as an economic means.[184] The section below will address further the implications of the socio-economic approaches of the CBD in the context of ABS.

4.1.1 Accommodating the costs of the conservation

The CBD also pursues a broad range of objectives. It focuses not only on the conservation but also on the sustainable use of biodiversity.[185] What is not quite clear is how these two objectives could be mutually supportive. According to the CBD Outlook 4, human activities are considered to be the leading causes of the degradation of biodiversity. [186] Thus, further promotion of the utilization of biodiversity could compromise the goals of biodiversity conservation.

The notion of 'wise use'[187] and the legal principle of 'sustainable use', which is a new kind of utilization that does not cause irreversible harms to the natural resources at stake, are promising responses to these inherent conflicts. According to Article 2 of the CBD, sustainable use is use at the rate that does not lead to the long-term decline of biological diversity. Uses that relate to non-exhaustible resources or are such that they cannot exhaust such resources could be regarded as sustainable use under this definition. Whether the utilization of genetic resources could be regarded as sustainable use remains as yet unclear.

The conservation of biodiversity comes with costs that, in some instances, might be too high for the world's poor to pay. According to a report of The Economics of Ecosystems & Biodiversity (TEEB), the conservation of biodiversity involves a variety of

[184] UNEP, *Report of the Ad hoc Working Group on the Work of Its Second Session* (n 84) para 10, 12, 23; UNEP, *Global Conservation Needs and Costs* (n 83) para 1(vii); UNEP, *An Analysis of Possible Financial Mechanisms* (n 115) para 2.
[185] CBD, art 1.
[186] CBD, *Global Biodiversity Outlook 4: A Mid-Term Assessment of Process Towards the Implementation of the Strategic Plan for Biodiversity 2011–2020* (CBD Outlook 4) <http://www.cbd.int/gbo/gbo4/publication/gbo4-en-lr.pdf> accessed 5 March 2015. See also, CBD, preambular 6.
[187] Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) (Ramsar, 2 February 1971, in force 21 December 1975) UNTS I–1483, art 2(6), 3(1), 6(3) on the concept of 'wise use of wetlands and their flora and fauna'.

sacrifices, including the costs of designating protected areas, of implementing monitoring and compliance mechanism, of integrating information management.[188]

The so-called 'opportunity costs' (e.g., biodiversity left unused and adjusted land-use projects to save space for protected areas) could be the greatest costs to developing counties. If not for conservation purposes, developing countries would be able to draw on the benefits of exploiting and trading those biological resources. Considering the resource-poor situations of developing countries, it is easy to understand why an international instrument that exclusively focuses on conservation measures poses an unaffordable solution to the issue of resource management.

4.1.2 Benefit sharing and sustainable use

From a financial resource perspective, there must be some way to accommodate the costs of the conservation at an international level. Voluntary contributions by States that account for the principle of CBDR could be one approach, as suggested in Articles 20 and 21 of the CBD. However, this approach could be unsustainable in many ways. Developed countries lack the motivation to continue free gifting their valuable financial resources to developing countries, while the opposite is also true—developing countries are no longer willing to make their biodiversity available free of charge.[189]

In this context, ABS is often seen as an innovative solution to reconcile the tensions between developing countries and developed ones.[190] According to the Bonn Guidelines, Parties are urged to adopt of incentive measures to ensure conservation and sustainable use of biodiversity through ABS, with the focus on implementing well-designed economic and regulatory instruments, using valuation methods, and creating and using markets.[191] This market-based approach of the ABS regime that channels financial resources for the purpose of the conservation of biodiversity could be more sustainable than the command-and-control approach. This is because the global genetic

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[188] TEEB, *The Economics of Ecosystems & Biodiversity: Mainstreaming the Economics of Nature: A Synthesis of the Approach, Conclusions and Recommendations of TEEB* (2010) <http://doc.teebweb.org/wp-content/uploads/Study%20and%20Reports/Reports/Synthesis%20report/TEEB%20Synthesis%20Report%202010.pdf> accessed 15 April 2015, 15, 19, 27–28.

[189] text of chp 3, s 3.2 Discusses the rationales for the recognition of Sate sovereignty over their genetic resources.

[190] ibid.

[191] See Bonn Guidelines, para 51.

market could operate by itself in accordance with the relevant market forces, supply and demand. Users of genetic resources, rather than Governments, will pay for the conservation of biodiversity upon the profits they generate from genetic utilizations. As long as the uses of genetic resources create benefits (including financial benefits), the providers of such genetic resources would always be better off if such benefits are appropriately shared.

Bram De Jonge and Niels Louwaars point out the broader aspects of ABS to the conservation of biodiversity. According to them, benefit sharing from the use of genetic resources can provide sustainable sources of finance, know-how, and technology that will help to conserve biological diversity.[192] Monetary and non-monetary benefits under the ABS regime, therefore, can be viewed both as the incentives for developing countries to preserve their genetic resources and the much-needed means to enact conservation.[193]

The author therefore believes that the motivations for and the means to shoulder the burden of the conservation activities are two sides of the same coin.

4.2 Access to genetic resources for sustainable uses

This section will focus on the rationales for the State's obligation to facilitate access to genetic resources for environmentally sound uses. First, it will analyse the concept of environmentally sound use. The potential negative impacts of biotechnology and the uses of genetic resources, environmentally and socially, will also be one of the issues that could have implications for ABS.

Generally speaking, facilitating access to genetic resources could be seen as a pre-condition to promote utilization of genetic resources that generate a wide range of benefits to be shared with the providers. While access for the purposes of non-commercial researches could be deemed an environmentally sound use of such resources, it remains unclear what could constitute sound use with regards to different access purposes.

Rationales for facilitating access for non-commercial research and other uses are generally justiciable, yet a precautionary approach must be taken to the application of biotechnology. Utilization of genetic resources, while in large part consistent with the

[192] Jonge and Lauwaars (n 79) 40.
[193] ibid.

principle of sustainable use, might have certain side effects to the conservation of such resources. The author will therefore address the environmentally sound use principles, the key rationales for facilitating access, and some unwanted behaviour that could be the results of the unsustainable utilization of genetic resources and the benefit sharing therefrom.

4.2.1 Environmentally sound uses

As far as the access rules are concerned, the CBD requires each Contracting Party to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties.[194] What shall constitute 'environmentally sound uses', however, remains unclear. According to the submission of States on the implementation of ABS rules, two important conditions for an access to be granted are that the utilization will cause no environmental harm and that a satisfactory benefit sharing agreement (MAT) has been made with the access provider.[195]

One might ask whether access to biological resources for the utilization of the genetic resources contained therein could be regarded as environmentally sound use in all cases. It is thus important to understand on what circumstances States can decline access on the ground of environmentally unsound use.

According to Article 10(b) of the CBD, States shall take measures relating to the use of biological resources to minimize adverse impacts on biological diversity. Furthermore, the term 'sustainable use' is defined as the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity. The notion of irreversible harm seems to be the factor that defines unsustainable use. That said, it is not clearly defined what kinds of activities and uses could cause irreversible harm to an area's biodiversity.

Article 19(3) of the CBD outlines the punitive measures for those whose use has an adverse effect on the conservation and sustainable use of biodiversity of GMOs. The Cartagena Protocol on Biosafety later set up the legal framework for handling the trans-boundary movement of GMOs that might adversely affect an area's biodiversity. Risks to

[194] CBD, art 15(2).
[195] UNEP, *Compilation of Submissions by Parties* (n 55) 12.

human health are another aspect of adverse effect outlined by the Cartagena Protocol.[196] Given this, utilization of genetic resources that involves the trans-boundary movement of GMOs could be restricted. Certainly, GMOs might get special treatment, with certain precautions.

The COP 5 Decision V/5 raises concerns about the potential impacts of genetic use restriction technologies to food security and agricultural biodiversity and requires that these be taken into account by States in a precautionary manner.[197] Genetic use restriction technologies, or so-called suicide seeds, are methods for restricting the uses of GMOs that cause second-generation seeds to be sterile. These technologies could pose risks to biodiversity because they promote increased use of genetically modified crops.[198] Although the potential impacts of these technologies could be both positive and negative, the report indicates an uncertainty in the field of genetic utilization concerning the course of the advancement of biotechnology and its impacts.

On the other hand, the Nagoya Protocol elaborates on the issues of facilitating access for environmentally sound uses as stipulated by the CBD.[199] The Nagoya Protocol emphasizes simplified measures on access that should be applied to non-commercial research purposes.[200]

While PIC are still required for such research,[201] and such access could be declined on the basis of unsatisfied MATs,[202] it is unlikely that the access could be declined on the basis of environmentally unsound use. Therefore, purely academic research on genetic resources could be deemed to have environmentally sound uses.

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[196] Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Cartagena Protocol) (Montreal, 20 January 2000, in force 11 November 2003) UNTS A–30619, preambular 5, art 4.
[197] COP 5 Decision V/5, *Agricultural Biological Diversity: Review of Phase I of the Programme of Work and Adoption of a Multi–Year Work Programme*, para 23.
[198] UNEP, *Report of the Ad Hoc Technical Expert Group Meeting on the Potential Impacts of Genetic Use Restriction Technologies on Smallholder Farmers, Indigenous and Local Communities and Farmers' Rights* (Montreal 2003) (UNEP/CBD/SBSTTA/9/INF/6–UNEP/CBD/WG8J/3/INF/2) 6.
[199] CBD, art 15(2).
[200] Nagoya Protocol, art 8(a).
[201] text to n 43.
[202] text of chp 2, s 2.1.2 on the relationship between PIC and MATs.

4.2.2 Indirect negative effects of genetic utilization

4.2.2.1 The side-effects of the incentive mechanism

Not only do GMOs pose direct potential risks to the sustainable use of biodiversity, but ABS and its promotion for the utilization of genetic resources could lead to other unsustainable usage of biological resources.

Bram De Jonge and Niels Louwaars note that, when all genetic diversity within a crop has been sampled and stored in a gene bank, less emphasis may be put on on-farm management of diversity.[203] The preparatory works of the CBD note that gene banks are controversial because of their control over genetic resources.[204] Once a sample is stored, users could go to gene-banks to obtain useful genetic resources, rather than approaching in-situ conservators for such resources. They could be unbeatable competitors in this case. However, gene banks play an important role in mitigating biological risks; they can reintroduce certain genetic resources when there are biological failures, as noted by Timothy Swanson.[205]

From the economic incentive point of view, benefits-sharing could in some cases promote unsustainable exploitation of the biological resources at stake. Peter Munyi and Harry Jonas have noted that the ABS system in Africa could actually lead to widespread unsustainable harvesting of wildlife of the indigenous and local communities involved.[206] When users approach local peoples for useful biological resources with a promise of sharing profits, it is more likely than not that such people will take more than is wise. The impacts could be that such resources are unnecessarily over-exploited.

Although the utilization of genetic resources often promotes appreciation for the value of related biological resources,[207] industrial businesses in principle focus more on the activities that maximize profits. This is not necessarily bad for biodiversity; rather, it is not sufficient for genetic diversity to be appreciated only for its intrinsic, environmental values.

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[203] Jonge and Louwaars (n 79) 40–41.
[204] UNEP, *Biotechnology: Concepts and Issues for Consideration in Preparation of a Framework Legal Instrument For the Conservation of Biological Diversity* (Geneva 1990) (UNEP/Bio.Div.3/7) para 20.
[205] Timothy Swanson, *Global Action for Biodiversity* (Earthscan 1997) 45.
[206] Munyi and Jonas (n 38) 227.
[207] See text to n 116.

Timothy Swanson stresses that the core argument for the need to protect biodiversity is that diversity of life is in itself valuable. A world of diverse creatures provides a wider set of choices.[208] From this ground, it could be argued that species should be protected from extinction because having more diversity is better than less, regardless of whether or not such species have immediate economic potentials. Timothy Swanson clarifies that human selection of valuable genetic resources for the purpose of gaining economic profits can discriminate against valuable diversity; after all, uniform and specialized resources are enemies to biodiversity.[209] Depending too heavily on one species resource could be dangerous should environmental factors put that species at risk. The famine caused by the Ireland potato blight (1845)[210] is an example of the drastic impact of unsustainable plant selection.

4.2.2.2 Regulatory loopholes

In his analysis, Gerd Winter takes the view that rules on access can lead to regulatory competition, which encourages States to make access easier and lower the standards of conservation of biodiversity, so as to attract users of genetic resources.[211]

The Parties are under no obligation to consult other Parties holding the same genetic resources.[212] A user of genetic resources will more likely than not to first approach the provider countries with the best access. Such countries need not be a country of origin for the resources. Legitimate providers of genetic resources include both the countries of origin for those resources and the countries that have obtained such resources by the means of collections.[213]

In an effort to ensure a fair share for provider countries from which genetic resources originate, the Nagoya Protocol accorded a variety of measures, including the dual ABS compliance regulatory in both user States and provider States.[214] This regulatory promotes the use of codes of conduct and best practices[215] and provides model

[208] Swanson (n 205) 63–65.
[209] ibid 44–45, 50.
[210] See 'The Famine 1: Potato Blight' <http://www.wesleyjohnston.com/users/ireland/past/famine/blight.html> accessed 20 April 2015.
[211] Winter, 'Towards Regional Common Pools of GRs' (n 47) 26.
[212] CBD, art 15(1); Nagoya Protocol, art 6(1).
[213] CBD, art 15(3); Nagoya Protocol, art 6(1).
[214] Nagoya Protocol, art 15.
[215] ibid, art 20.

contractual clauses.[216] Assessing the effectiveness of these measures, however, falls outside the scope of the thesis.

4.2.3 Rationales for facilitating access

Generally speaking, access to genetic resources in gene-rich areas of the world should be encouraged. Genetic utilization generates economic profits; if these are shared appropriately, they will create further appreciation for genetic diversity.

Whether shared benefits could provide a strong enough incentive for the stakeholders to take actions for the conservation of such resources remains uncertain. However, as long as genetic resources can be put to good use, there will be an increase in public awareness about the value of these resources. Where there is no utilization of genetic resources, the related benefits will not be generated. It will follow that there would be no benefits to be shared. On this ground, generally, it is more desirable to facilitate rather than restrict access to genetic resources.

The Nagoya Protocol explicitly promotes access to genetic resources for research purposes to encourage research and the exchange of information on genetic resources.[217] The Ad Hoc Working Group of Experts on Biological Diversity notes that there exists an inter-relation between biotechnology and biodiversity. Accordingly, biotechnology not only realizes the value of genetic resources but also improves methods of preserving genetic resources and speeds the evaluation of germplasm.[218] Furthermore, biodiversity is the foundation from which biotechnology can develop and create new genetic uses and understanding.[219] Thus, simpler access to genetic resources for research purposes will not only support the value realization of genetic resources, but also improve conservation methods.

Aside from the mentioned potential negative impacts of biotechnology, the utilization of genetic resources through applications of biotechnology in large part is

[216] ibid, art 19.
[217] ibid, art 8(a) Stresses the needs to 'promote and encourage research which contributes to the conservation and sustainable use of biological diversity'.
[218] UNEP, *Biotechnology: Concepts and Issues for Consideration* (n 204) para 3.
[219] ibid para 4.

positive in terms of sustaining biological diversity. At least such uses could be more environmentally sound than uses for bulk consumptions[220] of biological resources.

Even when those biological resources are treated as exhaustible natural resources, they could not be exhausted by genetic utilization. The Ad Hoc Working Group of Experts on Biological Diversity rightly point out that the taking of seeds does not exhaust the genetic resources of a place, because plants can reproduce themselves.[221] Generally, degradation of biological resources will lead to the degradation of the genetic pool, because the former contain the latter. The exploitation of biological resources for bulk consumption (e.g., destroying a forest for new construction or heating) degrades the biological resources, while sampling or coding of genetic resources does not.

Therefore, genetic utilization through the application of biotechnology, aside from the potential impacts of GMOs, is generally desirable for and consistent with the principle of the sustainable use of biodiversity.

4.3 Channelling benefits back to the conservation

It could be a problem if shared benefits are not redirected to the conservation of biodiversity, considering that ABS is motivated from the fact that the costs of such conservation should be accommodated by the financial resources generated from related benefit sharing.[222]

Article 9 of the Nagoya Protocol requires the Parties to encourage users and providers to direct benefits arising from the utilization of genetic resources towards the conservation of biological diversity and the sustainable use of its components. The implications could be that shared benefits should in principle be invested into the projects that aim to conserve biodiversity. The binding effects of this provision, however, are limited to encouraging such use of benefits, rather than making such use compulsory.

With genetic resources that occur in trans-boundary situations, or for which seeking or obtaining a PIC is impossible, multilateral benefit sharing could be applied.[223]

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[220] See text of chp 2, s 2.2.1 Distinguishes utilization and transfers of biological resources that are subject to ABS from those that are subject to general trade laws.
[221] UNEP, *Relationship Between Intellectual Property Rights and Access to Genetic Resources* (n 113) para 15.
[222] text of chp 4, s 4.1.1.
[223] Nagoya Protocol, art 10.

With multilateral benefit-sharing mechanism options, providers must invest the benefits to support the conservation of biological diversity and the sustainable use.[224]

While States have the responsibility to use their biological resources in a sustainable manner, they also have the authority to exploit their natural resources according to their own environmental policies.[225] Thus, sustainable use of biodiversity should mean the imposition of conditionality on the funding and transfer of technology as noted by the Ad Hoc Working Group of Experts on Biological Diversity.[226]

Elisa Morgera and others argued that the use of received shared benefits is largely at the discretion of provider States,[227] which could undermine the effectiveness of ABS as a private funding mechanism for the conservation of biodiversity. This could be true. However, this author believes that, even when the providers of genetic resources would use the economic profits shared from the utilization of genetic resources to build new roads rather than to fund an environmental project, the ideas that benefits create incentives for the conservation of biodiversity sustain. After all, such providers will always have the better financial capacity to pursue the developmental projects they prefer. This is the core rationalization that ABS provides positive incentive not to destroy biodiversity due to its economic value.

4.4 Social aspects of ABS

There are many social considerations to the ABS mechanism under the Nagoya Protocol, especially with respect to ABS related to traditional knowledge associated with genetic resources. Rules on traditional knowledge might be considered a critical legal innovation under the Nagoya Protocol. The appreciation for traditional knowledge in the regime of environment conservation implies that several social aspects of the relevant communities will be involved. In Chapter 6, the author will elaborate on the notions of the rights of indigenous and local communities. This section, on the other hand, will note the potential impacts of the utilization of traditional knowledge to the social structure of the relevant communities.

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[224] ibid.
[225] CBD, art 3.
[226] UNEP, *Report of the Ad hoc Working Group on the Work of Its Second Session* (n 84) para 21.
[227] Morgera, Tsioumani and Buck, *Unravelling the Nagoya Protocol* (n 51) 27.

The Nagoya Protocol notes the rationales for the recognition of indigenous people and local communities' sovereignty over their traditional knowledge. Accordingly, such traditional knowledge is not only important for the sustainable use of biodiversity, but is also indispensable for the sustainable livelihoods of these communities.[228] Thus, the Protocol values traditional knowledge associated with genetic resources not only for its economic potential, but also for its intrinsic value in reflecting the rich cultural heritage[229] of the peoples concerned.

It has been noted by Jack K. Githae, however, that access and utilization of traditional knowledge can in many ways interfere with the livelihoods and culture heritages of these communities.[230] The privatization approach to the ownership over traditional knowledge can discriminate against the collective nature of such knowledge.[231]

Many different communities share the same knowledge, and the origins of such knowledge cannot be traced.[232] The knowledge shared among the networks of indigenous and local communities has special characteristics; it often involves the spiritual beliefs, family-bound heritages, and life-styles of such communities.[233] Their rules and methodologies for sharing their knowledge within their cultural context therefore should be respected.

The Nagoya Protocol further recognises the importance of the customary laws of indigenous and local communities and requires that, in the implementation of ABS, States should in principle take into consideration indigenous and local communities' customary laws, community protocols, and established procedures.[234]

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[228] Nagoya Protocol, preambular 22.
[229] ibid, preambular 25.
[230] Jack K. Githae, 'Potential of TK for Conventional Therapy – Prospects and Limits' in Evanson C. Kamau and Gerd Winter (eds), *Genetic Resources, Traditional Knowledge & the Law: Solutions for Access & Benefit Sharing* (Earthscan 2013) 97–99.
[231] Brendan Tobin, 'Setting Protection of TK to Rights – Placing Human Rights and Customary Law at the Heart of TK Governance' in Evanson C. Kamau and Gerd Winter (eds), *Genetic Resources, Traditional Knowledge & the Law: Solutions for Access & Benefit Sharing* (Earthscan 2013) 107.
[232] John B. Kleba, 'A Socio-Legal Inquiry into the Protection of Disseminated Traditional Knowledge – Learning from Brazilian Casese' in Evanson C. Kamau and Gerd Winter (eds), *Genetic Resources, Traditional Knowledge & the Law: Solutions for Access & Benefit Sharing* (Earthscan 2013) 122.
[233] Githae (n 230) 78.
[234] Nagoya Protocol, art 12(1).

On the other hand, ABS should not run counter to the traditional practices and traditional uses of genetic resources (e.g., the storing and exchanging of seeds). Accordingly, Parties shall not restrict the customary use and exchange of genetic resources and associated traditional knowledge within and among indigenous and local communities.[235]

The rights of indigenous and local communities are twofold. These communities have the rights to use and provide access to genetic resources[236] and they have the rights to make use of and provide access to traditional knowledge.[237] The legal basis for the establishment of rights to genetic resources is different from those for traditional knowledge, however. Chapter 6 of the thesis will discuss this matter in further detail, with particular attention to the novelty of the rules on traditional knowledge and the notion of the rights of indigenous and local communities.

4.5 Concluding remarks on the principle of sustainable use

For the sake of a conclusion, some key insights could be drawn from the analysis above. For one, promoting for utilization of genetic resources could be equated with the promotion for sustainable uses. The utilization of genetic resources is in large part consistent with the principle of sustainable use, for the reason that such uses rarely pose direct threats of degradation of biological resources. ABS could be seen as one of the necessary means to accommodate the costs of the conservation of biodiversity by channelling back the benefits to the custodians of biodiversity.

While it is desirable that benefits will be directed back to the conservation of biodiversity, it is not a prerequisite for the functioning of the incentive mechanism. There is a need to search more into the legal basis for the rights of indigenous and local communities and their customary uses of traditional knowledge so that ABS will not disrupt the social context where such valuable knowledge is best preserved. More on this will be discussed in Chapter 6.

[235] ibid, art 12(4).
[236] ibid, art 6(2).
[237] ibid, art 7.

5 The Principle of Common but Differentiated Responsibilities

This chapter discusses the principle of common but differentiated responsibilities of States (hereinafter CBDR) and the possible implications of the principle for the implementation of ABS. To this end, it will address the legal content and status of the principle of CBDR under international laws. The chapter will then compare the nature of the differentiated responsibilities toward biodiversity conservation of developed States against the differentiated responsibilities of developed States toward climate change. The comparison will allow for the creation of a critical analysis on the nature of State responsibilities in the context of the ABS mechanism. The chapter will demonstrate that ABS is rarely a reflection or extension of the principles of CBDR, because the ABS operates on different grounds.

As discussed in Chapter 3, Section 3.2, ABS aims at reconciling the tensions between the developed countries and developing ones for the reason that the former are no longer willing to free gift their technologies and valuable financial resources, while the latter are no longer willing to make available their genetic resources without charge.[238] Thus, ABS could be seen as an innovative solution to access genetic resources around the world. Accordingly, ABS should in principle enable developing countries to draw on the benefits from accesses to their genetic resources; on other hand, it should facilitate the access to genetic resources by developed countries.

With respect to the conservation of biodiversity, however, ABS seems not to sufficiently reflect the notion of legitimate differentiated responsibilities that works in favour of developing States. The nature of ABS's contractual obligations could work against the interests of providers of genetic resources in developing countries because of a variety of externalities and the possible market failure of the genetic market. This chapter will aim to test this assumption.

5.1 The principle of CBDR

In this section, the legal content and legal status of the principle of CBDR will be briefly introduced with the view to set a common ground for the discussion on whether ABS reflects or deviates from the core principles of CBDR.

[238] text of chp 3, s 3.2.

5.1.1 The legal content of the principle of CBDR

5.1.1.1 Differentiated responsibilities under international laws

Ulrich Beyerlin and Thilo Marauhn rightly point out that there is a diversity of international arrangements that reflect the core of the principle of CBDR.[239] Accordingly, while all States could undertake a common commitment to conserve natural resources, each state could take up different obligations depending on the group of countries to which it belongs.[240]

The States' differentiated commitments to the UNFCCC[241] to combat climate change clearly reflect this notion. Accordingly, the States that were classified in the Annex B of the UNFCCC shall undertake quantitative commitments to reduce greenhouse gases (GHGs), whereas other States shall only have to report on their legislative measures.[242]

Furthermore, according to Tuula Kolari, in cases where States might undertake identical obligations, there could be rules that aim to redistribute financial or technical resources.[243] Or maybe the differentiated treatment could fall on the time-line for fulfilling identical commitments. For example, under the Montreal Protocol,[244] developing States are allowed to postpone their obligation to reduce the consumption and production of controlled substances for ten years.[245]

Generally speaking, States are free to enter into any international agreement or to decline it. Such differentiated responsibilities could not be a result of coercion, therefore; rather, they are justifiable. According to the United Nations Resolution No. 2625,[246] the

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[239] Beyerlin and Maruhn (n 178) 61–70.
[240] ibid.
[241] United Nations Framework Convention on Climate Change (UNFCCC) (New York, 9 May 1992, in force 21 March 1994) UNTS I–30822, art 4(2), 12, Annex I.
[242] See further, Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol) (Kyoto, 11 December 1997, in force 16 February 2005) UNTS A–30822, Annex B.
[243] Tuula Kolari, 'The Principle of Common but Differentiated Responsibilities as Contributing to Sustainable Development through Multilateral Environmental Agreements' in Hans Christian and Bugge & Christina Voigt (eds), *Sustainable Development in International and National Law* (Europa Law Publishing 2008) 252.
[244] Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) (Montreal 16 September 1987, in force 01 January 1989) UNTS I–26369, art 5(1).
[245] ibid.
[246] *Declaration on Principles of International Law concerning Friendly Relations and Co–operation among States in accordance with the Charter of the United Nations* (24 October 1970) UN Resolution 2625(XXV) A/RES/25/2625.

principle of State sovereignty and the principle of friendly relations and co-operation among States are interrelated. Accordingly, States have equal rights and duties and are equal members of the international community, notwithstanding differences of an economic, social, political, or other nature.[247] Furthermore, it notes that each State also has the duty to comply fully and in good faith with its international obligations and to live in peace with other States.[248]

In order to address global issues, cooperation among the States is absolutely essential. One of the most pressing global issues to date are environmental issues. As mentioned in Chapter 4, the scope of the CBD is extremely broad to the extent that it covers all species and all territories within and beyond national jurisdiction of the Contracting Parties. Because the CBD aims to address the conservation of biodiversity at global levels and of the greatest scales, it could be that the broad participation of States are the core conditions to realize the objectives of the CBD.[249]

That said, there are a variety of views on which to build the legal grounds for the differentiation of State obligations. In other aspects, as noted by Patricia and others, it is not entirely clear whether developed countries have the legal obligation to undertake more responsibilities than the developing ones.[250]

In the section below, the author will discuss some of the key arguments that rationalise the principle of CBDR.

5.1.1.2 The justifications for CBDR

One of the rationales for the differentiated responsibilities of the States is that States are different in their capacities to fulfil international commitments. Ulrich Beyerlin and Thilo Marauhn point out that, in the field of international environment law, states normally enter into treaties with intention to comply with the commitments therein because they have discussed their own interests during the negotiations of the treaty.[251] Non-

[247] ibid, Principle 6.
[248] ibid, Principle 6(f).
[249] text of chp 4, s 4.1.
[250] Patricia Birnie, Alan Boyle and Catherine Redgwell, *International Law and the Environment* (3rd edn, Oxford 2009) 134 Takes the view that the Principle 7 of the Rio Declaration indicates the obligations of 'solidarity assistance to developing states'. See further, Karin Michelson, 'South, North, International Environmental Law' (2000) *Yearbook of International Environmental Law* 52, 70 Raises the question of whether the principle of CBDR reflects 'ability to pay or a responsibility to pay'.
[251] Beyerlin and Marauhn (n 178) 319.

compliance is often the result of a deficiency in administrative, economic, and technical infrastructure.[252] Thus, one might argue that it would be better to conclude a functional treaty, which recognises differentiated responsibilities, than one that would never be complied with. Because States are different in their capacities to implement a treaty, rules on differentiated responsibilities are not only necessary for a treaty to be agreed upon, but also for the effective implementation of that treaty in the long run.

The Rio Declaration,[253] however, indicates a different notion of CBDR from a capacity concern. According to Principle 7 of the Rio Declaration, States provide different contributions to global environmental degradation, and developed countries should acknowledge the responsibility that they bear in the view of the pressures their societies place on the global environment and of the technologies and financial resources they command.[254]

Principle 8 of the Rio Declaration further clarifies that States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies. According to Karin Michelson, Principle 8 of the Rio Declaration targets the unsustainable patterns of production and consumption of industrialized countries.[255] Hence, current pressures on the environment could be a basis for differentiated responsibilities of developed States.

On the grounds of the analysis above, there can be no conclusive assertion on whether developed States should take up more responsibilities because of the spirit of cooperation or because they have legal obligations to pay for the degradation of the environment. However, no matter what their legal basis, differentiated responsibilities are a matter of fact to ensure participation and implementation of international treaties.

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[252] ibid.
[253] United Nations Conference on Environment and Development (UNCED), Rio Declaration on Environment and Development (Rio Declaration) (Rio de Janeiro, 3–14 June 1992) (UN Doc. A/CONF.151/26) (vol. I).
[254] ibid, Principle 7.
[255] Karin Michelson, 'South, North, International Environmental Law' (2000) *Yearbook of International Environmental Law* 52, 70.

5.1.2 Legal status of the principle of CBDR

With respect to the legal status of the principle of CBDR, Ulrich Beyerlin and Thilo Marauhn note that the CBDR principle is a legal principle. It has a normative quality and thus has the potential to become a customary norm of international laws.[256]

That being said, a legal principle does not necessarily clarify what actions or measures must be taken in certain circumstances. Philippe Sands and others argued that a legal principle is different from a legal rule in that rules direct to certain measures and actions, while legal principles do not.[257] A legal principle, on the other hand, could have a weighing power in arguing for certain directions of legislation.[258]

The CBDR principle could have different sizes and shapes depending on the subject matter of the treaty's main concerns. It is as yet unknown just how differentiated legal commitments must be between developing and developed countries. The Section 5.2.2 will compare further CBDR under the UNFCCC and those under the CBD with a view that the principle could have different characters within the context of different regimes.

5.2 CBDR principle under the CBD

5.2.1 Common responsibilities

As analysed in Chapter 4, Section 4.1, broad participation could be necessary to realize the broad objectives of the CBD, which is to address biological diversity as a whole and at the global level. Thus, implementing CBDR for the purpose of achieving the participation of more States thus plays an important role in the biodiversity regime. There are up to 194 State members of the CBD to date.[259] This could indicate that the international commitments therein should be in large part desirable to the views of almost all the States of the world.

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[256] Beyerlin and Marauhn (n 178) 69–70.
[257] Philippe Sands and others, *Principles of International Environmental Law* (3rd edn, Cambridge 2012) 189. See also, Gerd Winter, 'A Fundament and Two Pillars: The Concept of Sustainable Development 20 Years after Brundtland Report' in Hans Christian and Bugges & Christina Voigt (eds), *Sustainable Development in International and National Law* (Europa Law Publishing 2008) 39. See further, Pattaro (n 9) 814–42.
[258] ibid.
[259] See CBD, 'List of Parties' <http://www.cbd.int/information/parties.shtml> accessed 28 February 2015.

Elisa Morgera and others argue that the ABS mechanism reflects certain compromises between developing countries and developed countries. [260] Such compromises are probably necessary for the conclusion of the Convention because, as was mentioned in Chapter 3, Section 3.2, developing countries hold most of biodiversity of the world, but are no longer willing to provide valuable genetic resources for free.[261] On the other hand, industrialized countries are also no longer willing to free gift their technologies.[262]

Generally speaking, although biodiversity is not equally expressed in all part of the world and all States are different states of their biotechnology development, all States do have a common concern in the conservation of biological diversity at the international level, as stipulated in the CBD.[263] The preparatory works of the CBD express that the proposal for the use the term 'common responsibilities' or 'common duties' for the conservation of biodiversity was rejected by many delegations early on, because such terms could indicate legal obligations.[264] The notion of common responsibilities was softened to the 'common interest' of humankind.

The Ad Hoc Working Group of Experts on Biological Diversity argues that, while biodiversity is held in different territories of the world, biodiversity is the collective asset of humankind in a way that the international community shares an interest in the conservation of such valuable resources.[265] The Johannesburg Declaration adds that biodiversity is critical for sustainable development and poverty eradication, and is essential to our planet, human well-being, and to the livelihood and cultural integrity of people.[266] With respect to the notion of collective assets, it further points out that

[260] Morgera, Tsioumani and Buck, *Unravelling the Nagoya Protocol* (n 51) 56.
[261] See further, UNEP, *Relationship Between Intellectual Property Rights and Access to Genetic Resources* (n 113) 29.
[262] ibid.
[263] CBD, preambular 3.
[264] UNEP, *Report of the Ad Hoc Working Group of Legal and Technical Experts on Biological Diversity on the Work of Its First Session* (Nairobi 1990) (UNEP/Bio.Div/WG.2/1/4) para 33.
[265] UNEP, *Relationship Between Intellectual Property Rights and Access to Genetic Resources* (n 113) 37.
[266] United Nations, *Report of the World Summit on Sustainable Development* (4 September 2002) (UN Doc A/CONF.199/20), Annex (*Plan of Implementation of the World Summit on Sustainable Development*) (Johannesburg Plan of Implementation) para 44.

biodiversity loss somewhere could degrade the common pools of biodiversity of the planet as a whole.[267]

Gregory Mankiw defines the notion of 'externalities' in the context of economics. According to his definition, the term refers to the impacts (positive or negative) of one person's actions on the wellbeing of a bystander who has no way to control the impacts of the other person's actions.[268] It could be argued that, in the context of biodiversity conservation, all humans might have to pay the negative externalities of development that lead to the loss of biodiversity no matter where such degradation might take place. However, the extent to which States shall be willing to take joint action to combat the degradation of biodiversity could be different from the extent to which they are willing to take joint action to prevent climate change.

5.2.2 Global warming and the loss of biodiversity

The point of comparing the regime on global warming under the UNFCCC and the regime on biodiversity under the CBD is to demonstrate that, while global warming and continued loss of biodiversity are both urgent environmental issues, the extents to which the notion of the common concerns of humankind direct concrete actions to combat these threats are different. The former calls for global measurable actions, while the latter calls for soft commitments that depend largely on local environmental policies.

The industrialized State Parties to the UNFCCC undertake measureable commitments to reduce GHGs, while under CBD, no such commitments could be spelled out. With respect to the identified causes of environment degradation, the UNFCCC exclusively targets reducing the concentration of GHGs, because the concentration of such is identified to be a key factor causing global warming.[269] Furthermore, according to the UNFCCC, the production of such GHGs will increase global warming no matter where such gases are generated.[270] Therefore, the United States would still have to pay for the negative externalities of global warming that take place in China, even though it does not directly cause such negative impacts, and vice versa. Furthermore, GHGs concentration is scientifically measureable at the international level. Therefore, in a way,

[267] UNEP, *Relationship Between Intellectual Property Rights and Access to Genetic Resources* (n 113) 37.
[268] N. Gregory Mankiw, *Principles of Economics* (5th edn, Cengage Learning 2008) 11.
[269] UNFCCC, preambular 2.
[270] ibid.

States do have common concerns about global warming, because they have stakes that will be affected by global warming.

The root causes of biodiversity loss remain multiple and immeasurable. According to the CBD Outlook 4, the direct causes of biodiversity degradation include habitat loss, degradation and fragmentation, overexploitation of biological resources, unsustainable forms of production, pollution, multiple pressures on the ecosystem, and even global warming, to name a few.[271] No set of measures could be taken to address this extremely broad range of causes of the loss of biodiversity, which in turn affects all the species and ecologies on the Planet.

Furthermore, the biodiversity lost in one region does not directly lead to the loss of biodiversity elsewhere. For example, biodiversity loss in Brazil might have nothing to do with the state of biodiversity in Vietnam, and vice versa. In the long run, and to the extreme, the common pool of biodiversity of the world could suffer for the loss of biodiversity in specific areas; however, this threat is not urgent to the views of bystanders.

Furthermore, certain guidelines on biodiversity preservation in the territory of a State would not necessary improve biodiversity in the territories of another state, except for in a trans-boundary situation. Because of this, biodiversity is a relatively local concern. On the other hand, it has been noted that, if one state manages to decrease the quantity of GHGs injected into the atmosphere, the whole planet enjoy the same benefits of the decreased threat of global warming.[272]

From the above-mentioned ground, the soft commitments under the CBD could be partly explained by the nature of the subject matter that the Convention addresses.

5.3 ABS and the principle of CBDR

This section will discuss the extent to which ABS reflects core elements of the principle of CBDR.

[271] CBD Outlook 4 (n 186) 25. See also, COP 10 Decision X/2, *Strategic Plan for Biodiversity 2011–2020*, Annex (*Strategic Plan for Biodiversity 2011–2020 and the Aichi Biodiversity Targets*) para 10.
[272] The idea of positive and negative externalities is borrowed from Steven D. Levitt and Stephen J. Dubner, *Super Freak–Economics* (Penguin 2009) 171–73.

5.3.1 The contractual nature of ABS

According to some authors, ABS creates a win-win situation in which developed countries are bound to provide financial resources and technology in return for access to genetic resources in developing countries.[273] Benefit sharing, as has been noted in Chapter 2 Section 2.1.2, will be performed on the basis of MATs and contractual obligations. Thus, while States negotiate differentiated international obligations, the user and provider countries of genetic resources will negotiate the terms of benefit sharing on the basis of what they have to offer to each other in the spirit of free trade. In a way, CBDR rarely has a role in conducting MATs in the context of the ABS mechanism.

It has been mentioned that, as a general rule, access to genetic resources is the pre-condition for benefit sharing thereof.[274] There would be no benefit sharing if there were no access to genetic resources, and no utilization equates no generated benefits that need to be shared.[275]

Note that the phrase 'biology rich and technology poor countries', though it was mentioned during the negotiation of the CBD, did not find a place in the text of the CBD.[276] This could be because such a distinction might not reflect the reality. There can be States that are both biologically rich and technologically rich, as well as those that are biologically poor and technologically poor.[277] Furthermore, defining biological richness is a difficult task, considering that genetic resources can have both actual and potential values, which are the values that have not been realized or become scientifically known.[278]

On the basis of individual MATs, the terms on benefit sharing in principle will be negotiated accordingly.[279] Gene-poor developing countries will not likely benefit much from the ABS mechanism because they are not significant providers of genetic resources.

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[273] See for example, Lyle Glowka and Valerie Normand, 'The Nagoya Protocol on Access and Benefit-Sharing: Innovations in International Environmental Law' in Elisa Morgera, Matthias Buck and Elsa Tsioumani (eds), *The 2010 Nagoya Protocol on Access and Benefit-Sharing in Perspective: Implications for International Law and Implementation Challenges* (Martinus Nijhoff Publishers 2013) 21–22.
[274] See further, Morgera, Tsioumani and Buck, *Unravelling the Nagoya Protocol* (n 51) 55.
[275] ibid.
[276] UNEP, *Report of the Ad hoc Working Group on the Work of Its Second Session* (n 84) para 22.
[277] Peter-Tobias Stoll, 'ABS, Justice, Pools and the Nagoya Protocol' in Evanson Chege Kamau and Gerd Winter (eds), *Common Pools of Genetic Resources: Equity and Innovation in International Law* (Earthscan 2013) 307.
[278] See CBD, art 2 for the definition of 'genetic resources'.
[279] Nagoya Protocol, art 6(3)(g)(ii).

The assumption that developing countries are holding most of the biodiversity and genetic diversity therein could be true.[280] However, this fact could not rule out the possibility that there are gene-poor developing countries; this could be an issue with the principle of CBDR that ABS does not necessarily support. In other words, being classified as a developing country does not make such countries significant beneficiaries of ABS, unless they happen to be also significant holders of genetic resources.

With respect to providers and users as private actors within the ABS mechanism, there could be a variety of concerns relating to whether benefits will flow to the people who need them most for the purpose of the conservation of biodiversity. According to the Nagoya Protocol, benefits from the utilization of genetic resources should in principle be shared with indigenous and local communities who provide such resources.[281] In other words, benefits should be preferably shared with the in-situ holders of relevant genetic resources. However, while MATs will decide the terms of benefit sharing in the spirit of the free will of the parties engaging in such MATs, the extent to which such benefit sharing could be fair is questionable, considering the unequal bargaining powers between the providers of genetic resources in developing countries and the users in developed countries.[282]

On these grounds, the author will further analyse the functioning of ABS in the context of the genetic resource market in order to understand the circumstances in which ABS does not favour in-situ genetic resources holders.

5.3.2 Rules of laws and rules of market

As mentioned in Section 5.3.1, being gene-rich could be a precondition for a developing country to reap the benefits from the utilization of genetic resources.

However, being gene-rich is probably not enough. The core determiner for whether such a country could benefit from ABS is that the gene-rich country must also be a significant provider of genetic resources. There is a distinction between having a chance to receive benefits and the actual receipt of such benefits.

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[280] The assumption that developing countries hold most of the biodiversity on earth might be true according to Australian Government–Department of the Environment, 'Australia State of the Environment Report 2001' (2001) <www.environment.gov.au/node/21579> accessed 31 March 2015.
[281] Nagoya Protocol, 5(2).
[282] text of chp 2, s 2.1.4.2.

It is generally true that gene-rich countries are often better advantaged when it comes to providing genetic resources, because of the availability of such resources within the State's territory. However, there are a few exceptions to the norm. Three factors may undermine the opportunities for a developing country that is a biodiversity-rich country to obtain the benefits from the utilization of genetic resources.

First, both the countries of origin for the genetic resources and the countries that have acquired such resources in accordance with the CBD can be legitimate providers of genetic resources.[283] The competition among providers is tense, and ex-situ collectors in industrialized countries may have a better position than the countries of origins in terms of service competiveness.

Second, users of genetic resources can be domestic users.[284] Hence, ABS may prove to be a self-serving rule, under which benefits do not flow from developed countries to developing ones, but rather from the users to the providers of genetic resources within a domestic market. This mechanism is favourable for the holders of genetic resources, but it has little to contribute to the principle of CBDR.

Third, if ABS is to be viewed as a tool to globalize the international market of genetic resources,[285] then one can argue that such globalization inherited its own shortcomings. The key problem with globalization is uneven distribution of growth and costs.[286] Developing countries must invest significant amounts of money to capture the benefits from the utilization of genetic resources. They must improve their competitiveness by adopting a sound legal framework for ABS, implement a costly compliance mechanism, and train human resources, to name a few.[287]

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[283] CBD, art 15(3); Nagoya Protocol, art 6(1).
[284] ibid, art 15(4), 15(5), 15(7). See also, text of chp 2, s 2.1.3.
[285] Claudio Chiarolla, 'The Role of Private International Law under the Nagoya Protocol' in Elisa Morgera, Matthias Buck and Elsa Tsioumani (eds), *The 2010 Nagoya Protocol on Access and Benefit-Sharing in Perspective: Implications for International Law and Implementation Challenges* (Martinus Nijhoff Publishers 2013) 424–30.
[286] *United Nations Millennium Declaration*, UN Resolution 55/2 (A/55/L2) para 5; World Summit on Sustainable Development, *Johannesburg Declaration on Sustainable Development* (Johannesburg, 4 September 2002) (A/CONF.199/20) para 14; *Report of the World Commission on Environment and Development: Our Common Future in Development and International Co–Operation: Environment* (Oslo, 4 August 1087) (Brundtland Report) (A/42/427) chp 2, para 6.
[287] COP 4 Decision IV/8, *Access and Benefit-Sharing*, para 4(c). See also, COP 5 Decision V/26, *Access to Genetic Resources*, para 14 Addresses the key capacity–building needs.

The free market rules do not favour the 'least developed countries' or 'most environmentally vulnerable countries'. Instead, the market will reward only those who provide valuable genetic resources. Therefore, it is possible that the ABS system would not ensure benefits to those who need it most. From the perspectives of funding for the conservation of biodiversity, the central funding strategy under Articles 20 and 21 of the CBD could be inevitable for accommodating the costs of the conservation. The central funding is critical to the provision of resources for environmental projects such as gene banks, ex-situ conservation, raising public awareness or mitigating the effects of climate change and other natural disasters.[288]

Most ABS rules focus on those who actually provide valuable genetic resources rather than those who hold most of such biodiversity.

5.4 Concluding remarks on the principle of CBDR

From the grounds of the analysis in this chapter, it could be observed that ABS mechanism works best for the developing countries and will best reflect the principle of CBDR if the three following conditions are met: (i) such developing countries are also gene-rich countries, (ii) such countries manage to be a significant competitor in the genetic market and (iii) such countries are skilful at asking for benefit-sharing.

Ideally, ABS works best for the benefits of the developing countries if certain genetic resources can be found only on the territories of a State – so that such State attain the monopoly status in the market, but this is rarely a case.

Because of the contractual nature of ABS mechanism, ABS departs from the notions of the principle of CBDR. Further, since the ABS mechanism is quite competitive-oriented ABS will deliver its results through the mechanism of free market rather than command-and-control rules of laws. In other words, ABS should not be viewed as an obvious extension of the principle of CBDR.

[288] CBD, art 20(2). See also, COP 1 Decision I/2, *Financial Resources and Mechanism*, Annex 1.

6 Issues Relating to Traditional Knowledge

This chapter addresses the key legal issues related to traditional knowledge rights as outlined in ABS, under the Nagoya Protocol. Section 6.1 will introduce the basic ABS rules, so as to outline the core conceptual problems that may have implications on the implementation of the relevant ABS.

It is important to clarify what is traditional knowledge, or at least the key characteristics of traditional knowledge. Until this concept is sufficiently clear, there would be legal uncertainty with respect to whether access to knowledge will be subject to PIC and MATs. Section 6.2 will outline the key characteristics of traditional knowledge and their implications.

To obtain a PIC to access traditional knowledge can be complex in the unknown element of who should provide the PIC. While there would be no clear-cut answer for this question, it would be reasonable to examine the core legal basis for the establishment of ownership over traditional knowledge. Therefore, in Section 6.3, the author will discuss the notable legal basis for protection of ownership over traditional knowledge.

6.1 ABS rules on traditional knowledge

As discussed in Chapter 2, the Nagoya Protocol has significantly improved the legal status of the ABS with regard to the utilization of traditional knowledge. When it comes to the uses of traditional knowledge, ABS shifts from being purely encouraged under the CBD[289] to being compulsory under the Nagoya Protocol.[290] In addition, many provisions of the Nagoya Protocol were assigned specifically to regulate ABS rules with respect to traditional knowledge.[291]

Indigenous and local communities have rights to their genetic resources[292] and traditional knowledge.[293] The legal basis for the rights pertaining to genetic resources is different from those for the rights pertaining to traditional knowledge. While discussions on why such communities should be recognised for their rights over genetic resources found in their territories is one of the most interesting debates surrounding ABS. The

[289] CBD, art 8(j).
[290] Nagoya Protocol, art 5(5).
[291] ibid, art 5(5), 7, 12, 16, preambular 22, 23, 24, 25.
[292] ibid, art 5(2), 6(2).
[293] ibid, art 5(5), 7.

author, however, found it necessary for this chapter to focus exclusively on the issues relating to the rights of the relevant communities pertaining to their traditional knowledge.

6.1.1 Rules on access

Under the Nagoya Protocol, access to traditional knowledge associated with the genetic resources held by indigenous and local communalities shall be subject to community PIC for approval and involvement of these indigenous and local communities.[294]

However, the Protocol does not provide definitions for the phrases 'traditional knowledge associated with genetic resources'[295] and 'indigenous and local communities'. This fact is critical, because in cases where the core elements of traditional knowledge are not clarified in national laws, private actors might not know the circumstances under which access to a piece of knowledge will be allowable and the circumstances under which they are under obligation to seek a PIC and share the benefits. Note that the term 'prior and informed consent for approval and involvement',[296] while clarifying the possibility that PIC shall be required for access to traditional knowledge, seems to soften the notion of PIC by adding a few scenarios under which PIC is needed.

Annalisa Svaresi rightly notes that the use of such terminology makes it uncertain whether both prior consent and the involvement of the related communities are required, or whether only one of the two needs to be involved.[297] The use of the phrase 'held or owned by'[298] indigenous and local communities could be also problematic. If the term 'owners' was consistently used instead, it would indicate that ownership should be the exclusive basis to decide with whom the benefits should be shared. But the phrase 'held by' could indicate that one need not be the owner or inventor of such knowledge to have a right to benefit sharing. For example, the holders of certain pieces of traditional knowledge could be a library or a researcher who documented knowledge in oral forms from peoples elsewhere.

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[294] Nagoya Protocol, art 7.
[295] CBD, art 8(j) The CBD uses a different term for traditional knowledge, namely 'knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity'.
[296] Nagoya Protocol, art 7.
[297] Svaresi (n 154) 69.
[298] Nagoya Protocol, preambular 23, art 5(5), 7.

Evanson C. Kamau argues that the CBD words 'knowledge, innovations and practices *of* indigenous and local communities'[299] indicate that there are no distinctions between the 'holder' and 'owner' of traditional knowledge.[300] Accordingly, only indigenous and local communities could be the owners and the holders of traditional knowledge.[301] While his argument could be valid, it does not rule out the circumstance where holders of traditional knowledge do not own such knowledge. The issue of whether holder or owner is needed is critical to achieve proper granting of PIC and guarantee the right to benefit sharing. More on this will be discussed in Section 6.3.

The arguments on bio-piracy are among the most notable among a variety of possible motivations for sharing benefits with the holders and owners of traditional knowledge. As Monica Ribadenira Sarmiento has pointed out, the bio-piracy of traditional knowledge could be an urgent issue that needs to be addressed at the international level. She has even suggested that bio-piracy should be treated like a crime.[302] Traditional knowledge, like all other forms of knowledge, is an intangible asset that could be an important factor of production and commercialization. Accordingly, the uses of traditional knowledge without consent or compensation for its holders, from an economic perspective, can be seen as an action of robbing. However, to avoid bio-piracy, it is necessary that the rightful holder of such knowledge be appropriately identified. More on the complexity of the establishment of ownership over traditional knowledge will be discussed in Sections 6.2.1 and 6.3.

6.1.2 Rules on benefit sharing

Under the Nagoya Protocol, benefit sharing with respect to access to traditional knowledge shall also proceed upon mutually agreed terms (MATs).[303] With whom such MATs should be concluded, however, remains uncertain. As mentioned in Section 6.1.1, community PIC is a possibility, but might not be compulsory. In cases where the relevant

[299] CBD, art 8(j). Emphasis added.
[300] Evanson C. Kamau, 'Protecting TK Amid Disseminated Knowledge–A New Task for ABS Regime? A Kenyan Legal View' in Evanson C. Kamau and Gerd Winter (eds), *Genetic Resources, Traditional Knowledge & the Law: Solutions for Access & Benefit Sharing* (Earthscan 2013) 151.
[301] ibid.
[302] Monica Ribadeneira Sarmiento, 'Biopiracy or Fallacy? Identifying Genuine Bio–Piracy Cases in Ecuador' in Evanson C. Kamau and Gerd Winter (eds), *Genetic Resources, Traditional Knowledge & the Law: Solutions for Access & Benefit Sharing* (Earthscan 2013) 346.
[303] Nagoya Protocol, art 7.

communities are not those who can grant PIC, they are not likely to be the ones that will negotiate the relevant MATs.

The relationship between PIC and MATs with regard to traditional knowledge has the exact same nature as the relationship between PIC and MATs with regard to genetic resources.[304] Users of traditional knowledge would expect the rights to utilize such knowledge once they satisfy the requirements as agreed within the MATs; on the other hand, in cases where MATs could not be agreed on, it is likely that access to traditional knowledge will not be authorized.[305] The detailed discussion on the relationship between PIC and MATs can be found in Chapter 2, Section 2.1.2.

Under Article 5(4) of the Nagoya Protocol, the benefits shall also be understood as both monetary and non-monetary. It remains uncertain what could constitute a 'fair and equitable' sharing of the benefits from traditional knowledge as compared to benefit sharing the outcomes of genetic resource use.[306]

One might observe that implementation of the ABS regime on traditional knowledge at the national level could be even more challenging than the rules related to genetic resources. First, it could be a challenge to delimitate traditional knowledge from other knowledge that does not fall under the scope of ABS. Second, the process of identifying the rightful owners or holders of traditional knowledge could be complex. And, last but not least, the goal to further respect, preserve, and maintain traditional knowledge, as stipulated under the CBD,[307] could be difficult to achieve, considering the complex nature of traditional knowledge. Thus, the following sections will address the core characteristics of traditional knowledge, the possible rationales for benefit sharing, and the issues of protecting traditional knowledge in accordance with the IPRs system.

6.2 Core characteristics of traditional knowledge

The core characteristics of traditional knowledge could have implications on what legal treatments are appropriate to apply to such knowledge. In this section, the author will address the nature of common property of traditional knowledge and the notion of non-

[304] text of chp 2, s 2.1.2.
[305] ibid.
[306] text of chp 2, s 2.1.4.2.
[307] CBD, art 8(j).

science–based knowledge and its implication. Furthermore, the core elements that could make traditional knowledge subject to the scope of ABS will also be analysed.

6.2.1 Common property

Although there is no agreed-upon definition for traditional knowledge, the notion of the collective nature of traditional knowledge is commonly understood.[308] Traditional knowledge is the collective property and cultural patrimony of indigenous and local communities.[309] Consequently, individuals in principle cannot claim ownership rights over traditional knowledge, even if such individuals or specific families are holding or practising such knowledge.[310]

Brazil's ABS legislation adopts exactly the notion of collective ownership rights to traditional knowledge. Under the related Brazilian laws, traditional knowledge is always collective, even in cases when a single member of the community holds the secret of the knowledge.[311] However, Brazilian laws are not clear-cut on the definition of traditional knowledge. They read: 'Associated traditional knowledge is defined as the individual or collective information or practices of an indigenous community or a traditional community of actual or potential value associated with genetic heritage'.[312] From the views of the author, this provision does not clarify what is traditional knowledge, but only re-affirms the collective nature of such knowledge.

Some authors provide a better picture of how traditional knowledge could be categorized. According to Tianbao Qin, traditional knowledge can be categorized into family-held knowledge, collectively-held knowledge, collectively-known knowledge, and public knowledge.[313] Evanson C. Kamau and others take a similar stand on the matter.[314]

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[308] See for example, UNEP, *Development of Elements of Sui Generis Systems for the Protection of Traditional Knowledge, Innovations and Practices to Identify Priority Elements* (Montreal 2007) (UNEP/CBD/WG8J/5/6) para 19.
[309] ibid.
[310] ibid.
[311] The ABS Capacity Development Initiative, *National Study on ABS Implementation in Brazil* (April 2004) <http://www.abs-initiative.info/fileadmin/media/Knowledge_Center/Pulications/ABS_Dialogue_042014/National_study_on_ABS_implementation_in_Brazil_20140716.pdf> accessed 11 April 2015, 9.
[312] Brazilian Provisional Act 2.186–16, art. 7 as cited in the ABS Capacity Development Initiative, *National Study on ABS Implementation in Brazil* (n 311) 8.
[313] Tianbao Qin, 'Common Pools of Traditional Chinese Medical Knowledge in China' in Evanson Chege Kamau and Gerd Winter (eds), *Common Pools of Genetic Resources: Equity and Innovation in International Biodiversity Law* (Earthscan 2013) 151.

They argue that there are three levels at which traditional knowledge may be held: by a community, by a nation, or by the world.[315] The point of this categorisation could be that, although traditional knowledge is collectively owned, there is a possibility that individual groups, families, or practisers could have the right to grant PIC to access their knowledge because such knowledge has not been disseminated to the extent that the original owner of the knowledge might not identifiable.[316]

The further implications of this categorisation could be that there should be different legal treatments for different categories of traditional knowledge. For example, it would be unfair for a State to presume the right to grant PIC to family-owned knowledge. The opposite could also be true: it could be unfair for a group of individuals to reap the benefits that should belong to a whole community.

6.2.2 'Traditional'

Evanson C. Kamau has pointed out that the term 'traditional knowledge' could lead to misleading perceptions of traditional knowledge as a primitive, un-technical, out-dated, or inferior in comparison with science-based knowledge.[317] He notes that there are contradicting views on traditional knowledge that suggest traditional knowledge is actually systematic and disciplined.[318]

Brendan Tobin notes that 80 per cent of the world's poor depend on traditional healers for their health services.[319] Thus, they must be effective at least to the perception of the indigenous and local communities. If these communities did not think such practices were disciplined and valuable, they would not likely trust the treatments. That said, one could argue that the main cause for the continuance of traditional medicine could be merely the lack of modern medical infrastructure or resource barriers to medical care. It is hard to tell.

According to the COP Decision III/14, traditional knowledge should be given the same respect as any other form of knowledge.[320] In another instance, the COP suggests

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[314] Kamau (n 300) 150. See also, Kleba (n 232) 133–36.
[315] Kamau (n 300) 150.
[316] ibid 152–53.
[317] ibid 145.
[318] ibid.
[319] Tobin (n 231) 104.
[320] COP 3 Decision III/14, *Implementation of Article 8(j)*, preambular 9.

that traditional knowledge could complement science-based science in the adaptation of States to environmental degradation and climate change.[321]

That said, the legal and technical disparities between traditional knowledge and science-based knowledge could be inevitable in the context of the IPRs regime. The reason is that, upon the IPRs system, knowledge must pass certain thresholds, such as patentability requirements, to be protected by IPRs. Section 6.3.3 will discuss this further as concerns the legal basis for the protection of traditional knowledge.

6.2.3 Associated with genetic resources

The Nagoya Protocol uses the term 'traditional knowledge associated with genetic resources' rather than pointing to general knowledge.[322] This could indicate that the Nagoya Protocol might not require States to regulate ABS rules that cover all kinds of traditional knowledge. It is possible that only traditional knowledge having something to do with the utilization of associated genetic resources will fall under the scope of ABS.

On this ground, one could argue that knowledge that has nothing to do with genetic resources (e.g., knowledge about the weather or their own spiritual Gods) would not fall under the scope of the Nagoya Protocol.

Traditional knowledge is often thought to play an important role in providing informational leads for researchers and business actors. Linda Wallbott and others note that traditional knowledge often supports the identification of potentially valuable genetic resources and biochemical compounds that are found in nature, and from which new products might be developed.[323]

As concerns medicinal applications for the pharmaceutical sector, Sebastian Oberthur and G. Kristin Rosendal have further clarified that such knowledge about the characteristics, effects, and possible uses of particular plants is important for the exploitation of genetic resources in biotechnology and life science.[324] The use of traditional knowledge as an informative guide to valuable genetic resources should thus

[321] COP 9 Decision IX/13, *Article 8(j) and Related Provisions*, s B(4).
[322] Nagoya Protocol, preambular 22, art 5(5), 7.
[323] Linda Wallbott, Franziska Wolff and Justyna Pozarowska, 'The Negotiation of the Nagoya Protocol: Issues, Coalitions and Process' in Sebastian Oberthur and G. Kristian Rosendal (eds), *Global Governance of Genetic Resources: Access and Benefit Sharing after the Nagoya Protocol* (Routledge 2014) 38.
[324] Sebastian Oberthur and G. Kristian Rosendal, 'Global Governance of Genetic Resources: Background and Analytical Framework' in Sebastian Oberthur and G. Kristian Rosendal (eds), *Global Governance of Genetic Resources: Access and Benefit Sharing after the Nagoya Protocol* (Routledge 2014) 3.

be subject to benefit sharing under the Nagoya Protocol. Therefore, the knowledge's having actual and potential value could be an element to help decide whether it shall subject to ABS.

6.2.4 Relevance for the conservation and sustainable use of biodiversity

The CBD and the Nagoya Protocol emphasize the relevance and importance of traditional knowledge for the conservation and sustainable use of biological diversity.[325] However, it is unclear whether or not being relevant and important to the conservation and sustainable use of biodiversity is a prerequisite for a piece of knowledge to fall under the scope of ABS with respect to traditional knowledge. Furthermore, 'relevant' in this context remains undefined.

The H'mong indigenous peoples in Vietnam know that the *lá ngón* plant[326] contains extreme poisonous elements. They know where to find these plants in the forests. The traditional use of the plant is to assist suicide.[327] Group suicides within these communities is an urgent issue for the local government.[328]

It is debatable whether these practices could be regarded as relevant to the conservation of biodiversity, considering that these peoples seek lá ngón only when they want to end their lives.[329] One could argue that, to some extent, their knowledge about the existence of the species could be regarded as relevant for the conservation and sustainable use of such species, because it provides a chance for future access. In the view of the author, however, the element of conservation relevance for traditional knowledge does not necessarily mean that such traditional practices must be limited to harvesting, collecting, and actively cultivating the relevant biological resource.

The H'mong people's knowledge about lá ngón would surely be economically sensible if the related genetic resources were used in medical research or products. On this ground, the economic potential of the traditional knowledge could outweigh the

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[325] CBD art 8(j), preambular 12; Nagoya Protocol, preambular 22.
[326] For information on the toxic plant, see HT Fung and others, 'Two Cases of Gelseminum Elegans Benth Poisoning' (2007) 14(4) *Hong Kong Journal of Emergency Medicine* <http://hkcem.com/html/publications/Journal/2007-4/p221-224.pdf> accessed 11 April 2015.
[327] Vietnam Breaking News, 'Suicide Plant Plagues Central Mountains' (2012) <http://www.vietnambreakingnews.com/2012/10/suicide-plant-plagues-central-mountains/> accessed 22 April 2015.
[328] ibid.
[329] ibid.

requirements of conservation relevance. As long as traditional knowledge has actual or potential value that contributes to the realization of value in related genetic resources, such knowledge would fall under ABS, despite possible negative local practices.

6.2.5 Utilization of traditional knowledge

Traditional knowledge is pieces of information or traditional practices that associate with genetic resources and have actual or potential value. Even though the concept of traditional knowledge is easily understood, complexity remains concerning what constitutes access to traditional knowledge falling under the scope of ABS.

The Nagoya Protocol recognises the diversity of circumstances in which traditional knowledge is held or owned by indigenous and local communities in oral, documented, or other forms.[330] One might argue that there are a diversity of circumstances in which traditional knowledge could be accessed and used depending on the media through which such knowledge is accessed. For example, access could happen by just talking to those who know about the usefulness of the related biological resources.[331]

There could be some boundary between collecting and documenting of traditional knowledge and actually utilize them. Take an example, under the Brazilian ABS rules, collection of traditional knowledge shall not be regarded as an access, and thus no PIC and MATs shall be required.[332]

According to John B. Kleba, it is also unclear whether marketing campaigns that make use of traditional practices as a marketing concept would be regarded as use.[333] An example for such use could be that a company advertises the concept of a traditional perfumery or health-care practice based on its use of certain wildlife plants even though their product has no biotic elements of such plants.

On the other hand, such marketing techniques are likely to generate certain economic benefits that should be shared. Such sharing would not be regarded necessary under the Nagoya Protocol. The campaigner might not have to obtain PIC for marketing

[330] Nagoya Protocol, preambular 25.
[331] Kleba (n 232) 124–25.
[332] See further, ABS Capacity Development Initiative, *National Study on ABS Implementation in Brazil* (n 311) 5.
[333] Kleba (n 232) 128.

use of the ideas (without any access to related genetic materials) if such use does not constitute a utilization of traditional knowledge under the relevant laws.

Thus, the author believes that traditional knowledge should be protected under ABS if it has actual and potential value. However, such values must be related to the uses of the relevant genetic resources (e.g., rather than spiritual values). Therefore only knowledge that has genetic resources – related values will be subject to ABS rather than all other kinds of knowledge.

6.3 Legal basis for ownership of traditional knowledge

This section will address the key legal basis for identifying the rightful owners of traditional knowledge and the protection of such ownership rights.

Generally, it is difficult to identify which communities or groups will have the right to grant PIC when it comes to traditional knowledge. The COP has suggested some of the methods for the identification of owners of traditional knowledge, including (i) documenting,[334] (ii) registering,[335] and (iii) applying IPRs,[336] which then includes the notion of the sui generis system.[337]

Ownership of traditional knowledge is difficult to identify for the reason that, unlike with genetic resources, ownership of traditional knowledge is not based on control over biological resources or land-use rights.

The analysis in Chapter 3 Section 3.4.1 indicates that ownership over biological resources could be one legal basis for ownership of the related genetic resources, for the reason that the former contains the latter. Those who provide valuable biological resources are generally also the owners of the genetic resources contained in such biological resources. Those who own lands could be entitled with the ownership over all wildlife resources attached to those lands, and also of the genetic resources contained therein. There are, however, a few exceptions to this norm, depending on the legal system of the State.[338]

While ownership over biological resources could be a basis for ownership over

[334] COP 8 Decision VIII/5, *Article 8(j) and Related Provisions*, s B(I)(4), (5).
[335] COP 5 Decision V/16, *Article 8 (j) and Related Provisions*, para 17.
[336] COP 4 Decision IV/9, *Implementation of Article 8(j) and Related Provisions*, preambular 8, 9.
[337] UNEP, *Elements of Sui Generis Systems for the Protection of Traditional Knowledge* (n 308) para 8.
[338] text of chp 3, s 3.4.1.

genetic resources, it cannot be a basis for ownership over traditional knowledge. The key reason for this discrepancy is that traditional knowledge is an intangible asset and a product of human minds, rather than a natural resource. The same plant species could be found in the territories of two different communities, but if only one group uses the plant for traditional medical treatment, then only that group 'owns' the traditional knowledge. Thus, ownership over biological resources could have nothing to do with ownership of traditional knowledge.

In the parts below, the author will provide further commentary on the suggested methods of documenting, registering, and applying IPRs for the sake of identifying who could be the rightful owners of traditional knowledge.

6.3.1 Documenting and recording

According to the COP Decision IX/13, the documenting and recording of traditional knowledge can benefit indigenous and local communities by help them to retain control and ownership of their traditional knowledge.[339] Together with preamble clause 25 of the Nagoya Protocol, which suggests that traditional knowledge could exist in oral forms, documentation of such knowledge could be understood as a promising tool to recognise the existence of such knowledge and its owners.

That being said, the COP also emphasizes that such documentation could have potential negative impacts to the rights and cultures of the relevant communities. It confirms that the documentation and recording of traditional knowledge should be voluntary, and not constitute a prerequisite for the protection of traditional knowledge.[340]

One might infer that if traditional knowledge is documented without also recording the original owners of such knowledge, the relevant communities will not be able to assert their rights in future. On the other hand, if such knowledge should be more safely kept in a secret cycle of the relevant communities,[341] such documentation will go against the will of the relevant communities. For example, if all traditional knowledge (e.g., plants and their possible uses in medical treatments) are documented and published on the website of a national library, people would no longer have to approach the relevant

[339] COP 9 Decision IX/13, *Article 8(j) and Related Provisions*, s C.
[340] ibid.
[341] text of chp 6, s 6.2.1.

communities for access to such knowledge. Therefore, documenting in this case might do no good for such communities.

6.3.2 Registering

The process of registering traditional knowledge in order to protect it and help decide who has the rights to grant PIC has also been perceived as a threat to the security of that knowledge. According to the UNDRIP,[342] indigenous people have the right to control and develop their intellectual heritage in accordance with their customary laws.[343] Thus, registers of traditional knowledge could run counter to the rights of such peoples if they are performed without their consents.

The COP notes that registering should not be a prerequisite for protection.[344] It emphasises that registers are only one approach to the protection of traditional knowledge; information should be provided to such registers on a voluntary basis, and with the prior consent of the communities concerned.[345]

Upon his analysis of case studies in Brazil, John B. Kleba noted that different communities could have overlapping claims over the same traditional knowledge, which may result in dispute.[346] Thus, registers of ownership of traditional knowledge, from the point of view of the author, should in principle allow an appeal mechanism so that other groups of local communities are provided the opportunity to raise their concerns early in the process of registering.

The documenting, recording, and registering of traditional knowledge might seem straightforward as an administrative instrument, but such registration might not be a legitimate basis to establish the authority of the registered group to grant access to the knowledge. Those who are documented as owners of a fraction of traditional knowledge may not be the rightful owners of such knowledge and thus would not have the right to grant PIC accordingly.

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[342] United Nations General Assembly, 'United Nations Declaration on the Rights of Indigenous Peoples' (13 September 2007) (UN Doc A/RES/61/295) (UNDRIP).
[343] ibid, art 31.
[344] COP 8 Decision VIII/5, *Article 8(j) and Related Provisions*, s B(4), (5).
[345] ibid.
[346] Kleba (n 232) 120–21.

6.3.3 Application of IPRs system

The tensions between the exclusivity and collectiveness notion of rights are some of the key concerns for the reason that the core of the IPRs system is to grant exclusive rights to individuals, while traditional knowledge should be in principle the common property of communities.[347]

The Working Group on Article 8(j) pointed out that IPRs, as generally understood under international law, are often at odds with the understanding of rights in traditional knowledge as perceived by the relevant communities in at least three ways: (i) the customary rules context of traditional knowledge may be lost when the knowledge escapes to foreign systems; (ii) granting exclusive rights over commercializing certain pieces of knowledge may conflict with customary laws concepts of knowledge;[348] and (iii) for many communities, traditional knowledge is both a right and an obligation—youths must earn the right to receive the knowledge by satisfying the obligations of appropriate use of such knowledge.[349]

The Working Group on Article 8(j) argued that the IPRs system often fails to respect the nature of common property of traditional knowledge and the customary and cultural norms that regulate such knowledge within the relevant communities. This description of traditional knowledge agrees with the provisions of the Nagoya Protocol on the rights of these communities to identify the rightful holders of their traditional knowledge,[350] and the obligations of States to take into account the customary laws of these communities during the implementation of ABS into national legislation.[351]

The author, however, would like to focus on another issue: it is uncertain whether traditional knowledge is even eligible for protection under IPRs. Furthermore, it is also uncertain whether IPRs are sufficient for the protection of the rights of the communities to their traditional knowledge in the long run.

Not all factions of traditional knowledge have been disseminated to public domain to the extent that the original owners of such knowledge are unidentifiable;

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[347] See text to n 311.
[348] UNEP, *Elements of Sui Generis Systems for the Protection of Traditional Knowledge* (n 308) para 26.
[349] ibid, para 27.
[350] Nagoya Protocol, preambular 24.
[351] ibid, art 12(1).

furthermore, not all traditional knowledge is known by the general public.[352] The traditional knowledge that is still held in secret among certain families and practisers, the regime on trade secrets could have some implications.

According to Article 39 of the TRIPS Agreement, information that is under the control of the owners shall be protected from being disclosed, in accordance with the rights of trade secrets, so long as such information is not generally known among or readily accessible to persons within the circles that normally deal with the kind of information in question.[353] On this ground, traditional knowledge that is still within the secret circle of one or more families or other groups, such as traditional healers, could be protected under trade secret law.[354] However, the core condition for knowledge to be protected under trade secret is that its secrecy is necessary to protect its commercial value.[355] The burden of controlling the secrecy of non-commercial knowledge is placed upon the holders of such knowledge.[356] If it is difficult to remedy unauthorized disclosure by one member of a community to outsiders, the author believes that trade secret law would not support the right to secrecy of traditional knowledge.

Traditional healing methods and healing varieties of plants can be patentable under the IPRs regime.[357] However, a large part of traditional knowledge would fail the test of inventiveness that is required to patent an item or process.[358] This is especially true of knowledge that has already been made known to the public. Even if the traditional knowledge does achieve patent status, the protection would expire within a period of twenty years.[359] It is unclear whether or not the events following such expiration would be desirable for the communities concerned.

It is important to note that the TRIPs Agreement only provides the minimum standards for the protection of intellectual property.[360] The IPRs system varies in application among the different legal systems of various States. Furthermore, the

[352] See text to n 313, 315.
[353] TRIPS Agreement, 39(2).
[354] ibid, art 39.
[355] ibid, art 39(2)(b).
[356] ibid, art 39(2)(c).
[357] ibid, art 27(1).
[358] ibid.
[359] ibid, art 33.
[360] ibid, art 1(1).

application for patents could be costly to poor communities, whereas the effectiveness of the protection against infringements might vary depending on different domestic legal systems.

6.4 Concluding remarks on traditional knowledge

The concept of traditional knowledge is far from being clear-cut, and this could lead to difficulties in the implementation of the ABS mechanism under the Nagoya Protocol. National ABS measures should clarify how to obtain community PIC and MATs to legitimatize accesses to traditional knowledge.

It is a challenge to delimitate traditional knowledge from general knowledge that falls outside the scope of ABS. However, the chapter pointed out that having actual or potential values and being relevant for the realization of the values of genetic resources could be the two criteria for a piece of knowledge to be subject to ABS.

Assuming that traditional knowledge was sufficiently clarified, there could still be issues concerning what activities will constitute access to such knowledge.

IPRs system, documenting, and registers are the notable legal mechanisms for the recognition and protection of the ownership rights for traditional knowledge. However, all of these approaches inherit certain conflicts with the nature of traditional knowledge, and these conflicts need to be taken into account.

7 Conclusion

The complexities and legal uncertainties of the concepts of ABS could explain why only a few States have adopted national measures to implement the mechanism. This chapter conceptualizes the core problems that are responsible for the difficulties in the implementation of the ABS mechanism. It sums up the analyses on how ABS rules might inter-play with other legal principles of international law. The key implications for better implementations of ABS into national laws will then be outlined.

Chapter 2 demonstrated that, while the core content of ABS under the CBD and Nagoya Protocol could seem straightforward on paper, the ABS mechanism hosts a variety of conceptual problems. These include lack of clarity over what would constitute the utilization of genetic resources, how a sharing of benefits would be regarded as fair and equitable, and what is the nature of PIC and MATs. The inter-relationship between PIC and MATs reflects the contractual nature of ABS transactions, as authorization and benefit-sharing terms are decided on the basis of PIC and MATs. ABS concepts could be viewed from a number of perspectives, and each perspective has the potential to shed insight into the concept of ABS. However, analysis of the ABS in light of the well-established legal principles of international law, particularly the principle of State sovereignty over natural resources, the principle of the sustainable use of biodiversity, the principle of CBDR, and the key issues related to traditional knowledge, could provide critical implications for the implementation of ABS.

Chapter 3 tackled the principle of State sovereignty over natural resources in the context of ABS. It argued that: i) the increased expectations that genetic resources have value and ii) the expansion of IPRs over living organisms could be the core motivations underlying the recognition of State sovereignty over genetic resources. Although the principle of State sovereignty is obviously a legitimate basis for the rights of States to legislate national ABS rules, the exercise of State sovereignty could be limited by a variety of other legitimate interests within and without national legal systems. At the national level, States have to take into account a multitude of rules on property rights over natural resources, legitimate claims on IPRs, and the rights of indigenous and local communities. At the international level, States have to balance their access rules against

the principle of free access under the ITPGRFA and the regime of common heritage of humankind of natural resources found in the Area under the UNCLOS.

Chapter 4 clarified the circumstances under which the applications of biotechnology and the utilization of genetic resources can threaten the sustainable use of biodiversity. It outlined the rationale for facilitating access to non-commercial research though the analysis of the relationship between biotechnology and the utilization of genetic resources. The ABS mechanism could be seen as a necessary means to accommodate the costs of conserving biodiversity and channel back the benefits to the custodians of biodiversity. Furthermore, promoting the utilization of genetic resources, although not without certain risks, is in large part consistent with the principle of the sustainable use of biodiversity.

Chapter 5 analysed the principle of CBDR in order to examine whether or not ABS concepts reflect the notion that developed States should take more responsibility for conserving biodiversity than developing ones. It also addressed whether gene-rich developing countries will be the primary ones to benefit from ABS. The analysis concluded that, because of the contractual nature of the ABS mechanism, ABS departs from the principle of CBDR. It is the author's opinion that ABS will deliver its results through the mechanism of the free market rather than the command-and-control rules of law.

Chapter 6 elaborated on the complexity of the concept of traditional knowledge and the possible legal mechanisms to recognise the rightful holders and owners of such knowledge. It noted that the two core conditions for a piece of knowledge to be subject to ABS are having actual or potential value and being relevant for the realization of the value of genetic resources. However, further research on traditional knowledge is necessary in order to provide a better understanding of the concept of traditional knowledge and the implications for implementing ABS into national laws.

The analysis presented indicates that the concept of ABS is justifiable on a variety of legal grounds and desirable at least to providers of genetic resources and holders of traditional knowledge in the world poor. However, a wide range of legal uncertainties about the key concepts of the ABS mechanism could significantly undermine the functionality of that mechanism nationally and internationally.

The concept of utilizing genetic resources, as well as that of access to traditional knowledge, is too technically complex. These concepts are overwhelmingly challenging for States to clarify in their national legislations the scope of ABS. Dual legal treatments for different biological matters (one for ownership and transfer of biological resources and one for those of genetic resources) could help capture the core values from utilization of genetic resources. In the same vein, new kinds of legal treatments could help to reflect the key characteristics of traditional knowledge and its utilization.

At the international level, the shift from the regime of common heritage of humankind of genetic resources to recognition of State sovereignty over such resources could provide an enabling legal basis for gene-rich countries to retain the control over and reap the benefits from the utilization of their resources. But States must adopt adequate national ABS measures to ensure such benefit-sharing. The regulatory burdens of developing States, together with the uncertainty of the functionality of ABS, could explain why only a few States have adopted ABS into their national systems.

On the positive side, promoting the utilization of genetic resources generally supports the principle of sustainable use for biological resources. Hence, it is consistent with the overall objective of conserving biodiversity. ABS could be regarded as an incentive mechanism for the conservation of biodiversity because it benefits from the utilization of genetic resources, which could accommodate the costs of and create motivations for the conservation of biodiversity.

It is necessary to ensure that the benefits of genetic resource use will be channelled back to the real custodians of biodiversity. However, because of the competitive nature of ABS transactions, the holders of genetic resources in developing countries are not necessarily the ones who will be able to attract the most users of genetic resources. There are certain loopholes that make it more preferable for users of genetic resources to approach providers somewhere else rather than to share benefits with the in-situ providers of such resources. Gene banks and providers who have acquired genetic resources from the countries of origin are some notable competitors in the genetic resources market.

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