

AN EQUITABLE APPROACH TO TRADITIONAL
KNOWLEDGE PROTECTION

SAMUEL LIM*

I.	INTRODUCTION	136	R
II.	THEORETICAL JUSTIFICATIONS	138	R
III.	A SURVEY OF LEGAL APPROACHES	142	R
IV.	THE APPLICABLE SCOPE OF ARTICLE 5(5)	146	R
	A. <i>The Material Scope</i>	147	R
	1. <i>Traditional Knowledge Associated with Genetic Resources</i>	147	R
	2. <i>Utilization of Traditional Knowledge</i>	150	R
	B. <i>The Temporal Scope</i>	154	R
	C. <i>The Territorial Scope</i>	158	R
V.	THE STAKEHOLDERS OF ARTICLE 5(5)	160	R
	A. <i>The Beneficiaries</i>	160	R
	1. <i>“Indigenous and Local Communities”</i>	160	R
	2. <i>“Holding such Knowledge”</i>	164	R
	B. <i>The Representatives</i>	167	R
VI.	THE ARTICLE 5(5) OBLIGATION AND ITS EXCEPTIONS	169	R
	A. <i>The Obligation to Take Appropriate “Legislative, Administrative or Policy Measures”</i>	169	R
	B. <i>The Obligation to Share Benefits in a Fair and Equitable Way</i>	172	R
	C. <i>The Obligation of Mutually Agreed Terms</i>	175	R
VII.	APPLICATION OF THE PROPOSED ARTICLE 5(5) FRAMEWORK	176	R
	A. <i>The Quassia Plant in French Guiana</i>	176	R
	B. <i>The Rooibos Plant in South Africa</i>	179	R
	C. <i>Argan Oil in Morocco</i>	182	R
VIII.	CONCLUSION	184	R
	APPENDIX	186	R

* LL.M. 2019 (New York University School of Law). Thanks to Professor Rochelle C. Dreyfuss, Anna D’Agostino, Andrew Van Duyn, Karl Pielmeier, Nora Niazian, and the editors of the Journal for their feedback on earlier drafts. I am also grateful to Marwa Farag, Alexandra Maurer, Julie Bloch, Pimvipa Kunanusorn, Charlotte Verdon, and Mustafa Khan. All errors remain my own.

The use of traditional knowledge associated with genetic resources in pharmaceutical and biotechnology patents remains a vexing topic within the international community. Acknowledging the delicate nature of the issue, this article unpacks the myriad legal issues surrounding biopiracy debates and makes two overarching claims: First, the theoretical justification for traditional knowledge protection is found in equity, a multifaceted concept that not only seeks to reconcile competing interests between holders and users of traditional knowledge but also increasingly aims to achieve a form of distributive justice that remedies past injustices. Second, in the light of the foregoing theoretical bases, the proper legal approach to traditional knowledge protection should refer to Article 5(5) of the Nagoya Protocol, which requires States to equitably share benefits arising from the use of traditional knowledge. Consistent with the equity rationale of traditional knowledge protection, the remainder of the article proposes a legal framework for the application of Article 5(5), having regard to established principles of international law. Finally, using historical examples, this article shows how the intergenerational and collective nature of traditional knowledge does not necessarily inhibit its protection under international law.

I. INTRODUCTION

Indigenous peoples and local communities have long contributed to humanity's heritage of scientific knowledge. In Thailand, for instance, indigenous healers harvest the plao noi plant to treat ulcers. This is but one example of what the World Intellectual Property Organization (WIPO) terms "traditional knowledge associated with genetic resources."¹ However, the commercial use of such knowledge in pharmaceutical and biotechnology patents remains a vexing topic within the international community. For example, in 2015, a French government research institute reportedly applied French Guianese traditional knowledge of the quassia plant's antimalarial properties by isolating the plant's chemical compound.² This followed reports alleging that Eli Lilly commercialized Malagasy traditional knowledge of the rosy periwinkle

1. World Intellectual Prop. Org. [WIPO] Intergovernmental Comm. on Intellectual Prop. & Genetic Res., Traditional Knowledge, & Folklore, *Joint Recommendation on Genetic Resources and Associated Genetic Resources*, annex, WIPO/GRTKF/IC/38/10 (Nov. 16, 2018) [hereinafter Joint Recommendation].

2. Geneviève Bourdy et al., *Quassia "Biopiracy" Case and the Nagoya Protocol: A Researcher's Perspective*, 206 J. ETHNOPHARMACOLOGY 290, 290 (2017).

kle's anti-diabetic qualities³ and that Merck employed the Brazilian Tupi-Guarani people's traditional knowledge of the jaborandi plant's anti-inflammatory properties to develop the antiglaucoma drug Timpilo.⁴ Industry watchdogs refer to these episodes as quintessential examples of biopiracy. Regardless of the veracity of these allegations, there is a broad consensus that the social, cultural, and economic interests of indigenous peoples in their traditional knowledge must be protected alongside their human right to self-determination.⁵ Clarifying the nature and scope of traditional knowledge protection is thus one way of preventing further impediment to indigenous peoples' socioeconomic progress.

After a survey of theoretical justifications for protecting traditional knowledge, this article canvasses a spectrum of legal mechanisms available to realize this objective. Although a more comprehensive study of these legal solutions would be necessary to refine the precise scope of traditional knowledge protection afforded to indigenous peoples, this article proposes that Article 5(5) of the Nagoya Protocol (the Protocol) offers the most appropriate basis for traditional knowledge protection. Using examples of state practice across jurisdictions, this article will define Article 5(5) in terms of the provision's applicable scope, its intended stakeholders, and its substantive content. Finally, this article will apply the proposed legal framework to three case studies of alleged biopiracy, demonstrating that conventional intellectual property principles should not prevent international law's recognition of indigenous people's right to equitable compensation for the use of their traditional knowledge.

3. Konstantia Koutouki & Katharina Rogalla Von Bieberstein, *The Nagoya Protocol: Sustainable Access and Benefits-Sharing for Indigenous and Local Communities*, 13 VT. J. ENVTL. L. 513, 515 (2012).

4. Aleksandra Skirycz et al., *Medicinal Bioprospecting of the Amazon Rainforest: A Modern Eldorado?*, 34 TRENDS IN BIOTECH. 781, 782 (2016).

5. See International Covenant on Civil and Political Rights art. 1(3), Dec. 16, 1966, 999 U.N.T.S. 171 [hereinafter ICCPR] ("States Parties to the present Covenant, including those having responsibility for the administration of Non-Self-Governing and Trust Territories, shall promote the realization of the right of self-determination, and shall respect that right"); International Covenant on Economic, Social and Cultural Rights art. 1(3), Dec. 16, 1966, 933 U.N.T.S. 3 [hereinafter ICESCR] (using the same language as the ICCPR).

II. THEORETICAL JUSTIFICATIONS

Because traditional knowledge challenges orthodox conceptions of intellectual property and patent law, safeguarding it using conventional legal doctrines demands scrutiny; the allocation of rights in novel forms of knowledge requires theoretical justification. In exploring the conceptual underpinnings of traditional knowledge, Aman Gebru identifies three broad justifications for traditional knowledge protection: the property rationale, the instrumentalist rationale, and equity.⁶ Although all three theories have much to commend, this article proposes that equity presents the most suitable basis of protection.

Under the property rationale, traditional knowledge is considered a type of property and can thus be protected under well-established principles and theories of property law. According to the Lockean labor theory that underpins a utilitarian notion of property law, indigenous peoples should enjoy legal protection over the fruits of their labor, as they were the ones to expend effort to discover the useful properties of plant and animal resources.⁷ Another property theory asserts that indigenous peoples hold rights because traditional knowledge is part of a community's collective cultural personality, similar to how creators possess moral rights to the personality interests embedded in a copyrighted work.⁸ Still others advocate that privacy concerns and the need for outsiders to respect the sacred nature of indigenous peoples' cultural knowledge justify protection.⁹ Indeed, all these theories find support in regional human rights jurisprudence that defines property to include "incorporeal elements, and any other immaterial object that may have a value."¹⁰ However, attempts to shoehorn tradi-

6. Aman Gebru, *International Intellectual Property Law and the Protection of Traditional Knowledge: From Cultural Conservation to Knowledge Codification*, 15 *ASPER REV. INT'L BUS. & TRADE L.* 293, 307 (2015).

7. *Id.* at 310–11.

8. See Julia Carbone, *A Capabilities-Based Framework*, in *GENETIC RESOURCES AND TRADITIONAL KNOWLEDGE* 339, 346–47 (Tania Bubela & E. Richard Gold eds., 2012) (describing the personality theory as granting property rights in creative efforts because they are a "reflection of the self").

9. Justin Hughes, *Traditional Knowledge, Cultural Expression, and the Siren's Call of Property*, 49 *SAN DIEGO L. REV.* 1215, 1253–54 (2012).

10. *Mémoli v. Argentina*, Preliminary Objections, Merits, Reparations, and Costs, Judgment, Inter-Am. Ct. H.R. (ser. C) No. 265, ¶ 170 (Aug. 22,

tional knowledge into the existing property paradigm remain unsuccessful because traditional knowledge is owned intergenerationally and collectively.¹¹ The Lockean labor theory would only entitle the narrow subset of an indigenous community that discovered the relevant knowledge to claim property rights.¹² As such, this theory fails to ensure due respect of traditional knowledge “as a collective interest rather than as a commodity.”¹³ Similarly, the protection of traditional knowledge on the basis of personality is also unsustainable because the theory, which is based on the Hegelian conception of the self, relates to the individual and not the collective.¹⁴ Finally, the privacy argument for traditional knowledge is inadequate as a justification for protection because a right to privacy cannot cover knowledge that is widely circulated within the community or documented in ancient texts. Given that most legal instruments contemplate documented and disclosed traditional knowledge, some other explanation for protection is required. In short, existing theories of property do not provide a coherent explanation for the protection of traditional knowledge.

Unlike property rationales, the “instrumentalist” theory focuses on the policy goals served by traditional knowledge protection. These objectives include preserving indigenous culture, incentivizing innovation, conserving biodiversity, ensuring food accessibility, and promoting public health.¹⁵ The international community has tasked various international organizations such as WIPO,¹⁶ the U.N. Food and Agriculture

2013) (remarking on the scope of the right to property under article 21 of the American Convention on Human Rights).

11. Farida Shaheed (Special Rapporteur in the Field of Cultural Rights), *Rep. of the Special Rapporteur in the Field of Cultural Rights*, U.N. Doc A/70/279, ¶ 39 (Aug. 4, 2015) [hereinafter Shaheed Report].

12. Hughes, *supra* note 9, at 1246.

13. Carbone, *supra* note 8, at 344.

14. *Id.* at 346–47.

15. *See* Gebru, *supra* note 6, at 312 (noting that instrumentalist rationales may be divided into the incentive to conserve, the incentive to invent, or the incentive to use or commercialize).

16. World Intellectual Prop. Org. [WIPO] Intergovernmental Comm. on Intellectual Prop. & Genetic Res., Traditional Knowledge, & Folklore, *The Protection of Traditional Knowledge: Draft Articles*, annex, at 7, WIPO/GRTKF/IC/38/4 (Sep. 28, 2018) [hereinafter WIPO Draft Articles].

Organization,¹⁷ the U.N. Environmental Programme,¹⁸ and the World Health Organization (WHO)¹⁹ with implementing strategies to protect traditional knowledge. However, an instrumental view of traditional knowledge has limited utility for understanding the true rationales for protection. For example, an aspiration to maintain cultural authenticity may be misguided where indigenous peoples desire to integrate with modern society.²⁰ Furthermore, while protection of traditional knowledge can conserve the environment by imposing an additional bar to genetic resource exploitation, traditional knowledge is intangible and thus can be misappropriated *ex situ* from the resource (e.g. in research labs or libraries). Finally, the objective of promoting public health potentially militates against the protection of traditional knowledge because the dissemination of cost-effective and life-saving drugs could be unduly encumbered by indigenous communities restricting traditional knowledge of the properties of genetic resources.

Ultimately, the most persuasive rationale for the protection of traditional knowledge is equity. Although equity is a multifaceted concept that plays an imprecise role in guiding the development of international norms, at its core it embodies some notion of equilibrium, fairness or justice, “reconciling, not only competing State interests, but also different

17. See International Treaty on Plant Genetic Resources for Food and Agriculture art. 9, Nov. 3, 2001, 2400 U.N.T.S. 303 (requiring parties to protect “traditional knowledge relevant to plant genetic resources for food and agriculture”).

18. See Convention on Biological Diversity art. 8(j), Jun. 5, 1992, 1760 U.N.T.S. 79 [hereinafter CBD] (providing for the protection of “knowledge, innovation and practices of indigenous and local communities”); 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, arts. 5(5), 7, Oct. 29 2010, 3008 U.N.T.S. [hereinafter Nagoya Protocol] (providing for the rights of prior consent to access of and equitable benefits-sharing for traditional knowledge associated with genetic resources).

19. World Health Org. [WHO] Comm’n on Intellectual Prop. Rights, Innovation, & Pub. Health, *Public Health: Innovation and Intellectual Property Rights*, at 164–65 (2006), <https://www.who.int/intellectualproperty/documents/thereport/ENPublicHealthReport.pdf?ua=1> [<https://perma.cc/C8UQ-QW9L>].

20. Gebru, *supra* note 6, at 314.

ethical and cultural views of the peoples of the world.”²¹ Of course, this presupposes that some common understanding of fairness exists among all peoples, a proposition that is not without difficulty. But the concept of equity that underpins the instruments granting protection of traditional knowledge is more limited, referring to intra-generational equity, or equity between currently living groups of people.²² Intra-generational equity is a recent, though not entirely settled, concept that derives from international environmental law. Broadly, it envisions mutuality or a balancing of interests between various stakeholders. Under this theory, biopiracy is inequitable, at least in a moral sense, because multinational companies use indigenous peoples’ traditional knowledge to develop patents and reap billions in annual profits,²³ while indigenous peoples in developing countries bear mounting costs to their economies and the environment through excessive harvesting of genetic resources. Intra-generational equity thus demands a quid pro quo exchange or fair compensation for the use of indigenous people’s traditional knowledge.

There is another dimension to equity that merits further discussion. Some have observed that the uneven concentration of genetic resources (and, by extension, associated traditional knowledge) in certain States was accompanied by historical injustices perpetrated against those territories via colonization.²⁴ Elisa Morgera recounts how, subsequently, “[c]olonialism fostered the collection and appropriation of cultural and natural heritage into museums, zoological and botanical gardens and other ex situ collections in colonizing countries.”²⁵ This historical asymmetry has not been aided by modern bioprospecting multinational corporations or the ever-expanding categories of protected intellectual property (e.g. germplasm) obtained

21. Francesco Francioni, *Equity in International Law*, in MAX PLANCK ENCYCLOPEDIA OF PUBLIC INTERNATIONAL LAW, ¶ 3. (Rüdiger Wolfrum ed., 2013).

22. See U.N. Conference on Environment and Development, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I), annex I, princ. 10 (Aug. 12, 1992) (“Environmental issues are best handled with the participation of all concerned citizens, at the relevant level.”).

23. ELISA MORGERA ET AL., UNRAVELING THE NAGOYA PROTOCOL: A COMMENTARY ON THE NAGOYA PROTOCOL ON ACCESS AND BENEFIT-SHARING TO THE CONVENTION ON BIOLOGICAL DIVERSITY 3–4 (2014).

24. *Id.* at 7.

25. *Id.* at 7–8.

from these expeditions. Equity in this context thus encapsulates a different idea: It refers to a mode of distributive justice and the righting of past wrongs. In this regard, equity might be seen as inter-generational, albeit not in the international environmental law sense of literally protecting future generations. Given the historical asymmetry occasioned by colonization, Gebru argues that indigenous communities require both Eurocentric measures and frameworks “that are respective and reflective of the interests of indigenous peoples and local communities”²⁶ to protect their traditional knowledge. As this article will demonstrate, equity in the first sense, and increasingly in the second, are captured in the language of *sui generis* instruments protecting traditional knowledge.

III. A SURVEY OF LEGAL APPROACHES

While States have examined a plethora of legal recommendations to protect traditional knowledge, most proposals do not accord sufficient weight to the equity rationale. Broadly speaking, there are two categories of traditional knowledge protection: defensive and positive. Defensive protection prevents pharmaceutical companies from receiving patents over traditional knowledge while positive protection confers indigenous people rights to their traditional knowledge.²⁷ Proposals for defensive protection include the invalidation of patents when the applicant fails to name the indigenous community as the proper inventor,²⁸ supply documentation of traditional knowledge publications provided in registers and libraries,²⁹

26. Gebru, *supra* note 6, at 308.

27. See World Intellectual Prop. Org. [WIPO] Intergovernmental Comm. on Intellectual Prop. & Genetic Res., Traditional Knowledge, & Folklore, *The Protection of Traditional Knowledge: Updated Draft Gap Analysis*, annex I, ¶ 11, WIPO/GRTKF/IC/37/6 (Aug. 31, 2018) [hereinafter *Gap Analysis*] (describing alternative methods of protecting traditional knowledge).

28. See Paris Convention for the Protection of Industrial Property, as last revised at the Stockholm Revision Conference art. 4ter, Mar. 20, 1883, 21 U.S.T. 1583, 828 U.N.T.S. 305 [hereinafter Paris Convention] (“The inventor shall have the right to be mentioned as such in the patent.”).

29. See, e.g., Abha Nadkarni & Shardha Rajam, *Capitalising the Benefits of Traditional Knowledge Digital Library (TKDL) in Favour of Indigenous Communities*, 9 NUJS L. Rev. 183, 184 (2016) (highlighting the use of traditional knowledge digital libraries in India to prevent biopiracy).

disclose the source material of inventions,³⁰ or meet minimum standards of novelty.³¹

From a legal perspective, defensive protection of traditional knowledge has its limits. Defensive protection requires patent examiners to treat traditional knowledge as prior art included in the entirety of publicly available knowledge that pertains to a patent's claim of novelty. Only where the prior art discloses the invention as claimed would the patent be invalid for a lack of novelty. However, pharmaceutical patents usually pass the novelty threshold without difficulty because the compositions are typically several steps removed from the traditional knowledge that constitutes prior art. Margo Bagley observes that while traditional knowledge databases are undoubtedly useful tools that reduce costs associated with challenging improperly acquired patents, such databases do not actually provide defensive protection apart from concomitant "positive rights to authorize and control uses of traditional knowledge."³² Additionally, procedural requirements in patent law, such as a requirement to name the inventor, diverge between States.³³ The consequences of procedural non-compliance are similarly not always absolute bars to patent registration. For example, patent laws in some countries do not consider failure to disclose the inventor to be a sufficient basis to invalidate a patent.³⁴ Perhaps more fundamentally, defensive protection wrongly emphasizes the "property" dimension of traditional knowledge protection by unduly focusing on rights of exclusion. In contrast, equity does not necessitate preventing pharmaceutical companies from obtaining patents, but merely requires patent holders to furnish equitable compensation when filing and obtaining patents that use traditional knowledge.

30. *Gap Analysis*, *supra* note 27, ¶ 34.

31. *Id.* ¶ 36.

32. Margo Bagley, *The Fallacy of Defensive Protection for Traditional Knowledge*, 58 WASHBURN L.J. 323, 353 (2019).

33. SAM RICKETSON, *THE PARIS CONVENTION FOR THE PROTECTION OF INDUSTRIAL PROPERTY: A COMMENTARY* 389 (2015).

34. Chidi Oguamanam, *Pressuring "Suspect Orthodoxy": Traditional Knowledge and the Patent System*, in *INDIGENOUS INTELLECTUAL PROPERTY: A HANDBOOK OF CONTEMPORARY RESEARCH* 313, 331 n. 72 (Matthew Rimmer ed., 2015).

On the other hand, proposals for positive protection of traditional knowledge empower indigenous people to assert legal (and usually proprietary) claims over their traditional knowledge, including patents,³⁵ trade secrets with respect to undisclosed knowledge,³⁶ geographical indications, collective marks, unfair competition claims,³⁷ and human rights claims.³⁸ However, these proposals, while undoubtedly moving in the right direction, may not be entirely sufficient as they still pose several difficulties. First, international intellectual property law does not countenance rights in cumulative and collective knowledge held in perpetuity.³⁹ Moreover, indigenous people cannot obtain patents because traditional knowledge in the observable properties of plants/animals is usually deemed a non-patentable natural phenomenon. Trade secrecy law does not cover knowledge that is widely disseminated within an indigenous community, while claims of unfair competition cannot assist indigenous communities that are not commercializing their knowledge. Protections for collective trademarks and geographical indications are of minimal utility, as these mechanisms do not protect traditional knowledge in and of itself, but rather a particular manifestation of it. While it appears that traditional knowledge could fall under regional human rights treaties protecting property, there have been no cases or international instruments defining property to include traditional knowledge as a specific object of legal protection, and the collective and intergenerational nature of traditional knowledge militates against such an approach. The myriad of technical obstacles suggests that these proposals place misguided emphases on the property and instrumental justifications for traditional knowledge protection.

35. *Gap Analysis*, *supra* note 27, ¶ 25.

36. *Id.* ¶ 40.

37. *Id.* ¶ 45; Paris Convention, *supra* note 28, art. 10*bis*.

38. See Indigenous and Tribal Peoples Convention (No. 169) art. 7(1), June 27, 1989, 1650 U.N.T.S 383 [hereinafter ILO 169] (providing that indigenous and tribal peoples shall have the right to “exercise control, to the extent possible, over their own economic, social and cultural development”); ICCPR, *supra* note 5, art. 18(1) (providing for the human right to religion, which is relevant insofar as traditional knowledge associated with genetic resources could be applied in a religious context such as a ceremony); ICESCR, *supra* note 5, art. 15(1) (providing for the human right to participate in cultural life).

39. *Gap Analysis*, *supra* note 27, ¶ 86.

Against this backdrop, 196 States ratified the 1992 Convention on Biological Diversity (CBD), which establishes two novel protections for traditional knowledge under Article 8(j): first, the right to obtain free prior and informed consent for the use of traditional knowledge, and second, the right to equitably share benefits arising from the use of traditional knowledge.⁴⁰ But since the language of Article 8(j) is aspirational rather than obligatory, 117 States subsequently ratified the 2010 Nagoya Protocol, which reiterates, in mandatory language, the twin rights to prior informed consent (under Article 7) and equitable benefit-sharing (under Article 5(5)). Although a thorough study of the Article 7 right to prior informed consent would undoubtedly yield useful insights, this article will focus on the Article 5(5) right to equitable benefits. There are three reasons for this narrower scope. First, Article 7 merely requires traditional knowledge users to obtain “prior informed consent or approval and *involvement*” from indigenous communities,⁴¹ which could be interpreted to require only requires a *de minimis* threshold of engagement.⁴² Second, when equitable benefit-sharing agreements are established in compliance with Article 5(5), prior informed consent is necessarily implied. Finally, Article 5(5) represents the clearest invocation of the equity rationale, requiring all parties to “take legislative, administrative or policy measures, as appropriate, in order that the benefits arising from the utilization of traditional knowledge associated with genetic resources are shared in a fair and equitable way with indigenous and local communities holding such knowledge.”⁴³

Crucially, Article 5(5) crystallizes the abstract notion of equity into a concrete principle with particularized content. As indicated in the travaux préparatoires, the Protocol is underpinned by a need to ensure that indigenous people equitably benefit from the “environmental, cultural, social and eco-

40. CBD, *supra* note 18, art. 8(j).

41. Nagoya Protocol, *supra* note 18, art. 7 (emphasis added).

42. See Gurdial Singh Nijar, *Traditional Knowledge Systems, International Law and National Challenges: Marginalization or Emancipation?*, 24 EUR. J. INT'L L. 1205, 1215 (2013) (noting that the Nagoya Protocol does not spell out the “substantive content of the requirements” and that the precise meaning of terms could vary).

43. Nagoya Protocol, *supra* note 18, art. 5(5).

conomic valuation of . . . [their] traditional knowledge.”⁴⁴ Furthermore, Article 5(5) is consistent with Special Rapporteur Farida Shaheed’s remarks that traditional knowledge is implicitly predicated on indigenous people’s right to self-determination and “struggle for cultural survival.”⁴⁵ Although Article 5(5) does not expressly employ human rights language, the rules of treaty interpretation require the Protocol to be interpreted in conjunction with States Parties’ respective human rights obligations.⁴⁶ Seen in this light, Article 5(5) best encapsulates the equity rationale of traditional knowledge protection and should therefore be readily implemented by States Parties to the Protocol. Accordingly, clarifying Article 5(5)’s applicable scope, its relevant stakeholders, and its substantive content will pave the way for indigenous communities to benefit from equitable treatment when their traditional knowledge is used.

IV. THE APPLICABLE SCOPE OF ARTICLE 5(5)

Some have criticized the Protocol for being a “masterpiece in creative ambiguity” because of its regrettable silence on threshold matters concerning the temporal, territorial, and subject matter scope of Article 5(5).⁴⁷ Indeed, the disparate interpretations that arise from such ambiguity have created much legal uncertainty. However, implementing a new legal document into practice is itself a long journey. To that end, this article makes the following suggestions: first, that Article 5(5)’s protected subject matter includes the observable properties of animal and plant genetic resources; second, that the Article 5(5) obligation is triggered when the traditional

44. Conference of the Parties to the Convention on Biological Diversity, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Seventh Meeting*, at 15, U.N. Doc. UNEP/CBD/COP/DEC/VII/19 (Apr. 13, 2004). See generally Vienna Convention on the Law of Treaties art. 32, May 23, 1969, 1155 U.N.T.S. 331 [hereinafter VCLT] (establishing the travaux préparatoires as a supplementary source of treaty interpretation when the initial interpretation is ambiguous or absurd).

45. Shaheed Report, *supra* note 11, ¶ 37.

46. VCLT, *supra* note 44, art. 31(3).

47. *Summary of the Tenth Conference of the Parties to the Convention on Biological Diversity*, EARTH NEGOTS. BULL. (Int’l Inst. of Sustainable Dev., Winnipeg, Can.) Nov. 1, 2010, at 22, <https://enb.iisd.org/download/pdf/enb09544e.pdf> [<https://perma.cc/WXW7-N2PN>].

knowledge is directly used in a claimed invention; third, that the obligation to equitably share benefits under Article 5(5) begins with access and continues through the utilization of traditional knowledge; and finally, that the Article 5(5) obligation should apply extraterritorially.

A. *The Material Scope*

1. *Traditional Knowledge Associated with Genetic Resources*

Article 5(5) protects “traditional knowledge associated with genetic resources.”⁴⁸ As a preliminary matter, the expressions “genetic resources” and “traditional knowledge” are not in dispute. First, “genetic resources” are defined under Article 2 of the Protocol to include “genetic and/or biochemical compositions of genetic resources” and “biological systems, living organisms, or derivatives thereof . . . even if it does not contain functional units of heredity.”⁴⁹ As such, genes, enzymes, compounds, tissue, and organs derived from plants or animals would constitute genetic resources.⁵⁰ Second, in relation to traditional knowledge, WIPO distinguishes between traditional knowledge *lato sensu* and traditional knowledge *stricto sensu*.⁵¹

Traditional knowledge *lato sensu* involves an expansive conception of knowledge that encompasses both technical know-how and traditional folklore expressions. Specifically, traditional knowledge *lato sensu* is (1) created and maintained by indigenous communities collectively, (2) connected to indigenous cultural identity, (3) intergenerational, (4) capable of oral transmission or codification, and (5) capable of evolution.⁵² For instance, the religious rites surrounding the consumption of an herb is a traditional cultural expression that constitutes traditional knowledge *lato sensu*. In contrast, Article 5(5) concerns traditional knowledge *stricto sensu*, which is a technical and particularized type of traditional knowledge.⁵³ In the Protocol’s context, traditional knowledge *stricto sensu* refers to “traditional knowledge *associated with genetic re-*

48. Nagoya Protocol, *supra* note 18, art. 5(5).

49. *Id.* art. 2

50. MORGERA ET AL., *supra* note 23, at 64–65.

51. *Gap Analysis*, *supra* note 27, ¶ 71.

52. WIPO Draft Articles, *supra* note 16, at 5.

53. *Gap Analysis*, *supra* note 27, ¶ 71.

sources,”⁵⁴ which includes, for example, the antiseptic properties of tree bark. However, disagreements arise as to the scope of this knowledge, since association exists in degrees.⁵⁵ For example, do indigenous peoples possess traditional knowledge associated with genetic resources when they ingest, as part of a religious ritual believed to confer longevity, the organ of an animal that is subsequently discovered to contain an enzyme with cancer-treating properties?

On one hand, “associated with” could be construed narrowly to signify knowledge “inextricably linked” or invariably related to the genetic resource.⁵⁶ If subject to this high threshold, indigenous peoples would have to locate an enzyme, compound, oil, or resin that contains useful properties rather than merely identifying the existence of an animal organ or plant part. In the medical context, a strict standard would further require indigenous communities to describe a cluster of disease symptoms that the enzyme/compound purports to treat. This standard would be premised on the idea that indigenous peoples must contribute in some way to the innovative process before they can claim profits from the resulting drugs.

However, “associated” should be defined broadly, requiring indigenous people only to possess “information which relates to the characteristics and properties of a ‘genetic resource’”⁵⁷ Moreover, this article proposes that simple knowledge of an observably useful quality of a genetic resource should suffice. Prescribing a lower degree of requisite specificity for traditional knowledge aligns with the fact that indigenous science uses a primarily observational epistemology,⁵⁸ and traditional knowledge protection should account for non-Western perspectives on science. As Lord Hoffman

54. Nagoya Protocol, *supra* note 18, art. 5(5) (emphasis added).

55. Michelle Rourke, *Who Are “Indigenous and Local Communities” and What Is “Traditional Knowledge” for Virus Access and Benefit-Sharing? A Textual Analysis of the Convention on Biological Diversity and its Nagoya Protocol*, 25 J. L. & MED. 707, 719 (2018).

56. Gurdial Singh Nijar, *Incorporating Traditional Knowledge in an International Regime on Access to Genetic Resources and Benefit Sharing: Problems and Prospects*, 21 EUR. J. INT’L L. 457, 466 (2010).

57. Peter Harrison, *Grasping Frankenstein’s Monster: Uncertainty in the Downstream Scope of the Nagoya Protocol*, 1 INTELL. PROP. Q. 61, 83–84 (2019).

58. See *Merrell Dow Pharmaceuticals Inc. and Anr. v. H.N. Norton & Co. Ltd.*, [1996] R.P.C. 76 (HL) 88 (UK) (discussing how there may be “descriptions under which something may in a relevant sense be known without any-

once opined about patent law, “[t]here is an infinite variety of descriptions under which the same thing maybe known . . . described according to what they look like, how they are made, what they do and in many other ways.”⁵⁹ In that decision, Lord Hoffman held that a prior disclosure of an invention did not need to manifest in the technical language of chemistry (e.g. in a medical journal), characterizing the issue as “essentially an epistemological one: what does it mean to know something . . . ?”⁶⁰ He then provided a particularly relevant illustration:

Imagine a scientist telling an Amazonian Indian . . . : “We have found that the reason why the bark is good for fevers is that it contains an alkaloid with a rather complicated chemical structure which reacts with the red corpuscles in the bloodstream. It is called quinine.” The Indian replies: “That is very interesting. In my tribe, we call it the magic spirit of the bark.” Does the Indian know about quinine? My Lords, under the description of a quality of the bark which makes it useful for treating fevers, he obviously does. I do not think it matters that he chooses to label it in animistic rather than chemical terms. He knows that the bark has a quality which makes it good for fever and that is one description of quinine.⁶¹

Kenya,⁶² Bhutan,⁶³ and Burundi⁶⁴ have all defined traditional knowledge associated with genetic resources expansively in their legislation and administrative regulations implementing the Protocol obligations. For example, Burundi protects “knowledge of the properties of biological resources.”⁶⁵ Fur-

one being aware of its chemical composition or even that it has an identifiable molecular structure”).

59. *Id.*

60. *Id.*

61. *Id.*

62. The Wildlife Conservation and Management Act, No. 47 (2013) KENYA GAZETTE SUPPLEMENT No. 181 § 22.

63. Access and Benefit Sharing Policy, 2014 Draft, § 6(d) (Bhutan) (defining traditional knowledge associated with genetic resources as “knowledge, innovations and practices . . . related to the utilization of biodiversity”).

64. Law No. 1/13 of July 28, 2009 relating to Industrial Property in Burundi, Office of the President.

65. *Id.* art. 247.

thermore, a broad conception of traditional knowledge comports with State practice. For instance, the South African San people were deemed to possess sufficient knowledge over the appetite-suppressing properties of the hoodia plant to warrant equitable benefit-sharing, even though the community did not identify the relevant compound.⁶⁶ Consistent with these developments, WIPO has proposed that traditional knowledge associated with genetic resources be expansively defined as “substantive knowledge of the properties and uses of genetic resources held by indigenous peoples or local communities.”⁶⁷

In addition to the epistemological argument, a broad definition of the word “associated” would also foreclose artificial distinctions between categories of traditional knowledge for the purpose of protection. It would be arbitrary and administratively unwieldy to distinguish between fixed and unfixed, documented and undocumented, codified and uncoded, disclosed and undisclosed, or sacred and secular traditional knowledge for the purpose of determining the appropriate scope of protection.

2. *Utilization of Traditional Knowledge*

Another area of contention concerns the definition of “utilization of traditional knowledge” under Article 5(5).⁶⁸ What utilizations of traditional knowledge invoke the article’s equitable benefit-sharing obligation? This is crucial because patentable technologies (e.g. active ingredients of drugs and cosmetics) derived from traditional knowledge often depart significantly from the original knowledge that served as a reference point. As noted previously, the pharmaceutical company Eli Lilly purportedly developed a cancer drug using Malagasy traditional knowledge of the rosy periwinkle’s antidiabetic properties,⁶⁹ while French researchers allegedly isolated a cancer-treating compound using French Guianese knowledge of the Quassia’s fever-treating qualities.⁷⁰ In addition, research

66. See Graham Dutfield & Uma Suthersanen, *Traditional Knowledge and Genetic Resources: Observing Legal Protection Through the Lens of Historical Geography and Human Rights*, 58 WASHBURN L.J. 399, 418–19 (2019).

67. Joint Recommendation, *supra* note 1, ¶ 1.

68. Nagoya Protocol, *supra* note 18, art. 5(5).

69. MICHAEL F. BROWN, WHO OWNS NATIVE CULTURE 135–38 (2009).

70. Bourdy et al., *supra* note 2, at 292.

that relies on traditional knowledge may not necessarily yield commercial outcomes.⁷¹ For example, although American research labs successfully isolated the chang shan herb's active alkaloid compounds, whose antimalarial properties were known by traditional Chinese medical practitioners,⁷² trials revealed that humans could not tolerate effective doses of the compound.⁷³ In determining the scope of traditional knowledge utilizations that trigger the Article 5(5) obligation, plausible distinctions could be drawn between commercial and non-commercial application or between upstream and downstream research use of traditional knowledge. However, this article proposes that "utilization of traditional knowledge" means the use of traditional knowledge that *directly leads* to the subsequent invention.

First, commercial research should not be distinguished from non-commercial research. Article 2 of the Protocol, which explains that "utilization of genetic resources" includes "research and development on the genetic and/or biochemical composition of genetic resources" and related derivatives,⁷⁴ supports this reading. Importantly, Article 2 does not distinguish between commercial and non-commercial research. However, the argument that non-commercial research may not necessarily amount to a utilization of traditional knowledge under Article 5(5) is not without merit. The Protocol does not define utilization of traditional knowledge, and it is difficult to imagine that a student researcher who conducts lab experiments on the antiseptic properties of tree bark known by indigenous peoples would be expected to conclude a benefit-sharing agreement. However, the results of non-commercial research are often leads for the downstream exploitation of traditional knowledge.⁷⁵ Indeed, the Protocol's travaux préparatoires reveal that drafters and negotiators alike contemplated utilization to encompass non-commercial re-

71. Hughes, *supra* note 9, at 1225–26.

72. *Id.*

73. *Id.* at 1226 n.41.

74. Nagoya Protocol, *supra* note 18, art. 2.

75. See MORGERA ET AL., *supra* note 23, at 74 (noting that when traditional knowledge serves as "lead information for the utilization of genetic resources, it can be understood as hinging on the same intent (research and development) as in the case of genetic resources.").

search.⁷⁶ Operating under this understanding, the AIDS Research Alliance and the University of California, Berkeley promised the Samoan government twenty percent of royalties realized from any potential sales of drugs developed from research inspired by Samoan traditional knowledge in the hepatitis-treating qualities of the mamala plant.⁷⁷

There is also no principled basis on which to draw a categorical line between the utilization of genetic resources and the utilization of any of their more specific derivatives, such as organs, tissue, compounds, enzymes, oils, resins, and genes. Admittedly, the greater the specificity of the relevant derivative resource used, the less proximate the utilization of traditional knowledge becomes. It is therefore no surprise that Protocol drafters declined to state whether isolating gene sequences or conducting bioinformatic research would comprise utilizations of traditional knowledge.⁷⁸ Nevertheless, the Article 8(j) Working Group stressed that “traditional knowledge . . . sparks the process or provides the lead to the properties of a genetic resource although it may not be reflected in the end-product.”⁷⁹ Notably, the CBD’s Group of Technical and Legal Experts on Traditional Knowledge Associated with Genetic Resources endorsed a similarly nuanced approach:

Although the traditional knowledge used for the final product may not match the body of traditional knowledge, traditional knowledge adds value to genetic resources by providing a massive increase of efficiency in identifying genetic resources with potential properties. Traditional knowledge can therefore be considered as an indicator of the potential properties of a genetic resource. At the same time, it was

76. Ad Hoc Open-Ended Working Grp. on Access & Benefit-Sharing, *Report of the Meeting of the Group of Legal and Technical Experts on Concepts, Terms, Working Definitions and Sectoral Approaches*, annex, ¶¶ 44–45, U.N. Doc. UNEP/CBD/WG-ABS/7/2 (Dec. 12, 2008) [hereinafter Definition Report].

77. DANIEL ROBINSON, *BIODIVERSITY, ACCESS AND BENEFIT-SHARING: GLOBAL CASE STUDIES* 105 (2015).

78. MARGO BAGLEY & ARTI RAI, *THE NAGOYA PROTOCOL AND SYNTHETIC BIOLOGY RESEARCH: A LOOK AT THE POTENTIAL IMPACTS* 20 (2013); MORGERA ET AL., *supra* note 23, at 69.

79. Conference of the Parties to the Convention on Biological Diversity, *Report of the Sixth Meeting of the Ad Hoc Open-Ended Inter-Sessional Working Group on Article 8(j) and Related Provisions of the Convention on Biological Diversity*, at 36, U.N. Doc. UNEP/CBD/COP/10/12 (Nov. 21, 2009).

noted by some that traditional knowledge does not always provide useful leads to genetic resources.⁸⁰

Indeed, that final qualifying sentence should deter attempts to interpret utilization so broadly as to cover all research and development activities regardless of proximity to the traditional knowledge. For example, although the Amazigh people of Morocco established benefit-sharing agreements with L'Oréal for the use of their traditional knowledge in argan oil, known for its skin and hair care properties, commentators opined that this agreement was not mandatory because L'Oréal's "patented pressed cake extract [was] arguably *not* directly based on traditional knowledge."⁸¹

Ultimately, lawmakers should refrain from adopting a hard-line approach when defining which utilizations of traditional knowledge trigger the equitable benefit-sharing obligation. Bright-line rules cannot suffice where flexibility is required. Accordingly, this article proposes that "utilization of traditional knowledge" should refer to traditional knowledge that *directly leads* to the resulting invention. In a similar vein, WIPO has advanced a definition of utilization requiring that the claimed invention/product be "a direct result of the use" of traditional knowledge.⁸² This is consistent with laws in Samoa⁸³ and Vietnam,⁸⁴ which require a subsequent invention to be "based on" or "directly based on" the traditional knowledge. In determining whether the traditional knowledge directly leads to the resulting invention, one WIPO Technical

80. Ad Hoc Open-Ended Working Grp. on Access and Benefit-Sharing, *Report of the Meeting of the Group of Technical and Legal Experts on Traditional Knowledge Associated with Genetic Resources in the Context of the International Regime on Access and Benefit-Sharing*, annex, ¶ 13, U.N. Doc. UNEP/CBD/WG-ABS/8/2 (July 15, 2009).

81. ROBINSON, *supra* note 77, at 124.

82. WIPO Draft Articles, *supra* note 16, at 6.

83. *See* Intellectual Property Act, Law No. 9 of 2011, art. 7(10) (Samoa) (granting defensive protection against inventions "based on or derived from biological material or knowledge available within any local or indigenous community").

84. Circular No. 01/2007/TT-BKHCN of February 14, 2007, Guiding the Implementation of the Government's Decree No. 103/2006/ND-CP of September 22, 2006, Detailing and Guiding the Implementation of a Number of Articles of the Law on Intellectual Property Regarding Industrial Property art. 23.11 (Viet.).

Study pinpoints four relevant factors that may provide useful guidance:

[W]hether the [traditional knowledge] was incidental or fundamental to the development of the invention; whether the [traditional knowledge] contributed to one earlier step to a chain of innovations that over time culminated in the invention, or was a direct input to the claimed inventive step; whether particular qualities of a [genetic resource] were essential to the invention, or the [genetic resource] was in effect only a vehicle for a separate innovative concept; or whether [the traditional knowledge] was used in a particular embodiment or one example in the description of the invention, but was not indispensable to arriving at (or replicating) the invention as claimed.⁸⁵

Hence, Phytopharm's manufacture of an appetite-suppressing drug using the San people's knowledge of the hoodia plant's hunger-suppressing properties would constitute a utilization of traditional knowledge under Article 5(5), because the traditional knowledge was a fundamental, essential, and direct input leading to the production of the drug.⁸⁶

B. *The Temporal Scope*

Given the absence of an express clause governing the Protocol's temporal scope, two divergent interpretations persist today. On the first view, developed States contend that benefit-sharing obligations are only triggered by the initial access to traditional knowledge and not subsequent utilization of that knowledge. Since Article 28 of the Vienna Convention on the Law of Treaties (Vienna Convention) presumes against retroactive application of the Protocol,⁸⁷ the continued production

85. Conference of the Parties to the Convention on Biological Diversity, *WIPO Technical Study on Patent Disclosure Requirements Related to Genetic Resources and Traditional Knowledge*, at 2, U.N. Doc. UNEP/CBD/COP/7/INF/17 (Dec. 15, 2003).

86. Nijar, *supra* note 56, at 462.

87. VCLT, *supra* note 44, art. 28 (stating that treaties cannot "bind a party in relation to any fact which took place or any situation which ceased to exist before the date of the entry into force of the treaty with respect to that party.").

of pharmaceuticals that were developed without benefits-sharing agreements prior to the Protocol entry into force in October 2014 cannot violate the Article 5(5) obligation. In other words, the access of traditional knowledge prior to October 12, 2014 is not subject to the benefit-sharing obligation. This position is espoused by the European Union⁸⁸ and Switzerland.⁸⁹

However, this article argues in favor of the second interpretation that benefits from continued utilization of traditional knowledge accessed pre-Protocol should still be subject to Article 5(5). In this conception, the trigger for benefits-sharing is the utilization rather than the access of traditional knowledge, and utilization is broadly construed to include the subsequent manufacture of drugs. Accordingly, States that authorize production of drugs based on traditional knowledge after October 2014 in the absence of a benefit-sharing agreement would be in continuing breach of Article 5(5), even if the initial access of traditional knowledge occurred before 2014.⁹⁰ Put differently, upon ratification of the Protocol, States are required to conclude benefit-sharing agreements with indigenous communities for existing drugs that once utilized traditional knowledge. This understanding is supported by the plain and ordinary meaning of the Protocol's text, as Article 5(5) requires State Parties to ensure that "benefits arising from the utilization of traditional knowledge associated with genetic resources are shared in a fair and equitable way,"⁹¹ and this interpretation comports with the Protocol's object and purpose to promote fair and equitable sharing of benefits.⁹² It is also consistent with International Court of Justice (ICJ) juris-

88. Regulation 511/2014 of the European Parliament and of the Council of 16 April 2014 on Compliance Measures for Users from the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization in the Union, 2014 O.J. (L150) 59, 64 [hereinafter E.U. Regulation 511/2014].

89. Loi fédérale sur la protection de la nature et du paysage [LPN] [Federal Act on the Protection of Nature and Cultural Heritage], July 1, 1966, AS 1637 (1966), as amended by Annex to the Federal Decree of 21 March 2014, AS 2629 (2014), art. 25(d) (Switz.).

90. INT'L UNION FOR CONSERVATION OF NATURE, THOMAS GREIBER ET AL., AN EXPLANATORY GUIDE TO THE NAGOYA PROTOCOL ON ACCESS AND BENEFIT-SHARING 72–73 (2012).

91. Nagoya Protocol, *supra* note 18, art. 5(5).

92. *Id.* at 3. See generally VCLT, *supra* note 44, art. 31(2) (stating that the preamble is part of the context used to interpret the purpose of a treaty).

prudence affirming the idea that an extended lapse of time since the commission of an initial unlawful act will not allow States to escape liability for a continuing breach of international law.⁹³ Therefore, access of traditional knowledge that took place prior to the ratification of the Nagoya Protocol will not void the obligation to equitably share benefits where the utilization of that traditional knowledge continues. Furthermore, Article 5(5) should be read in light of the CBD's Article 8(j),⁹⁴ which articulated a similar aspiration nearly three decades prior. Finally, this interpretation corresponds to the widespread and subsequent practice of States defining access to encompass utilization in their legislation implementing Article 5(5), including Cuba,⁹⁵ Panama,⁹⁶ Vietnam,⁹⁷ Denmark,⁹⁸ Norway,⁹⁹ the Philippines,¹⁰⁰ Kenya,¹⁰¹ Namibia.¹⁰²

93. See Legal Consequences of the Separation of the Chagos Archipelago from Mauritius in 1965, Advisory Opinion, 2019 I.C.J. Rep. 169, ¶¶ 177–78 (Feb. 25) (“having found that the decolonization of Mauritius was not conducted in a manner consistent with the right of peoples to self-determination, it follows that the United Kingdom’s continued administration of the Chagos Archipelago constitutes . . . an unlawful act of a continuing character which arose as a result of the separation of the Chagos Archipelago from Mauritius.” The Court found that the United Kingdom was “under an obligation to bring an end to its administration of the Chagos Archipelago as rapidly as possible.”).

94. Ad Hoc Open-ended Working Grp. on Access and Benefit-Sharing, *Collation of Operative Text Submitted by Parties, Governments, International Organizations, Indigenous and Local Communities and Relevant Stakeholders in Respect of the Main Components of the International Regime on Access and Benefit-sharing Listed in Decision IX/12*, annex I, at 33, U.N. Doc. UNEP/CBD/WG-ABS/7/4 (Jan. 28, 2009).

95. Ministerio de ciencia, tecnología y medio ambiente resolución No. 111/96 [Ministry of Science, Technology, and Environment Resolution No. 111/96] art. 2 (Cuba).

96. Ministry of Economics and Finance, Executive Decree No. 25, art. 3 (Apr. 29, 2009) (Pan.).

97. National Assembly, Law on Biodiversity, No. 20/2008/QH12, art. 3(29) (Nov. 13, 2008) (Viet.).

98. Greenland Home Rule Parliament Act No. 20 of November 20th 2006 on Commercial and Research-Related Use of Biological Resources, art. 3 (Den.).

99. Lov om forvaltning av naturens mangfold (naturmangfoldloven) [Nature Diversity Act] 19 juni 2009 nr. 100 § 60 (Nor).

100. Department of Environment and Natural Resources, Department of Agriculture, Palawan Council for Sustainable Development, and National Commission on Indigenous Peoples, Guidelines for Bioprospecting Activities in the Philippines, Admin. Ord. No. 1, § 5 (Jan. 14, 2005).

Ethiopia,¹⁰³ Brazil,¹⁰⁴ Zambia,¹⁰⁵ Bhutan,¹⁰⁶ Malaysia,¹⁰⁷ the African Union,¹⁰⁸ and the Andean Community¹⁰⁹ define access to encompass utilization. South Africa¹¹⁰ and India¹¹¹ have promulgated laws that address utilization but not access.

Concededly, this approach might seem unfair to companies that, at the time of research investment, relied on the free utilization of traditional knowledge. But Article 5(5) obligations do not necessitate drastic alterations of pharmaceutical companies' cost-benefit analysis, as the fair and equitable standard is a flexible one that factors these concerns into the overall calculus. Moreover, concerns that the proposed approach would inhibit the production of drugs derived from traditional knowledge accessed centuries ago are mitigated in three ways. First, the beneficiaries of equitable benefits must still qualify as indigenous and local communities, a strictly defined criterion that many modern communities no longer satisfy. Second, it may be reasonable to assume that the Protocol does not apply to traditional knowledge accessed prior to the CBD's entry into force in 1993. Third, it may be safely assumed that a right

101. The Environmental Management and Co-ordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, No. 160 (2006), § 2 (Kenya); Wildlife Conservation and Management (Bio-Propecting) Regulations No. 47 (2016) § 2 (Kenya).

102. Access to Biological and Genetic Resources and Associated Traditional Knowledge Bill (2017) § 1 (Namib.).

103. Access to Genetic Resources and Community Knowledge and Community Rights Proclamation, Article 2, Proclamation No. 482/2006, *Negarit Gazette*, Year 13, No. 13 (Eth.).

104. Medida Provisória 2,186-16 de 23 de Agosto de 2001, art. 26 (Braz.).

105. The Protection of Traditional Knowledge, Genetic Resources and Expressions of Folklore Act No. 16 (2016) *GOVERNMENT GAZETTE (Acts)* § 2 (Zam.) [hereinafter Zambia Law].

106. The Biodiversity Act of Bhutan (Water Sheep Year 2003) art. 51.

107. Access to Biological Resources and Benefit Sharing Bill 2017, s. 21 (Malay.) [hereinafter Malaysia Law].

108. African Union Comm'n, *African Union Strategic Guidelines for the Coordinated Implementation of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation*, at 3–4 (2015).

109. Andean Cmty., *Decision 391—Common Regime on Access to Genetic Resources* art. 1 (July 2, 1996).

110. Regulations on Bio-Propecting, Access and Benefit-Sharing, GN R.138 of GG 30739 § 1 (8 Feb. 2008) (S. Afr.) [hereinafter South Africa Law].

111. The Biological Diversity Act, 2002, § 3(1) (India).

to remuneration would only last for the duration of a patent so as to prevent the existence of a right in perpetuity. Furthermore, although the proposed interpretation might seem like retroactive treaty application by another name, the non-retroactivity principle under Article 28 of the Vienna Convention only applies to situations that have “ceased to exist before the date of the entry into force of the treaty,”¹¹² and the Protocol will thus not apply to access and utilization of traditional knowledge that ceased prior to 2014.¹¹³ However, the continued use of traditional knowledge accessed before 2014 would constitute ongoing conduct that has not yet ceased to exist.

C. *The Territorial Scope*

The Protocol does not contain a jurisdictional clause defining its territorial applicability. Article 29 of the Vienna Convention thus applies such that unless a different intention can be established from the text, treaties are presumed to lack extraterritorial application.¹¹⁴ As such, the use of traditional knowledge beyond national jurisdiction does not trigger Article 5(5). This is further reinforced by the absence of mandatory language under Protocol Articles 10 and 11, which merely require States to “endeavour to cooperate”¹¹⁵ and to “consider the need for . . . a global multilateral benefit-sharing mechanism” in situations involving cross-border use of traditional knowledge.¹¹⁶ It is therefore no surprise that domestic equitable benefit-sharing rules in some States, like Malaysia, only apply to traditional knowledge used locally.¹¹⁷

Be that as it may, this article contends that multinational companies’ ability to acquire traditional knowledge in one State and utilize it in another warrants an effects-based approach to territorial applicability. An effects-based approach to territorial applicability enables States to enforce equitable ben-

112. VCLT, *supra* note 44, art. 28.

113. Gurdial Singh Nijar, *The Nagoya Protocol on Access and Benefit Sharing of Genetic Resources: Analysis and Implementation Options for Developing Countries* 20 (South Ctr. Research Paper No. 36, 2011), https://www.southcentre.int/wp-content/uploads/2013/08/Ev_130201_GNjar1.pdf [https://perma.cc/7E MW-J998].

114. VCLT, *supra* note 44, art. 29.

115. Nagoya Protocol, *supra* note 18, art. 11.

116. *Id.* art. 10.

117. Malaysia Law, *supra* note 107, at 56.

efit-sharing agreements regardless of where the traditional knowledge utilization takes place, so long as the State exercises supervisory control over the entity's activities. Since the Protocol "appl[ies] to traditional knowledge associated with genetic resources within the scope of the Convention,"¹¹⁸ Article 3 authorizes the Protocol to import the CBD's jurisdiction, which applies "in the case of processes and activities, regardless of where their effects occur, carried out under [a state party's] jurisdiction or control, within the area of its national jurisdiction or beyond the limits of national jurisdiction."¹¹⁹ The language denotes that a State must enforce the Article 5(5) obligation if an entity is within its control, regardless of where the harmful effects (i.e. the utilization of traditional knowledge) occur. This grants indigenous peoples an effective remedy and prevents the utilization of traditional knowledge with impunity in situations where it is acquired in one State and commercially applied in another. Significantly, the limiting principle of control is satisfied when relevant entities act in "complete dependence" on the State.¹²⁰ This approach finds an analogue in the jurisprudence of regional human rights courts¹²¹ and human rights committees¹²² indicating that the obligations to respect human rights apply extraterritorially if the State exercises control over an entity's conduct.

118. Nagoya Protocol, *supra* note 18, art. 3.

119. CBD, *supra* note 18, art. 4(b).

120. Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosn. & Herz. v. Serb. & Montenegro), Judgment, 2007 I.C.J. Rep. 43, ¶ 392 (Feb. 26).

121. *See e.g.*, Big Brother Watch v. United Kingdom, No. 58170/13, ¶ 271 (Sept. 13, 2018), <http://hudoc.echr.coe.int/fre?i=001-186048> (assuming that UK surveillance activities affecting individuals outside the United Kingdom could violate the European Convention); Environment and Human Rights, Advisory Opinion OC-23/17, Inter-Am. Ct. H.R. (ser. A) No. 23, ¶¶ 93, 95 (Nov. 15, 2017) (holding that construction activities within Colombia causing cross-border pollution would violate the American Convention on Human Rights).

122. Committee on Economic, Social and Cultural Rights, *General Comment No. 24 (2017) on State Obligations Under the International Covenant on Economic, Social and Cultural Rights in the Context of Business Activities*, ¶ 29, U.N. Doc. E/C.12/GC/24, (Aug. 10, 2017) ("The extraterritorial obligation to respect requires States parties to refrain from interfering directly or indirectly with the enjoyment of the Covenant rights by persons outside their territories.") [hereinafter General Comment 24].

V. THE STAKEHOLDERS OF ARTICLE 5(5)

Article 5(5) confers rights and obligations on multiple stakeholders, implicating State governments, multinational companies, indigenous peoples, local communities, and community representatives. Unravelling the complex web of rights and obligations necessitates identifying these stakeholders, yet definitions are lacking under the Protocol. Accordingly, this article proposes that the beneficiaries of traditional knowledge protection are indigenous peoples and local communities, which differ slightly in their definitions; that Article 5(5) permits the identification of multiple indigenous and local communities; and that the appropriate representatives of indigenous peoples and local communities are the State government or locally-elected individuals.

A. *The Beneficiaries*

1. *“Indigenous and Local Communities”*

Although Article 5(5) explicitly identifies indigenous and local communities as the beneficiaries of traditional knowledge protection, the Protocol does not define who indigenous and local communities are. At the outset, there is a threshold inquiry as to the relationship between indigenous and local communities. One view is that “indigenous” and “local” should be construed conjunctively and therefore require that a purported beneficiary be both indigenous and local.¹²³ However, this interpretation renders the phrase redundant because both “indigenous” and “local” connote some measure of geographical distinctiveness.¹²⁴ Accordingly, “indigenous and local communities” should be read disjunctively, referring to both indigenous communities and local communities. Indeed, the expression “indigenous and local communities” alludes to long-standing concepts entrenched in international human rights instruments.¹²⁵ Perhaps because of this interpretive ambiguity, parties to the Protocol agreed in 2014 to revise the phrase to

123. Rourke, *supra* note 55, at 721.

124. *See id.* (noting that this interpretative construction is tautological).

125. *See* Elisa Morgera, *Justice, Equity and Benefit-Sharing Under the Nagoya Protocol to the Convention on Biological Diversity*, 24 ITALIAN Y.B. INT’L L. 113, 141 (2014) (“Benefit-sharing as a safeguard has been used to fill gaps (as equity *preater legem*) in one international human rights regime with reference to another international human rights regime and international biodiversity

“indigenous *peoples* and local communities.”¹²⁶ This followed recommendations by both the UN Permanent Forum on Indigenous Issues¹²⁷ and the Article 8(j) Working Group,¹²⁸ who both stressed that the phrase had been adopted by the UN General Assembly.¹²⁹

Indigenous peoples are specifically defined in terms of four elements under Articles 1(1)(b) and 1(2) of the Indigenous and Tribal People’s Convention No. 169:

[P]eoples in independent countries . . . are regarded as indigenous on account of their [1] descent from the populations which inhabited the country, or a geographical region to which the country belongs, [2] at the time of conquest or colonisation or the establishment of present state boundaries and who, irrespective of their legal status, [3] retain some or all of their own social, economic, cultural and political institutions. . . [4] Self-identification as indigenous . . . shall be regarded as a fundamental criterion for determining the groups to which the provisions of this Convention apply.¹³⁰

Special Rapporteur Erica-Irene Daes confirmed that these four elements of geographical precedence, historical subjugation, institutional independence, and self-identification define the population, noting that “indigenous peoples” are distinguishable from “peoples” because of the former’s history of colonial subjugation.¹³¹

law, with a view to contributing not only to procedural but also to distributive justice and recognition.”).

126. Conference of the Parties to the Convention on Biological Diversity, *Decision Adopted by the Conference of the Parties of the Convention on Biological Diversity*, at 15–16, U.N. Doc. UNEP/CBD/COP/DEC/XII/12, (Oct. 13, 2014) (emphasis added).

127. U.N. Permanent Forum on Indigenous Peoples, Rep. on the Tenth Session, ¶¶ 26–27, U.N. Doc. E/2011/43-E/C.19/2011/14 (May 27, 2011).

128. Conference of the Parties to the Convention on Biological Diversity, *Report of the Eighth Meeting of the Ad Hoc Open-Ended Inter-Sessional Working Group on Article 8(j) and Related Provisions of the Convention on Biological Diversity*, ¶ 19, U.N. Doc. UNEP/CBD/COP/12/5 (Nov. 11, 2013).

129. G.A. Res. 65/178, at 3 (Mar. 24, 2011).

130. ILO 169, *supra* note 38, arts. 1(1)(b), 1(2).

131. Erica-Irene Daes (Chairperson-Rapporteur of the Working Group on Indigenous Populations), *Standard-Setting Activities: Evolution of Standards Con-*

Unfortunately, there are even fewer authorities to guide the definition of local communities, which is presumably not constrained by the definition of indigenous peoples.¹³² However, the two groups do overlap significantly.¹³³ For instance, the Article 8(j) Working Group emphasizes that geographical precedence, institutional independence, and self-identification are characteristics common to both indigenous peoples and local communities.¹³⁴ As such, this article proposes the following four-part definition for local communities: groups that (1) descend from populations that claim historical precedence to the geographical region; (2) retain some or all of their social, economic, cultural, and political institutions; (3) self-identify as a local community; and (4) comprise a minority. Simply put, this proposed definition modifies the definition of indigenous peoples by replacing the element of historical subjugation with the minority requirement. A minority population is in turn defined in terms of three elements, articulated by former Special Rapporteur Francesco Capotorti, as (1) a numerically inferior group of nationals in a non-dominant position who (2) possess ethnic, linguistic, or religious traits different from the rest of population and (3) demonstrate solidarity in preserving their culture, language, religion, or traditions.¹³⁵ Affirming this definition, Special Rapporteur

cerning the Rights of Indigenous People, ¶¶ 61, 69, U.N. Doc. E/CN.4/Sub.2/AC.4/1996/2 (Jun. 10, 1996) [hereinafter *Indigenous People Report*].

132. See Todd Berry & Charles Lawson, “Local Communities” and Traditional Knowledge at WIPO: A Very Broad Application?, 40 EUR. INTELL. PROP. REV. 485, 487 (2018) (noting that the definition of “local communities” is apparently broader than that of “indigenous peoples”).

133. Ad Hoc Open-Ended Inter-Sessional Working Grp. on Article 8(j) and Related Provisions of the Convention on Biological Diversity, *Participatory Mechanisms for Indigenous and Local Communities in the Work of the Convention*, ¶ 19, U.N. Doc. UNEP/CBD/WG8J/7/L (Nov. 3, 2011); MORGERA ET AL., *supra* note 23, at 38 (observing that “many of the key characteristics of local communities are commonly attributed also to indigenous peoples”).

134. See Ad Hoc Open-Ended Inter-Sessional Working Grp. on Article 8(j) and Related Provisions of the Convention on Biological Diversity, *Report of the Expert Group Meeting of Local Community Representatives Within the Context of Article 8(j) and Related Provisions of the Convention on Biological Diversity*, annex, art. 1, U.N. Doc. UNEP/CBD/WG8J/7/8/Add.1 (Sep. 4, 2011).

135. FRANCESCO CAPORTORTI (SPECIAL RAPPORTEUR OF THE SUB-COMMISSION ON PREVENTION OF DISCRIMINATION AND PROTECTION OF MINORITIES), *STUDY ON THE RIGHTS OF PERSONS BELONGING TO ETHNIC, RELIGIOUS AND LINGUISTIC*

Daes similarly stresses that the group must “lack the numerical strength ever to gain power through democratic means, before it qualifies as a minority.”¹³⁶ For example, a minority would include “subsistence farmers . . . , in-shore fisherpeople, nomadic herders, hunter-gatherers, [and] forest peoples . . . [who] often exist precariously on the edge of . . . industrialized, high-input systems”¹³⁷

Substituting the element of historical subjugation with the minority requirement in the definition of local communities is appropriate for two reasons: First, Protocol drafters distinguished local communities from indigenous peoples to accommodate groups that never experienced colonization but nonetheless remain vulnerable to biopiracy due to their numerical disadvantage.¹³⁸ Examples include “small farming communities in France who have occupied and farmed their lands for many generations acquiring useful . . . specialist knowledge about . . . agriculture, cheese-making and wine-making”¹³⁹ Second, international law recognizes a meaningful distinction between indigenous peoples and minorities. Special Rapporteur Daes observes that “a strict distinction must be made between ‘indigenous rights’ and ‘minority rights,’”¹⁴⁰ since indigenous peoples as defined in the Indigenous and Tribal People’s Convention do not need to be numerically disadvantaged. Hence, several African States and island nations regard their entire population as indigenous peoples.¹⁴¹ On the other hand, the Karen people of Thailand cannot be an indigenous

MINORITIES, ¶ 568, U.N. Doc. E/CN.4/Sub.2/384/Rev.1, U.N. Sales No. E.78.XIV.1 (1977).

136. Indigenous People Report, *supra* note 131, ¶ 52.

137. Naomi Roht-Arriaza, *Of Seeds and Shamans: The Appropriation of the Scientific and Technical Knowledge of Indigenous and Local Communities*, 17 MICH. J. INT’L L. 919, 964 (1996).

138. Cf. Alejandro Lago Candeira & Luciana Silvestri, *Challenges in the Implementation of the Nagoya Protocol from the Perspective of a Member State of the European Union: The Case of Spain*, in THE 2010 NAGOYA PROTOCOL ON ACCESS AND BENEFIT-SHARING IN PERSPECTIVE 269, 290–94 (Morgera et al. eds., 2012) (observing that some communities in Europe qualify as local communities).

139. Expert Grp. Meeting of Local Cmty. Representatives within the Context of Article 8(j) and Related Provisions of the Convention on Biological Diversity, *Guidance for the Discussions Concerning Local Communities Within the Context of the Convention on Biological Diversity*, ¶ 5, U.N. Doc. UNEP/CBD/AHEG/LCR/1/2 (Jul. 7, 2011).

140. Indigenous People Report, *supra* note 131, ¶ 47.

141. Nijar, *supra* note 42, at 1212.

people because their State was never colonized, but they do qualify as a local community. Finally, the identification of both indigenous peoples and local communities as traditional knowledge protection beneficiaries is consistent with the underlying equity rationale, given that each group lacks the clout necessary to accomplish their socioeconomic objectives.

2. “*Holding such Knowledge*”

Article 5(5) requires indigenous and local communities to “hold” the relevant traditional knowledge.¹⁴² The word “holding” dispenses with the idea that traditional knowledge constitutes property, since possession (i.e. “holding”) does not necessarily denote ownership.¹⁴³ The omission of ownership language is consistent with this article’s hypothesis that traditional knowledge protection is fundamentally grounded in the rationale of equity. Nevertheless, two related issues emerge from the interpretation of the phrase “holding such knowledge.” First, must all members of the indigenous and local community possess the relevant knowledge? Second, does the holding of traditional knowledge in one community preclude the holding of that same knowledge by other communities? This article answers both questions in the negative.

First, Article 5(5) does not require every member of the indigenous people and local community to actively possess the community’s traditional knowledge. In practice, traditional knowledge is often confined to shamans and medical healers within the group. Yet it would be inappropriate for shamans and healers, who steward and accumulate intergenerational knowledge on behalf of their communities, to claim individual rights in that knowledge. Notably, international human rights law recognizes that indigenous peoples are guaranteed the enjoyment of their rights as a collective.¹⁴⁴ Accordingly, not every member of the indigenous community must hold the relevant traditional knowledge.

On the second issue, multiple indigenous peoples and local communities can simultaneously hold traditional knowledge under Article 5(5), even when these communities are

142. Nagoya Protocol, *supra* note 18, art. 5(5).

143. Duffield & Suthersanen, *supra* note 66, at 413.

144. G.A. Res. 61/295, annex, United Nations Declaration on the Rights of Indigenous Peoples, at 3 (Sept. 13, 2007).

widely dispersed. Again, this comports with a rejection of the property rationale, since traditional knowledge does not naturally imply rights of exclusion. Traditional knowledge unpredictably diffuses across multiple communities when groups migrate and splinter according to the vicissitudes of history.¹⁴⁵ For example, anthropologists observe that despite the Pacific Island nations' varied cultural conceptions of the hibiscus plant, all their medical traditions include similar notions of the hibiscus' pustule-treating properties.¹⁴⁶ Of course, a greater number of traditional knowledge holders increases transaction costs and reduces the likelihood of successful negotiations, especially when communities emerge from obscurity to make traditional knowledge claims after the conclusion of benefit-sharing agreements.¹⁴⁷ For example, the San people recently challenged the validity of a benefit-sharing agreement negotiated between Schwabe Pharmaceuticals and the Xhosa people for use of the latter's traditional knowledge of the South African geranium's respiratory benefits on the ground that San forbears transmitted this knowledge to the Xhosa centuries ago.¹⁴⁸ This problem is further complicated by the evidentiary difficulties inherent in authenticating historical claims. Nevertheless, one solution would be to give primacy to expert opinion in the evaluation of anthropological claims. Practical difficulties do not outweigh the inequity of the alternative scenario in which pharmaceutical companies discharge their Article 5(5) obligation in a "race to the bottom" to negotiate agreements with the weakest indigenous community.¹⁴⁹

However, in situations where shared knowledge is widely known across multiple States, the Article 5(5) obligation

145. See Dutfield & Suthersanen, *supra* note 66, at 409–10 (debunking that the notion that geographies of genetic resources are static).

146. Daniel Robinson & Miranda Forsyth, *People, Plants, Place, and Rules: the Nagoya Protocol in Pacific Island Countries*, 54 GEOGRAPHICAL RES. 324, 331–32 (2016).

147. Carmen Richerzhagen & Karen Holm-Mueller, *The Effectiveness of Access and Benefit Sharing in Costa Rica: Implications for National and International Regimes*, 53 ECOLOGICAL ECON. 445, 450 (2005).

148. Roger Chennells, *Traditional Knowledge and Benefit Sharing After the Nagoya Protocol: Three Cases from South Africa*, 9 L. ENV'T & DEV. J. 163, 170 (2013).

149. Angela Daly, *Legislating on Biopiracy in Europe: Too Little, Too Late?*, in INDIGENOUS INTELLECTUAL PROPERTY: A HANDBOOK OF CONTEMPORARY RESEARCH 365, 373 (Matthew Rimmer ed., 2015).

should only be owed to indigenous peoples and local communities within the State where the traditional knowledge was first accessed. Otherwise, the transaction costs to pharmaceutical companies become prohibitively high. Going forward, multilateral discussions are likely to revolve around the development of a binding instrument addressing situations where traditional knowledge is shared by indigenous peoples and local communities located in multiple States. One such multilateral framework was already proposed in the Draft Association of Southeast Asian Nations (ASEAN) Framework Agreement on Access to Biological and Genetic Resources.¹⁵⁰ But at present, Article 11(2) of the Protocol merely encourages States to cooperate multilaterally in those circumstances.¹⁵¹

State practice demonstrates the feasibility of multi-party negotiations. In 2002 the South African Council for Scientific and Industrial Research (CSIR) famously concluded benefit-sharing agreements with San people from South Africa, Botswana, and Namibia for traditional knowledge in the hoodia plant's appetite-suppressing properties.¹⁵² Similarly, in 2007, the CSIR granted five percent royalties to both the Seleka and Shongoane communities for use of their traditional knowledge in the natural sweetener molomo monate.¹⁵³ Analyzing these agreements suggests that there are five relevant factors to consider in ascertaining the appropriate allocation of benefits between multiple beneficiaries: (1) how long the group has held the traditional knowledge, (2) how long the group has exclusively held the traditional knowledge, (3) the relative population sizes, (4) the proportion of the community that holds the traditional knowledge, and (5) whether that commu-

150. Draft Association of Southeast Asian Nations (ASEAN) Framework Agreement on Access to Biological and Genetic Resources, art. 7 (Feb. 24, 2000).

151. Nagoya Protocol, *supra* note 18, art. 11(2).

152. Laura Foster, Re-Invention Hoodia: Patent Law, Epistemic Citizenship, and the Making of Difference in South Africa 1, 44 (2012) (Ph.D. dissertation, University of California, Los Angeles), <https://escholarship.org/content/qt2z0012rf.pdf> [<https://perma.cc/R6LC-52HM>].

153. Margo A. Bagley, *Toward an Effective Indigenous Knowledge Protection Regime: Case Study of South Africa* 15 (Ctr. for Int'l Governance Innovation, Paper No. 207, 2018), <https://www.cigionline.org/sites/default/files/documents/Paper%20no.207web.pdf> [<https://perma.cc/43XG-EJU5>].

nity exercises sovereignty over the associated genetic resource.¹⁵⁴

B. *The Representatives*

Article 5(5) does not provide criteria for identifying legitimate representatives of indigenous peoples and local communities to negotiate mutually agreed terms. Accordingly, this article posits two possible approaches. The first is a paternalistic, top-down approach. On this view, the State government has a superior ability to undertake interstate negotiations and to counterbalance multinational companies' strong bargaining power. However, this approach risks States compromising the interests of indigenous peoples and local communities in favor of competing national priorities. Therefore, such an approach might reasonably be limited to situations where indigenous peoples comprise the national population's majority, since democratic legitimacy is largely assured. For example, in 2004, the Samoan government represented its people and negotiated a twenty percent royalty agreement with the AIDS Research Alliance for the use of traditional knowledge of the mamala plant's anti-hepatitis properties.¹⁵⁵ Domestic laws in certain jurisdictions, such as Zambia¹⁵⁶ and Kyrgyzstan,¹⁵⁷ also empower the national governments to negotiate on behalf of indigenous peoples or local communities.

The second approach involves authorizing elected representatives of indigenous peoples and local communities to negotiate equitable benefit-sharing agreements. This arrangement is preferable in most situations, as it respects these communities' rights to self-determination. Article 12(1) of the Protocol provides some guidance here, as it obliges State Parties to "take into consideration indigenous and local communities' customary laws, community protocols and procedures . . . with respect to traditional knowledge associated with genetic resources."¹⁵⁸ As such, traditional knowledge users must

154. Chennells, *supra* note 148, at 174.

155. ROBINSON, *supra* note 77, at 105.

156. Zambia Law, *supra* note 105, § 26.

157. See Law of the Kyrgyz Republic on the Protection of Traditional Knowledge art. 5 (June 26, 2007) (Kyrg.) (naming the State as a legal subject in the field of traditional knowledge).

158. Nagoya Protocol, *supra* note 18, art. 12(1).

ensure that they are consulting with genuine representatives of indigenous peoples and local communities who have been appointed according to customary protocols. This avoids situations like the Maya bioprospecting controversy, where an American university research union overlooked the informal governance structures of Mayan Indians and erroneously signed benefit-sharing agreements for ethnobiological knowledge with Mayan individuals who did not properly represent their communities.¹⁵⁹ In a similar vein, it would be inappropriate for traditional knowledge users to conclude agreements with an individual shaman who holds a corpus of traditional knowledge on behalf of the community.¹⁶⁰ Consistent with this approach, the Andean Community has gradually shifted its emphasis on cultural assimilation to one recognising the rights of indigenous peoples to self-regulate, inclusive of issues concerning traditional knowledge. For example, Peru has introduced legislation providing that indigenous peoples “may have recourse to their traditional systems for the purposes of the distribution of benefits.”¹⁶¹ A similar approach has been adopted in the Philippines¹⁶² and by members of the African Regional Intellectual Property Organisation.¹⁶³

159. See Dafna Feinholz-Klip et al., *The Limitations of Good Intent: Problems of Representation and Informed Consent in the Maya ICBG Project in Chiapas, Mexico, in INDIGENOUS PEOPLES, CONSENT AND BENEFIT SHARING: LESSONS FROM THE SAN-HOODIA CASE 315* (Rachel Wynberg et al. eds., 2009) (describing how “gaps in the way local communities were included” led to the abandonment of the project).

160. Chennells, *supra* note 148, at 178.

161. Law No. 27811 Introducing a Protection Regime for the Collective Knowledge of Indigenous Peoples Derived from Biological Resources, art. 10, El Peruano (Aug. 10, 2002) (Peru).

162. See The Indigenous Peoples’ Rights Act of 1997, Rep. Act No. 8371, § 32 (Oct. 29, 1997) (Phil.), <https://www.officialgazette.gov.ph/1997/10/29/republic-act-no-8371/> [<https://perma.cc/92F4-D84L>] (declaring that indigenous peoples “have the right to practice and revitalize their own cultural traditions and customs” and that the state will protect “the right to the restitution of cultural, intellectual religious, and spiritual property taken without their free and prior informed consent or in violation of their laws, traditions and customs.”).

163. See African Reg’l Intellectual Prop. Org., *Swakopmund Protocol on the Protection of Traditional Knowledge and Expressions of Folklore* § 4 (Aug. 9, 2010) (noting that the ownership relationship over cultural knowledge “may be established formally or informally by customary practices, laws or protocols.”).

VI. THE ARTICLE 5(5) OBLIGATION AND ITS EXCEPTIONS

Article 5(5) imposes three distinct obligations: to fairly and equitably share benefits arising from the use of traditional knowledge; to take appropriate legal measures to that end; and to ensure that such sharing is mutually agreed. However, the Protocol does not expound on the precise content of these obligations, and commentators have not addressed the resulting uncertainty in any great depth. As such, this article proposes the following: first, States have no discretion to exclude Article 5(5) protection except on grounds of public health; and second, the determination of what is fair and equitable hinges on a five-factor evaluative judgment.

A. *The Obligation to Take Appropriate “Legislative, Administrative or Policy Measures”*

Article 5(5) obliges States Parties to “take legislative, administrative or policy measures, as appropriate,” to ensure that benefits from the use of traditional knowledge are equitably shared.¹⁶⁴ In contrast to CBD Article 8(j), which merely “encourages” the equitable sharing of benefits arising from the use of traditional knowledge,¹⁶⁵ Article 5(5) employs the mandatory imperative phrase “shall take.”¹⁶⁶ However, it remains unclear whether Article 5(5) can be subordinated to overriding national interests. Unlike the obligation to ensure equitable sharing of benefits in genetic resources under Article 5(2), the Article 5(5) obligation concerning traditional knowledge does not contain the qualifying phrase “in accordance with domestic legislation.”¹⁶⁷ However, this article contends that the qualifying phrase “as appropriate” offers States some latitude to exercise discretion. This interpretation is consistent with Article 8 of the Protocol, which envisages three possible exceptions to benefit-sharing legislation when matters of biological diversity, human health, or food security are implicated.¹⁶⁸ Despite the possibilities provided in Article 8, this article argues that States may only permissibly carve out policy exceptions to Article 5(5) on the ground of public health, not

164. Nagoya Protocol, *supra* note 18, art. 5(5).

165. CBD, *supra* note 18, art. 8(j).

166. Nagoya Protocol, *supra* note 18, art. 5(5).

167. *Id.* art. 5(2).

168. *Id.* at art. 8(b).

for biological diversity, food security, or innovation policy reasons. Furthermore, States can limit Article 5(5) on public health grounds only to the extent strictly necessary to counteract exigent circumstances.

First, Articles 8(a) and 8(c) of the Protocol require States to consider biological diversity and the importance of food security when “implementing access and benefit-sharing legislation.”¹⁶⁹ However, these provisions do not necessarily create exceptions to the Article 5(5) obligation, but rather affect the determination of a fair and equitable quantum of compensation. Granted, the purpose of biological diversity would be served if knowledge about preserving vulnerable plants in times of drought was unencumbered by benefit-sharing obligations, but traditional knowledge associated with genetic resources for the purpose of the Protocol relates to the properties of genetic resources rather than methods of using genetic resources, which would more appropriately constitute traditional cultural practices. In addition, circumscribing rights to traditional knowledge would more likely accelerate the exploitation of genetic resources for use in drug research and therefore actually undermine biological diversity. Moreover, carving out a food security exception to Article 5(5) would have an imperceptible impact on the availability of food. Excluding traditional knowledge protection to improve food access would be conceptually misguided because food security calls for conservation of the genetic resource, not traditional knowledge of the genetic resource’s properties. Finally, the Protocol does not allow limitations on the Article 5(5) obligation based on a pro-patent innovation policy. Just as moral rights can exist outside copyright, nothing prevents patent rights—particularly the right to be compensated—from coexisting alongside traditional knowledge protection, which does not foreclose the grant of patents over resulting inventions. The right to obtain an equitable share of the benefits arising from the use of traditional knowledge simply mirrors the compulsory licensing regimes found in copyright and patent law, where holders of intellectual property rights are legally compelled to license exclusive rights in exchange for a fee. But even if traditional knowledge protection did undermine patent ownership, Special Rapporteur Farida Shaheed observes

169. *Id.* arts. 8(a), (c).

that “the objective of intellectual property rights law is not to provide the maximum possible return to rights holders.”¹⁷⁰ Although rights-holders are entitled to recoup their research investments, intellectual property rights might well be subject to “inalienable” human rights,¹⁷¹ such as indigenous peoples’ right to self-determination.

Second, Article 8(b) expressly carves out a public health exception during “imminent emergencies that threaten or damage human . . . health.”¹⁷² As stated in the Protocol’s preamble, securing rapid access to traditional knowledge is crucial for “public health preparedness and response purposes.”¹⁷³ In response to legislative developments in South Africa¹⁷⁴ and the Philippines,¹⁷⁵ an intergovernmental committee under the aegis of WIPO drafted a public health exception for use of traditional knowledge in government hospitals or for other public health purposes.¹⁷⁶ This applies with greater force because the right to health is a core human right entrenched in the Universal Declaration of Human Rights¹⁷⁷ and the International Covenant on Economic, Social and Cultural Rights (ICESCR).¹⁷⁸ Similarly, Article 8(1) of the Agreement on Trade-Related Aspects of Intellectual Property Rights expressly provides that States may “adopt measures necessary to protect public health and nutrition.”¹⁷⁹

Third, the public health limitation should only be invoked where measures to protect public health are strictly necessary. Under the Protocol, States can only invoke the public

170. Shaheed Report, *supra* note 11, ¶ 62.

171. *Id.* para. 32.

172. Nagoya Protocol, *supra* note 18, at art. 8(b).

173. *Id.* at pmb.

174. Traditional Health Practitioners Act 22 of 2007 (S. Afr.).

175. Traditional and Alternative Medicine Act of 1997, Rep. Act No. 8423 (July 28, 1997) (Phil.).

176. World Intellectual Prop. Org. [WIPO] Intergovernmental Comm. on Intellectual Prop. & Genetic Res., Traditional Knowledge, & Folklore, *The Protection of Traditional Knowledge: Revised Objectives and Principles*, annex at 33, WIPO/GRTKF/IC/9/5 (Jan. 9, 2006).

177. G.A. Res. 217 (III) A, Universal Declaration of Human Rights, art. 25(1) (Dec. 10, 1948).

178. ICESCR, *supra* note 5, art. 12(1).

179. Agreement on Trade-Related Aspects of Intellectual Property Rights, annex 1C, art 8(1), Apr. 15, 1994, 1869 U.N.T.S. 299.

health exception where there is an “imminent emergency.”¹⁸⁰ This comports with Article 46(2) of the Declaration on the Rights of Indigenous Peoples,¹⁸¹ Article 4 of the ICESCR,¹⁸² and Article 18(3) of the International Covenant on Civil and Political Rights (ICCPR),¹⁸³ which permit limitations on human rights if they are strictly necessary. The cross-pollination of human rights principles is particularly appropriate here because traditional knowledge protection is premised on the human right to self-determination. Thus, while Special Rapporteur Shaheed accepts that traditional knowledge may “be made available to others for the fulfilment of their right to health,”¹⁸⁴ she also affirms that this measure must be “strictly necessary.”¹⁸⁵ For example, it would not be strictly necessary to use traditional knowledge to treat diseases that can be cured by drugs cited on the WHO’s list of essential medicines, unless the traditional knowledge yields superior efficacy, safety, or affordability compared to existing medications.¹⁸⁶ But even in such situations, it would be prudent for States not to prematurely waive the benefit-sharing obligation and rather facilitate an “expeditious fair and equitable sharing.”¹⁸⁷

B. *The Obligation to Share Benefits in a Fair and Equitable Way*

The substantive obligation in Article 5(5) requires States to share benefits “in a fair and equitable way.”¹⁸⁸ However, the Protocol affords no guidance to assist in the evaluation of “fair and equitable.” Endeavoring to demystify this expression, CBD Parties adopted the non-binding Bonn Guidelines in 2002, which flesh out relevant factors such as the types of benefits (e.g. monetary versus non-monetary), timing of benefits (e.g. royalty, milestone, or up-front), distribution of benefits (e.g.

180. Nagoya Protocol, *supra* note 18, at art. 8(b).

181. G.A. Res. 61/295, United Nations Declaration on the Rights of Indigenous Peoples, art. 46(2) (Sept. 13, 2007).

182. ICESCR, *supra* note 5, art. 4.

183. ICCPR, *supra* note 5, at art. 18(3).

184. Shaheed Report, *supra* note 11, ¶ 43.

185. *Id.* ¶ 44.

186. See Semra Sevim, *Traditional Medicine*, 41 ENV’T POL’Y & L. 136, 140 (2011) (noting that governments must “ensure the accessibility, the availability, the acceptability and the quality of a medicine).

187. Nagoya Protocol, *supra* note 18, at art. 8(b).

188. *Id.* art 5(5).

between multiple beneficiaries), and specific conditions of the country and stakeholders involved.¹⁸⁹ However, these factors appear rather circular because they do not provide reasons why, for example, monetary rather than non-monetary benefits might be preferred. Accordingly, this article argues that the “fair and equitable” inquiry should be an evaluative judgment, having regard to the five factors below.

The first factor is the traditional knowledge’s intrinsic value, which examines how closely the indigenous peoples hold their traditional knowledge.¹⁹⁰ For example, knowledge that is in “active service to enrich, sustain, or address the needs of the indigenous group or local community” should be ascribed greater value.¹⁹¹ The second factor is the distance between the traditional knowledge and the genetic resource. For instance, traditional knowledge inextricably linked to and directly derived from the genetic resource should be accorded greater value, since the genetic resource would not be exploited but for the contemporaneous utilization of associated traditional knowledge. In contrast, the off-site use of traditional knowledge documented in publications would warrant less remuneration. The third factor is the proximity between the traditional knowledge and its subsequent utilization.¹⁹² As previously mentioned, a pharmaceutical company’s utilization of traditional knowledge may deviate significantly from indigenous use of such knowledge, especially when scientists apply sophisticated techniques to isolate genes, modify derivatives to create proteins, or synthesize analogous substitutes. It appears that the more indirect, tangential, and sophisticated the subsequent utilization of traditional knowledge, the lower the share

189. SECRETARIAT OF THE CONVENTION ON BIOLOGICAL DIVERSITY, BONN GUIDELINES ON ACCESS TO GENETIC RESOURCES AND FAIR AND EQUITABLE SHARING OF THE BENEFITS ARISING OUT OF UTILIZATION 14–15 (2002). *See generally* VCLT, *supra* note 44, art. 31(2)(a) (permitting the consultation of agreements made between all the parties in connection with the conclusion of the treaty).

190. *See* Ruth Okediji, *A Tiered Approach to Rights in Traditional Knowledge*, 58 WASHBURN L. J. 271, 313 (2019) (discussing the minimum conditions necessary for traditional knowledge to qualify as “closely held”).

191. *Id.*

192. *See* Dutfield & Suthersanen, *supra* note 66, at 430 (noting that the difficulty in determining “benefit” lies in evaluating the “interdependence amongst [the user’s ability to locate the value of the traditional knowledge] and consequent uses.”).

of benefits granted to indigenous peoples.¹⁹³ The fourth factor is the relationship between traditional knowledge and its potential commercialization.¹⁹⁴ Non-commercial research warrants a reduced share of benefits, especially if the research aims to generate positive externalities (e.g. by promoting climate change awareness).¹⁹⁵ However, this is not dispositive of the inquiry because non-commercial research often forms the basis of commercial activity. Thus, one solution is to incorporate into benefit-sharing agreements a milestone payment clause that activates upon commercialization of traditional knowledge. The fifth factor is extrinsic considerations. These include miscellaneous costs pertaining to the genetic resource's scarcity, upkeep costs falling on indigenous communities to cultivate the genetic resource, and administrative costs for disseminating benefits to the community.¹⁹⁶

Extensive State practice affords valuable guidance. In 1995, the Kani people of India concluded a benefit-sharing agreement with biologists from the Tropical Botanic Garden Research Institute for the anti-fatigue properties of the *arogyapacha* plant's leaves. The Kani obtained a comparatively high fifty percent upfront fee and royalties derived from the commercialized drug.¹⁹⁷ Similarly, in 2009, Griffith University researchers agreed to a fifty percent revenue benefit-sharing contract with the Jarlmadangah Buru people of Western Australia to use traditional knowledge of the analgesic properties

193. See e.g., ROBINSON, *supra* note 77, at 124–25 (discussing how a subsequent utilization of traditional knowledge that did not derive directly from the traditional knowledge meant that the benefits received by the indigenous people were largely those in exchange for the supply of the genetic resource itself).

194. See Nijar, *supra* note 56, at 464–65 (discussing the blurred lines between commercial and non-commercial purposes).

195. See Elisa Morgera, *The Need for an International Legal Concept of Fair and Equitable Benefit Sharing*, 27 EUR. J. INT'L L. 353, 377 (2016) (noting that “little attention has been paid to benefit sharing from the non-commercial use of traditional knowledge, including pure research aimed at providing global benefits (such as advancing climate science).”).

196. See Dutfield & Suthersanen, *supra* note 66, at 432 (identifying “several further exogenous considerations [that] can play a part in attempting to capture a fair and equitable benefit as perceived by the knowledge holders and their communities”).

197. Philippe Cullet et. al., *Intellectual Property Rights, Plant Genetic Resources and Traditional Knowledge*, in RIGHTS TO PLANT GENETIC RESOURCES AND TRADITIONAL KNOWLEDGE 112, 138 (Susette Biber-Klemm et. al. eds, 2006).

of barringtonia tree bark.¹⁹⁸ Commentators explain that the unusually high pay-out was due to the proximity between the traditional knowledge, the isolation of the relevant compound, and the subsequent commercial development of the analgesic drug.¹⁹⁹ In contrast, a mere twenty percent royalty on profits was settled between the Samoan Government and the AIDS Research Alliance.²⁰⁰ Although the Samoan people possessed traditional knowledge in the anti-hepatitis qualities of the mamala plant, the AIDS Research Alliance intended to conduct speculative research on the potential AIDS-treating properties of prostratin, a protein found in mamala. The South African CSIR concluded a six percent royalty agreement with the Maswanganyi and Mabunda communities for knowledge about the insect-repelling qualities of lippia javanica shrub.²⁰¹ In addition to the royalties, however, the CSIR taught the community how to distil lippia oil and established a community enterprise to manufacture insect-repellent candles using community-cultivated lippia javanica.²⁰² In a similar vein, the CSIR agreed to a six percent share of royalties with the San people of South Africa, Namibia, and Botswana for the utilization of the appetite-suppressing properties in hoodia.²⁰³ While these case studies do not prescribe rigid thresholds, the agreements set useful precedents that can serve as a starting point for discourse.

C. *The Obligation of Mutually Agreed Terms*

Article 5(5) states that “sharing shall be upon mutually agreed terms,”²⁰⁴ which essentially requires the formation of a private law contract. When companies fail to negotiate benefit-sharing agreements prior to the utilization of traditional knowledge, States should mandate negotiations. However, questions arise as to the appropriate remedy in scenarios where negotiations have collapsed but the use of traditional knowledge nonetheless continues. In those situations, State-

198. ROBINSON, *supra* note 77, at 139–40.

199. *Id.* at 140.

200. *Id.* at 105.

201. Bagley, *supra* note 153, at 14.

202. *Id.*

203. Chennells, *supra* note 148, at 168–69.

204. Nagoya Protocol, *supra* note 18, art. 5(5).

compelled mutual consent would not be sensible. Indeed, the ICJ has never ordered a monetary award for benefits-sharing. The closest analogue to this situation came before the ICJ in the Fisheries Jurisdiction case, where the court held that the equitable solution to a failure to conclude a fair and equitable benefit-sharing agreement was to mandate negotiations.²⁰⁵ Nevertheless, the court qualified that “it would not only be improper but quite out of the question for a court of law to direct negotiations in every case . . . when the circumstances did not justify the same.”²⁰⁶ Indeed, the appropriate recourse, if any, would generally reside in a dispute resolution clause within a treaty or contract concluded between the relevant parties. The contours of such a mechanism are beyond the scope of this article, but suffice it to say that international courts and tribunals are unlikely to overstep their bounds and determine equitable compensation apart from a clear articulation of mutual consent.

VII. APPLICATION OF THE PROPOSED ARTICLE 5(5) FRAMEWORK

An application of the proposed framework to three well-known controversies illustrates how the framework might assist in ascertaining the nature and scope of traditional knowledge protection afforded to indigenous people. The three scenarios—concerning the quassia plant, rooibos bush, and argan tree—were selected for their recency and archetypal representation of food-related, cosmetic, and medical traditional knowledge.

A. *The Quassia Plant in French Guiana*

In 2003, the Institut de recherche pour le développement (IRD), a French government research institute, conducted a survey of 117 French Guianese individuals regarding their experiences with malaria treatment.²⁰⁷ Among the documented treatments, the study revealed a widely-known traditional malaria treatment using quassia tree leaves.²⁰⁸ Experimenting with

205. Fisheries Jurisdiction Case (U.K. v. Ice.), Judgment, 1974 I.C.J. Rep 395, ¶¶ 77–78 (July 25).

206. *Id.*, Declaration by Judge Singh, at 41.

207. Bourdy et al., *supra* note 2, at 291.

208. *Id.*

quassia leaf concentrates, the researchers then embarked on a protracted process to isolate the leaf's active compound in 2004.²⁰⁹ Seven years later, the researchers finally succeeded in this endeavor and acquired patents over Simalikalactone E, the active compound in quassia.²¹⁰ Hailed as a "success story in French research," the researchers received the 2013 IRD Prize in innovation for Southern countries.²¹¹ However, during the 2015 French National Assembly debates on the Nagoya Protocol, reports surfaced that the Institute had misappropriated French Guianese traditional knowledge in the quassia plant's antimalarial and anti-cancer properties.²¹²

From the outset, it appears that French Guianese people possess traditional knowledge associated with genetic resources under Article 5(5) because they knew of the quassia's "tonic, digestive, febrifugal and antimalarial properties."²¹³ Indeed, Guianese merchants sell "bitter cups," which are chalices carved out of quassia wood that diffuse antimalarial and febrifugal properties into the beverage contained in the cup.²¹⁴ The greater difficulty lies in ascertaining whether this traditional knowledge directly led to the isolation of Simalikalactone E such that the French researchers could be said to have utilized traditional knowledge under Article 5(5). It may be argued that too many steps existed between the traditional knowledge and the compound's isolation, since researchers interviewed Guianese individuals, examined the quassia leaf concentrates, and devised a novel method to extract the compound. Nevertheless, the better view is that traditional knowledge was still utilized because the Guianese knowledge in the quassia's antimalarial properties was fundamental, essential, and indispensable to the isolation of Simalikalactone E. France promulgated traditional knowledge laws on August 8, 2016, and ratified the Protocol on August 31, 2016. Therefore, upon ratification of the Protocol and its retroactive application rules, the researchers were ostensibly in continuing breach of an obligation to equitably share benefits arising from the use of traditional knowledge. No issue of extraterritorial applica-

209. *Id.* at 292.

210. *Id.* at 292–93.

211. *Id.* at 293.

212. *Id.*

213. Bourdy et al., *supra* note 2, at 292.

214. *Id.*

bility arises because French Guiana remains a French territory. But to the extent that traditional knowledge in the quassia is also shared by other indigenous peoples in the Amazon basin, the issue of extraterritoriality might rear its head in the future.

The holders of the relevant traditional knowledge are the Pahikweneh, Lokono, and Teleuyu peoples, who collectively account for five percent of the French Guianese population and appear to satisfy the definition of indigenous peoples under Article 5(5). Legally classified as indigenous peoples by the Inter-American Court of Human Rights,²¹⁵ these groups (1) inhabited the coastal region between Saint Laurent du Maroni and Saint Georges de l'Oyapock prior to colonization,²¹⁶ (2) retain their governance institutions of local chieftainship, (3) were colonized in 1643, and (4) self-identify as indigenous. The research institute did ultimately sign “a commitment sharing agreement for potential benefits . . . [with] the Amerindians and Bushinengue communities” in 2016,²¹⁷ but traditional knowledge in the quassia is also commonly shared by other indigenous peoples and local communities in Belize, Colombia, Costa Rica, Guatemala, Guyana, Honduras, Mexico, Nicaragua, northern Brazil, Panama, Suriname, and Venezuela.²¹⁸ An extensive anthropological study is inappropriate here, but given the prohibitively high transaction costs of negotiating with indigenous peoples in multiple States, the research institute would, in this proposed framework, only retain an Article 5(5) obligation to negotiate with appointed representatives of indigenous peoples within French Guiana. The U.N. Economic and Social Council has recognized the French Indigenous and Bushinenge Communities Board in French Guiana as an appropriate partner with “custodians of traditional knowledge.”²¹⁹ In the determination of fair and equita-

215. *Kaliña and Lokono Peoples v. Suriname*, Merits, Reparations, and Costs, Judgment, Inter-Am. Ct. H.R. (ser. C), No. 309 (Nov 25, 2015) (proceeding on the basis that the Kaliña and Lokono Peoples are “indigenous peoples”).

216. *Indigenous Peoples in French Guiana*, INT’L WORLD GRP. FOR INDIGENOUS AFFS., <https://www.iwgia.org/en/french-guiana> [https://perma.cc/V9JD-DAZB] (last visited Nov. 11, 2020).

217. Bourdy et al., *supra* note 2, at 295.

218. *Id.* at 290.

219. Press Release, Economic and Social Council, Partnering with Custodians of Traditional Knowledge Key to Tackling Climate Change, Protecting

ble benefits, the parties would have to weigh factors favoring a higher monetary sum, such as the effectiveness of the quassia's malaria-treating properties²²⁰ and their intrinsic link to the domestically cultivated tree, with those militating against a larger quantum of benefits, include the non-commercial nature of the research and the distance between the quassia's antimalarial properties and the isolated compound. Relevant factors for determining the appropriate allocation of benefits between the indigenous peoples include relative population size and how long and exclusively the communities have held such knowledge.

States have narrow discretion to limit the Article 5(5) obligation in imminent emergencies that threaten human health. The WHO estimates that malaria kills half a million people annually,²²¹ so the Article 5(5) obligation could be justifiably waived given the Simalikalactone E molecule's effectiveness in treating malaria. However, limitations on Article 5(5) are not strictly necessary for the treatment of malaria in this case, as there exist reasonable treatment alternatives, such as artemisinin combination therapy and mosquito nets. On the other hand, Simalikalactone E represents a potentially more cost-effective and efficacious treatment because widespread use of existing remedies has strengthened malaria's resistance. Unless malaria rates have skyrocketed above the usual level, however, the threat of malaria may not necessarily be regarded as an imminent situation.

B. *The Rooibos Plant in South Africa*

In 1772, botanist Carl Thunberg wrote that “the [San and Khoi] country people made tea”²²² using a red bush-like plant, later named rooibos. Colonial subjugation saw the San and Khoi people relocated from their traditional lands, thus open-

Humanity, Speakers Stress as Permanent Forum Continues Session, U.N. Press Release HR/5432 (Apr. 23, 2019).

220. William Fisher, *The Puzzle of Traditional Knowledge*, 67 DUKE L.J. 1511, 1515 (2018) (noting that the quassia's malaria-treating properties actively keep malaria death rates in Guianese communities below five deaths per year).

221. *Id.* at 1514.

222. Rachel Wynberg, *Making Sense of Access and Benefit Sharing in the Rooibos Industry: Towards a Holistic, Just and Sustainable Framing*, 110 S. AFRICAN J. BOTANY 39, 43 (2017).

ing a market for Dutch settlers, who had acquired a taste for the tea, to capitalize. Early settlers witnessed local San and Khoi people “cut [rooibos] tea with knives[,] . . . bruise it with wooden mallets against rocks . . . [and leave] the bruised leaves . . . to . . . ferment under the hot sun.”²²³ Building on these methods, Barend Ginsberg devised a streamlined process to improve tea production.²²⁴ The industry grew, and from 1954 onwards, South Africa’s apartheid government operated a State-run monopoly over the rooibos tea industry.²²⁵ But while the rooibos trade continues to supply ten percent of worldwide herbal tea and reaps \$22 million worth in annual revenue, fewer than seven percent of rooibos tea is cultivated by descendants of the San and Khoi.²²⁶ Against this backdrop, reports surfaced in 2009 that Nestlé had obtained several patents over rooibos tea, which prompted some media backlash.²²⁷

As a preliminary matter, Carl Thunberg’s observations confirm that the San and Khoi peoples have, since the 18th century, held traditional knowledge associated with the rooibos plant, namely its digestive, skin-care, and nervous tension treatments.²²⁸ Again, however, the greater difficulty lies in ascertaining whether Nestlé utilized San and Khoi traditional knowledge. Nestlé’s patents only covered research results relating to the antioxidant molecules responsible for the rooibos’ anti-inflammatory, skin-care, and hair-care properties.²²⁹ Furthermore, Nestlé’s asserted that the research was conducted for non-commercial purposes.²³⁰ Nevertheless, the distinction between commercial and non-commercial research would be irrelevant in the proposed framework, as the material fact is that the traditional knowledge of the rooibos’ anti-inflammation and skin-care properties directly led to the relevant discoveries and was fundamental to the development of the pat-

223. *Id.*

224. *Id.*

225. *Id.* at 44.

226. *Id.* at 40.

227. Bagley, *supra* note 153, at 11.

228. *Id.*

229. *Id.*

230. Nestlé Denies “Rooibos Robbery”, MAIL & GUARDIAN (May 28, 2010), <https://mg.co.za/article/2010-05-28-nestl-denies-rooibos-robbery/> [<https://perma.cc/2K7A-FGP3>].

ent. On the issue of temporal scope, South African law establishes that the equitable benefits-sharing obligation is triggered at the point of utilization, which means Nestlé was potentially in continuing breach of Article 5(5) upon the Protocol's entry into force.²³¹ Finally, while Nestlé contends that it “neither sourced the plants in South Africa nor did research on them there,”²³² the proposed framework applies Article 5(5) regardless of where the traditional knowledge utilization takes place so long as South Africa exercises supervisory control over the company.

The San and Khoi readily satisfy the definition of indigenous peoples because they (1) traditionally inhabited the mountainous region around Wupperthal, (2) experienced historical subjugation, (3) exercise institutional independence, and (4) self-identify as indigenous.²³³ Following an investigation of both communities' traditional knowledge claims, the Department of Environment Affairs concluded that “there is no evidence to dispute the claim by the San and the Khoi people of South Africa that they are the rightful holders of traditional knowledge associated with rooibos.”²³⁴ Apportioning benefits between two groups of indigenous peoples is also not without precedent, since the CSIR previously granted the Seleka and Shongoane each five percent royalties for use of traditional knowledge in the natural sweetener molomo monate.²³⁵ Nestlé should consult with the San Council and National Khoisan Council, well-established representatives for their respective communities, as well as State representatives of mixed-race descendants “who do not easily identify as ‘indigenous’ and do not associate themselves with contemporary San and Khoi political structures such as the San Council and National Khoisan Council.”²³⁶

As to the evaluation of what is fair and equitable, four factors weigh in favor of greater remuneration, namely (1) the San and Khoi peoples' continued consumption of the rooibos

231. South Africa Law, *supra* note 110, § 1 (defining both discoveries about and utilization of traditional knowledge as events triggering benefit-sharing obligations).

232. MORGERA ET AL., *supra* note 23, at 73.

233. Wynberg, *supra* note 222, at 42–44.

234. *Id.* at 42.

235. Bagley, *supra* note 153, at 15.

236. Wynberg, *supra* note 222, at 46.

tea for food and health, (2) the proximity between the rooibos leaves and the knowledge in their practically useful properties, (3) the close relationship between the rooibos' traditionally known properties and the properties disclosed in the patent, and (4) the administrative costs associated with disseminating benefits across two sizable indigenous communities. Only the non-commercial nature of the research cuts in favor of Nestlé. Ultimately, in 2014, both communities concluded a three percent royalty benefit-sharing agreement with Nestlé for the manufacture of a tea vending machine, as a parallel "strategy to leverage wider benefits from the rooibos tea industry."²³⁷

C. *Argan Oil in Morocco*

For centuries, the Amazigh people of Morocco have extracted oil from pressed argan tree seeds for cosmetic use. In 1219, renowned physician Ibn al-Baytar documented the skin-care and haircare properties of argan oil.²³⁸ Several hundred years later, in the 1980s, multinational companies uncovered the oil's cosmetic value and conducted extensive research on its active compounds.²³⁹ Almost a decade later in the early 1990s, industry watchdogs criticized the cosmetic companies' exploitation of Amazigh traditional knowledge.²⁴⁰ But in 1994, scientist Zoubida Charrouf initiated several women-led economic cooperatives that culminated in the signing of a three-way agreement with chemical company BASF and cosmetic giant L'Oréal.²⁴¹ Under this arrangement, BASF refines argan oil for L'Oréal to incorporate into its cosmetics.

Clearly, the Amazigh people possess traditional knowledge associated with genetic resources in argan oil's haircare and skincare properties. Here, two utilizations of traditional knowledge may be alleged: the first concerns BASF's isolation and use of argan biochemical extracts during the refinement process, and the second relates to L'Oréal's use of BASF's processed extracts to create its own "patented pressed cake ex-

237. *Id.* at 42.

238. ROBINSON, *supra* note 77, at 115.

239. *Id.* at 116.

240. *See Id.* at 115 ("This need to conduct R&D raises the relevance of [benefit sharing] and has even led to some criticisms about the apparent lack of [benefit sharing] agreements made by companies in the 1990s and early 2000s.")

241. *Id.* at 117.

tracts.”²⁴² While BASF’s utilization of biochemical extracts is directly based on Amazigh traditional knowledge, L’Oréal’s use of BASF’s processed extract to create its own “patented pressed cake extract is arguably *not* directly based on traditional knowledge because it is from a processed extract not previously used by the [Amazigh].”²⁴³ It should be noted that while Morocco signed the Protocol in December in 2011, it has never ratified the Protocol; the following analysis thus proceeds only for the sake of argument.

The Amazigh qualify as indigenous peoples because they (1) inhabited the Souss Valley and Anti-Atlas mountains prior to colonization, (2) experienced colonial subjugation by France and Spain, (3) retain traditional governance structures of chieftainship, and (4) self-identify as indigenous. However, BASF and L’Oréal’s agreement with a single economic cooperative raises the issue of adequate representation, since “traditional knowledge about the cosmetic benefits of Argan is widely held” among the Amazigh, who constitute the majority of Morocco’s population.²⁴⁴ While the women in the economic cooperative and their communities stand to benefit from the current agreement,²⁴⁵ the distribution of benefits to a narrow population segment for the use of widely held knowledge could raise “questions of distributional equity.”²⁴⁶ Given that the Amazigh comprise Morocco’s homogenous majority, the government would be well suited to spearhead negotiations to offset the multinational companies’ strong bargaining position. To this end, Morocco might emulate the Samoan government, which in 2004 represented its people and negotiated a twenty percent royalty agreement with the AIDS Research Alliance for the use of traditional knowledge in the mamala plant’s anti-hepatitis properties.²⁴⁷

The issue of extraterritorial application could arise if BASF and L’Oréal, respectively German and French companies, choose to utilize the traditional knowledge elsewhere. However, there is no suggestion that this is the case. Finally, if

242. *Id.* at 124.

243. *Id.*

244. ROBINSON, *supra* note 77, at 124.

245. *Id.*

246. *Id.* at 125.

247. *Id.* at 105.

Morocco were to ratify the Protocol, the companies would not be able to carve out a public health exception for argan oil because cosmetic benefits do not rise to “imminent emergencies that threaten . . . human health.”²⁴⁸ Regulatory authorities would also be entitled to review the BASF agreement to evaluate whether the terms are fair and equitable. Indeed, all five proposed factors favor a greater quantum of equitable benefits: (1) the Amazigh actively use argan oil’s cosmetic properties; (2) there is closeness between argan oil and its cosmetic properties; (3) there is tight proximity between argan oil’s cosmetic properties and BASF’s isolation of argan biochemical extracts; (4) BASF’s utilization of argan oil’s cosmetic properties is commercial; and (5) the administrative costs associated with cultivating argan appear quite high.

VIII. CONCLUSION

Since 1996, stakeholders have signed over 465 benefit-sharing agreements for the use of traditional knowledge.²⁴⁹ Consistent with the equity rationale of traditional knowledge protection and established principles of international law, this article’s proposed legal framework for Article 5(5) of the Nagoya Protocol strikes the appropriate balance between the need to uphold cultural authenticity, indigenous self-determination, and biological diversity and the importance of promoting science, innovation, and public health. This framework may prove useful to States as they consider how to implement Article 5(5) in their domestic legislation.²⁵⁰ Moreover, the international community’s experience with Article 5(5) will likely find renewed relevance during negotiations for a similar provision in a binding instrument governing the conservation and sustainable use of marine biological diversity in areas be-

248. Nagoya Protocol, *supra* note 18, art. 8(b).

249. See Nicolas Pauchard, *Access and Benefit Sharing Under the Convention on Biological Diversity and Its Protocol: What Can Some Numbers Tell Us About the Effectiveness of the Regulatory Regime?*, RESOURCES, Feb. 2017, at 1, 11 (noting that between 1996 and 2015, there have been 217 benefit sharing agreements for commercial research and 248 for non-commercial research).

250. Of course, these ground-up initiatives can and should be encouraged through the simultaneous development of complementary infrastructure and online information systems.

yond national jurisdiction.²⁵¹ Nevertheless, many issues remain open for discussion. What formalities should be required as a condition for the exercise of the right to equitable compensation? Who should administer the right to equitable compensation? Should international law impose reporting obligations on companies signing benefit-sharing agreements?²⁵² These questions provide fodder for multilateral discussions and perhaps represent the first steps towards the development of an equity-based approach to traditional knowledge protection.

251. G.A. Res. 72/249, International Legally Binding Instrument Under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (Jan. 19, 2018).

252. Daly, *supra* note 149, at 374.

APPENDIX

Genetic Resource	Traditional Knowledge	Indigenous People/Local Community	User	Utilization	Benefit Agreement
Chang shan (1940) ²⁵³	Anti-malarial properties	Chinese medical practitioners	U.S. & Chinese labs	Isolated alkaloids	No
Rosy periwinkle (1954) ²⁵⁴	Anti-diabetic properties	Malagasy (Madagascar)	Eli Lilly	Cancer drug	No
Arogyapacha (1995) ²⁵⁵	Anti-fatigue properties	Kani (India)	Research institute	Anti-fatigue drug	50% fee & royalty
<i>Lippia javanica</i> (1997) ²⁵⁶	Insect-repellent properties	South African local communities	Research institute & South African company	Mosquito candles	6% royalty, created jobs
Turmeric (1997) ²⁵⁷	Wound-healing properties	Ayurvedic practitioners	U.S. university	Obtained patent	No, patent revoked
Neem (2000) ²⁵⁸	Fungicide & pesticide	Ayurvedic practitioners	W.R. Grace	Obtained patent	No, patent revoked
Kwao krua (2000) ²⁵⁹	Aphrodisiac qualities	Karen (Thailand)	South Korean company	Obtained patent	No
Hoodia (2002) ²⁶⁰	Hunger-suppressing qualities	San (South Africa)	Research institute & Polish company	Dietary supplement	6% royalty

253. See *supra* notes 72–73 and accompanying text.

254. Okediji, *supra* note 190, at 276.

255. See *supra* note 197 and accompanying text.

256. See *supra* notes 201–02 and accompanying text.

257. Nadkarni & Rajam, *supra* note 29, at 187.

258. Dutfield & Suthersanen, *supra* note 66, at 420–21.

259. Ryan Levy & Spencer Green, *Pharmaceuticals and Biopiracy: How the America Invents Act May Reduce the Misappropriation of Traditional Medicine*, 23 U. MIAMI BUS. L. REV. 401, 407–15 (2015).

260. See *supra* note 203 and accompanying text.

Genetic Resource	Traditional Knowledge	Indigenous People/Local Community	User	Utilization	Benefit Agreement
Mamala (2004) ²⁶¹	Treats hepatitis	Samoan	AIDS Research Alliance	AIDS research	20% royalty
Argan (2005) ²⁶²	Food & skin care	Amazigh (Morocco)	L'Oréal & Cognis	Derived and patented extract	Yes, sum unknown
Molomo monate (2007) ²⁶³	Natural sweetener	South African local communities	Cargill	Obtained patent	10% milestone, 5% royalty
Barringtonia (2009) ²⁶⁴	Analgesic properties	Aboriginal Australian community	Australian university	Isolated compound	50% returns
Rooibos & Honeybush (2010) ²⁶⁵	Anti-oxidant properties	South African	Nestlé	Applied for patent	No
Quassia (2015) ²⁶⁶	Anti-fever properties	French Guianese & Amazon region	Research institute	Isolated compound	No

261. See *supra* note 77 and accompanying text.

262. See *supra* Section VII(C).

263. See *supra* note 153 and accompanying text.

264. See *supra* note 198 and accompanying text.

265. See *supra* Section VII(B).

266. See *supra* Section VII(A).

