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Expanding the Arsenal Against Biopiracy: Application of the Concession Agreement Framework to Prevent Misappropriation of Biodiversity

*Tak Jong Kim**

INTRODUCTION: THE FAÇADE OF EQUITABLE BENEFIT SHARING IN MODERN BIOPROSPECTING

Those who cannot learn from History are condemned to repeat it. Those who fail to negotiate are condemned by History.

—*Srividhya Ragavan*¹

In its most basic form, bioprospecting is a scientific and commercial research paradigm in which bioprospectors explore secluded locations in order to find “new drugs and new foodstuffs from exotic plants and animals.”² Usually from developed countries, bioprospectors derive genetic and biochemical materials that are both scientifically and commercially valuable, and they subsequently patent these materials abroad to justify legal ownership through intellectual property law.³ Although the chances of discovering useful genetic and biochemical materials through this bioprospecting paradigm are low, the rewards of a successful venture are highly lucrative and

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1. Srividhya Ragavan, *New Paradigms for Protection of Biodiversity*, 13 J. INTELL. PROP. RTS. 514, 514 (2008) (expanding on the famous quote by Santayana George in his influential work, *The Life of Reason*).
2. See Maggie Kohls, *Blackbeard or Albert Schweitzer: Reconciling Biopiracy*, 6 CHI.-KENT J. INTELL. PROP. 108, 108 (2007) (summarizing the objectives of various critics of bioprospecting and their proposed approaches to meet those objectives).
3. See Elizabeth Longacre, *Advancing Science While Protecting Developing Countries from Exploitation of Their Resources and Knowledge*, 13 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 963, 966 (2003) (discussing how to justly allocate rights over the use of biodiversity and traditional knowledge and to promote scientific innovations).

may contribute significantly toward scientific advancements.⁴ Yet those who oppose bioprospecting label it derogatively as “biopiracy.”⁵

Beneath the veil of optimism in discovering a completely new type of food or a breakthrough cure for a deadly disease, bioprospecting can harbor fundamental issues of injustice and unfairness.⁶ Professor Vandana Shiva explains that “[f]ive hundred years after Columbus, a more secular version of the same project of colonization continues through patents and intellectual property rights The creation of property through piracy of others’ wealth remains the same as 500 years ago.”⁷

Undoubtedly, bioprospecting is about wealth; however, its ramifications are not limited to wrongful wealth-creation alone.⁸ Bioprospecting is intricately tied to the larger global debates on the preservation of traditional

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4. See Kohls, *supra* note 2, at 112 (explaining that while the probability of finding an exotic plant with true medicinal properties are between one in 10,000 to 50,000, and the potential market value for such finds is worth billions of dollars).
 5. *Id.* at 108–09; see also Burton Ong, *Harnessing the Biological Bounty of Nature: Mapping the Wilderness of Legal, Socio-Cultural, Geo-Political and Environmental Issues*, in INTELLECTUAL PROPERTY AND BIOLOGICAL RESOURCES 1, 7 (Burton Ong ed., 2004) (recognizing that the lack of a definitive definition of “biopiracy” among the bioprospecting opponents is one of their problems). But see Nancy Kremers, *Speaking with a Forked Tongue in the Global Debate on Traditional Knowledge and Genetic Resources: Are U.S. Intellectual Property Law and Policy Really Aimed at Meaningful Protection for Native American Cultures?*, 15 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1, 19 (2004) (limiting “biopiracy” to “illegitimate appropriation and commercialization of human, plant, and other genetic material without the informed consent of its owners or traditional custodians,” *emphasis added*); see VANDANA SHIVA, PROTECT OF PLUNDER?: UNDERSTANDING INTELLECTUAL PROPERTY RIGHTS 49 (Zed Books Ltd. 2001) (defining “biopiracy” as “the use of intellectual property systems to legitimize the exclusive ownership and control over biological resources . . . products . . . and processes that have been used over centuries in non-industrialized cultures”).
 6. See Sudhir D. Ghatnekar & Mandar S. Ghatnekar, *Bio-Prospecting or Bio-Piracy?*, INDIAN EXPRESS NEWSPAPER, Feb. 8, 1999, <http://www.expressindia.com/news/fe/daily/19990208/fec08011.html> (arguing that the developing countries must take the initiative to conserve their biodiversity against “foreign hands”).
 7. VANDANA SHIVA, BIOPIRACY: THE PLUNDER OF NATURE AND KNOWLEDGE 2 (South End Press 1997) (asserting that while the modern “project of colonization” is carried out under a different legal mandate, by different actors, for different natural resources, and through different doctrines, the underlying rationale remains unchanged as the desire to exploit for gain).
 8. *E.g.*, Ghatnekar & Ghatnekar, *supra* note 6 (noting that the estimated global profits from commercial products derived from bioprospecting can be as high as \$50 billion).

knowledge and lifestyle, conservation of natural resources, benefit-sharing, scientific innovation, and moral responsibility.⁹ The potential injustice and unfairness of bioprospecting can impact each of these concerns at multiple levels of society, from the individual to the entire world. Thus, it is imperative that bioprospecting must not become biopiracy.¹⁰

Nevertheless, examples of biopiracy are numerous.¹¹ Presently, there are various legal mechanisms that exist to address this undesirable aspect of bioprospecting,¹² but biopiracy continues in more insidious ways under the façade of equitable benefit-sharing. One example is the patent-based agreement between the indigenous people of the Peruvian Amazon, the Aguaruna, and Washington University in St. Louis, collaborating with the Monsanto Company and the U.S. government.¹³ In this benefit-sharing agreement, the Aguaruna permitted Washington University to bioprospect on their lands and to access their traditional knowledge in return for a 25% royalty fee.¹⁴ But 25% of what? This 25% royalty fee represented a quarter share of Washington University's *one percent* royalty from Monsanto's profits derived from any patented products based on Aguaruna's genetic resources and traditional

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9. See Paul J. Heald, *The Rhetoric of Biopiracy*, 11 CARDOZO J. INT'L & COMP. L. 519, 519–20 (2003) (analyzing the rhetoric used by advocates for indigenous groups); see also Hanns Ullrich, *Traditional Knowledge, Biodiversity, Benefit-Sharing and the Patent System: Romantics v. Economics?* 3 (EUI Working Paper LAW No. 2005/07, 2005), available at <http://cadmus.iue.it/dspace/bitstream/1814/3327/1/law05-07.pdf> (noting that the “defense” movement against expanding intellectual property began at the United Nations Conference on the Environment and Development of Rio de Janeiro in 1992).
 10. See, e.g., WORLD INTELLECTUAL PROPERTY ORGANIZATION, INTELLECTUAL PROPERTY AND TRADITIONAL KNOWLEDGE, BOOKLET NO. 2, 1 [hereinafter BOOKLET NO. 2] available at http://www.wipo.int/freepublications/en/tk/920/wipo_pub_920.pdf (last visited Oct. 5, 2010) (stating that protecting traditional knowledge is not just about protecting the knowledge itself but also the indigenous communities' cultural values, ways of life, and sustainable development).
 11. See, e.g., Nancy Kremers, *Speaking with a Forked Tongue in the Global Debate on Traditional Knowledge and Genetic Resources: Are U.S. Intellectual Property Law and Policy Really Aimed at Meaningful Protection for Native American Cultures?*, 15 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1, 19, 27–33 (2004) (summarizing the famous cases of biopiracy involving tumeric, neem, ayahusaca, and hoodia).
 12. See *infra* Part II (discussing the various legal mechanisms that are currently available to combat biopiracy).
 13. GRAIN, *Biodiversity for Sale: Dismantling the Hype about Benefit Sharing*, Apr. 2000, <http://www.grain.org/briefings/?id=134> [hereinafter GRAIN-1] (last visited Oct. 5, 2010).
 14. *Id.* (stating that the royalty figures often quote a percentage of an undefined whole or a sub-percentage of an unknown fraction of product sales).

knowledge.¹⁵ In other words, the Aguaruna would receive only a meager 0.25% royalty.

Today, this façade of equitable benefit-sharing is taking on greater complexity, and thus, becoming much harder to detect. The highly praised bioprospecting bilateral agreement between Merck & Co., Inc. and the Instituto Nacional de Biodiversidad of Costa Rica (INBio) is illustrative. In this two-year agreement, INBio collected biological samples from Costa Rica's rainforests for Merck's drug-screening program.¹⁶ In exchange, Merck agreed to a benefit-sharing regime that involved a \$1.135 million research budget, royalty payments on any resulting commercial products, and technical assistance and training of INBio's staff.¹⁷ This benefit-sharing regime, however, is hardly equitable. Considering that Costa Rica's rainforests hold roughly 5-7% of the world's biodiversity, if the Merck/INBio bioprospecting agreement were widely replicated, the world's biodiversity would be "auctioned off for the paltry sum of [approximately] \$10 million per annum."¹⁸ It is easy to understand, therefore, why some critics of the Merck/INBio bioprospecting agreement call INBio a "'Trojan Horse' that international 'biopirates' use to gain entrance to the country to plunder its riches."¹⁹

Biopiracy persists today in increasingly sophisticated ways despite the arsenal of legal mechanisms that exist to defend against it. As this arsenal expands, this paper argues that the concession agreement framework should play a substantial role in addressing the issues of injustice and unfairness that may arise in bioprospecting. This discussion focuses narrowly on bioprospecting as it relates to patents on genetic resources and not on traditional knowledge due to its diminished significance in the modern bioprospecting paradigm.²⁰ Part I briefly examines the background of biopiracy.²¹ Part II surveys the various legal mechanisms advanced by the opponents of biopiracy, and it also discusses the advantages and disadvantages of each

15. *Id.* (opining that some methods of royalty calculations are deliberately confusing).

16. Latin American Alliance, *Bioprospecting/Biopiracy and Indigenous Peoples*, available at www.iphandbook.org/jforum/posts/downloadAttach/442.page (last visited Nov. 2, 2010) [hereinafter Latin American Alliance].

17. *Id.*

18. *Id.*

19. Roger Hamilton, *Bioprospecting, with No Apologies*, IDBAMERICA, Apr. 2004, <http://www.iadb.org/idbamerica/index.cfm?thisid=2705>.

20. *Infra* Part I.C; see also Kohls, *supra* note 2, at 110 (noting that folk songs, crafts, and tribal insignias are subjects of other areas of legal regime, such as copyright law).

21. See *infra* Part I (outlining the fundamental issues in biopiracy and its broader implications).

mechanism.²² Part III argues that a direct, bilateral agreement in the form of a concession agreement between the bioprospectors and the holders of the genetic resources (GR-holders) can address some of the issues of unfairness and injustice in bioprospecting.²³ Part IV outlines considerations that may hinder the application of the concession agreement framework.²⁴ While there is no single solution to prevent biopiracy, this paper concludes that the concession agreement framework should become an important tool to empower the GR-holders who are seeking to protect their natural resources against biopiracy.

I. FROM BIOPROSPECTING TO BIOPIRACY: UNDERSTANDING THE MODERN BIOPROSPECTING PARADIGM

*You never know what you're going to find or where you're going to find it . . . Nothing's off limits.*²⁵

—Margann Miller-Wideman,
Spokesperson for The Monsanto Company

Bioprospecting is a relatively recent phenomenon that owes its controversial emergence into the global intellectual property debate to the rapid development of the biotechnology industry.²⁶ Today, the lucrative commercial exploitation of biotechnological innovations has led both industrial and academic entities to search nature, the “cornucopian repository of valuable . . . genetic resources,”²⁷ and to gather potentially useful biological resources from all over the world.²⁸ These biological resources are the raw materials that fuel the modern biotechnology industry.²⁹

22. See *infra* Part II (explaining the “positive protection” and “defensive protection” mechanisms available to address the concerns in bioprospecting).

23. See *infra* Part III (advocating the use of concession agreements because it effectively addresses the unique needs of an extractive industry, such as bioprospecting).

24. See *infra* Part IV (focusing on the weakness of the concession agreement framework concerning permanent sovereignty and the long-term exclusivity).

25. Latin American Alliance, *supra* note 16.

26. BURTON ONG, HARNESSING THE BIOLOGICAL BOUNTY OF NATURE: MAPPING THE WILDERNESS OF LEGAL, SOCIO-CULTURAL, GEO-POLITICAL AND ENVIRONMENTAL ISSUES, IN INTELLECTUAL PROPERTY AND BIOLOGICAL RESOURCES 1, 1–2 (Burton Ong ed., 2004) at 1–2 (noting the significant development of the biotechnology industry since the early 1980s).

27. *Id.* at 1.

28. See *id.*

29. See S.K. Verma, *Plant Genetic Resources, Biological Inventions and Intellectual Property Rights: The Case of India*, in INTELLECTUAL PROPERTY AND BIOLOGICAL RESOURCES 128, 130–31 (Burton Ong ed., 2004) (estimating that

To facilitate their search for biological resources, the bioprospectors frequently turn for assistance to the segments of local communities who possess intimate, traditional knowledge of the natural world.³⁰ Hence, in bioprospecting, the seemingly distinct concepts of genetic resources and traditional knowledge are intricately intertwined.³¹ Specifically, genetic resources are found within a geographic region's biodiversity, which is defined as "the variability among living organisms from all sources . . . within species, between species and of ecosystems."³² The scope of this definition encompasses billions of genetic resources, but only a few may possess commercially or scientifically valuable properties.³³ This reality presents prohibitively time-consuming and costly challenges for the bioprospectors, who must screen the entire biodiversity of a large geographic region for those rare and potentially useful genetic resources.³⁴

Fortunately for the bioprospectors, traditional knowledge of the region's indigenous communities can help mitigate some of the challenges of bioprospecting by providing a "broad range of 'indigenous' works ranging from folklore to shamanic knowledge" that narrows the scope of the search towards only the most promising genetic resources.³⁵ In this function, tradi-

6.5% of all genetic research is focused upon germplasm found in nature and roughly 80% of the world population depends on medicine derived from botanical sources).

30. ONG, *supra* note 26, at 1–2 (elaborating that the local communities may include traditional healers, herbalists, farmers, and plant/animal breeders).
31. Emanuela Arezzo, *Struggling Around the "Natural" Divide: The Protection of Tangible and Intangible Indigenous Property*, 25 CARDOZO ARTS & ENT. L.J. 367, 372 (2007) (analyzing the current normative framework and the international debates surrounding the protection of genetic resources and the associated traditional knowledge).
32. See Convention on Biological Diversity, art. 2, June 5, 1992, 31 I.L.M. 818, [hereinafter CBD] available at <http://www.cbd.int/convention/convention.shtml> (defining various terms used in the CBD).
33. See generally, Gertrui Van Overwalle, *Protecting and Sharing Biodiversity and Traditional Knowledge: Holder and User Tools*, 53 ECOLOGICAL ECON. 585, 585 (2005) (evaluating current intellectual property protection systems, intellectual property-like regimes, and protection and sharing initiatives outside the intellectual property frameworks).
34. Arezzo, *supra* note 31, at 372 (opining that while tropical regions, such as in Brazil and Peru, may harness vast treasures of useful exotic plants and animals, those potentials remain dormant if the bioprospectors cannot find them).
35. *Id.* at 370–71 (describing that traditional knowledge encompasses not only the fruits of an intergenerational creative process, but also shamanic knowledge, rituals, dances, and songs, handed down orally). But see generally, Murray L. Eiland, *Patenting Traditional Medicine*, 89 J. PAT. & TRADEMARK OFF. SOC'Y 45, 51 (2007) (stating that there is no consensus on the precise definition of traditional knowledge).

tional knowledge is equally valuable to the bioprospectors as the genetic resource itself because it entails information on the *use* of biodiversity, which makes bioprospecting an economically feasible paradigm.³⁶ It is in this context where the bioprospectors associate with these other stakeholders that form the backdrop of biopiracy.³⁷

A. Scope of the Paper: Dissociating Genetic Resources from Traditional Knowledge

Undoubtedly, traditional knowledge associated with genetic resources is an important part of bioprospecting and thus, important in any discussion of biopiracy. However, this paper explores biopiracy much more specifically as it relates to the misappropriation of genetic resources, and therefore distinguishes the entangled concepts of genetic resources and traditional knowledge. It is important to note that this focus on genetic resources in no way undermines the significance of traditional knowledge, which represents the technical know-how and ecological, scientific, or medical knowledge in addressing biopiracy. Instead, the decision to narrow the scope of the discussion to the misappropriation of genetic resources is the result of the modern paradigm of bioprospecting that relies less and less on traditional knowledge.

Bioprospecting in the 21st century is a highly systemized process. The traditional—and arguably romantic—paradigm of bioprospecting that involves adventurous bioprospectors rummaging the remote rainforests of the world and interviewing indigenous tribes for valuable genetic resources rarely takes place today.³⁸ Rather, modern bioprospecting consists of three distinct steps: 1) protection of diversity, 2) collection, and 3) research and development of the biological samples.³⁹ The second step involves the collection of biological samples, also known as “sample-hunting,”⁴⁰ which is often carried out by *local* institutions that have ready access to the sites of

36. See Arezzo, *supra* note 31, at 372-73 (noting that traditional knowledge facilitates foreign corporations to invest in large research projects where successful outcomes are extremely uncertain).

37. See BOOKLET NO. 2, *supra* note 10, at 1-2 (explaining that at the heart of biopiracy is the misappropriation of genetic resources AND traditional knowledge and the lack of recognition for the GR-holder's contributions).

38. See Heald, *supra* note 9, at 520-21 (outlining two different scenarios that illustrate bioprospecting behaviors of foreign companies that may constitute as “biopiracy”).

39. GRAIN, *Bargaining Over the Benefits of Biodiversity*, SEEDLING, (October 1993), <http://www.grain.org/seedling/?id=382> [hereinafter GRAIN-2] (last visited Jan. 4, 2010).

40. *Id.*

great biodiversity instead of the foreign bioprospectors.⁴¹ These locally based collectors can be universities,⁴² private entities,⁴³ or government and non-governmental organizations.⁴⁴ The collection strategies can be random, “targeted to certain species, or solely directed to local people’s pharmacopoeia.”⁴⁵ By way of example, the National Cancer Institute randomly collected over 35,000 plant samples between 1956 and 1976.⁴⁶ Further, the sheer amount of biological samples collected is even more impressive for bioprospectors who focus on micro-organisms. For instance, the U.S. biotechnology firm, Diversa Corporation,⁴⁷ boasts that it has collected genes for over three million microorganisms.⁴⁸

The second step is screening, defined as a “preliminary procedure, such as a test or examination, to detect the most characteristic sign or signs of a disorder specific or desired characteristic . . . that may require further investigation.”⁴⁹ After receiving the biological samples from local institutions, the foreign bioprospectors proceed to screen hundreds of thousands of samples to identify valuable and potentially useful genetic resources. In the past, screening massive amounts of samples was prohibitively time-consuming and costly for the bioprospectors, and thus, traditional knowledge served as critical “filters” that enhanced the effectiveness of the screening process.⁵⁰

41. *See id.* (noting that in addition to collecting samples, the local institutions may also taxonomically identify the biological samples for the foreign bioprospectors).

42. *See, e.g.*, Telephone Interview with Neil A. Belson, President and Founder, NewAgriculture, Inc. (Nov. 7, 2009) (explaining that NewAgriculture’s predecessor biotechnology firm, Pharmacogenetics, Inc., partnered with the Central University of Ecuador to collect biological samples from the rainforests of Ecuador).

43. Latin American Alliance, *supra* note 16.

44. *Id.* (explaining that such governmental and non-governmental organizations include scientific research institutes, conservation/environmental groups, and public sector institutions).

45. GRAIN-2, *supra* note 39.

46. Latin American Alliance, *supra* note 16 .

47. *About: History & Milestones*, VERENIUM.COM, http://www.verenium.com/about_history.asp (last visited Jan. 9, 2010) (noting that in 2007, Diversa Corporation merged with Celunol Corporation to form the Verenium Corporation).

48. GRAIN, *Sprouting Up: Diversa Dominates Global Search for Blockbuster Microbes*, SEEDLING, (Jan. 2005), <http://www.grain.org/seedling/?id=316> [hereinafter GRAIN-3].

49. *Screening Definition*, THEFREEDICTIONARY.COM, <http://medical-dictionary.thefreedictionary.com/screening> (last visited Oct. 2, 2010) (citing from MOSBY’S MEDICAL DICTIONARY (8th ed., 2009)).

50. *See* Latin American Alliance, *supra* note 16 (reporting that the U.S.-based company, Shaman Pharmaceuticals, Inc., opined that traditional knowledge

However, “with advances in molecular biology and the availability of more sophisticated high-throughput diagnostic tools for screening,” mass sampling has now become cost-effective.⁵¹ Diversa Corporation, for example, claims to be able to screen a billion genes from micro-organisms per day in search of promising microbial enzymes.⁵² This rate of screening is phenomenal, and in the modern bioprospecting paradigm, it effectively decreases the significance of traditional knowledge.

Research and development of the genetic resources displaying useful and valuable properties represents the third step of modern bioprospecting.⁵³ By this final step, however, the collection activity is already complete.⁵⁴ The genetic resources are removed from their geographic regions of origin, and the research and development is carried out almost exclusively in the industrialized North, the home countries of the foreign bioprospectors.⁵⁵

In essence, one way of characterizing the modern bioprospecting paradigm is that it is a converse of the traditional paradigm. In the traditional bioprospecting paradigm, the knowledge of the useful properties of genetic resource, embodied in the traditional knowledge of the indigenous communities, led the bioprospectors to a specific genetic resource. In contrast, in the modern bioprospecting paradigm, the genetic resource itself is the source of the knowledge of its useful properties, which is revealed through sampling and screening. This paradigmatic reversal, which all but removes the need for traditional knowledge in bioprospecting, is an outcome of both necessity and choice. Today, the focus of most natural products’ research involves

made bioprospecting “5,000 times more effective than random collection” of biological samples); *see, e.g.*, Ragavan, *supra* note 1, at 515 (noting that the largest plant sample collection program conducted by the National Cancer Institute was terminated in 1981 because of its failure to identify a greater number of new anti-cancer agents through mass sampling and screening); *Cf. Axt, Josephine R. et. al., Biotechnology, Indigenous Peoples, and Intellectual Property Rights, Washington D.C., UNT Digital Library. <http://digital.library.unt.edu/ark:/67531/metacrs8176/>. (last visited Oct. 2, 2010) (opining that had the National Cancer Institute used traditional knowledge, the program’s success rate would have doubled).*

51. Latin American Alliance, *supra* note 16.

52. GRAIN-3, *supra* note 48.

53. GRAIN-2, *supra* note 39.

54. *See* Ragavan, *supra* note 1, at 515 (explaining that this step involves, “experimentation, appreciation of the resources and understanding the prevailing traditional knowledge over the resources”).

55. GRAIN-2, *supra* note 39 (noting that in the past thirty years, over 90% of all new pharmaceuticals research and development has taken place in the OECD countries of the industrialized North).

microbial sources rather than plant or animal sources.⁵⁶ A sample of dirt from a tropical rainforest contains thousands of microorganisms, and there is little traditional knowledge concerning these tiny organisms that are invisible to the naked eye.⁵⁷ Hence, mass sampling and screening is necessary for the bioprospectors simply because they do not know what it is that they are looking for.⁵⁸ At the same time, continuous advances in cost-effective and efficient screening technologies necessitate their use in lieu of the traditional knowledge of the indigenous communities.

Moreover, the modern bioprospecting paradigm represents the deliberate choices of the bioprospectors, who are choosing to avoid the hurdles of bioprospecting laws enacted in many countries to fight biopiracy.⁵⁹ In so doing, the bioprospectors are shifting their focus to marine environments where only a few countries have specific “legislation regulating access to and exploitation of . . . their marine . . . and other genetic resources.”⁶⁰ More importantly, the bioprospectors are choosing to avoid traditional knowledge because the use of such knowledge inevitably will involve the indigenous communities. As Mark Plotkin, president of the Amazon Conservation Team and research associate at the Smithsonian Institution’s Museum of Natural History, bluntly stated, “the corporations [bioprospectors] don’t want the headaches of dealing with them [the indigenous communities].”⁶¹

Due to the modern realities of bioprospecting, the scope of this paper is limited to the misappropriation of genetic resources only. Traditional knowledge is an important aspect of bioprospecting and in preventing biopiracy, and therefore, it is impossible to completely segregate genetic resources from the associated traditional knowledge. But the primary aim of this paper is to introduce a new legal mechanism to prevent misappropriation of genetic re-

56. *Id.* (attributing one possible reason as the ease of which microorganisms can be readily cultured in a lab without the need to return to the geographical source again to retrieve the biological sample).

57. *Id.*

58. GRAIN-3, *supra* note 48.

59. *See, e.g.*, Legislative Assembly of the Republic of Costa Rica. Biodiversity Law No.7788, Apr. 23, 1998), http://www.grain.org/brl_files/costarica-biodiversitylaw-1998-en.pdf [hereinafter Biodiversity Law No.7788] (promoting bioprospecting and deterring biopiracy in three ways: 1) regulating access to the biological resources, 2) limiting the scope of the intellectual property rights to the bioprospectors, and 3) imposing severe sanctions for unauthorized access to the biological resources).

60. Terry Collins, *Clear Rules Needed to Govern Deep Sea Bioprospecting: UNU, EUREKALERT!*, June 8, 2005, http://www.eurekalert.org/pub_releases/2005-06/unu-crm060105.php.

61. *See* Searching for Nature’s Medicines, ACTIONBIOSENCE.ORG, <http://www.actionbioscience.org/biodiversity/plotkin.html> (last visited Jan. 5, 2010) (interviewing Mark J. Plotkin on the crucial need to protect biodiversity as a repository of medicine, knowledge, and models for medical research).

sources in the context of the modern bioprospecting paradigm where traditional knowledge has diminished significance.

B. Explaining Biopiracy: The Misappropriation of Genetic Resources

“Biopiracy” is not a term of art with an accepted legal meaning.⁶² There is no definitive working definition of the term shared by scholars, commentators, politicians, and NGOs, who each define the term in slightly different ways.⁶³ However, these various definitions of biopiracy can be categorized into two broad types, namely, “critical” and “legalistic.”⁶⁴ The critical definition characterizes biopiracy generally and emphasizes the larger questions of equity.⁶⁵ For instance, Professor Graham Dutfield defines biopiracy as the “ways that corporations from the developed world claim ownership of, free ride on, or otherwise take unfair advantage of, the genetic resources and traditional knowledge and technologies of developing countries.”⁶⁶ While this critical definition effectively highlights the problems that can transform legitimate bioprospecting into biopiracy,⁶⁷ it omits the mechanism through which the bioprospectors, and thus, the corporate and academic entities from the developed countries take unfair advantage of the developing countries. The legalistic definition supplements the critical definition by introducing the role that the intellectual property law has in perpetuating biopiracy. A representative legalistic definition comes from Professor Shiva who defines biopiracy as the “*use of intellectual property systems to legitimize the exclusive ownership and control over biological resources . . . products . . .*”

62. Ong, *supra* note 26, at 7; *see also* IKECHI MGBEOJI, GLOBAL BIOPIRACY: PATENTS, PLANTS, AND INDIGENOUS KNOWLEDGE 68 (UBC Press, 2006) (stating that the term “biopiracy” was coined by a Canadian activist, Pat Mooney); *see also*, Graham Dutfield, *What is Biopiracy?*, in EXPERT INTERNATIONAL WORKSHOP ON ACCESS AND BENEFIT-SHARING: RECORD OF DISCUSSION, Cuernavaca, Mexico, October 24-27, 2004, 89-92, (Mariana Bellot-Rojas & Sophie Bernier eds., 2005) (opining that the term has “strategic vagueness” that may not help those working toward a legal solution to biopiracy).

63. *See, e.g.*, Kohls, *supra* note 2, at 108-09 (providing a representative list of various definitions of biopiracy that are currently being used by various “bio-opponents”).

64. Crucible II Group, SEEDING SOLUTIONS: VOLUME 1 (IDRC, 2000), http://www.idrc.ca/en/ev-64405-201-1-DO_TOPIC.html (last visited Nov. 2, 2009) (noting a third category of definition, “industry,” which emphasizes the role of the bioprospectors in biopiracy).

65. *See id.*

66. Dutfield, *supra* note 62, at 89. (opining that the term has “strategic vagueness” that may not help those working toward a legal solution to biopiracy).

67. *See* CBD, *supra* note 32, at art. 1 (promoting bioprospecting through “fair and equitable sharing of the benefits arising out of the utilization of genetic resources”); *see, e.g.*, ONG, *supra* note 26, at 7 (repeating that there is a legitimate difference between “bioprospecting” and “biopiracy”).

and processes that have been used over centuries in non-industrialized cultures.”⁶⁸ Hence, to understand the sophisticated and subtle nature of misappropriating genetic resources through the intellectual property law, particularly the patent law, it is important to begin the discussion of biopiracy from this legal definition.⁶⁹

An important purpose of the patent system is to grant the inventor or its assignee with exclusive rights for a limited period of time to stimulate technological innovations.⁷⁰ To effectuate this purpose, the patent system separates appropriable knowledge that can be patented from knowledge residing in the public domain that cannot.⁷¹ Genetic resources at issue in bioprospecting, however, present unique challenges to the patent system because it is unclear whether biotechnological subject matters are patentable.⁷² Frequently, biotechnological inventions may represent nothing more than a discovery of substance found in nature.⁷³ Moreover, the alleged inventors may obtain patent rights over the biotechnological subject matters merely through isolation, purification, synthesization, adaptation, or application.⁷⁴ In the bioprospecting context, bioprospectors claim that such processes are inventive steps that justify the removal of the genetic resources from the public do-

68. SHIVA, *supra* note 5, at 50 (emphasis added).

69. See Dutfield, *supra* note 62, at 92 (noting, however, that how one defines “biopiracy” is important to devise a way to *resolve* biopiracy).

70. George Wei, *Fitting Biological Products within the Intellectual Property Framework: Challenges Facing the Policy Makers*, in INTEL. PROP. AND BIOLOGICAL RESOURCES 28, 31 (Burton Ong ed., 2004) (explaining that the patent owner simply has the right to *exclude* rather than a positive right to exploit the invention). But *cf.* Shiva, *supra* note 5, at 21–33 (arguing that the rationales for upholding domestic patent regimes, namely, promoting creativity, inventiveness, knowledge generation, investments, research, and technology transfers, are “myths” in the international context).

71. Hanns Ullrich, *Traditional Knowledge, Biodiversity, Benefit-Sharing and the Patent System: Romantics v. Economics?* 3, 506 (EUI Working Paper LAW No. 2005/07, 2005), available at <http://cadmus.iue.it/dspace/bitstream/1814/3327/1/law05-07.pdf> at; see also Agreement on Trade-Related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, art. 27.1, Dec. 15, 1993, 33 I.L.M. 81 [hereinafter TRIPS], available at http://www.wto.org/english/tratop_e/trips_e/t_agm0_e.htm (last visited Nov. 1, 2009).

72. See, e.g., OLIVER MILLS, BIOTECHNOLOGICAL INVENTIONS: MORAL RESTRAINTS AND PATENT LAW 13–17 (Ashgate, 2005) (outlining the objections to patenting biological subject matters such as characterizing biotechnology as an attempt at “playing God”).

73. See Wei, *supra* note 70, at 31 (opining that the objections to patentability are stronger the closer the invention is to the natural product).

74. See Ullrich, *supra* note 71, at 9 (asserting that it is these incremental improvements that are claimed as patentable invention).

main.⁷⁵ This debate on patentability of biotechnological subject matters implicates complex issues that are beyond the scope of this paper.⁷⁶ Regardless of whether biotechnological subject matters should or should not be patentable, the current patent system not only permits, but also promotes patents on inventions derived from genetic resources.⁷⁷ This western intellectual property regime is central to biopiracy.

The western intellectual property regime has recognized traditional knowledge (TK) as “in the ‘public domain,’ and thus, freely available for use by anybody.”⁷⁸ However, the difficulties facing TK holders suggest that traditional knowledge, or genetic resources (GR), are not freely available. Biodiversity and genetic resources have long been considered a “heritage of mankind” and at the local level, the “cultural and economic heritage” of the indigenous communities who have maintained them for centuries.⁷⁹ While these indigenous communities, as GR-holders, request the creation of collective intellectual property rights, the present international legal framework is not designed to operationalize such rights *because* they are “collective (not individual or exclusive) and traditional knowledge (not new, but ancestral).”⁸⁰

75. *Id.* at 19.

76. *See generally* Mills, *supra* note 72, at 7–17 (discussing that patenting biotechnological subject matter implicates political, religious, cultural, moral, and economical issues).

77. *See* Wei, *supra* note 70, at 35–41 (listing various international and regional agreements that permit patentability of plant and animal subject matters); *see, e.g.*, TRIPS, *supra* note 71, at art. 27.1 (“[P]atents shall be available for any inventions, whether products or processes, in all fields of technology.”); *but see id.* at art. 27.3(b) (permitting signatories from excluding biological process from patentability).

78. *See* Carlos M. Correa, *Traditional Knowledge and Intellectual Property: Issues and Options Surrounding the Protection of Traditional Knowledge* 3, QUAKER UNITED NATIONS OFFICE (Nov. 2001), available at <http://www.quno.org/geneva/pdf/economic/Discussion/Traditional-Knowledge-IP-English.pdf> (providing an overview of traditional knowledge and proposed biopiracy solutions and the international forums for redress).

79. GRAIN-2, *supra* note 39.

80. *See, e.g.*, Marcelo Dias Varella, *Access to Genetic Resources and Benefit Sharing: Main Aspect of Some Legal Frameworks: Main Aspects of Some Legal Frameworks*, OPEN MEETING OF THE GLOBAL ENVIRONMENTAL CHANGE RESEARCH COMMUNITY, at 11 (Oct. 2003), available at <http://ssrn.com/abstract=674502> (noting that such rights would require identification of a specific legal entity and cannot be given to a vaguely defined community or multigenerational entities). *But see generally* CHARLES R. MCMANIS, *Fitting Traditional Knowledge Protection and Biopiracy Claims into the Existing Intellectual Property and Unfair Competition Framework*, in INTELLECTUAL PROPERTY AND BIOLOGICAL RESOURCES 425, 425–30 (Burton Ong ed., 2004); Daniel Ger-

This clash of incompatible intellectual property concepts and resource rights (or lack thereof) encapsulates biopiracy. Bioprospectors own unequal shares of patents obtained from the GR/TK and receive unequal benefits. The rhetoric used to describe biopiracy as the “looting and plundering”⁸¹ of indigenous communities of developing countries is a consequence of an incompatible intellectual property regime that allows bioprospectors to monopolize genetic resources without providing indigenous communities a mechanism to control or receive compensation.⁸² Although the fact that the customary legal systems of the indigenous communities are incompatible with the western intellectual property regime does not make them less valid, incompatibility “does, however, make compliance difficult.”⁸³ The indigenous communities are entitled to the recognition of their intellectual property and to the right to control, develop, and protect their genetic resources. Addressing the injustice and unfairness of biopiracy lies in properly recognizing the rights of indigenous communities, or the GR-holders.⁸⁴

C. Broader Implications of Biopiracy: The Tension between the Industrialized North and the Farming South

At first glance, it may seem that the scope of biopiracy is well-defined and limited to the realm of intellectual property law.⁸⁵ However, biopiracy also implicates broad and complex international issues that affect the polarization between the developed “North” and the developing “South.”⁸⁶ On Earth, the majority of plant diversity is concentrated in the Southern Hemisphere.⁸⁷ This skewed biological diversity has been a significant contributing factor to the inequitable global economic regime that exists today.⁸⁸ During the colonial era, the colonial powers of the northern hemisphere organized

vais, *Traditional Knowledge & Intellectual Property: A TRIPS-Compatible Approach*, 2005 MICH. ST. L. REV. 137, 149–160 (2005).

81. ONG, *supra* note 26, at 7.

82. See, e.g., Longacre, *supra* note 3, at 970–72 (listing various examples of recent biopiracy, such as tamate, lycopene, and ayahuasca).

83. See Eiland, *supra* note 35, at 47.

84. See, e.g., Margo A. Bagley, *Patently Unconstitutional: The Geographical Limitation on Prior Art in a Small World*, 87 MINN. L. REV. 679, 735–36 (2003) (discussing the benefits to be reaped from removing the geographic limitation in Section 102 of the Patent Act).

85. See, e.g., Arezzo, *supra* note 31, at 375–76.

86. See Eiland, *supra* note 35, at 47–48 (highlighting the general argument that wealthy nations in the North improperly rely upon colonial era conceptions of property to gain access to the resources in the South).

87. MGBEOJI, *supra* note 62, at 68.

88. See, e.g., *id.* (noting that the cumulative foreign debt of the South to the North was estimated at \$1.34 trillion and increasing in 1990).

their colonies in the South as suppliers of cheap raw plant materials.⁸⁹ This basic paradigm continues in the contemporary global trading system today, whereby the South has been organized to “feed the industrial machineries and factories of the North.”⁹⁰ In order to continue to supply the North with the “inescapable low price of commodities,”⁹¹ the South destroys its environment to meet Northern demands for raw materials and borrows funds extensively from the North to purchase the finished goods.⁹² Scholars characterize this modern relationship between the industrialized North and the farming South as a “neo-feudalism.”⁹³

Biopiracy exacerbates this exploitive North-South relationship. The North employs an intellectual property regime that legitimizes the exclusive ownership of the genetic resources located in the South.⁹⁴ By controlling the rights to these resources, the economically wealthy North reaps a disproportionate share of the benefits derived from commercializing the genetic resources. Most of the *users* of the genetic resource-derived products, which include the consumers, scientific researchers, and private entities, reside in the North.⁹⁵ Hence, biopiracy continues the promotion of the northern industries by creating ever-expanding markets for patented genetic resources originating from the South.⁹⁶ Moreover, unregulated and unmonitored bioprospecting causes environmental risks and damages the economies of the South by depriving them of the opportunity to retain and exploit their own natural resources.⁹⁷ In the modern global economy, where intellectual capital is a more significant source of wealth creation than physical capital, the in-

89. See *id.* (explaining that these colonies, located in Africa, Asia, and Latin America, supply raw materials such as timber, tea, metal, and other cash crops to the North).

90. *Id.*

91. *Id.*

92. *Id.* at 68.

93. MGBEOJI, *supra* note 62, at 69.

94. See SHIVA, *supra* note 5, at 49 (asserting that biopiracy occurs specifically because the western intellectual property regime, designed for import monopolies, is inadequate to address the unique characteristics of the bioprospecting paradigm).

95. See ONG, *supra* note 26, at 10–11 (opining that the South serves as providers of *in situ* biological/genetic resources to the North).

96. See MGBEOJI, *supra* note 62, at 35 (arguing that at the heart of the biopiracy controversy is the motive to gain economic profits from patented products).

97. See Arezzo, *supra* note 31, at 373 (noting that developing countries lose their rights to profit from trading and exporting their genetic resources abroad).

ability of the South to capitalize on their genetic resources essentially dooms them to perpetual poverty and a crushing debt burden to the North.⁹⁸

The scope of issues involved in biopiracy is not limited to the intellectual property regime and the North-South relationship. For instance, extensive bioprospecting may reduce the Earth's biodiversity, and thus, biopiracy implicates conservation. A majority of global biodiversity is located in the South.⁹⁹ Through bioprospecting, only those plants serving the interests of man may flourish, and consequently, leave the Earth with reduced biodiversity at unacceptable levels to posterity.¹⁰⁰

Under principles of fairness and distributive justice, biopiracy is a circumvention of the developed and affluent North's moral responsibility to bridge the gap with the developing and poor South.¹⁰¹ Understandably, biopiracy is a deeply political and economic issue.¹⁰² While the core debates on biopiracy are about the indigenous communities' rights, control, and compensation, it is imperative to recognize *how* biopiracy implicates other broad and important international debates.¹⁰³

98. See MGBEJI, *supra* note 62, at 35 (characterizing the intellectual property system as merely a contemporary struggle between nations over economic and technological interests); see also *id.* at 68 (noting some experts estimate an annual net cash flow of \$50 thousand million flowing from the poorest nations to the richest nations).

99. *Id.* at 35; see also Kremers, *supra* note 5, at 17 (providing examples of biopiracy affecting the Saami people located in Scandinavian countries of Finland and Norway).

100. But see Mills, *supra* note 72, at 15 (offering a different school of thought which opines that biodiversity can be enriched by adding engineered plant varieties).

101. See generally THOMAS M. FRANCK, FAIRNESS IN INTERNATIONAL LAW AND INSTITUTIONS 413-16 (Oxford Univ. Press 2002) (1995).

102. See, e.g., Kremers, *supra* note 5, at 24-25 (noting that legal protection of the genetic resources and the associated traditional knowledge involves many complex factors, such as the large diversity of the stakeholders each possessing distinct political and economic goals).

103. See Arezzo, *supra* note 31, at 374 (arguing that, for example, even if there were research cooperation among the developed and developing countries, the terms of such agreements will be biased and the developing countries would be excluded from subsequent research, losing an invaluable opportunity to further their own development).

II. THE ARSENAL: EXISTING LEGAL MECHANISMS TO COMBAT BIOPIRACY

Remember the two benefits of failure. First, if you do fail, you learn what doesn't work; and second, the failure gives you the opportunity to try a new approach.

—Roger Von Oech¹⁰⁴

In 1998, the World Intellectual Property Organization (WIPO) conducted a series of fact-finding missions in order to oppose biopiracy and understand the needs and expectations of the indigenous TK/GR holding communities.¹⁰⁵ Professor Carlos Correa broadly classified the WIPO findings of these opponents to biopiracy as equity, conservation, and preservation.¹⁰⁶

TABLE 1: Classifying the Concerns of the Indigenous Communities.

	Concerns of the Indigenous Communities
Equity	Genetic resources and the associate traditional knowledge generates <i>value</i> that requires fair recognition and compensation to its custodians.
Conservation	Genetic resources and the associate traditional knowledge should be protected to ensure conservation of the biodiversity and the environment.
Preservation	Genetic resources and the associate traditional knowledge should be protected to encourage and maintain the traditional practices and culture.

Today, bioprospecting has become a legitimate, routine, and aggressively pursued industrial practice.¹⁰⁷ And the western intellectual property regime is an established part of the modern international legal landscape.¹⁰⁸ In addition, there is a strong global policy for increasing access to the genetic resources in order to promote scientific innovation and economic develop-

104. Author and speaker on fostering creativity and creative thinking. He is the president of Creative Think, a California-based consulting firm.

105. *See generally* BOOKLET NO. 2, *supra* note 10, at 3–10.

106. *See* Correa, *supra* note 78, at 5–7.

107. *See, e.g., id.* at 3 (noting that on a global scale, the market size for traditional medicine developed from genetic resources is over \$43 billion).

108. *See generally* Arrezzo, *supra* note 31, at 376–78 (tracing the efforts of developing countries to address biopiracy through existing normative international frameworks); *see also* TRIPS, *supra* note 71, at art. 27 (“[P]atents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application . . . patents shall be available and patent rights enjoyable *without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced*”) (emphasis added).

ment.¹⁰⁹ In this context, opponents of biopiracy have proposed numerous solutions to avert misappropriation of the genetic resources.

However, while various opponents of biopiracy may be in agreement on the core concerns of biopiracy, a closer look reveals that many of their specific objectives are contradictory to each other, making it clear that no single solution will resolve all of their distinct concerns.¹¹⁰ Some of the proposed solutions may be defined as “defensive protection” mechanisms that seek to prevent wrongful patents for the genetic resources.¹¹¹ The “positive protection” mechanisms empower the GR-holders to take affirmative steps to protect and to seek remedies against the bioprospectors who misappropriated their genetic resources.¹¹²

In observing the various legal mechanisms available to address biopiracy, Professor Dutfield opines that how one “defines biopiracy goes a long way towards determining what [one] should do about it.”¹¹³ For instance, if the problem of biopiracy is that the patent system legitimizes misappropriation of the GR/TK, then defensive protection mechanisms will be useful.¹¹⁴ If the problem is inequitable benefit-sharing, then certain positive protection mechanisms might be the desired remedy.¹¹⁵ Thus, in order to *understand* biopiracy, it is necessary to explore the important role that intellectual property law plays in facilitating the misappropriation of genetic resources. However, intellectual property law need not play a prominent role

109. Longacre, *supra* note 3, at 965 (emphasizing the importance of striking a balance between GR-holders’ rights and encouraging scientific innovation); see also CBD, *supra* note 32, at art. 8(j) (requiring contracting countries to promote “wider application” of “indigenous communities” traditional knowledge, innovation, and practices and encourage equitable sharing of benefits arising out of their utilization.).

110. BOOKLET NO. 2, *supra* note 10, at 16 (observing that “no single template or comprehensive ‘one-size-fits-all’ solution is likely to suit all of the national priorities and legal environment, let alone the needs of traditional communities in all countries.”); Kremers, *supra* note 5, at 24 (insisting that a “one-size-fits-all” solution may not be desirable due to the complexities of issues involved in biopiracy); see also Kohls, *supra* note 2, at 110–14 (classifying various definitions, and at times, conflicting objectives of biopiracy).

111. BOOKLET NO. 2, *supra* note 10, at 12.

112. *Id.* at 17 (explaining that a “positive protection” mechanism has strengths because it provides a forum of protection, an ability to choose specific policies, and a capacity to carry out those policies).

113. Dutfield, *supra* note 62, at 4.

114. *Id.*; see discussion *infra* Parts II(A-B) (explaining the “defensive protection” mechanisms of disclosure of origins requirement, prior informed consent, and the worldwide digital database of traditional knowledge).

115. Dutfield, *supra* note 62, at 4; see also discussion *infra* Parts II.C, II.E (discussing the “positive protection” mechanisms of private agreements and *sui generis* regimes).

towards *resolving* biopiracy. The following are some of the most prominent and growing forms of defensive and positive protection mechanisms that comprise the present “arsenal” against biopiracy.

A. Worldwide Digital Databases of Traditional Knowledge

To be granted a valid patent, the patent applicant must demonstrate that the claimed invention is novel and has an inventive step.¹¹⁶ As a defensive protection mechanism, the worldwide digital databases of traditional knowledge prevent the misappropriation of genetic resources by defeating the alleged novelty and inventiveness claims in a patent application.¹¹⁷ These databases, such as the Traditional Knowledge Digital Library (TKDL) project and the Traditional Knowledge Resource Classification (TKRC), recognize the existence of certain traditional knowledge as “prior art” and are, therefore, considered knowledge already in the public domain.¹¹⁸ If a patent application concerns the GR/TK recorded in the databases, the patent examiner will deny the application.¹¹⁹ This allows the worldwide digital databases to confer a degree of legitimacy to the often undocumented and unwritten traditional knowledge that may lead bioprospectors to a valuable genetic resource, while also facilitating the retrieval of prior art information so that patent examiners can challenge the bioprospectors’ assertion of novelty and inventiveness in their patent applications for the GR/TK-derived inventions.¹²⁰

116. JOHN BARTON, ET. AL., INTEGRATING INTELLECTUAL PROPERTY RIGHTS AND DEVELOPMENT POLICY 82 (Commission on Intellectual Property Rights, Sept. 2002), available at http://www.iprcommission.org/papers/pdfs/final_report/CIPRfullfinal.pdf.

117. See *id.* at 82. (noting that patents for information in the public domain is fundamentally contradictory to the rationale of the patent system). But see Eiland, *supra* note 35, at 65–66 (observing that an easily accessible worldwide digital databases of traditional knowledge may actually *increase* the misappropriation of genetic resources by providing a ready, searchable databases to potential bioprospectors).

118. See generally BARTON, *supra* note 116, at 74.

119. See Eiland, *supra* note 35, at 64–65 (providing that the worldwide digital databases would allow patent examiners to determine the novelty of the claimed invention).

120. See BARTON, *supra* note 116, at 82 (opining that a robust documentation of traditional knowledge may also contribute towards its preservation and promotion). But see Eiland, *supra* note 35, at 65 (voicing concerns that before the worldwide digital database can become truly useful, there must be substantial amount of traditional knowledge recorded within the database first); see also *id.* at 66 (implying that the patent examiners who are trained in the hard sciences may find it difficult to accurately identify traditional knowledge within the worldwide digital databases).

The worldwide digital databases are important mechanisms toward addressing biopiracy, but there are significant obstacles to overcome before the databases can truly become effective. To have a meaningful effect on deterring illegal patents, the indigenous communities who possess the GR/TK must play a crucial role in expanding the databases by actively contributing their traditional knowledge.¹²¹ However, much traditional knowledge will continue to remain undocumented, and some indigenous communities may even withhold or falsify their knowledge because they believe that the traditional knowledge is sacred and should be kept secret.¹²² In addition, the worldwide digital databases are long-term projects that require extensive financial and administrative support from NGOs and governments.¹²³ In fact, both the TKDL and TKRC are supported by their governments for compiling the traditional knowledge for the benefit of the indigenous communities within their respective countries.¹²⁴ Hence, the worldwide digital databases are exceptional projects that leave many other indigenous communities around the world without an analogous worldwide digital database to protect their own GR/TK.¹²⁵ Finally, due to the long-term nature of these projects, the worldwide digital databases are ineffective at preventing misappropriation of genetic resources that is currently occurring.¹²⁶ Therefore, the worldwide digital databases' effectiveness on addressing biopiracy remains to be seen.

B. Disclosure of Origins and Prior Informed Consent

Some scholars suggest that the mandatory disclosure of origins requirement and prior informed consent should become additional conditions for

121. See Eiland, *supra* note 35, at 66 (saying that it is the indigenous communities who have relevant access to the genetic resources and traditional knowledge, and they must voluntarily divulge such information in order to successfully document it).

122. See, e.g., *id.* at 80 (implying that some indigenous communities will not be cooperative and noting specifically Peru's indigenous communities who refused to disclose their traditional knowledge as an example).

123. See *id.* (highlighting that, for example, the WIPO Task Force includes representatives of only the politically and economically strong stakeholders, such as China, India, US, and EC).

124. See BOOKLET NO. 2, *supra* note 10, at 29 (explaining that the TKDL and TKRC are both supported and developed by the Indian government).

125. See Kohls, *supra* note 2, at 121 (stating that, as an example, the Society for Research and Initiatives for Sustainable Technologies and Institutions in India developed their databases in order to register only *local* knowledge and *national* medicinal plants).

126. See BOOKLET NO. 2, *supra* note 10, at 29 (stating that the TKDL took nearly two years to compile a database on all uses of Ayurveda, a system of traditional Indian medicine).

patentability.¹²⁷ The disclosure of origins requirement would compel bioprospectors to include information about the origin of the genetic resource and the source of the traditional knowledge in their patent applications.¹²⁸ Meanwhile, prior informed consent would require bioprospectors to show proof of obtaining prior informed consent from the GR-holders before being granted a patent.¹²⁹ Like the worldwide digital databases, the disclosure of origins requirement and prior informed consent function as defensive protection mechanisms to prevent wrongful patents. In addition to denying patent applications that do not disclose the origin of the underlying GR/TK or proving prior informed consent from the GR-holders, these defensive protection mechanisms serve to improve the substantive examination of patent applications, prevent enforceability of bad patents, and increase transparency of national and international systems of intellectual property law.¹³⁰

Although some national legislations have incorporated requirements for disclosure of origins and prior informed consent, an international system mandating these two additional conditions for patentability does not currently exist.¹³¹ Such an international system is strongly advocated by numerous scholars, such as Professors Joshua Sarnoff and Nuno Pires de Carvalho,

127. See Nuno Pires de Carvalho, *Biodiversity, Biotechnology, and the Legal Protection of Traditional Knowledge: From the Shaman's Hut to the Patent Office: In Search of a TRIPS-Consistent Requirement to Disclose the Origin of Genetic Resources and Prior Informed Consent*, 17 WASH. U. J.L. & POL'Y 111, 124–36 (2005) (arguing that the disclosure of origins requirement is not only incompatible with TRIPS, but other frameworks, such as the Union for the Protection of New Varieties of Plants Convention, the Patent Cooperation Treaty, and the Patent Law Treaty).

128. See Kremers, *supra* note 5, at 39 (explaining how a disclosure of origins requirement can act as a defensive mechanism to prevent bioprospectors from illegally obtaining or exercising legal rights over the genetic resources).

129. See, e.g., Longacre, *supra* note 3, at 999 (noting that the genetic resources-source country, local authorities, or indigenous communities can give prior informed consent); see also Nuno Pires de Carvalho, *International and Comparative Law Issues: Requiring Disclosure of the Origin of Genetic Resources and Prior Informed Consent in Patent Applications Without Infringing the TRIPS: The Problem and the Solution*, 2 WASH. U. J.L. & POL'Y 371, 374 (2000).

130. See U.N. Comm. on Trade & Dev., *The Conference of the Parties, Jan. 30–Feb. 3, 2006, Analysis of Options for Implementing Disclosure of Origin Obligations in Intellectual Property Applications*, 3–5, UNCTAD/DTIC/TED/2005/14 (Dec. 22, 2005) (prepared by Joshua Sarnoff & Carlos Correa) [hereinafter Sarnoff] (outlining the benefits of including a mandatory disclosure of origins requirement as a condition of patentability); see also Kremers, *supra* note 5, at 39–40 (opining that courts can easily refuse to enforce the patent when the patent applicant fails to make the requisite showing of compliance with disclosure of origins requirement).

131. See Sarnoff, *supra* note 130, at 24 n. 41 (citing, for example, that Peru has a national legislation imposing the disclosure of origins requirement as a condi-

both of whom see the disclosure of origins requirement as one way of harmonizing the two most prominent international legal frameworks affecting genetic resources: the Convention on Biological Diversity (CBD) and Trade-Related Aspects of Intellectual Property Rights (TRIPS).¹³² Specifically, under TRIPS Article 27.1, misappropriation of genetic resources is possible because patents are granted for *any* invention “provided that they are new, involve an inventive step and are capable of industrial application.”¹³³ In contrast, CBD Article 15.5 provides that access to the genetic resources should be based on prior informed consent.¹³⁴ Since prior informed consent would allow the GR-holders to challenge a patent even though it conforms with TRIPS Article 27.1, the CBD and TRIPS are often seen as contradictory.¹³⁵

To harmonize these two important international frameworks, Professor Sarnoff proposes an amendment that adds the disclosure of origins requirement to TRIPS.¹³⁶ This amendment would effectively transplant prior informed consent into TRIPS Article 27.1 as one of the requirements for patentability because a disclosure of origins requirement will “improve determination of inventorship . . . thereby assisting in the identification of [GR-holders] involved” from whom the patent applicants must obtain prior informed consent to use the GR/TK.¹³⁷ However, as Professor Carvalho ar-

tion of patentability for those patents developed using genetic resources and traditional knowledge with Peruvian origin).

132. *See id.* at 75–80 (advocating for an amendment to TRIPS that implements the disclosure of origins requirement based on equitable and moral principles); *see, e.g.,* Carvalho, *supra* note 127, at 145–48 (arguing that the disclosure of origins requirement and prior informed consent should also be used as a condition for enforcing patent rights).
133. TRIPS, *supra* note 71, at art. 27.1 (emphasis added); *see* Eiland, *supra* note 35, at 67–68 (implying that TRIPS article 27.1 makes no mention of requiring the disclosure of the origins of either the genetic resources or associated traditional knowledge).
134. CBD, *supra* note 32, at art. 15.5 (“[A]ccess to genetic resources shall be subject to prior informed consent of the Contracting Party . . .”).
135. *See, e.g.,* Kohls, *supra* note 2, at 132–33 (noting that a disclosure of origins requirement under TRIPS would allow GR-holders to block patents on genetic resources before they are granted). *But see* Sarnoff, *supra* note 130, at 3–4 (suggesting instead that TRIPS simply does not require any measures to effectuate the CBD obligations, and thus, these two international legal frameworks are not contradictory).
136. *See* Sarnoff, *supra* note 130, at 1–2 (arguing that a disclosure of origins requirement allows the patent system to deter misappropriation and take responsibility to address unjust conducts).
137. *See id.* at 7–8 (opining that the disclosure of origins requirement will increase transparencies of legal principles, such as the prior informed consent, and thereby reduce uncertainties of legal and equitable principles); *see also id.* at 9

gues, any amendment to TRIPS is unlikely due to strong oppositions from major and influential developed countries, such as the United States and Japan.¹³⁸ Although the disclosure of origins requirement and prior informed consent can be powerful mechanisms to resolve biopiracy, it is unlikely to be implemented in the near future.¹³⁹

C. *Sui generis* System of Intellectual Property Rights

Recognizing the unique characteristics of the GR/TK, many scholars and commentators propose *sui generis* rights in order to create a distinct legal system “of its own kind” that can more appropriately address the GR/TK and its unique policy needs.¹⁴⁰ For instance, a *sui generis* system might give the GR-holders property-like rights over their genetic resources.¹⁴¹ As a positive protection mechanism, *sui generis* rights may also include rights to control access to the genetic resources, to participate at all levels of the decision-making process, to enforce indigenous customary laws, and to mandate equitable benefit sharing.¹⁴² Instead of forcing the GR/TK into existing legal frameworks, a *sui generis* system would create separate legal regimes that seek to recognize, protect, and promote the rights of the GR-holders while simultaneously encouraging access to the genetic resources.¹⁴³

Although many countries have separately enacted their own *sui generis* systems, there has been little progress in developing a uniform, international

(noting further that the disclosure of origins requirement can be used to comply with prior informed consent for access and equitable benefit-sharing requirements where they exist).

138. See, e.g., Longacre, *supra* note 3, at 999–1003 (illustrating additional problems of disclosure of origins requirement and prior informed consent, such as from whom the prior informed consent should most appropriately be obtained).
139. See also Kohls, *supra* note 2, at 133–35 (insisting that an amendment to TRIPS restricts the flexibilities of member states to experiment with various protection mechanisms).
140. See BOOKLET NO. 2, *supra* note 10, at 20–21 (illustrating prominent *sui generis* regimes, such as the Biodiversity Law No. 7788 of Costa Rica, that regulate access to the genetic resources and provide equitable benefit sharing to the GR-holders).
141. See Correa, *supra* note 78, at 14 (stating that the Third World Network developed such a *sui generis* system in 1994, the Community Intellectual Rights Act).
142. See BARTON, *supra* note 116, at 79 (noting that a *sui generis* system enacted in the Philippines granted its GR-holders such rights).
143. See *id.* at 80 (detailing the national legislations from the Philippines, Guatemala, and Bangladesh that attempt to achieve a balance between the need to protect the genetic resources and to increase access to them).

sui generis system.¹⁴⁴ Professor Correa opines that such an international system has numerous complex, conceptual, and practical problems, such as defining the subject matter of protection, the requirements and duration of such protection, the conferred rights, and the enforcement mechanisms.¹⁴⁵ These problems may limit the effectiveness of a *sui generis* system to address biopiracy outside of specific national boundaries.¹⁴⁶ Moreover, some scholars question whether a single, international, and comprehensive *sui generis* system should be adopted at all.¹⁴⁷ Professor John Barton adds that a single, all-encompassing *sui generis* system “may be too specific and not flexible enough” to accommodate the various concerns of the opponents of biopiracy.¹⁴⁸ Unless the various obstacles and the academic disagreement over the proper scope (national or international *sui generis* system) are resolved, the numerous national *sui generis* systems that currently exist may just form an incoherent and ineffective patchwork of legal mechanisms that ultimately fail to defend against biopiracy.¹⁴⁹

144. See, e.g., *id.* (implying that it is unlikely that various national systems can find sufficiently common characteristics to form a workable international *sui generis* system). See generally WIPO, Intergovernmental Comm. on Intell. Prop. & Genetic Resources, Jul. 7–15, 2003, Comparative Summary of *Sui Generis* Legislation for the Protection of Traditional Cultural Expression, WIPO/GRTKF/IC/5/INF/3 (Apr. 28, 2003) [hereinafter Summary], available at http://www.wipo.int/export/sites/www/tk/en/laws/pdf/grtkf_ic_5_inf_4_annex.pdf (summarizing the various national *sui generis* regimes enacted around the world).

145. See Correa, *supra* note 78, at 14 (observing that the issues surrounding *sui generis* system have stalled the progress of implementing an international *sui generis* regime); see also Charles R. McManis, *Fitting Traditional Knowledge Protection and Biopiracy Claims into the Existing Intellectual Property and Unfair Competition Framework*, INTELLECTUAL PROPERTY AND BIOLOGICAL RESOURCES 425, 474 (Burton Ong ed., 2004) (arguing that an attempt to create a consistent international *sui generis* regime will unleash the “politics of intellectual property law”).

146. See Correa, *supra* note 78, at 14 (stating that an international *sui generis* system must address not only the genetic resources and the associated traditional knowledge but also artistic creations and folklore, which adds further complexities).

147. See *id.* (explaining that resolving whether a single or multiple *sui generis* regimes will most effectively address biopiracy is a critical policy issue).

148. See BARTON, *supra* note 116, at 80 (noting that a single *sui generis* regime may not accommodate those opponents of biopiracy, such as the Kechuan Indian in Peru, who operate under a different concept of wealth that is contradictory to the western concept).

149. See, e.g., BOOKLET NO. 2, *supra* note 37, at 20–22 (giving examples of national legislations of *sui generis* systems); McManis, *supra* note 145, at 475–76 (explaining that *ad hoc* systems lead to over- and under-protection that ultimately fail to serve the public interest); but see, e.g., BARTON, *supra* note 116, at 80

D. Private Agreements

A private agreement is a contractual relationship between the bioprospectors and the GR-holders, and is an example of a positive protection mechanism.¹⁵⁰ Private agreements enable the bioprospectors to own,¹⁵¹ use, and license the genetic resources.¹⁵² In her comment, Maggie Kohls strongly advocates the increased use of private agreements in the bioprospecting context.¹⁵³ She asserts that through private agreements, the bioprospectors would acknowledge the source of the GR/TK, and by design, negotiate to compensate the GR-holders for their genetic resources and traditional knowledge.¹⁵⁴ In addition, because bioprospectors have an enormous financial stake in successfully reaching an agreement, they will be compelled to engage in creative and individualized solutions that invite continued cooperation from GR-holders.¹⁵⁵ This room for creativity within the private agreement framework is possible because TRIPS only sets a minimum requirement for patentability that encourages flexibility and private experimentation at the national and local levels.¹⁵⁶ Moreover, because bioprospectors must acknowledge the source of the GR/TK due to their need to negotiate a contract with the relevant GR-holders, the private agreement framework may

(highlighting various efforts, such as by the G15 Group of developing countries, seeking to establish an international *sui generis* system).

150. See Kohls, *supra* note 2, at 128–29 (illustrating examples of private agreements, such as the Natura Cosmetics SA private agreement with the indigenous communities of Brazil).
151. See *id.* at 122–23 (elaborating that a “joint ownership” of the genetic resource in a private agreement framework recognizes the specific contributions of the GR-holders as suppliers of the genetic resource, and in some cases, the traditional knowledge).
152. See Kremers, *supra* note 5, at 38–39 (suggesting that private agreements can eliminate some of the obstacles that made joint ownership infeasible, specifically the unrealistic premise that ownership rights can be allocated between contracting parties).
153. See Kohls, *supra* note 2, at 135 (opining that in addition to addressing the core issues of biopiracy, private agreements can also address the issues of preservation and conservation of genetic resources and traditional knowledge).
154. See *id.* (asserting that private companies are willing to accept source disclosure and benefit sharing if those legal requirements are clear and stable).
155. See *id.* (suggesting that the bioprospectors are also motivated by the necessity to ensure preservation and conservation of the biodiversity because it is the source of the valuable genetic resources that bioprospectors need).
156. See *id.* at 134 (stating that TRIPS gives discretion to individual states to pursue its national intellectual property legislation, serving as a “laboratories of experimentation”).

have the added benefit of mandating prior informed consent and a disclosure of origins requirement without any inconsistency with TRIPS.¹⁵⁷

Despite the promising potential of private agreements to resolve biopiracy, they nevertheless have weaknesses.¹⁵⁸ Since the contracting parties must reach an agreement before the true value of a genetic resource is realized, some scholars fear that genetic resources will be incorrectly valued.¹⁵⁹ Also, there are concerns that when bioprospectors form private agreements with government entities of developing countries, the GR-holders may not benefit from equitable benefit sharing because the compensation may pool within the government without streaming down to the indigenous communities.¹⁶⁰ Further, Professor Nancy Kremers postulates that a private agreement for genetic resources may not form because it must accommodate complex relationships among cultural, social, legal, and environmental factors that are absent in a normal business agreement.¹⁶¹ There may also be a potential problem of negotiating with non-representative parties who claim to be representing the GR-holders.¹⁶² Moreover, ensuring that the GR-holders receive adequate legal representations is a critical concern towards the feasibility of forming private agreements.¹⁶³ Finally, private agreements are difficult to enforce in a transnational setting.

Nevertheless, private agreements should become an important mechanism to address biopiracy because they can responsively and immediately address issues of control and equitable benefit sharing. Although biopros-

157. See Eiland, *supra* note 35, at 69 (implying that because the bioprospectors can only have access to the genetic resources pursuant to private agreements, they must disclose the source of the genetic resources, and if applicable, the traditional knowledge).

158. See Kremers, *supra* note 5, at 34–35 (explaining that the uncertainty inherent in any transnational contracting is also present in a bioprospecting private agreement).

159. See Carvalho, *supra* note 127, at 153–56 (noting that there might not be a duty on the bioprospectors to reveal the potential value of the genetic resource to the GR-holders).

160. See Eiland, *supra* note 35, at 70 (criticizing the assumption that the benefits will “trickle down” to indigenous communities from governments that enter into private agreements with the bioprospectors).

161. See Kremers, *supra* note 5, at 35 (noting that a bioprospecting private agreement may be prohibitively more complicated than traditional foreign investment experiences in petroleum or timber industries).

162. See BARTON, *supra* note 116, at 77 (reporting that a private agreement between a British pharmaceutical company and a government entity of South Africa for hoodia cactus resulted in claims of biopiracy because the government entity was not representative of the GR-holders, the San People).

163. See, e.g., *id.* at 37 (implying that legal representation is required to give indigenous communities business advice in addition to legal advice).

pecting for genetic resources has become an established practice, many bioprospectors are now moving away from the traditional bioprospecting of raw materials to marine exploration.¹⁶⁴ Any further delays in resolving biopiracy within the GR/TK context may render both the positive and defensive protection mechanisms obsolete.¹⁶⁵ In order to prevent biopiracy in a meaningful and timely manner, private agreements should become a prominent weapon for the GR-holders to combat biopiracy.

III. EXPANDING THE ARSENAL AGAINST BIOPIRACY: THE CONCESSION AGREEMENT FRAMEWORK

What is new is the emerging belief that together, the custodians of biological diversity in the Third World and those who want to make money out of it in the North can do it in collusion now, through equitable and just partnerships.

—GRAIN¹⁶⁶

One potential method to address the injustice and unfairness of biopiracy may be found by creating a legal regime that provides GR-holders with *mandatory* control and *permissive* equitable benefit-sharing while simultaneously ensuring that bioprospectors have access to genetic resources.¹⁶⁷ While intellectual property law may achieve these goals,¹⁶⁸ it is through the flexible and practical framework of private agreements that most effectively and responsively provide GR-holders with mandatory control over bioprospectors and their activities, while simultaneously developing an equitable benefit-sharing regime.

A concession agreement is a private agreement with special characteristics that make it particularly capable of meeting the objectives of mandatory control and permissive equitable benefit sharing for GR-holders.¹⁶⁹ Conces-

164. See Eiland, *supra* note 35, at 72 (stating that there has been a lack of recent discoveries of commercially valuable products from traditional biological raw materials).

165. See *id.* (noting that marine exploitation takes place within defined, nationally controlled coastlines, which gives bioprospectors the legal certainty missing in bioprospecting for genetic resource and the associated traditional knowledge).

166. GRAIN-2, *supra* note 39.

167. See, e.g., Longacre, *supra* note 3, at 994 (opining that the GR-source states must find a balance between strict control or no control over their genetic resources).

168. See Kohls, *supra* note 2 at 134 (saying that TRIPS is flexible and does not preclude “mutually agreeable” solutions between bioprospectors and GR-holders).

169. See DETLEV F. VAGTS ET AL., TRANSNATIONAL BUSINESS PROBLEMS 528 (4th ed., Foundation Press 2003) (1986) (noting that in a concession agreement, also known as a development agreement, the contracting parties do not have the

sion agreements are often employed in public-sector projects, most famously to facilitate prospecting and developing natural mineral or oil deposits.¹⁷⁰ Bioprospecting in many ways is analogous to these traditional prospecting activities, as both involve considerable risks of failure and raise questions of ownership and control over the resources that are extracted from the land.¹⁷¹

In 1981, the tribunal in the famous LIAMCO arbitration described the unique characteristics of a concession agreement as a “*semi-public* agreement made between a *State* and a *private individual* . . . whose object covers a project of . . . exploitation of natural resources, and in which are defined the *rights* and *obligations* of the parties in their mutual relationship.”¹⁷² In addition to these characteristics, a concession agreement is distinct from a normal private agreement because it serves predominantly as a major instrument of economic development for resource-rich states.¹⁷³ Hence, a concession agreement can be viewed as a joint public venture whereby the foreign private institution (FPI) and the host state cooperate in the development of a desired natural resource for their mutual benefits.¹⁷⁴

The fundamental characteristics of a concession agreement illustrate how useful the concession agreement framework can be in the bioprospect-

presumed parity of bargaining powers); *see generally* Mohamed Ebrahim Al-Naqbi, *Oil Concession Agreement: An Exploration of the Effect of Asymmetric Negotiations on Conflict Creation in Three Middle Eastern Countries between the Years of 1900-1975 (Iran, Iraq, Saudi Arabia)*, AAT 3047492, GEORGE MASON UNIVERSITY, 2002 (exploring the impact of the asymmetrical negotiation strengths between the private oil companies and concession-granting nations in the early concession agreements of the 20th Century).

170. JEFFREY DELMON, *PRIVATE SECTOR INVESTMENT IN INFRASTRUCTURE: PROJECT FINANCE, PPP PROJECTS AND RISK* 251 (Wolters Kluwer 2d ed. 2009).
171. *See* ONG, *supra* note 26, at 7 (saying that the principle difference is that the bioprospectors are seeking biological resources that can be developed for commercial exploitation).
172. *Libyan American Oil Co. v. Libyan Arab Republic*, 20 I.L.M. 1, 29–30 (1981) (deciding a dispute that arose between LIAMCO, a foreign private institution, and the Libyan Government over petroleum concession agreement) (emphasis added).
173. *See* VAGTS ET AL., *supra* note 169, at 528 (explaining that concession agreements are hardly distinguishable from a developing country’s development plan); *see also* Delmon, *supra* note 170, at 251 (opining that concession agreements are the backbone of public-private partnership ventures).
174. *See* Samuel K. B. Asante, *Stability of Contractual Relations in the Transnational Investment Process*, 28 INT’L & COMP. L.Q. 401, 401–403 (1979) (stating that the concession agreement lies more in the public law rather than in the private contract domain); *see also* Delmon, *supra* note 170, at 251–53 (noting further that concession agreements serve as a mechanism that allows the concession granting states to allocate certain risks to the foreign private institutions).

ing context.¹⁷⁵ Table 2 briefly summarizes the applicability of the concession agreement framework to bioprospecting in detail, and it also highlights how the concession agreement framework can satisfy some of the desired objectives of GR-holders.¹⁷⁶

TABLE 2: Comparison of the Concession Agreement Framework in its Traditional Context and Bioprospecting¹⁷⁷

	Traditional Prospecting	Bioprospecting
Semi-public Venture	State & Private Entity	State & Bioprospectors
Extraction of Natural Resource	Petroleum Minerals Gas	Biological and biochemical resources Traditional knowledge associated to genetic resources
Long-Term Relationship	Extraction Exclusivity of access and use Joint Public Venture Cooperative infrastructure construction and development Exclusive rights may last for decades	Extraction Exclusivity of access and use (patent) Joint Public Venture Cooperative research and development Exclusive patent rights may last for decades
Defined Rights and Obligations	Obligations/Duties: Conservation Good faith Ownership Incidental use (land, water, etc.) Compensations Royalties	Desired Objectives: Conservation Good faith Ownership Incidental use (associated TK) Compensation Royalties
Economic Development Strategy	Financial assistance Transfer of technology and human resources	Desired Objectives: Financial assistance Transfer of technology and human resources
Flexibility to Modify	Renegotiation provision	Desired Objectives: Option to renegotiate
Dispute Resolution	Arbitration	Desired Objective: Forum of redress

175. See VAGTS ET AL., *supra* note 169, at 528–30 (outlining the elements of the concession agreements and how the bargaining parity shifted to the resource-rich states over the years); see, e.g., Al-Naqbi, *supra* note 169, at 374–80 (concluding that the asymmetry in bargaining relationship vanished in recent concession agreements, exploring the transformation of Iran, Saudi Arabia, and Iraq oil concession agreements as illustrating this current trend).

176. See generally, Correa, *supra* note 78, at 2–4 (describing the bioprospecting paradigm and biopiracy as it relates to traditional knowledge).

177. See generally, James N. Hyde, *Permanent Sovereignty over Natural Wealth and Resources*, 50 AM. J. INT'L L. 854, 861–66 (1956) (explaining the impact

A. Semi-Public Venture: Accommodating the Increased Role of Governments in Preventing Biopiracy

In the modern bioprospecting paradigm, there is a definitive trend towards forming bilateral agreements between northern-based entities and southern-based government and government-related entities.¹⁷⁸ A concession agreement for bioprospecting could involve a genetic resources-source state (GR-source state) and a FPI. Therefore, it could become a semi-public venture between a government and the bioprospectors. However, before a GR-source state can enter into a contract with the bioprospectors, it must have recognized property rights and authority within its jurisdiction to negotiate for control and use of the genetic resources.¹⁷⁹ In concession agreements for bioprospecting, this authority derives from the principle of permanent sovereignty over natural resources.¹⁸⁰ Article 1 of the seminal Resolution No. 1803 (XVII) on Permanent Sovereignty over Natural Resources mandates that “the right of peoples and nations to *permanent sovereignty over their natural wealth and resources* must be exercised in the interest of their national development and of the well-being of the people of the State concerned.”¹⁸¹

Resolution 1803 is unclear as to whether people or nations possess the right of permanent sovereignty.¹⁸² However, in the bioprospecting context, there is no such ambiguity. It is the GR-source states who possess the sovereign rights over the genetic resources, and the CBD acknowledges this permanent sovereignty over natural resources of nations in Article 15.1,

of permanent sovereignty on the authority of resource-rich states to exploit their natural resources).

178. See Latin American Alliance, *supra* note 16 (noting some “high-profile” bioprospecting bilateral agreements such as the Merck/INBio agreement); see also Ragavan, *supra* note 1, at 518 (listing BIOAMAZONIA agreement in Brazil and the Indian agreement for *Jeevani* as another example of government-bioprospector bilateral agreements).

179. See, e.g., Emeka Duruigbo, *Permanent Sovereignty and Peoples’ Ownership of Natural Resources in International Law*, 38 GEO. WASH. INT’L L. REV. 33, 38 (2006) (tracing the origin of permanent sovereignty over natural resources to the General Assembly Resolution 626 (VII) of December 21, 1952 entitled Right to Exploit Freely Natural Wealth and Resources).

180. See Ragavan, *supra* note 1, at 862 (enunciating that the sovereign right cannot stand alone but in relation to treaties, international agreements, and other forms of estoppel).

181. Permanent Sovereignty Over Natural Resources, G.A. Res. 1803 (XVII), U.N. GAOR, Supp. No.17, U.N. Doc. A/5217, at 15 (December 14, 1962) (emphasis added).

182. See Duruigbo, *supra* note 179, at 43–49 (explaining that the right of permanent sovereignty may vest exclusively in peoples, solely in states, or jointly in people and the states).

“recognizing the *sovereign rights of States over their natural resources*, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation.”¹⁸³ Therefore, under the CBD, the state has a sovereign right over its genetic and other biological resources. The permanent sovereignty gives the GR-source states—not the indigenous communities—the authority to grant concessions to the FPI in a bioprospecting concession agreement.

Even if the indigenous communities of the GR-source states are considered the actual GR-holders, who the bioprospectors must recognize, Article 15.1 of the CBD implicitly subjects these indigenous communities to the jurisdiction of their respective states because the *states* have the authority to determine access to the genetic resources and to exploit the genetic resources according to its national policies.¹⁸⁴ Article 8(j) of the CBD makes this implication explicit by declaring that the Contracting Parties are “*subject to . . . national legislation . . . for the conservation and sustainable use of biological diversity and promote their wider application [and] utilization of such knowledge.*”¹⁸⁵

The Preamble of TRIPS mirrors the CBD’s grant of authority to the states over their genetic resources. Although TRIPS recognizes that intellectual property rights are “private rights,”¹⁸⁶ it immediately relates these private rights to national policy by stating that TRIPS “*recognize[s]* the underlying public policy objectives of national systems for the protection of intellectual property, including developmental and technological objectives.”¹⁸⁷ Together, the CBD and TRIPS grant permanent sovereignty to the GR-source states and not to the indigenous communities. In fact, Professor Marcelo Dias Varella opines that with the adoption of the CBD in 1992, the protection of national interests took priority over local interests of the indigenous communities.¹⁸⁸ For instance, many Latin American countries have centralized

183. CBD, *supra* note 32, at art. 15(1) (outlining the requirements for the Contracting Parties in order to gain legitimate access to the genetic resources under the CBD) (emphasis added).

184. *See id.* (noting that any access to the genetic resources is subject to national legislation); *see also id.* at PREAMBLE (“Reaffirming also that States are responsible for conserving their biological diversity and for using [it] in a sustainable manner.”).

185. CBD, *supra* note 32, at art. 8(j) (referring to “Contracting Parties” generally to include the GR-source state, GR-holders, and the foreign bioprospectors) (emphasis added).

186. TRIPS, *supra* note 71, at PREAMBLE (“Recognizing that intellectual property rights are private rights.”).

187. *See id.* (addressing the importance of adequate intellectual property rights in international trade) (emphasis added).

188. Varella, *supra* note 80, at 7.

the control of access to the genetic resources at the government level.¹⁸⁹ While there is recognition that the indigenous communities have the right to participate, the current trend is that they are not an independent group that can exercise decision-making power above national interests.¹⁹⁰ In short, GR-source states have the authority to become parties to a concession agreement for bioprospecting with bioprospectors who seek to extract the genetic resources.

Additionally, the GR-source states may gain the authority to engage in a bioprospecting concession agreement independently of permanent sovereignty. If the rights to the genetic resources and the associated traditional knowledge belong exclusively to the GR-holders, the GR-source states can nevertheless enter into a bioprospecting concession agreement by becoming a trustee of the GR/TK for the GR-holders.¹⁹¹ One example of a trustee system in bioprospecting involves the San People of South Africa and the Hoodia cactus.¹⁹² The South African government established the Council for Scientific and Industrial Research (CSIR) that assisted the San People in developing Hoodia and obtained a patent on the active ingredient.¹⁹³ Subsequently, CSIR sold the Hoodia patent to a British pharmaceutical.¹⁹⁴ Unfortunately, the San People were never aware of this deal and threatened legal actions

189. *Compare id.* (noting that the African countries have opted for an opposite approach of decentralizing the decision-making power and seeking to empower the indigenous communities), with African Union, *Framework on Bioprospecting*, AU/EXP/ST/13(III) 3-10 (Nov. 2007), available at http://www.africaunion.org/root/AU/Conferences/2007/November/HRST/AMCOST/docs/pdf/AU-EXP-ST-13_III_-ENG-Framework%20on%20Bioprospecting.pdf (advocating for a more centralized system to combat biopiracy in the African countries).

190. *See* Varella, *supra* note 80, at 8 (noting, for instance, that while the Brazilian Provisionary Measure 2.052/2000 respects the rights of indigenous communities to refuse access to their genetic resources and traditional knowledge, the legislation authorizes the national commission to override when necessary for the public interest). *But see* Summary, *supra* note 144, at 12 (identifying Costa Rican law, the Biodiversity Law No. 7788, that recognizes the right of local communities and indigenous peoples to oppose access to their genetic resources and traditional knowledge).

191. *See, e.g.,* Kohls, *supra* note 2, at 125-27 (noting examples of governments acting as trustees for the GR-holders of genetic resources).

192. *See id.* (describing hoodia cactus as an appetite suppressant, thirst quencher, and awareness heightener).

193. *See* BARTON, *supra* note 116, at 77 (explaining that the CSIR isolated hoodia's appetite-suppressing element, P57, and obtained a patent on it in 1995).

194. *See id.* (noting that the British pharmaceutical was PhytoPharma, an herbal manufacturer).

against CSIR for biopiracy.¹⁹⁵ Although the Hoodia cactus scenario is an example of the inappropriate use of the trustee model that perpetuated biopiracy, it nevertheless demonstrates the feasibility of how governments can represent the GR-holders in a semi-public, bioprospecting concession agreement.¹⁹⁶ Therefore, even if there is no international framework that explicitly recognizes permanent sovereignty over the genetic resources, a semi-public agreement can form in the bioprospecting context when governments become trustees and enter into a bioprospecting concession agreement on behalf of the GR-holders.¹⁹⁷

Framing bioprospecting concession agreement as a semi-public venture raises an important concern as to whether the interests of the indigenous communities, the actual GR-holders, are adequately represented by their governments. Observing the historical trend in other public-private extractive agreements certainly gives credence to this concern. Professor Emeka Duruigbo identifies the “resource curse,” which refers to a phenomenon of an inverse relationship between a country’s endowment with natural resources and its economic growth.¹⁹⁸ In the first concession agreement, the 1901 D’Arcy Concession, the notion of permanent sovereignty over natural resources was hailed as a catalyst for economic development of the developing countries.¹⁹⁹ However, this historic idealism contrasts sharply with the modern reality where kleptocratic activities have impoverished the citizenry of the resource-rich states and forestalled their economic development.²⁰⁰ If the GR-holders employ the concession agreement framework to prevent biopiracy, are they simply exchanging one group of actors that misappropriates to another domestic group of governmental actors?

An example from Norway answers the above question in the negative. Norway derived tremendous economic benefits from judicious uses of con-

195. *See id.* (insisting that the CSIR failed to attain prior informed consent as required by the CBD of all stakeholders before transferring the patent to PhytoPharma).

196. *See id.* (explaining that the CSIR negotiated directly with foreign corporations, such as Pfizer, who attempted to acquire rights to sell hoodia in the western diet and obesity markets, which are worth more than \$6 billion).

197. *See Kohls, supra* note 2, at 125 (qualifying the use of the trusteeship model on the fact that there is a mutuality of interest between the trustee and the GR-holders, which is not always true).

198. *See Duruigbo, supra* note 179, at 33–34 (emphasizing the “resource curse” as a “leadership curse” because the root of the “curse” are kleptocratic rulers that rob the benefits away from the country and its citizenry).

199. *See id.* at 34 (opining that this original optimism and the modern reality of the resource-rich developing countries could not be much starker).

200. *See id.* (citing examples such as the former Iraqi ruler Saddam Hussein who took ownership of the Iraqi oil wealth as one of his kleptocratic activities).

cession agreements.²⁰¹ In 1990, Norway established a Special Petroleum Fund that funded numerous social programs for their aging population, served as a buffer during economic recessions, and functioned to transfer its current wealth to future generations.²⁰² Although Norway clearly demonstrates that the resource curse is not inevitable, Norway's case is distinguishable from the numerous countries that inappropriately used their concession agreement benefits.²⁰³ For instance, prior to entering into its first concession agreement, Norway already possessed strong democratic institutions, established social forces and rule of law, and instituted a robust system of checks on government corruption.²⁰⁴ However, despite these distinguishing factors, Norway is a model for the GR-source states to follow regardless of whether they have strong political institutions.²⁰⁵ In addition, the infamous resource curse cases in Nigeria and Iraq are the exceptions, and they are not representative of the numerous GR-source states, such as Peru, Costa Rica, China, and India, that seek to exploit their genetic resources fairly and justly for public benefit.²⁰⁶ Hence, the GR-holders should not eliminate the concession agreement framework as a mechanism to address biopiracy simply because of the historical incidences of the resource curse. Although many GR-source states may not possess robust democracies and less corruption-prone institutions like Norway, there is little reason to doubt that the GR-source states

201. *See id.* at 83–86 (arguing that the keys to the effective use of concession agreements are a strong institution and proper spending of revenues derived from the natural resources).

202. *See id.* at 89 (explaining that although Norway was a net exporter of oil, it was not at the level of other oil-exporting countries, such as Nigeria and Saudi Arabia).

203. *See Duruigbo, supra* note 179, at 83–85 (noting non-political factors that contributed to Norway's success, such as racial and cultural homogeneity and undeterred foreign oil companies exploiting the oil fields at the detriment of the host State).

204. *See id.* at 84–86 (contrasting also the similarities of Norway against other oil-exporting countries that were victims to the symptoms of the "resource curse," such as sharp inflation, large budget deficit, loss of agriculture industry, and environmental deterioration).

205. *See id.* 90–91 (highlighting that a Nigerian scholar, Professor Pat Utomi, recently called for a fund system modeled after Norway's Special Petroleum Fund).

206. *See, e.g., Correa, supra* note 78, at 16–22 (outlining China and India's efforts to create a worldwide database of prior art and the Peruvian government's effort to address the needs of its indigenous communities); *see also* Merck Case: Merck-INBio Plant Agreement, available at <http://www.american.edu/TED/MERCK.HTM> [hereinafter Merck Case] (last visited Oct. 1, 2010) (describing the Merck-INBio Plant Agreement where the Costa Rica's Ministry of Natural Resources is successfully using their royalties from the genetic resource-derived products for conservation projects).

cannot adequately represent the interests of their indigenous communities or appropriately manage the benefits of bioprospecting concession agreements to pursue their economic developments and constructive national policies.

A. Long-Term Exclusive Relationship: Addressing the Risks and Challenges of Bioprospecting

The concession agreement framework effectively accommodates the long-term relationship that forms between the GR-source states and the bioprospectors. In a concession agreement entered in the context of an extractive industry, such as oil or mineral, the FPI are faced with two challenges.²⁰⁷ First, the FPI must invest heavily in the initial survey work, exploration, and prospecting before realizing any substantial returns on their investments.²⁰⁸ Second, there is no guarantee that the FPI will find the desired resource, or more importantly, sufficient quantities of the desired resource available for profit.²⁰⁹ The concession agreement is a mechanism that can address these twin risks of large initial investments and uncertain returns.²¹⁰

To justify the high risks of undertaking an expensive prospecting venture, the FPI wisely demands an exclusive and long-term relationship that allows sufficient time to prospect and hopefully collect returns on their investments.²¹¹ The Abu Dhabi Concession Agreement (Abu Dhabi Agreement) is an example of a simple concession agreement contract that

207. See Asante, *supra* note 174, at 409, 414 (discussing the need for a “renegotiation” provision to address the unique concerns of a transnational extractive venture); see, e.g., Michael U. Klein, *Bidding for Concessions*, WORLD BANK POLICY RESEARCH WORKING PAPER NO. 1957, 3 (August 1998), available at <http://ssrn.com/abstract=620608> (noting that many concession agreements are used in the context of infrastructure development such as water utilities and transport infrastructure).

208. See Asante, *supra* note 174, at 410 (explaining that FPI may expend anywhere from five to ten years in initial prospecting work just to discover the desired resource).

209. See *id.* (opining that these uncertainties also pose problems for the developing countries in reaching an agreement as to the tax, royalties, and other impositions chargeable to the FPI *before* the value of the desired resource is accurately determined). But see Klein, *supra* note 207, at 10 (asserting that the bargaining power of the concession-granting state may improve by employing a system of bidding for concessions that employs clear rules rather than negotiating on a case-by-case basis).

210. See, e.g., VAGTS ET AL., *supra* note 169, at 530 (arguing that a “renegotiation” provision of concession agreement allow the contracting parties to make changes to the agreement as the uncertainties are resolved over the life of the agreement).

211. See *id.* at 532 (noting that even if renegotiation is possible, the FPI and the host states seek to accommodate the twin concerns of concession agreements in advance).

illustrates the ways concession agreements can satisfy the FPI's demand for long-term exclusivity.²¹² In Article 2 of the Abu Dhabi Agreement, the state grants the FPI exclusive rights to "explore, search and drill for, produce, store, transport, and sell" petroleum, and Article 4 extends this exclusivity for thirty-five years.²¹³ The Abu Dhabi Agreement is not unique in conceding such a long-term exclusive right to the FPI.²¹⁴ It would be unreasonable for the FPI to prospect or develop a resource in the concession-granting state without an exclusive right to exploit that resource.

The bioprospectors face the same concerns. Like the FPIs in extraction industries, the bioprospectors seek to extract the genetic resources from the GR-source state's biodiversity.²¹⁵ To achieve this goal, bioprospectors incur enormous costs when searching for a potentially useful genetic resource without any assurance that such a genetic resource exists within the GR-source state's biodiversity.²¹⁶ While traditional knowledge may lead to a discovery, the concerns of uncertainty and large initial bioprospecting costs remain.²¹⁷

Since the concerns are similar, bioprospectors also demand long-term exclusivity.²¹⁸ In the bioprospecting context, intellectual property law provides exclusivity as the patents obtained from the genetic resource-derived

212. See Abu Dhabi Specimen Draft Oil Concession Agreement, *reprinted in* VAGTS ET AL., *supra* note 169 [hereinafter Abu Dhabi Agreement] (printing the concession agreement reached between Alpha Oil Corporation, which is now Occidental Petroleum Corporation, and Government of Abu Dhabi, which is now United Arab Emirates).

213. *Id.* at arts. 2, 4.

214. See Al-Naqbi, *supra* note 169, at 274 (indicating that between 1938 to 1968 Iraq entered into four oil concession agreements with durations that average 62.5 years).

215. See ONG, *supra* note 26, at 9 (explaining that biological resources have been recognized as potential source of economic wealth); see generally Arezzo, *supra* note 31, at 368–70 (noting that bioprospectors seek plants and herbs, which are enhanced in value by the traditional knowledge of the local communities).

216. See, e.g., Arezzo, *supra* note 31, at 372 (highlighting the importance of traditional knowledge for bioprospectors to narrow the scope of their search to only the most promising genetic resources).

217. See *id.* (opining that the plant and animal varieties in Brazil, Peru, and Australia alone represent billions of compounds with countless practical applications).

218. See, e.g., Eiland, *supra* note 35, at 46 (stating that the long-term process required in developing a drug from the raw genetic resource leaves little doubt in the modern intellectual property regime that genetic resource can become an intellectual property right).

products can last as long as twenty-five years.²¹⁹ Similar to extractive industries, the long-term relationship²²⁰ that can form between the bioprospectors and the GR-source states through the negotiated bioprospecting concession agreement and intellectual property law.²²¹

Additionally, the execution of the concession agreements also contributes to the long-term relationship between the host state and the FPI. Article 7 of the Abu Dhabi Agreement provides that “[a]fter discovery of [the desired resource] . . . the [foreign] Company shall proceed to develop . . . all productive structures, to install the facilities which are necessary to production storage and transport and to produce the [desired resource] therefrom.”²²² As noted previously, concession agreements function as a “joint public venture.”²²³ Hence, even after discovering the desired resource, there is a continuing relationship between the FPI and the host state that may entail cooperative development, exploitation, and use of the discovered natural resource.²²⁴

This continuing, long-term relationship can also exist between the bioprospectors and the GR-source state following the initial discovery and exploitation of the genetic resource. The story of *oryza longistaminata* is example of how a long-term relationship can arise within the bioprospecting paradigm.²²⁵ Traditional knowledge led a group of researchers from the University of California at Davis to identify and isolate *oryza longistaminata*,

219. See *id.* (explaining that the intellectual property regime has been used in the bioprospecting context with patents).

220. I am assuming here that the bioprospectors are recognizing the permanent sovereignty of the GR-source state over its genetic resources, and thus, an indispensable stakeholder in the bioprospecting paradigm.

221. See Asante, *supra* note 174 and accompanying text (discussing that concession agreements function as “joint public ventures”); Kremers, *supra* note 5, at 22 (opining that the developing countries realize that “however distasteful,” intellectual property regime is an established part of the international trade landscape).

222. Abu Dhabi Agreement, *supra* note 212, art. 7.

223. See, e.g., Asante, *supra* note 174, at 403 (asserting that concession agreements require the host state and the FPI to cooperate in order to develop a strategic public resource); see generally Ernest E. Smith & John S. Dzienkowski, *A Fifty-Year Perspective on World Petroleum Arrangements*, 24 TEX. INT’L L.J. 13, 33–6 (1991) (describing that the traditional bargaining disparity between the host state and the FPI has diminished and in modern concession agreements they function as partners in development).

224. See Asante, *supra* note 174, at 403 (emphasizing that since developing countries employ concession agreements as part of their “development strategy,” the obligations of the FPI extends further than just prospecting and extracting the desired resource).

225. See BOOKLET NO. 2, *supra* note 10, at 9 (explaining that *oryza longistaminata* is a wild rice growing in Mali).

which provides disease resistance to certain rice varieties.²²⁶ The researchers and GR-holders reached an agreement for equitable benefit-sharing where royalties from the genetic resource were used to create the Genetic Resource Recognition Fund that provides fellowships to agriculture students and researchers from the indigenous communities.²²⁷ Like concession agreements in other contexts, a relationship between the GR-source state and the bioprospectors may last long after the initial discovery and extraction of the desired genetic resource.²²⁸

In conclusion, due to shared challenges inherent to traditional prospecting and bioprospecting, long-term exclusivity is needed to address the issues of uncertainty and high investment costs.²²⁹ In addition, a concession agreement may include additional agreements that extend the contractual relationship between the parties beyond just the extraction and utilization of the desired resource.²³⁰ These similarities make the concession agreement framework applicable in the bioprospecting context as a legal mechanism to prevent biopiracy.

B. Defining the Rights and Obligations: Controlling the Conduct of the Bioprospectors

The concession agreement provides a mechanism for the GR-source states to impose a measure of control over the bioprospectors while they are prospecting and once they find the commercially valuable genetic resource. In other words, the GR-source states can control access to the genetic resources and require equitable benefit-sharing from bioprospectors as a condition for entering into the concession agreement.²³¹ This control is critical

226. *See id.* (noting that the Bela community developed systemic understanding that *oryza longistaminata* has stronger resistance to agricultural diseases such as rice blight.).

227. *See id.* at 24 (saying that the bioprospectors were required to pay a certain percentage of the sales for a specific number of years into the fund with an aim to build capacity in the indigenous communities).

228. *See also* Varella, *supra* note 80, at 9 (saying that the Costa Rican law requires the bioprospectors to invest in the conservation of the region from which they extract the genetic resources); CBD, *supra* note 32, at art. 18 (mandating cooperation between the Contracting Parties to any private agreement for access to genetic resource and its development).

229. *See supra* note 208 and accompanying text.

230. *See supra* notes 223, 227, and 229 and accompanying text.

231. *See* Kohls, *supra* note 2, at 110–4 (describing that some opponents of biopiracy do not object to bioprospecting or the use of the genetic resources per se); *see generally* Varella, *supra* note 62, at 9 (detailing that benefit sharing can take many different forms, such as direct monetary payment, technology transfer, equipment deliveries, and participation in research).

because the concession agreement will form a long-term exclusive relationship between the GR-source states and the bioprospectors.²³²

Historically, developing countries with abundant natural resources faced a similar need to control the actions of the FPI who sought to exploit natural resources.²³³ Professor Detlev Vagts explains that early concession agreements gave more power to the FPI because the resource-rich states did not possess the requisite legal experience, financial resources, or the technical know-how to exploit the natural resources themselves.²³⁴ In time, the balance of power in concession agreements shifted from the FPI to the resource-rich states.²³⁵ The early concession agreements were modified to limit the unreasonably long concession periods, exclusive exploitation rights of very large geographical areas and simplistic, sometimes harmful, contractual terms agreed to by the resource-rich states.²³⁶ The modern concession agreement framework evolved to entail elaborate contractual mechanisms that specifically define the rights and obligations of the FPI to establish a more equitable sharing of benefits for the resource-rich states.²³⁷

Detailed, contractually defined rights and obligations can remedy the issue of control over the conduct of the bioprospectors that is central to preventing biopiracy. The Abu Dhabi Agreement provides examples of the rights and obligations that a GR-source state can impose on the biopros-

232. See *supra* notes 224–227 and accompanying text (explaining how a long-term relationship can form between the GR-holders and the bioprospectors); see also CBD, *supra* note 32, at art. 5 (mandating that the Contracting Parties cooperate to utilize the genetic resources).

233. See VAGTS ET AL., *supra* note 169, at 529 (insisting that while the FPI's own motives are for profit, the resource-rich states needs to control the FPI in order to use the FPI as part of resource-rich states' overall development plan).

234. *Id.* at 528; see also Smith & Dzienkowski, *supra* note 223, at 17 (noting that in the 1901 D'Arcy Concession Agreement, the Shah of Persia granted the FPI exclusive access to 500,000 miles of the country's oil reserves for a period of 60 years); Al-Naqbi, *supra* note 169, at 6–8 (opining that greed, dash to benefit from foreign capital, and inexperience in negotiations all contributed toward an asymmetrical relationship between the FPI and the oil producing countries in the early oil concession agreements).

235. See, e.g., VAGTS ET AL., *supra* note 169, at 529 (describing that, for example, in 1950, Saudi Arabia later changed its concession agreements and applied a 50–50 principal to sharing revenues from the extracted oil).

236. See *id.*

237. See, e.g., Smith & Dzienkowski, *supra* note 223, at 26–7 (arguing that the covenants in concession agreements helped to balance the rights of the FPI and the resource-rich states); see also DELMON, *supra* note 170, at 253–4 (categorizing broadly the interests of the resource-rich states as defined completion date, performance, maintenance regime, and construction/operation of the project in a semi-public venture).

pectors.²³⁸ For instance, Article 2 of the Abu Dhabi Agreement confers rights to the FPI only for the contracted petroleum resource.²³⁹ Furthermore, Article 1 imposes geographic restrictions on the FPI to conduct their prospecting activities.²⁴⁰ Moreover, Article 3 unambiguously states that any other resources that the FPI may find, such as natural gas, belong exclusively to the resource-rich states, denying the FPI of any rights to these unintended resources.²⁴¹ Together these provisions effectively give the resource-rich states control to regulate access to their natural resources by defining what resources the FPI can take and where they may take it from.²⁴² Moreover, resource-rich states may force the FPI to accept “work obligations” that place the FPI on a specific timeline to begin and conclude their prospecting and resource-extracting activities.²⁴³ The GR-source states can apply these provisions to the bioprospecting concession agreements in order to force the bioprospectors to disclose the specific genetic resources that they seek to extract, limit the access to only those particular genetic resources, restrict the bioprospectors to a defined geographical area, and guarantee that the bioprospectors are actively developing the genetic resources.²⁴⁴

Further, the concession agreement framework gives additional control to the GR-source states by requiring the bioprospectors to share the benefits derived from the genetic resources. The Abu Dhabi Agreement has clearly defined compensation mechanisms and royalties that the FPI must pay based on their right to prospect, upon discovery of the desired resource, and once the extractions are underway.²⁴⁵ Also, the concession agreements set the

238. Abu Dhabi Agreement, *supra* note 212 (explaining rights and obligations states can impose).

239. *Id.* at art. 2 (“[E]xclusive rights to explore, search, and drill for, produce . . . sell Petroleum within the Concession Area.”); *see also id.* at art. 1 (defining the term “Concession Area”).

240. *Id.* at art. 1 (establishing the “Concession Area” as 7685.66 km² of the UAE).

241. *Id.* at art. 3 (agreeing that all natural gases discovered or produced in the Concession Area do not belong to the FPI).

242. *See supra* notes 238–41 (explaining how states can gain control of their resources).

243. Abu Dhabi Agreement, *supra* note 212, at art. 6 (mandating that the FPI begin prospecting for petroleum in the Concession Area within months and begin extraction within two years from the date of the concession agreement).

244. *But see infra* Part IV (noting that a long-term exclusive relationship with only one private entity may actually hinder scientific innovation and economic development, and thus, be detrimental to society and the GR-source state).

245. Abu Dhabi Agreement, *supra* note 212, at art. 10–11, 13 (implementing bonus payments, annual rentals, and royalty payments to the concession agreement); *see, e.g.,* Al-Naqbi *supra* note 169, at 251 (declaring that the FPI is subject to certain penalties/sanctions for failing to act according to their contractual obligations).

terms of relinquishment of the rights, mandate best conservation practices, and restrict the use of incidental resources, such as land and water.²⁴⁶ The GR-source state can use these mechanisms to control the conduct of the prospectors while they are bioprospecting and once they find the commercially valuable genetic resource.

There are numerous examples of the flexibility in creating equitable benefit-sharing regimes through private agreements in the bioprospecting context. Under the Provisionary Measure n.2.052, Brazil mandates that any contract for access to the GR/TK include a clause pertaining to technology transfer.²⁴⁷ At the same time, such contractual agreements should allocate intellectual property rights equitably between the GR-source state and bioprospectors.²⁴⁸ In another example, as part of the access contract to the genetic resources, the International Cooperative Diversity Group contract in Nigeria obliges bioprospectors to pay a certain percentage of revenues derived from the genetic resources to the local communities.²⁴⁹ Lastly, Costa Rican law requires bioprospectors to help support conservation of the region from where they extracted the genetic resources.²⁵⁰ As these examples illustrate, the GR-source states can actively take advantage of the flexibility of concession agreements to formulate equitable benefit-sharing regimes that fits their specific needs and policies.

Hence, the concession agreement contractual provisions that evolved to control the FPI in the traditional resource prospecting context can work to control access to the genetic resources and ensure equitable benefit sharing in the bioprospecting context, thereby satisfying the objectives of the GR-

246. *Id.* at arts. 12, 14, 21 (providing that the FPI relinquish 25% of the developed concession area every three to five years to the host State, which accomplishes the development-strategy goals of the concession agreement).

247. Varella, *supra* note 80, at 9. *But see* Carvalho, *supra* note 127, at 154–6 (opining that a contractual relationship establishing prospectively a regime for equitable benefit sharing may be unfair to the bioprospectors because the true value of the genetic resources will not be available until many years later when the research, testing, and commercialization of the genetic resource are completed).

248. Tania Bubela et al., *Respecting, Promoting, and Protecting Traditional Knowledge: A Comparative Case Study of Brazil, Kenya, and Northern Canada* 25–27 (International Expert Group on Biotechnology, Innovation and Intellectual Property), available at http://www.theinnovationpartnership.org/data/ieg/documents/cases/TIP_TK_Case_Study.pdf (explaining that in the Bioamazônia-Novartis bilateral agreement negotiated in 2000 but was ultimately rejected, Novartis as the FPI held exclusive intellectual property rights over the genetic resource-derived products in exchange for considerable monetary compensation and obligations to train Brazilian scientists).

249. Varella, *supra* note 80, at 9.

250. *Id.*

source states.²⁵¹ A concession agreement framework directly addresses biopiracy by providing the GR-holders with *mandatory* control and *permissive* equitable benefit-sharing for their genetic resources, while simultaneously ensuring the bioprospectors maintain continued access to the genetic resources.²⁵²

C. Economic Development: Promoting the Resource Use Policy of the Biodiversity-rich States

In many instances, the geographical areas with the greatest biological diversity and traditional knowledge are located in developing countries of great economic poverty, political instability, exploitation, and biological and environmental degradation.²⁵³ As a result, these developing countries, predominantly located in the Southern Hemisphere, cannot utilize their own resources because they do not have the requisite legal system, economic capacity, and technical and human resources.²⁵⁴

In advocating for TRIPS, the developed countries argued that a stronger, global intellectual property regime (IPR) would “foster technology and investment flows to developing countries,” which would consequently promote their trade and economic developments.²⁵⁵ This hypothesis is true for those

251. See generally DELMON, *supra* note 170, at 253–54 (implying that through equitable benefit sharing regimes of bonus, rentals, royalties, and profit-sharing, the resource-rich states can receive tremendous financial capital from exploiting their natural resources); Biodiversity Law No.7788, *supra* note 59.

252. See Longacre, *supra* notes 3, at 167.

253. See Rosemary J. Coombe, *Intellectual Property, Human Rights & Sovereignty: New Dilemmas in International Law Posed by the Recognition of Indigenous Knowledge and the Conservation of Biodiversity*, 6 IND. J. GLOBAL LEGAL STUD. 59, 94 (1998) (noting that the human and biological conditions are directly related to one another in conservation of biological resources, and thus, material wealth); see, e.g., MGBEOL, *supra* note 62, at 61 (reporting that over two thirds of the planet’s existing plant species are located in the Southern Hemisphere).

254. See *supra* Part I.B (describing the important commercial mechanism that led to the current North-Side divide of economic wealth); Coombe, *supra* note 253, at 94–95 (opining that a simple system of property rights that brings the indigenous communities in developing countries into greater contact with developed countries may exacerbate the complex problems of poverty and biodiversity conservation for those countries).

255. See CARLOS M. CORREA, *INTELLECTUAL PROPERTY RIGHTS, THE WTO AND DEVELOPING COUNTRIES: THE TRIPS AGREEMENT AND POLICY QUESTIONS* 23–24 (Zed Books Ltd. 2000) [hereinafter *POLICY QUESTIONS*] (stating that empirical evidence are beginning to show that the promises of developed countries are not materializing); Kremers, *supra* note 5, at 19 (contending that strong intellectual property laws may increase the current income and development disparities between the North and South).

developing countries that are past a certain development threshold, but remains unproven for those countries that are less developed.²⁵⁶ For “advanced developing countries,” an IPR will not only positively influence trade, but also promote increased access to technology, improved welfare, enhanced global efficiency, and more robust industrial development.²⁵⁷ Figure 1 and

Figure 2 illustrate the beneficial effects of adopting an IPR for those countries beyond a certain development threshold.²⁵⁸ These two figures show a strong correlation between increased economic and intellectual property-protecting activities in South Korea and China.²⁵⁹ In interpreting these figures, it is important to note that they only demonstrate a correlation and not a cause-and-effect relationship. Nevertheless, among the advanced developing nations, the figures below strongly support the general proposition that increased IPR can promote trade and economic development.²⁶⁰

The developing countries fully understand this relationship between intellectual property-protecting capability and economic development. Professor Daniel Gervais explains that the “only true measures” obtained by the developing countries during the TRIPS negotiations, in addition to Articles 7 and 8, were special “transition periods” to effectuate the TRIPS standards into their national laws.²⁶¹ These two articles mandate that there be a “transfer and dissemination of technology . . . in a manner conducive to the social

256. See CORREA, *supra* note 255, at 24 (noting that South Korea, China, Mexico, Argentina, and Brazil are countries that are “advanced” in its industrialization process).

257. See *id.* (arguing that due to the wide disparities among developing countries, accurately measuring the economic effect of TRIPS will be difficult).

258. WIPO: Statistics on Patents, <http://www.wipo.int/ipstats/en/statistics/patents> (last visited Sept. 14, 2010) (download the file “Patent grants by patent office (1883-2008) by resident and non-resident” under the Section “Patents Granted”); WTO: Statistic Database, <http://stat.wto.org/StatisticalProgram/WSDbStatProgramSeries.aspx?Language=E&subtopic=m; tv> (last visited Sept. 14, 2010) (select “Total Merchandise Trade” and run through the selection process by country, “World,” variable: “Exports,” and yearclick on “Trade Profiles” and run through the selection process by country, years, and variable: “Exports”).

259. “Exports” was used as a variable to determine the economic capacity because exports can be indicative of the presence of a nation in world trade. See generally, Daniel J. Gervais, *Intellectual Property, Trade & Development: The State of Play*, 74 *FORDHAM L. REV.* 505, 505 (2005) (noting that a “marriage” of intellectual property and trade rules will subject intellectual property rules to be interpreted from economic perspectives); CORREA, *supra* note 255, at 28 (stating that the importance to national economies of intellectual property-related industries reside in the fact that they export).

260. See Gervais, *supra* note 260, at 505 (explaining that TRIPS will lead to trade liberalization, which is a means to an end toward promoting economic growth).

261. See Gervais, *supra* note 260, at 509.

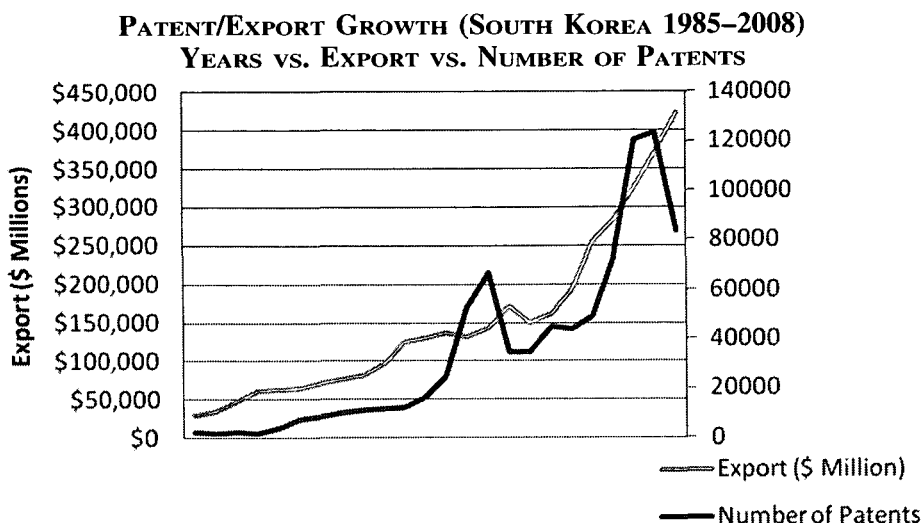


Figure 1: Demonstrating the relationship between rise in exports and the corresponding rise in patent capability (number of patents granted) in South Korea, an advanced developing country.

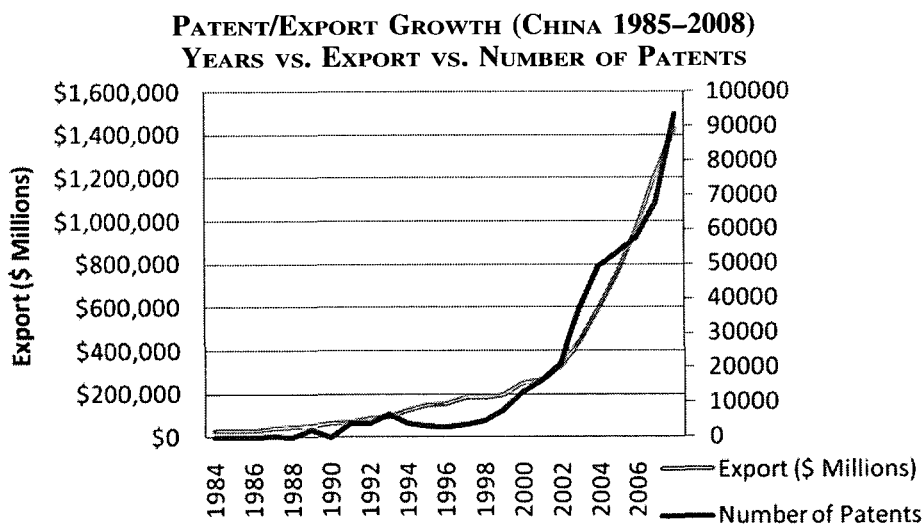


Figure 2: Demonstrating the relationship between rise in exports and the corresponding rise in patent (number of patents granted) capability in China, an advanced developing country.

and economic welfare.”²⁶² Even though an IPR may not independently or positively influence development-related activities, it can be presumed that

262. TRIPS, *supra* note 133, at art. 7 (outlining the objective of the TRIPS Agreement).

developing countries agreed to TRIPS because some level of IPR is needed in order to achieve optimal level of economic development.²⁶³

However, recent studies are beginning to show that—unlike the advanced developing countries—enhanced IPR does not necessarily promote economic development for those non-advanced developing countries that frequently possess the richest sources of biodiversity.²⁶⁴ To explain this observation, Professor Correa suggests that in non-advanced developing countries, the impact of increased IPR will mainly influence the market prices of products exported by the developed countries into the developing countries.²⁶⁵ Concurrently, the developing countries in the South would incur losses for which the developed countries in the North must subsequently compensate.²⁶⁶ Moreover, he argues that increased IPR may lead to “scientific and technological protectionism” that may actually reduce the dissemination of technology transfer to the developing countries that are currently playing a “catching-up” process.²⁶⁷ Nevertheless, Professor Gervais recommends that based on lack of sufficient empirical data and for practical reasons TRIPS (hence, increased IPR) should be “seen, and accepted, as a given” in the modern international legal system.²⁶⁸ Therefore, the developing countries should accept that an enhanced IPR may not promote their economic devel-

263. See Gervais, *supra* note 260, at 534 (questioning whether an IPR will benefit the truly poorer nations); Kremers, *supra* note 5, at 19 (noting that the debate on the positive or negative effects of an IPR on developing countries are occurring not only at the WIPO but also on variety of other international forums, such as the World Trade Organization).

264. See CORREA, *supra* note 255, at 25 (arguing that the poorest countries should not expect to gain any welfare benefits from an enhanced IPR).

265. See *id.* at 24–29 (arguing that an IPR will unlikely affect the transnational corporations’ decision on foreign direct investment flows or location of their Research & Development facilities abroad in the developing countries).

266. See *id.* at 25 (limiting this conclusion to only those intellectual properties considered to be “substantial innovations”).

267. See *id.* at 31–32 (explaining that transnational corporations are reluctant to share their technologies because transferring technologies will lead to reduced bargaining positions, higher global competition, and limited marginal advantages); see also Kremers, *supra* note 5, at 20–21 (reporting that many scholars doubt that without a strong technological base of its own, the developing countries could effectively compete with the foreign companies who hold monopoly powers on patents pursuant to TRIPS).

268. See Gervais, *supra* note 260, at 534–35 (noting that developing countries are engaging in TRIPS Plus Bilateral trade discussions instead of rejecting or fighting against TRIPS); see also Peter Drahos, *Intellectual Property Engineering: The Role of the Chemical, Pharmaceutical, and Biotechnology Industries*, in *INTELLECTUAL PROPERTY AND BIOLOGICAL RESOURCES* 258, 260 (Burton Ong ed., 2004) (clarifying that TRIPS sets a minimum standard of intellectual property protection that all signatories must conform).

opment by itself under the current TRIPS framework, as they had originally hoped during the TRIPS negotiations. Instead, the developing countries must look to alternative methods of economic development.

As developing countries, the GR-source states should resort to the concession agreement framework that, by design, guarantees technology transfers and other economic-development activities. Professor James Hyde believes that a concession agreement is more accurately labeled as an “international economic development agreement” because the FPIs assist the host states in developing their natural resources.²⁶⁹ Further, Professor Samuel Asante notes that concession agreements are “hardly distinguishable from a development plan.”²⁷⁰ Once again, the Abu Dhabi Agreement illustrates the “development plan” aspects of concession agreements.²⁷¹ Under Article 7, the FPIs are obligated to develop the petroleum industry *for* the host state, which requires the FPI to “develop . . . all productive structures [and] facilities . . . necessary to production, storage . . . transport and to produce [the desired resource].”²⁷² Further, through royalties, annual rents, bonus payments, and taxes, the host state secures foreign finance that is similar to a foreign direct investment (FDI) over a lengthy thirty-five year period, which is the duration of the Abu Dhabi Agreement.²⁷³ More importantly, concession agreements foster human resources in the host states. Under Article 24, the FPIs must give “priority to the citizens” of the host state when hiring employees, and under Article 26, the FPIs are required to provide the employees with education and training in various aspects of the industry including “technical, supervisory and management training.”²⁷⁴ Therefore, concession agreements can function as an instrument of public policy that the GR-source states can actively utilize to effectuate their national economic and development agendas.

The private agreement between Merck, Inc. and the Costa Rican government illustrates how a GR-source state can employ concession agreements

269. See Hyde, *supra* note 177, at 862 (justifying this label because of the concession agreement’s long duration and the FPI’s technical assistance involved); see also DELMON, *supra* note 170, at 251 (proclaiming that concession agreements are the “backbone” of a public-private partnership projects).

270. Asante, *supra* note 174, at 403 (observing the semi-public nature of concession agreements between a government and a foreign partner in developing strategic resources or building vital public utilities such as a water-treatment plant).

271. See Abu Dhabi Agreement, *supra* note 212 and accompanying text.

272. *Id.* at 535, at art. 7; see generally Klein, *supra* note 207, at 1–2 (explaining the various types of concession agreements, such as “build-lease-transfer” and “build-operate-transfer” models that can be negotiated between the FPI and the concession-granting states).

273. *Id.* at arts. 10, 11, 13, 17.

274. *Id.* at arts. 24, 26.

as a tool for economic development.²⁷⁵ In that agreement, the Costa Rican government successfully utilized their genetic resources to secure FDI-like financial resources and improved capacity for indigenous development and exploitation of their genetic resources.²⁷⁶ Specifically, Merck gave the Costa Rican government \$1 million as an initial fee and promised one to three percent royalties from the commercialized products based on the genetic resources.²⁷⁷ In addition, the Costa Rican government received \$135,000 worth of laboratory equipment and Merck's promise to build several research facilities in Costa Rica.²⁷⁸ Finally, this agreement led to human resources development whereby Merck trained its Costa Ricans employees. Hence, the GR-source states can use bioprospecting concession agreements to develop their economic capabilities and capitalize on their abundant genetic resources.

Professor Gervais, along with other scholars, agrees that it is unclear as to whether TRIPS will have any positive economic effect for the truly poor countries which include many of the GR-source states.²⁷⁹ However, economic development is important not only for the welfare of the GR-source states but also for protecting their own genetic resources from misappropriation.²⁸⁰ Hence, instead of depending on the uncertain promises of TRIPS and an enhanced IPR, GR-source states should employ the concession agreement framework to ensure that they can actively develop their natural resources according to their public policies and economic development plans.

275. See Kohls, *supra* note 2, at 128 (explaining that the agreement was between Merck & Co., Inc, a U.S. pharmaceutical company, and INBio, an agency of the Costa Rican government).

276. See Merck Case, *supra* note 206 (describing a two-year agreement in which INBio, a non-profit agency of the Costa-Rican government, will supply Merck with samples of plants, insects, and microorganisms from Costa Rica's protected rainforests). But see Hamilton, *supra* note 19 (criticizing the Merck/INBio agreement as a "'Trojan Horse' use[d] to gain entrance to the country to plunder its riches.>").

277. See Merck Case, *supra* note 206 (noting that Merck would have the right to use these samples to create pharmaceutical products).

278. See Kohls, *supra* note 2, at 128 (stating that INBio was required to give half of the royalties to the Ministry of Natural Resources, for use in conservation of rainforests).

279. See *supra* note 268 and accompanying text.

280. See *supra* note 258 and accompanying text.

D. Renegotiating Provisions: Incorporating a Method to Correct for Inequities in a Bioprospecting Concession Agreement

In bioprospecting concession agreements, bioprospectors and GR-holders form a long-term relationship.²⁸¹ But it is often difficult for either party to negotiate for every aspect of the concession agreement or prepare for every contingency in a relationship that may last twenty years—the life of a patent in the United States—or longer.²⁸² This difficulty is more pronounced in the bioprospecting context because the FPI often holds the greater bargaining position. For instance, because the contracting parties must estimate the value of the genetic resource before the bioprospectors find and develop it, they may not be aware of its real value.²⁸³ Even if the bioprospectors have knowledge of the genetic resource's true value, they may not need to disclose that information to the GR-holders.²⁸⁴

Therefore, the uncertainty inherent to the bioprospecting paradigm increases the likelihood that GR-source states may agree to inequitable benefit-sharing arrangements.²⁸⁵ GR-source states may agree to suboptimal agreement terms because of their immediate need to attract capital and human resources.²⁸⁶ Also, the bioprospectors often share a portion of political risks such as wars, nationwide strikes, and governmental instability.²⁸⁷ The politi-

281. See Arezzo, *supra* note 31, at 372–73. (describing that a long-term relationship arises out of the necessity to justify the high cost of bioprospecting and the uncertainty of finding a valuable genetic resource).

282. 35 U.S.C. § 154(a)(2) (2007) (stating that the patent term begins “on the date on which the patent issues and ending 20 years from the date on which the application for the patent was filed in the United States.”).

283. Eiland, *supra* note 35, at 69 (noting that the bargaining advantage of the FPI may lead to undervaluation of the genetic resources and the associated traditional knowledge).

284. See Carvalho, *supra* note 127, at 154–55 (explaining that the buyer has no duty to disclose to the vendor the circumstances that make the property valuable); see, e.g., *Laidlaw v. Organ*, 15 U.S. 178, 194 (1817) (holding that vendee is not bound to communicate to the vendor of goods extrinsic circumstances which might influence the value of the goods).

285. Kohls, *supra* note 2, at 112 and accompanying text (highlighting the low probability of finding a commercially valuable genetic resources through bioprospecting).

286. See *supra* notes 271–274 and accompanying text (explaining that concession agreements can be used as a FDI-like financial resource and mechanism for a developing countries' economic-development).

287. See DELMON, *supra* note 170, at 254 (advocating that the risks should be allocated to the party best able to manage it, and thus, political risks should be borne by the concession-granting state); see generally Coombe, *supra* note 253, at 93–96 (arguing that frequently, the regions with the greatest biological diversity is also regions of great poverty and political instability).

cal risk is greater in developing countries, so bioprospectors may demand unreasonable concessions from GR-source states for investing in those states.²⁸⁸ However, once the uncertainties are resolved during the course of the bioprospecting concession agreement and the true values of the genetic resources are revealed, GR-holders may find that their original private agreement is as unfair and unjust as biopiracy itself.²⁸⁹

The concession agreement framework allows for the renegotiation of the original agreement and, therefore, provides a mechanism to address any inequities that may arise during the agreement period. Professor Asante explains that the renegotiation provision is an “integral feature” of concession agreements not only because of the economic concerns, but also to encourage concession agreements in the future.²⁹⁰ Without a renegotiation provision, resource-rich states will be reluctant to engage in concession agreements and, consequently, the FPI will not have access to valuable natural resources.²⁹¹ This access restriction may encourage bioprospectors to devise ways to misappropriate the genetic resources and thus, to perpetuate biopiracy.²⁹² Therefore, the opportunity to renegotiate within the concession agreement framework mutually benefits both bioprospectors and GR-holders.²⁹³ At the same time, renegotiation provisions provide each party with the flexibility to monitor the equity concerns that may arise during the long life of a bioprospecting concession agreement.

288. See DELMON, *supra* note 170, at 255 (noting, however, that the FPI, not the concession-granting states, bear the brunt of the political risks when engaged in public-private partnership projects in *developed* countries with stable government and economies).

289. See VAGTS ET AL., *supra* note 169 at 528 (arguing that the resolution of uncertainties over time is a predictable trajectory of any concession agreement). *But see* Klein, *supra* note 207, at 10 (arguing that granting concessions to FPI through a system of bidding for the public-private partnership project can level the bargaining-power disparity between the concession-granting state and the FPI at the negotiation stage).

290. See Asante, *supra* note 174, at 413 (suggesting that the State, as a sovereign entity, can expropriate the FPI's investments to cure the perceived inequity, and a renegotiation provision can prevent this outcome in which the FPI has no effective remedy).

291. See *id.* at 411–12 (implying that a renegotiation provision invites capital, on reasonable terms, and with the power to modify or terminate a concession agreement).

292. See Kohls, *supra* note 2, at 120–21 (identifying company in India who fought for ouster of bioprospectors now but now holds multiple patents on genetic resource that was in question and does not provide profits to TK holders).

293. See Al-Naqbi, *supra* note 169, at 10 (illustrating that the nationalization of the oil fields in Iran during the 1950s was a direct result of failed renegotiations to resolve the inequities of the earlier, original oil concession agreements).

E. Arbitrating Disputes: Providing a Mechanism for Dispute Resolution through ICSID

Disputes between parties can arise in any contractual relationship, and concession agreements are no exception. In fact, it can be argued that disputes are more likely in a concession agreement context because of the long-term relationship that forms between the contracting parties,²⁹⁴ political risks associated with investing substantially in developing countries,²⁹⁵ and the uncertainties inherent in prospecting for valuable natural resources.²⁹⁶ To facilitate the formation of concession agreements, an effective dispute resolution mechanism provides a measure of certainty, predictability, and mutual confidence between the parties, which promotes compliance with their respective contractual obligations.²⁹⁷ Because a concession agreement is a semi-public venture involving a sovereign state and a foreign private investor, a unique arbitration mechanism is available through the International Convention for the Settlement of Investment Disputes (ICSID) to ensure that the contracting parties efficiently and timely resolve their disputes.

ICSID can serve as a powerful dispute resolution mechanism in the bi-oprospecting context. ICSID was formed under the auspices of the World Bank as an instrument of international policy for promoting foreign private investment and economic development in developing countries.²⁹⁸ Toward this end, ICSID is devoted to foreign private investor-sovereign state dispute settlements and serves as an international arbitration mechanism that is a “complete, exclusive and closed jurisdictional system, insulated from national laws.”²⁹⁹ ICSID protects the foreign investors from unilateral actions of host states—such as expropriation—that may jeopardize their investments. Thus, ICSID reduces the political risks of investing in developing countries.³⁰⁰ As an independent and neutral dispute resolution mechanism, ICSID shields the host states—often developing countries—from economic manipulation by developed countries.³⁰¹ Hence, ICSID creates a “level play-

294. See Asante, *supra* note 174, at 410.

295. See Coombe, *supra* note 253, at 94–96.

296. See Kohls, *supra* note 2, at 111–12.

297. See Vincent O. Orlu Nmehielle, *Enforcing Arbitration Awards Under the International Convention for the Settlement of Investment Disputes (ICSID Convention)*, 7 ANN. SURV. INT’L & COMP. L. 21, 23 (2001) (reporting that one impetus for creating ICSID was to establish the mutual confidence between contracting parties).

298. *Id.* at 22.

299. Giuliana Cane, *The Enforcement of ICSID Awards: Revolutionary or Ineffective?*, 15 AM. REV. INT’L ARB. 439, 442 (2004).

300. Orlu Nmehielle, *supra* note 297, at 23.

301. *Id.*; see, e.g., Dinesh D. Banani, Note, *International Arbitration and Project Finance in Developing Countries: Blurring the Public/Private Distinction*, 26

ing field” in international economic relations for foreign private investors and host states.³⁰²

However, consenting to the jurisdiction of ICSID excludes all other remedies; therefore, there is no exception to the final, binding character of an ICSID award.³⁰³ Consequently, domestic courts of the respective parties to the dispute are required to recognize the ICSID award—which serves the effect of *res judicata*—and they must ensure that the ICSID awards are enforced.³⁰⁴ Furthermore, submission to arbitration is construed as a waiver by the host state of sovereign immunity on jurisdiction matters and certain other proceedings.³⁰⁵ This binding characteristic is unique to ICSID and serves to separate it from other arbitration mechanisms.³⁰⁶ With 156 signatories currently,³⁰⁷ ICSID has become the forum of choice for settling commercial disputes that arise between foreign private investors and sovereign states.

The benefit to bioprospectors and GR-source states of having access to a neutral forum with the authority to issue final and binding awards needs no elaboration. The critical issue here is to determine whether ICSID is available for GR-source states and bioprospectors to resolve disputes which may

B.C. INT’L & COMP. L. REV. 355, 361 (2003) (describing that in international project finance agreements, developed countries have a clear preference for their domestic courts in New York or London applying the New York or English laws to the dispute).

302. See Orlu Nmehielle, *supra* note 297, at 23 (explaining that the ICSID Rules of Arbitration contributes to forming this balance).
303. Cane, *supra* note 299, at 442 (stating that an ICSID award is considered as a final judgment in the courts of the respective parties without regard to domestic laws).
304. See *id.* at 445 (observing that in non-ICSID awards, domestic courts often used the recognition/*exequatur* procedures to deprive the arbitral tribunal of its jurisdiction to hear the dispute); see generally Convention on the Settlement of Investment Disputes between States and Nationals of Other States art. 54(1), Aug. 27, 1965, 17 U.S.T. 1270, 575 U.N.T.S. 159 [hereinafter ICSID Convention] (“Each Contracting State shall recognize an award rendered pursuant to this Convention as binding and enforce the pecuniary obligations . . . as if it were a final judgment of a court in that State.”).
305. Cane, *supra* note 299, at 446 (concluding sovereign immunity is waived for jurisdiction issues and certain other proceedings based on articles 54 and 55 of ICSID).
306. See, e.g., *id.* at 440–41 (contrasting ICSID to the Convention on the Recognition and Enforcement of Foreign Arbitral Awards—more commonly known as the “New York Convention”).
307. International Centre for Settlement of Investment Disputes, *List of Contracting States and Other Signatories of the Convention*, <http://icsid.worldbank.org/ICSID/FrontServlet?requestType=ICSIDDocRH&actionVal=ContractingStates&ReqForm=Main> (choose English, French, or Spanish PDF) (last visited Oct. 1, 2010).

arise in bioprospecting concession agreements. Article 25(1) of ICSID outlines the bases for jurisdiction under ICSID, stating that “the jurisdiction . . . shall extend to any legal dispute arising directly out of an *investment*, between a *Contracting State* (or any constituent subdivision or agency . . .) and a *national* of another Contracting State, which the parties to the dispute consent in writing to submit to the Centre.”³⁰⁸

Hence, jurisdiction is based on three criteria. First, the legal dispute must arise out of an investment activity. The term “investment” is interpreted broadly in order to encompass a wide range of international business transactions rather than solely commercial trade in the traditional sense.³⁰⁹ Second, the legal dispute must involve a sovereign state and a foreign national.³¹⁰ A bioprospecting concession agreement easily meets both of these two requirements because it is a public-private venture between a GR-source state and a foreign bioprospector.³¹¹ In addition, a bioprospecting concession agreement is an investment because its primary purpose is to allow prospecting for valuable genetic resources for commercial exploitation by a foreign prospector, while also serving to promote the economic development of the GR-source state.³¹² Third, the requirement of mutual consent to the jurisdiction of ICSID can easily be satisfied during the negotiation of the bioprospecting concession agreement.³¹³ Therefore, if the GR-source states and the bioprospectors so choose, ICSID is available as an effective and binding dispute resolution mechanism, which gives the bioprospecting concession agreements strong legal force.

Despite its numerous advantages, however, many scholars and commentators have criticized ICSID because *execution* of an ICSID award against the host state depends upon the immunity rules prevailing in the country in which execution is sought.³¹⁴ Article 55 of ICSID explicitly states that

308. ICSID Convention, *supra* note 304, at art. 25(1) (emphasis added).

309. See Orlu Nmehielle, *supra* note 297, at 26 (arguing that the drafters of ICSID intentionally left the term “investment” undefined to accord to it a more flexible interpretation).

310. See generally ICSID Convention, *supra* note 304, at art. 25(2) (defining “National of another Contracting State”).

311. See Latin American Alliance, *supra* note 16, at 3.

312. Orlu Nmehielle, *supra* note 297, at 26.

313. *Id.*

314. See, e.g., *id.* at 30–1 (providing that ICSID distinguishes recognition, enforcement, and execution of the ICSID award); see also *Liberian Eastern Timber Corp. v. Republic of Liberia*, 650 F. Supp. 73, 74–76 (S.D.N.Y. 1986) (making the three distinctions of the ICSID award). But see *France: Court of Cassation Decision in Soabi (Seutin) v. Senegal (Recognition and Enforcement of Award in the Context of the ICSID Convention)*, June 11, 1991, 30 I.L.M. 1167, 1167–68 (noting that the Paris Court of Appeals did not distinguish between enforceability and execution of the award).

“[n]othing . . . shall be construed as derogating from the *law in force in any Contracting State* relating to immunity of that State or of any foreign State from execution.”³¹⁵ In other words, even though the GR-source state must recognize and ensure that ICSID awards are enforced, it may nevertheless evade execution of ICSID awards against its own property by hiding behind the defense of sovereign immunity.³¹⁶ Meanwhile, ICSID awards against the bioprospectors can readily be enforced and executed.³¹⁷ In effect, ICSID creates a loophole that favors the interests of sovereign parties over those of the foreign investors.³¹⁸

This disparity certainly can undermine the effectiveness of ICSID as a dispute-resolution mechanism. After all, what good is an award if there is no way to collect it? However, there are three reasons why this inequality of treatment of parties may not materially affect ICSID as a dispute-resolution mechanism in the bioprospecting context. First, the vast majority of awards are voluntarily complied with in transnational arbitrations.³¹⁹ Second, GR-source state will strive to comply with the ICSID award to maintain its reputational capital within the international community as a safe place for bioprospectors to invest now and in the future.³²⁰ Third, as Article 55 of ICSID makes clear, execution of the ICSID award depends on the domestic laws of the contracting State. Hence, when an ICSID award is in favor of bioprospectors, they can resort to forum-shopping for execution against the assets of the non-complying GR-source state.³²¹

While ICSID is certainly not perfect, it is important to realize that in the concession agreement framework, there exists a ready, effective, and binding system of dispute resolution mechanism for GR-source states and bioprospectors that is unavailable in other contexts, such as in private bilateral agree-

315. ICSID Convention, *supra* note 304, at art. 55 (emphasis added).

316. See Orlu Nmehielle, *supra* note 297, at 36; but see *id.* at 34–35 (expanding on Van den Berg’s argument that it is illogical for the sovereign state that consents to ICSID to waive immunity with respect to jurisdiction and enforcement but not on execution).

317. *Id.* at 30.

318. *Id.* at 31.

319. See Cane, *supra* note 299, at 439 (hypothesizing that the topic of enforcement escaped analysis from scholars and commentators because awards are so frequently complied with by the parties).

320. See *id.* at 447 (reporting that the legislative history of ICSID shows that the drafters did not consider states to be in danger of defaulting because of their need to maintain international reputational capital).

321. See *id.* at 457 (opining that “the only option available to a private party is to find a restrictive application of the immunity doctrine.”), quoting Vincent O. Orlu Nmehielle, *Enforcing Arbitration Awards Under the International Convention for the Settlement of Investment Disputes (ICSID Convention)*, 7 ANN.SURV. INT’L & COMP. L. 21, 30 (2001).

ments. Hence, for both bioprospectors and GR-source states, ICSID can provide a unique and indispensable dispute settlement system.

IV. TOWARDS A PRACTICAL APPLICATION OF THE CONCESSION AGREEMENT FRAMEWORK: SOME ISSUES THAT MUST BE RESOLVED

The path to our destination is not always a straight one. We go down the wrong road, we get lost, we turn back. Maybe it doesn't matter which road we embark on. Maybe what matters is that we embark.

—Barbara Hall³²²

Part III of this paper outlined the benefits and feasibility of applying the concession agreement framework to prevent the misappropriation of genetic resources by the bioprospectors.³²³ In assessing the potential effectiveness of the concession agreement framework in this paper, some important considerations toward a practical application of this framework in the bioprospecting context have been omitted thus far. Next, this paper explores two such considerations relating to the issues of a state's permanent sovereignty over the genetic resources and the long-term exclusive bioprospecting duration.

The most important premise underlying the use of the concession agreement framework in bioprospecting is the GR-source state's permanent sovereignty over its biodiversity.³²⁴ However, this underlying premise raises important questions that cannot be ignored. First, there are two different levels of control over the bioprospectors, while the concession agreement framework may only address one.³²⁵ Specifically, the CBD recognizes that states have sovereign rights over their natural resources;³²⁶ therefore, the CBD imposes obligations to adopt national legislation to restrict access to the biological resources.³²⁷ This legislation may be unrelated and prior to the intellectual property system concerns or any of the other legal mechanisms that might be imposed following access, such as prior informed consent, in

322. *Northern Exposure: Rosebud* (CBS television broadcast Nov. 8, 1993).

323. *Supra* Part III.

324. *See supra* Part III.A (highlighting that for a concession agreement framework to be applicable, the state must have rights over its genetic resources which can be through the concept of permanent sovereignty over natural resources or through a "trusteeship").

325. *See* CBD, *supra* note 32, at art. 15.1.

326. *Id.* ("Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation."); Latin American Alliance, *supra* note 16 (opining that the CBD creates a "boost for bilateralism.").

327. CBD, *supra* note 32, at art. 8(j).

order to prevent biopiracy.³²⁸ Hence, the national legislation provides the first level of control over the bioprospectors which may obligate the bioprospectors to employ a bilateral private agreement for the right to access the genetic resources. However, such access agreements between the GR-resource state and bioprospectors are already prevalent,³²⁹ and the concession agreement framework may offer few additional advantages at this level.

Assuming that the national legislation provides this first level of control, the concession agreement framework may only provide a second level of control that affords GR-holders an opportunity to formulate specific conditions for mandatory control over bioprospectors and permissive, equitable benefit-sharing. In other words, the concession agreement framework concerns the *post-access* behavior of bioprospectors.³³⁰ Due to these dual levels of control, the concession agreement framework might not be used because bioprospectors are not obligated to employ it absent national legislation mandating its use once access to the genetic resources has been granted through other means. Therefore, as a second level of control, the concession agreement framework may not be able to address the unauthorized access to the genetic resources that leads to biopiracy.³³¹

Secondly, the concept of permanent sovereignty is ambiguous as to the status of the rights of the indigenous communities who are the traditional custodians of the genetic resources and the associated traditional knowledge. Prior to the CBD, biodiversity had been considered a “heritage of mankind,” and at the local level, a “cultural and economic heritage of the people.”³³² Vesting the rights of the genetic resources and the associated traditional knowledge exclusively to the GR-source states may extinguish the claims of

328. Interview with Joshua Sarnoff, Professor of the Practice of Law, Wash. Univ. Coll.s of Law, in Wash., D.C. (Dec. 10, 2009) [hereinafter Sarnoff Interview]. *But see CBD, supra* note 32, at art. 15.5 (mandating that “[a]ccess to genetic resources shall be subject to prior informed consent of the Contracting Party providing such resources.”).

329. *See, e.g.,* Latin American Alliance, *supra* note 16 (discussing that, for example, the National Cancer Institute has signed bioprospecting *access* agreements with several countries); Ragavan, *supra* note 1, at 514 (noting that countries such as Costa Rica, Brazil, and India are making efforts to regulate access to the genetic resources through bilateral agreements but emphasizes the varying level of commitment of each country).

330. Sarnoff Interview, *supra* note 328.

331. *Id.*; *but see supra* Part III.C (arguing that negotiating for access is a part of the concession agreement, and thus, in a concession agreement framework, the bioprospectors’ right to access as well as their post-access behaviors are encompassed within a single framework).

332. *See* GRAIN-2, *supra* note 39 (questioning the appropriateness of privatizing biodiversity).

the indigenous communities of their rights to the GR/TK, and thereby calls into question the proper scope of term “GR-holders.”³³³

Finally, the concession agreement framework embodies a “top-down model” in which critical decisions concerning access, benefit-sharing, preservation of traditional knowledge and lifestyle, and conservation of natural resources are made by politicians, scientists, and corporate entities.³³⁴ As one commentator opined about such a top-down model, “the vast majority of local populations [are] left alienated in the periphery to receive the benefits if they ever trickle down.”³³⁵ Further, a top-down model of the concession agreement brings into question the role and rights of the indigenous communities in marketing, preserving, conserving, developing, and in some cases, defending their genetic resources and traditional knowledge.³³⁶

These three important questions, relating to the recognition of permanent sovereignty over the genetic resources, must be explored further in order for the concession agreement framework to become truly applicable in the bioprospecting context.

In addition to the concept of permanent sovereignty over genetic resources, the concession agreement framework requires a long-term exclusive relationship between GR-source states and bioprospectors. A multi-decade exclusivity requirement in a concession agreement framework may not be a desirable *innovation policy* for the global society or for the GR-source states in particular.³³⁷ This is where a critical distinction must be made. Traditionally, resource-rich states have used the concession agreement as part of a single, larger policy related to the use of their resources and economic development.³³⁸ However, prospecting for oil, lumber, and ore can be different from prospecting for genetic resources because the latter requires further research and development before a marketable product is realized.³³⁹ Hence, in

333. Sarnoff Interview, *supra* note 328.

334. GRAIN-2, *supra* note 39.

335. *Id.*; see, e.g., Ragavan, *supra* note 1, at 517 (arguing that such bilateral agreements exploit the “naivety of indigenous people” of the potential economic benefits of the genetic resources and the associated traditional knowledge).

336. GRAIN-2, *supra* note 39.

337. Sarnoff Interview, *supra* note 328 (explaining that, for example, the costs to innovation created by the Bayh-Dole Act’s transfer of upstream rights to universities that entered into exclusive licensing arrangements was seen as detrimental to innovation).

338. See Hyde, *supra* note 177, at 862 (characterizing the concession agreement as a “international economic development agreement”); Delmon, *supra* note 170, at 251 (stating that concession agreements are “hardly distinguishable from a development plan”).

339. Ragavan, *supra* note 1, at 515 (noting that once the bioprospectors identify a biological sample with the desired characteristics, it is subject to experimentation, appreciation of the resources, and investigation to understand its useful

contrast to traditional prospecting, bioprospecting implicates *innovation policy* as well as *resource-use policy*. A bioprospecting concession agreement that confers multi-decade long exclusivity to a single commercial entity, even if only for the life of a patent, may be highly detrimental to overall innovation by stifling subsequent and/or competitive research and development by other potential actors. Therefore, long-term exclusivity in the bioprospecting context may “give away too much to industry to the detriment of developing countries and society generally.”³⁴⁰

These two considerations of permanent sovereignty and long-term exclusivity are certainly not an exhaustive list, but they are illustrative of the practical application shortcomings of the concession agreement framework in the bioprospecting context. Resolving each of these considerations is certainly beyond the scope of this paper, which seeks only to lay the foundation and explain the advantages of the concession agreement framework in the bioprospecting context over other legal mechanisms. It is important that in expanding the various legal mechanisms to prevent biopiracy, the strengths and the weaknesses of each legal mechanism be fully explored and understood. This section of the paper began this process of assessing the practicality of employing the concession agreement framework as a legal mechanism to defend against the injustice and unfairness of biopiracy.

V. CONCLUSION

Bioprospecting will be a north star of our country's development.

—Rodrigo Gamez³⁴¹

This paper examined the propriety of employing the concession agreement framework as a legal mechanism to help defend against biopiracy. Fundamentally, a concession agreement is a type of private agreement that bioprospectors and GR-holders have used in the past to prevent misappropriation of the GR/TK and to create equitable benefit-sharing regimes.³⁴² However, as it has been illustrated, the unique characteristics of the bioprospecting paradigm may require a unique form of private agreement. After thorough analysis, the concession agreement framework should be that unique form.

characteristics); *see also id.* at 518 (opining that due to the subsequent research and development that must be conducted, it is difficult to assess the correct value of the genetic resources during the private agreement negotiation).

340. Sarnoff Interview, *supra* note 328.

341. Rodrigo Gamez Lobo is the president of the Costa Rica's National Institute of Biodiversity (“INBio”) headquartered in Santo Domingo de Heredia, Costa Rica.

342. *See generally* Kremers, *supra* note 5, at 34–37 (describing various examples of private, prospecting agreements and highlighting the obstacles and concerns in addressing the biopiracy controversy).

Professor Asante's closing comments in his influential work on permanent sovereignty and concession agreements succinctly sets forth the core argument of this paper:

A state has the power to control and use its natural wealth and resources. It may thus enter into binding agreements for the development of its natural wealth and resources. In the exercise of this power, it is obligated to act in accordance with recognized principles of international law . . . and with due regard for existing legal rights or interests, with adequate, prompt and effective compensation.³⁴³

GR-source states have the power to control and use their genetic resources. Therefore, GR-source states can enter into binding agreements with bioprospectors via a bioprospecting concession agreement. In this endeavor, GR-source states are obligated to comply with TRIPS and CBD giving due regard to the legal rights and interests of the indigenous communities who are the true custodians, guardians, and owners of the genetic resources. At the same time, GR-source states can work to formulate equitable benefit-sharing regimes that provide for "prompt and effective compensation" to indigenous communities, and additionally, promote the development of their countries. In effectuating objectives aimed at preventing biopiracy, this paper strongly advocates that GR-holders apply the concession agreement framework to bioprospecting in order to address the core issues of equity, conservation, and preservation of the genetic resources and traditional knowledge of the indigenous communities. By doing this, the concession agreement framework can become part of a formidable arsenal of legal mechanisms that empower GR-holders and GR-source states to fight the injustice and unfairness that transform bioprospecting into biopiracy.

343. Asante, *supra* note 174, at 867 (concluding that the concession agreement is the most appropriate form of private agreements in the context of transnational extraction industry).⁴