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Biopiracy in the Brazilian Amazon: Learning from International and Comparative Law Successes and Shortcomings to Help Promote Biodiversity Conservation in Brazil

Vanessa Danley

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BIOPIRACY IN THE BRAZILIAN AMAZON: LEARNING FROM INTERNATIONAL AND COMPARATIVE LAW SUCCESSES AND SHORTCOMINGS TO HELP PROMOTE BIODIVERSITY CONSERVATION IN BRAZIL

by Vanessa Danley*

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* LL.M., University of Oregon School of Law, May 2012.

INTRODUCTION

The term biopiracy was first created by the non-governmental organization, Action Group on Erosion, Technology and Concentration (“ETC Group,” formerly known as RAFI). The ETC Group defined biopiracy as the “appropriation of the knowledge and genetic resources of farming and indigenous communities by individuals or institutions who seek exclusive monopoly control (patents or intellectual property) over these resources and knowledge.”¹ Another and much simpler definition is robbery, or illegal appropriation of genetic material without the consent of the interested parties.² This illegal practice contributes to environmental harm and imperils Brazil’s biodiversity.

Biopiracy allows for inequitable profit distribution among the states, big multinational corporations, and indigenous communities. It is an undue appropriation of a country’s natural resources without the sharing of the benefits generated by the use of genetic resources. This practice violates the provisions of the Convention on Biological Biodiversity (“CBD”).³ The CBD, in conjunction with the Nagoya Protocol,⁴ regulates the use of natural resources and seeks to prevent biopiracy internationally.

Brazil also has enacted domestic laws such the Provisional Measure 2.186-16/2011⁵ and the legislative decrees that followed⁶ to implement CBD’s provisions. However, these laws are vague and not strictly enforced. In Brazil, the uncontrolled withdrawal of natural resources is a regular occurrence that threatens Brazil’s rich biodiversity and creates social injustices contributing to poverty within the indige-

1. The ETC Group, <http://www.etcgroup.org/en/issues/biopiracy>. (last visited) See also Cynthia M. Ho, *Biopiracy and Beyond: A Consideration of socio-cultural conflicts with Global Patents Policy*, 39 U. MICH. J.L. REFORM 433, 450 (2006).

2. DAVID HATHAWAY, A BIPIRATARIA NO BRASIL [BIPIRACY IN BRAZIL], IN SERIA MELHOR MANDAR LADRILHAR? BIODIVERSIDADE, COMO, PARA QUE E POR QUE 182 (UnB ed., 2008) (Br.).

3. Convention on Biological Diversity, *opened for signature* Jun. 5, 1992, 1760 U.N.T.S. 79 (*entered into force* Dec. 29, 1993), *available at* <http://www.cbd.int/> [hereinafter CBD]. Biopiracy violates CBD’s articles 8(j) and 15.

4. The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity, UN (2010), *opened for signature* Feb. 2, 2011, *available at* <http://www.cbd.int/abs/text/> [hereinafter Nagoya Protocol].

5. Medida Provisória No. 2186-16, *available in English at* http://www.mma.gov.br/estruturas/sbf_dpg/_arquivos/mp2186i.pdf [hereinafter MP].

6. Clarissa Bueno Wandscheer, *Commons Resources in Brazil: Biopiracy, Bioprospection, Biotechnology* (Jun. 19, 2006) (unpublished conference paper, Indiana University) (on file with Digital Library of the Commons, Indiana University), *available at* <http://dlc.dlib.indiana.edu/dlc/handle/10535/611>.

nous community. The increase in poverty leads to corruption. The indigenous peoples' lack of better opportunities accompanied by the loss of natural resources allows for the growth of illegal trade in the Amazon. The indigenous communities need to sell animals and plants to meet their subsistence needs.

In addition to the actual exploitation that facilitates biopiracy, existing patent laws also have a role in biopiracy activities. U.S. patent law⁷ allows for biopiracy because it does not recognize foreign "prior art."⁸ In addition, the international agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS)⁹ does not provide for benefit-sharing or protection of traditional knowledge.

However, not all exploitation of a country's biodiversity is illegal or is a case of biopiracy. Bioprospecting is the "legal" exploitation of biodiversity for commercial purposes.¹⁰ It can be viewed as an incentive for developing countries to protect biodiversity and traditional knowledge while developing biotechnology.¹¹

Costa Rica is a good example of a developing country that views bioprospecting as a way to protect biodiversity and promote sustainable development.¹² The Merck-INBio bioprospecting agreement between Merck pharmaceutical company and the Costa Rica INBio¹³ serves as a model of an agreement that takes into consideration environmental conservation.¹⁴

Part I of this paper provides an overview of the impacts of biopiracy in the Brazilian Amazon. It illustrates how the illegal exploitation of the fauna and flora puts species at risk of extinction. It also examines the role of indigenous communities. Part II addresses how the international legal framework that regulate benefit-sharing,

7. 35 U.S.C. § 101 (1952).

8. *Id.* § 103 (a). See also Vandana Shiva (U.S. Patent Act does not provide a general definition of "prior art"), available at www.twinside.org.sg/title/tur-cn.htm.

9. Agreement on Trade-Related Aspects of Intellectual Property Rights, opened for signature Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Legal Instruments - Results of the Uruguay Round vol. 31, 33 I.L.M. 1143, 1197-1223 (entered into force Jan. 1 1995), available at http://www.wto.org/english/tratop_e/trips_e/TRIPS_e.htm [hereinafter TRIPS].

10. Rachel Wynberg & Sarah Laird, *Bioprospecting: Tracking the Policy Debate*, Environment 49 (December 2007) at 20, available at <http://peopleandplants.squarespace.com/sarah-laird-selected-publicati/>.

11. Srividhya Ragavan, *New Paradigms for Protection of Biodiversity*, 13 J. INTELL. PROP. RIGHTS 515 (2008) (internal citations omitted).

12. *Id.* at 517.

13. National Biodiversity Institute, <http://www.inbio.ac.cr/en/default.html> [hereinafter INBio].

14. Ragavan, *supra* note 11, at 517.

such as CBD and the Nagoya Protocol, play an important role in regulating genetic resources' international commercialization. It considers how such regulations affect the rise of biopiracy-related activities.

Part III discusses the role of intellectual property rights as a hurdle to implement benefit-sharing. It examines the language of TRIPS and how it conflicts with the CBD and the Nagoya Protocol. It also provides a brief overview on how U.S. patents and trademark law facilitates biopiracy by allowing for the registration of products native to the Brazilian Amazon. It provides two examples of cases challenging U.S. law where the patents were obtained by exploitation of India's biodiversity.

Part IV describes Brazil's existing legal framework. It examines the shortcomings of its current laws regarding bioprospecting contracts and biodiversity protection. Furthermore, it identifies Costa Rica's successful program, the Merck-INBios agreement. It examines how bioprospecting can provide for biodiversity conservation and sustainable development.

Part V considers how Brazil could benefit from a contract like the Merck-INBios agreement to control the exploitation of its natural resources. This contract mandates that 50% of future royalties must be invested to promote biodiversity conservation. It then explains how changes in current legislation can prevent biopiracy, which will protect the Amazon's rich biodiversity as well as the indigenous communities that depend on the forest for their subsistence.

I. BIOPIRACY IN THE AMAZON FOREST

Brazil has 10% to 20% of all biodiversity in the entire planet, more than any other nation.¹⁵ The Amazon forest holds most of the Brazilian biodiversity and is home to various indigenous communities. Brazil is a developing country in the process of pursuing significant social and economic development. However, its biodiversity and indigenous communities are imperiled by this development.

Biopiracy not only encompasses the illegal trade of species of animals and plants, but also the illegal appropriation and monopoly of the knowledge of traditional populations regarding the use of natural

15. DANILO LOVISARO DO NASCIMENTO, *BIOPIRATARIA NA AMAZÔNIA: UMA PROPOSTA JURÍDICA DE PROTEÇÃO TRANSNACIONAL DA BIODIVERSIDADE E DOS CONHECIMENTOS TRADICIONAIS ASSOCIADOS* [BIOPIRACY IN THE AMAZON: A LEGAL PROPOSAL FOR THE TRANSNATIONAL PROTECTION OF THE BIODIVERSITY AND THE TRADITIONAL KNOWLEDGE], 30 (Juruá ed., 2010) (Br.). See John Tustin, *Traditional Knowledge and Intellectual Property in Brazilian Biodiversity Law*, 14 *TEX. INTELL. PROP. L.J.* 132 (2006) (internal citations omitted).

resources existing in the environment.¹⁶ This exploitation results in the loss of property rights in natural resources essential for the indigenous communities' survival.¹⁷ Moreover, this exploitation contributes to the extinction of endangered species and serious environmental degradation.¹⁸

Products and byproducts derived from Amazon biodiversity are mostly used by the pharmaceutical and biotechnology industries (usually located in the North) and are also referred to as "green oil."¹⁹ Despite the very lucrative aspect of this activity, the exploited State (usually located in the South) and the indigenous communities whose knowledge helped the industry to find and market the green oil do not receive any percentage of the foreign companies' profits.²⁰

Biopiracy in the Amazon forest creates a vicious cycle. The foreign individuals and entities benefit from the traditional knowledge and buy the resources needed at a very low cost. A very simple formula of the exploitation emerges: free knowledge + cheap resource = millions of dollars worth of products. Biopiracy causes Brazil to lose \$16 million per day, mostly as a result of lack of better public policy and poor enforcement of existing legislation.²¹

The pharmaceutical and biotechnology markets yield approximately \$700 billion per year.²² The market for medicinal plants alone, with the help of traditional knowledge, is \$43 million.²³ Unfortunately, most of the resources are obtained through biopiracy. Brazil and the indigenous and other traditional communities do not participate.²⁴

A. *The Illegal Extraction of Plants*

The uncontrolled exploitation of plants is responsible for the loss of Amazon biodiversity. The Brazilian Institute of the Environment and Natural Renewable Resources (IBAMA) estimates that thousands of medicinal plants and wood are illegally exported each

16. NASCIMENTO, *supra* note 15, at 26.

17. *Id.*

18. *Id.*

19. VANDANA SHIVA, *BIOPIRACY: THE PLUNDER OF NATURE AND KNOWLEDGE*, 72 (South End Press ed., 1997) [hereinafter SHIVA].

20. *Id.*

21. Darlene Menconi and Leonel Rocha, *Riqueza Ameaçada* [Threatened Wealth], *Isto é*, Sep. 24, 2003, at 92-98 (Br.).

22. HATHAWAY, *supra* note 2, at 183.

23. SHIVA, *supra* note 19, at 76.

24. HATHAWAY, *supra* note 2, at 186.

year.²⁵ Moreover, two thirds of the plants used by pharmaceutical companies are from tropical rainforests.²⁶

Foreign scientists have come to Brazil to operate an NGO, allegedly to promote conservation.²⁷ But the reality is that under the NGO veil, they illegally work with the indigenous communities to catalog plants and their medicinal capabilities and then sell them to foreign corporations.²⁸

The wood trade is a significant threat to Brazil's tropical forests. The United States, for example, is the largest importer of mahogany.²⁹ The over-harvesting of this type of wood causes deforestation. Deforestation is a result of not only the extraction of the mahogany tree itself, but also the cutting of trees in nearby areas due to the need for open spaces to allow transportation of the logs. Deforestation causes habitat alterations and, consequently, loss of biodiversity.³⁰ Besides wood, many other plants are exported without any regulatory measures. The Amazon native plants are largely used in the pharmaceutical, cosmetics, food, and pesticide industries.³¹

Foreign companies obtained patents for many Brazilian plants. For example, Aveda, a North American corporation, has a patent on the "copaiba," an Amazon tree. The Body Shop, a British corporation, has a patent on the fruit, "cupuaçu," also found in the Amazon.³² Merck Laboratories has a patent on the "jaborandi." "Jaborandi" contains the "pilocarpina" molecule, which is an important component of glaucoma medicine.³³

The most recognizable of the entire Brazilian flora is the "açai." The açai is also known as "superfood" because of its many health benefits.³⁴ In 2003, a Japanese company named K.K. Eyela Corporation registered a patent on the "açai" berry.³⁵ In 2007, after pressure from

25. NASCIMENTO, *supra* note 15, at 36.

26. *Id.* at 37.

27. *Id.* at 48.

28. *Id.*

29. IBAMA, *Geo Brasil 2002: Perspectiva do meio ambiente no Brasil*, [Environmental perspectives in Brazil] 43, available at http://uff.academia.edu/TherezaCarvalho/Papers/274499/GEO_Brasil_2002_Perspectivas_Do_Meio_Ambiente_No_Brasil (Br.).

30. *Id.* at 45.

31. NASCIMENTO, *supra* note 15, at 38.

32. Wandscheer, *supra* note 6.

33. HATHAWAY, *supra* note 2, at 187.

34. O Estado de São Paulo, Brazil Regains "Açai" Trademark from Japan (2007), <http://www.amazonia.org.br/english/noticias/noticia.cfm?id=235363> (last visited Sept. 15, 2011).

35. *Id.*

Brazil, the Japanese company cancelled the patent.³⁶ In an attempt to avoid international patents of its natural products, the Brazilian government created a list of more than 5,000 generic names of the Brazilian biological resources and sent it to international organizations to discourage registration. Although this initiative is a good start, it has been questioned because there are trademarks already registered in the U.S. for açai products.³⁷

B. *The Illegal Trade of Endangered Species*

The trade of wildlife is the world's third largest illegal activity, after guns and drugs.³⁸ Brazil's participation in this trade is estimated to be around 15%. Animals are traded for various reasons. Primates are mostly used for biomedical research. Birds, reptiles and mammals are used for pets, and for their byproducts, such as fur and skin.³⁹

According to the National Report on the Illegal Trade of Wildlife,⁴⁰ illegal trade has three aspects. The first is the use of animals by collectors and private zoos, which consists mainly of endangered and rare species.⁴¹ For example, a blue macaw (endangered) is worth \$60,000 in the international market.⁴² The second aspect of illegal trade is the use of wildlife as pets and the sale to pet shops around the world.⁴³

Finally, the third aspect and the focus of this paper, is the illegal trade of animals for scientific research.⁴⁴ This type of trade is considered biopiracy. It targets species that have some kind of chemical substance, which could be used in medicine production. For example, a type of snake called "jararaca-ilhoa" is worth about \$20,000

36. *Id.*

37. DANIEL F. ROBINSON, *CONFRONTING BIOPIRACY: CHALLENGES, CASES AND INTERNATIONAL DEBATES* 92 (Earthscan ed. 2010) [hereinafter ROBINSON].

38. NASCIMENTO, *supra* note 15, at 35.

39. *Id.*

40. Relatório Final da 1ª Comissão Parlamentar de Inquérito – CPI que investigou o tráfico de animais e plantas silvestres no país. O documento foi elaborado e divulgado pela Câmara dos Deputados [National Report on the Illegal Trade of Wildlife], RECNTAS, available at http://www.renctas.org.br/pt/trafico/rel_cpi.asp (follow "Download relatório completo") [hereinafter RECNTAS]. *Comissão Parlamentar de Inquérito Destinada a "Investigar o tráfico ilegal de animais e plantas silvestres da fauna e da flora brasileiras"* [National Report on the Illegal Trade of Wildlife] (2003) (documento foi elaborado e divulgado pela Câmara dos Deputados Sarney Filho), available at http://www.renctas.org.br/pt/trafico/rel_cpi.asp (follow "Download relatório completo") (Br.).

41. *Id.*

42. *Id.*

43. *Id.*

44. *Id.*

in the international market because of its venom.⁴⁵ Similarly, the brown spider's venom is being sold for \$24,000.⁴⁶ The possibility of new medicines that could be manufactured from the substances produced by these animals is very attractive to industries and the sale of these animals is very lucrative to poachers.⁴⁷

Developed countries are the most significant consumers of the animals, through the "black market." According to the Brazilian Federal Police, 38 million animals are captured illegally, and 40% are exported to developed countries.⁴⁸ This activity involves about \$1 billion per year in Brazil. IBAMA recognizes that uncontrolled exploitation of the Brazilian natural resources is the number one cause for environmental degradation, which leads to the extinction of many species.⁴⁹

As a consequence of the illegal trade, developed countries have a vast number of animals that are now legally bred in captivity.⁵⁰ Animals from Brazil, such parrots and macaws, became popular and are readily available throughout the world. Sadly, data shows that there are more animals (native to Brazil) in captivity around the world than in Brazil.⁵¹ Some species are facing extinction in Brazil, but are largely bred in other parts of the world.⁵²

It is disturbing to know that 90% of the wildlife trade in Brazil is illegal. Due to poor conditions in transportation and handling, only one animal (out of ten captured) survives.⁵³ Considering these numbers, loss of biodiversity is inevitable, not only in the Amazon forest, but also in other parts of Brazil.

45. *Id.*

46. *Id.*

47. The Economist, *Monkey Business: A Deadly but Lucrative Trade* (2001), http://www.economist.com/node/853197?story_id=853197 (last visited Sept. 15, 2011).

48. Portal Vegetariano Natureba, *Tráfico de Animais Silvestres [Wildlife Trade]*, <http://www.natureba.com.br/trafico-animais-silvestres.htm> (Br.). Portal Vegetariano Natureba, *Tráfico de Animais Silvestres [Wildlife Trade]*, <http://www.natureba.com.br/trafico-animais-silvestres.htm> (Br.) (last visited September 10, 2011).

49. *Id.*

50. *Id.*

51. *Id.*

52. NASCIMENTO, *supra* note 15, at 36.

53. See RECNTAS, *supra* note 40.

C. *Role of Traditional Communities: Knowledge and Participation*

The Amazon forest is home to an estimated 20 million people.⁵⁴ Biodiversity is a component of traditional knowledge. The traditional communities of the Amazon, such as the indigenous people, the “quilombolas” (African slaves descendents), and the population that lives in small communities at the riverbanks called “ribeirinhos,” depend on the natural resources for their subsistence.⁵⁵ They developed techniques, not only of fishing and hunting, but also of how to use the resources for medical purposes. For this reason, traditional communities play an important role in biopiracy.⁵⁶

Traditional communities are victims and they need special protection against exploitation. Moreover, they need to be empowered and informed about the role in conservation and sustainable development. Their participation in biopiracy occurs in two ways: either because their knowledge is stolen or because they were coerced to sell.⁵⁷

Traditional knowledge is an essential part of biopiracy because in order to know where to find the resources and what it can be used for, the exploiters need the help of local communities. Posing as scientist or tourist, the criminals deceive the people to obtain information.⁵⁸ The communities that inhabit the Amazon are friendly, simple, and mostly not well educated. The so-called scientist can easily pose as a Good Samaritan and extract the information.

Another dimension of the problem is poverty. Because indigenous communities lack resources, the only means of survival is to sell plants and animals for illegal trade. They constitute the first part of the network for trade of endangered species, as recognized by the investigation on biopiracy initiated by the House of Representative in 2003.⁵⁹ Moreover, the traditional populations are the main contributors to illegal trade of endangered species because of the high level of poverty these communities face. The lack of resources in time of

54. Greenpeace, *Amazônia: Salvar ou Destruir?* (2005) [Amazon: Save or Destroy?] http://www.greenpeace.org.br/tour2005_br163/noticias.php?conteudo_id=2164 (Br.). Greenpeace, *Amazônia: Salvar ou Destruir?* (2005) [Amazon: Save or Destroy?] http://www.greenpeace.org.br/tour2005_br163/noticias.php?conteudo_id=2164 (Br.) (last visited September 10, 2011).

55. NASCIMENTO, *supra* note 15, at 28. Traditional communities are the people that inhabit the Amazon and need natural resources for their subsistence. *Id.*

56. *Id.*

57. *Id.*

58. *Id.*

59. See RECNTAS, *supra* note 40.

drought, for example, leads these communities to sell wildlife for survival.⁶⁰

Some groups are fortunate to become better informed about the value of traditional knowledge with the help of nongovernmental organizations (“NGOs”).⁶¹ A good example is the Natura case. Natura is a leading cosmetic company in Brazil. In 2007, the Prosecutor’s office filed a civil action in the name of a tribe regarding possible use of unauthorized traditional knowledge by the company.⁶² This action is a step in the right direction; however, much more needs to be done to empower the traditional communities. Empowerment in the form of education and best infrastructure⁶³ is necessary to avoid exploitation.

The work of NGOs is essential in helping traditional communities to fight for their rights. A South African NGO, Biowatch, with the support of an international NGO, Action Aid, brought into the media attention, the exploitation of the knowledge of the San (the oldest human inhabitants in Africa) by the South African-based Council for Scientific and Industrial Research (“CSIR”) for the use of a plant known to suppress appetite.⁶⁴ Subsequently, the San started to receive compensation for the use of their knowledge.⁶⁵

Traditional populations worldwide are victims of political exclusion, persecution, and many other limitations, including lack of legal and civil rights.⁶⁶ Their economic activities and subsistence are crucial for the protection of the environment. Therefore, it is extremely important to respect the human rights of these people so they can live their lives with dignity. They need to understand the importance of protecting their knowledge, their habitat, and the biodiversity around them.

60. *Id.*

61. *Id.*

62. Blog by Reinaldo Azevedo, Índios Atacam Exploração Comercial da Natura [Indians attack Natura’s Commercial Exploitation], <http://veja.abril.com.br/blog/reinaldo/geral/indios-atacam-exploracao-comercial-da-natura-apoiada-por-marina/> (Br.). Posting of Fabio Zanini to Reinaldo Azevedo’s blog, Índios Atacam Exploração Comercial da Natura [Indians attack Natura’s Commercial Exploitation], <http://veja.abril.com.br/blog/reinaldo/geral/indios-atacam-exploracao-comercial-da-natura-apoiada-por-marina/> (Br.) (Jan. 9, 2009, 04:47 GMT).

63. See TheFreeDictionary.com (defining infrastructure as “the basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communications systems, water and power lines, and public institutions including schools, post offices, and prisons,” <http://www.thefreedictionary.com/infrastructure> (last visited Sept. 15, 2011)).

64. Laird, *supra* note 10, at 27.

65. *Id.* See also *infra* Part IV, A.

66. ROBINSON, *supra* note 37, at 39.

II. INTERNATIONAL LEGAL FRAMEWORK: BENEFIT-SHARING

International law plays an important role in biodiversity protection. As a result of animals migrating between continents and plants being traded around the world, the increase in international trade of biotechnology⁶⁷ created an interconnection between biodiversity conservation and intellectual property rights. Therefore, a number of treaties exist today on the subject.⁶⁸

In 1983, FAO International Undertaking on Plants Genetic Resources stated, "Plant genetic resources are heritage of mankind to be preserved, and to be freely available for use, for the benefit of present and future generations."⁶⁹ Since the South is the provider of most of the world's biodiversity, the North always had an interest in guaranteeing free access to the biological resources from the South.⁷⁰

Biodiversity has value and it is defined by international law as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."⁷¹ This very broad definition encompasses not only animals and plants' intrinsic value as living organisms but also the economic value of biodiversity.⁷²

The economic value of biodiversity can be measured by its diverse use and finality.⁷³ Some examples are: wildlife trade, ecosystem services, agriculture and food security, drugs and medicines.⁷⁴

67. CBD, *supra* note 3, Art. 2 defines "Biotechnology" as any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use, *available at* <http://www.cbd.int/convention/text/>.

68. For example, the Conference of the Parties to the CBD adopted a supplementary agreement to the Convention known as the *Cartagena Protocol on Biosafety to the Convention on Biological Diversity*. The Protocol is an international treaty governing the movements of living modified organisms resulting from modern biotechnology from one country to another and requires an advance informed agreement for the safe transfer, handling and use of any living modified organism created by biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity. *Cartagena Protocol on Biosafety to the Convention on Biological Diversity art. 1, opened for signature Jan. 29, 2000, 39 I.L.M. 1027 (entered into force Sep. 11, 2003)*. See *Id.* at art. 3, *available at* <http://bch.cbd.int/protocol/text/>. Although part of the CBD treaty regime, the Biosafety Protocol is beyond the scope of this paper.

69. DAVID HUNTER ET AL., *INTERNATIONAL ENVIRONMENTAL LAW AND POLICY* 1023 (3d ed., Foundation Press 2007) [hereinafter HUNTER].

70. *Id.*

71. *Id.* at 1004.

72. *Id.*

73. *Id.*

74. *Id.* at 1008.

The three most relevant sources of international law on point are the CBD, TRIPS, and the Nagoya Protocol. The CBD focuses primarily on biodiversity conservation but also has an economic component to it.⁷⁵ Because of the economic value of biodiversity, the principal objectives of the CBD are the “equitable sharing of the benefits arising out of the utilization of genetic resources” and the “protection of traditional knowledge.”⁷⁶ TRIPS, on the other hand, is an intellectual property right (“IPR”) agreement and its provisions conflict with the CBD because it only protects intellectual property rights without acknowledging benefit-sharing or traditional knowledge.⁷⁷ The most recent development in the benefit-sharing context is the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity.⁷⁸ The Nagoya Protocol’s main goal is to ensure that the parties to the agreement are adopting the benefit-sharing provision of the CBD.⁷⁹

Accordingly, there is a rising international awareness that biodiversity is indispensable to ensure the continuing existence of human life on this planet. Therefore, conservation is a matter of survival and biopiracy practices need to come to an end worldwide.

A. *The Convention on Biological Diversity*

The Convention on Biological Diversity was adopted in June 1992, at the Rio Earth Summit in Rio de Janeiro, Brazil.⁸⁰ The main goal was to create an international framework for the sustainable use of the planet’s natural resources.⁸¹

The parties negotiating the convention came to the realization that preservation of biodiversity was a “common concern of humankind.”⁸² Although States have the right to maintain their sovereignty,

75. *Id.* at 1032.

76. *Id.*

77. *Id.* at 1050.

78. Melissa Lewis, *Bioprospecting in the Wake of CBD COP10: The adoption of the Nagoya Protocol*, 19 ILSA Quarterly 2, 18 (2010) [hereinafter Lewis].

79. *Id.*

80. The Convention on Biodiversity, available at <http://www.cbd.int/history/> (“The Convention entered into force on 29 December 1993, which was 90 days after the 30th ratification.”).

81. *Id.* “The Convention on Biological Diversity was inspired by the world community’s growing commitment to sustainable development. It represents a dramatic step forward in the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources.” *Id.*

82. HUNTER, *supra* note 69, at 1023.

they also have the responsibility to preserve the natural resources within their territory for the sake of the rest of the world.⁸³

Despite the criticism regarding the vague language of the CBD, the Convention has numerous positive environmental concepts. The Convention encourages sustainable use of natural resources through its State members' national conservation laws.⁸⁴ It provides for the recognition of traditional knowledge and its relevance towards biodiversity conservation.⁸⁵ The CBD also recognizes that countries have the sovereign right over their genetic resources. This right gives the developing countries, the source of most genetic resources, some bargaining power to employ against the developed countries, because the latter hold the technology to explore the resources.⁸⁶

One of the most controversial articles of the CBD is Article 15, the benefit-sharing provision.⁸⁷ Sections 6 and 7 establish that compensation should be given for the use of a country's genetic resources.⁸⁸ This means an equitable part of the benefits and results obtained from the utilization of genetic resources or the traditional knowledge associated with these resources should be shared.⁸⁹ In other words, the South facilitates access to biodiversity for commercial purposes and the North should pay for it. This is the legal type of biopiracy also known as bioprospecting.⁹⁰ The objective of the benefit-sharing provision is that the countries rich in biodiversity can make agreements to trade access to genetic resources for a good share of the benefits.⁹¹

The Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization were adopted in 2002, by the Parties signatories of the CBD, to facilitate the understanding on how the benefit-sharing provision would work in practice.⁹² Developing countries believed that it is more than fair that the exploitation of the South's natural resources should be

83. *Id.*

84. CBD, *supra* note 3, at art. 6.

85. *Id.* at art. 8 (j).

86. Michael Blakeney, *Bioprospecting and Biopiracy*, reprinted in *Intellectual Property and Biological Resources* at 405 (Marshall Cavendish International ed., 2004).

87. Sandra Akemi Shimada Kishi, *Visão Crítica Sobre a Convenção da Biodiversidade: Seus Objetivos, Soberania Estatal e Acesso ao Conhecimento Tradicional* [Critical View of the Convention on Biodiversity: Objectives, State Sovereignty and Access to Traditional Knowledge], 6 *Revista Internacional de Direito e Cidadania* [REID] 214 (2010) (Br.).

88. *Id.* at 215.

89. *Id.*

90. SHIVA, *supra* note 19, at 74.

91. HUNTER, *supra* note 69, at 1037.

92. *Id.* at 1038.

compensated.⁹³ However, it is important to note that this compensation, which is usually in the form of royalties, should be invested in the conservation of the biodiversity.⁹⁴ Under the principle of sustainable development, the compensation will ensure that the natural resources will be available to future generations.⁹⁵ A portion of this compensation should also be reserved for the traditional communities whose knowledge allows for locating and using the natural resources.⁹⁶

The United States signed but did not ratify the convention.⁹⁷ Its main objections were the provisions of intellectual property, benefit-sharing, and the requirements for domestic conservation.⁹⁸ Home to major pharmaceutical companies, the U.S. holds many patents on genetic resources located in other countries.⁹⁹ Therefore, the U.S. has no interest in benefit-sharing, only in benefiting.¹⁰⁰

B. *The Nagoya Protocol*

The Nagoya Protocol is the latest international development in the CBD treaty regime.¹⁰¹ One of the most important objectives of the CBD is access to genetic resources and benefit-sharing provided in Article 15 of the Convention.¹⁰²

By recognizing the sovereign rights of the provider States over their natural resources, the Convention established that States have the authority to determine access to genetic resources in areas within their jurisdiction.¹⁰³ Moreover, the member States have the obligation to ensure the sharing of the benefits derived from their use.¹⁰⁴ CBD

93. *Id.*

94. *Id.* at 1042.

95. Michael I. Jeffery, *Intellectual Property Rights and Biodiversity Conservation: Reconciling the Incompatibilities of the TRIPS Agreement and the CBD*, reprinted in *Intellectual Property and Biological Resources* 186 (Marshall Cavendish International ed., 2004).

96. *Id.*

97. HUNTER, *supra* note 69, at 1022

98. *Id.*

99. *Id.*

100. *See infra* section III, subsection B.

101. The Nagoya Protocol, *supra* note 4

102. *Id.* "The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity is a supplementary agreement to the Convention on Biological Diversity. It provides a transparent legal framework for the effective implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources."

103. The Nagoya Protocol Background, *supra* note 4.

104. *Id.*

also encourages the equitable sharing of the benefits derivative from traditional knowledge as an important practice for the conservation and sustainable use of biodiversity.¹⁰⁵

State parties to the CBD adopted the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity at the Tenth Meeting of the Conference of the Parties, held in Nagoya, Japan, in October 2010.¹⁰⁶

The Nagoya Protocol is an

international agreement which aims at sharing the benefits arising from the utilization of genetic resources in a fair and equitable way, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding, thereby contributing to the conservation of biological diversity and the sustainable use of its components.¹⁰⁷

The Protocol supplements the CBD and it provides a more detailed legal framework on how to accomplish the CBD's objective for benefit-sharing.¹⁰⁸ The Protocol requires that its provisions be implemented by its State parties into domestic legislation.¹⁰⁹

The main goal of the Nagoya Protocol is to create more legal certainty and transparency for the State providers and users of genetic resources.¹¹⁰ It aims to do so by establishing more predictable conditions for access to genetic resources and ensuring benefit-sharing when genetic materials are taken outside the provider jurisdiction.¹¹¹

The Protocol will enter into force 90 days after being ratified by at least fifty parties to the CBD and is open for signature at the UN headquarters in New York, until February 1, 2012.¹¹² It will only be successful if the States cooperate to make benefit-sharing a reality.¹¹³ The success also depends on the adoption and enforcement of strong domestic legislation by the parties to the agreement.¹¹⁴

105. *Id.*

106. *Id.*

107. Access and Benefit Sharing, available at <http://www.cbd.int/abs/> [ABS]. (last visited date)

108. *Id.*

109. Lewis, *supra*, note 78, at 20.

110. *Id.* at 21.

111. *Id.*

112. ABS, *supra* note 107.

113. *Id.*

114. *Id.*

The Protocol it is a great step toward ending biopiracy because these transactions are to be made contractually, which could guarantee economic resources used for conservation and compensation for traditional knowledge.¹¹⁵ The adoption of this benefit-sharing agreement will help traditional communities and developing countries to overcome the lack of protection from domestic and international intellectual property rights laws.

III. INTELLECTUAL PROPERTY RIGHTS HURDLE

IPRs have caused much debate throughout the years, in particular, after the adoption of the CBD. Developed and developing countries have a different understanding of patent rights. The former have advocated for a more liberal approach in the granting of patents and for more strict enforcement of the rights arising from the patents, while the latter have to abide by the strict laws to continue developing.¹¹⁶ Developing countries maintain that they are in an inferior position when it comes to IPRs, especially in the context of biodiversity.¹¹⁷

A. *The Agreement on Trade-Related Aspects of Intellectual Property Rights*

The CBD's benefit-sharing provision generated much discussion and conflict in the international community.¹¹⁸ There is a close relationship between IPRs and benefit-sharing as it relates to biodiversity.¹¹⁹

Both the States providing genetic resources and responsible for biodiversity conservation, and the States receiving the genetic resources for industrialization of products, are aware of the relevance of the IPRs for the protection of biotechnological inventions.¹²⁰ Moreover,

115. Lewis, *supra* note 78, at 23.

116. Alan S. Gutterman, *The North-South Debate Regarding the Protection of Intellectual Property Rights*, 28 WAKE FOREST L. REV. 89, 90-91 (1993) [hereinafter Gutterman].

117. *Id.* at 136-37 ([I]t has become evident that expanded protection of IP rights is not sensible for all countries; neither is it wise to allow the United States and other developed countries to impose their conventions upon the rest of the world.) *Id.*

118. Jeffery, *supra* note 95, at 185.

119. *Id.*

120. *Id.*

IPRs are also important for the protection of traditional knowledge used to create the products.¹²¹

The CBD requires that intellectual property rights be “supportive of and do not run counter to” to the treaty’s objectives.¹²² During the CBD negotiations, the South argued that IPRs protect the patents of biotechnology industries and pose a major obstacle to benefit-sharing, because IPRs make it more difficult to transfer technology as it is protected under patent laws.¹²³ On the other hand, the North claimed that any technology transfer had to honor the intellectual property rights of industry from the North.¹²⁴ Both sides believed that their view would allow for better biodiversity conservation.¹²⁵ The results of these debates are the CBD’s articles articulating benefit-sharing and the protection of traditional knowledge, but also acknowledging IPRs.¹²⁶ The CBD created a balance of the interests between the North and South by recognizing that IPRs and biodiversity regulation are closely linked.¹²⁷

The Agreement on Trade-Related Aspects of Intellectual Property Rights (“TRIPS”) was negotiated under the umbrella of GATT¹²⁸ and WTO,¹²⁹ after the creation of the CBD, and entered into force in 1995.¹³⁰ It is very comprehensive and set standards for protection of IPRs.¹³¹ Notably, patents are the most well known form of IPRs.¹³²

121. *Id.* at 186.

122. HUNTER, *supra* note 69, at 1050.

123. *Id.* at 1034.

124. *Id.*

125. *Id.*

126. *Id.*

127. *Id.*

128. General Agreement on Tariffs and Trade, Oct. 30, 1947, 55 U.N.T.S. 194; 61 Stat. pt. 5; T.I.A.S. No. 1700. (The General Agreement on Tariffs and Trade (GATT) was an international agreement that promoted international trade and the reduction of trade barriers among member states from 1947-1994. Under the GATT regime, subsequent agreements resulted in trading “rounds.” The Uruguay Round created the World Trade Organization, which forms the legal and institutional framework for the multilateral trading system.) See HUNTER *supra* note 69 at 1257.

129. The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world’s trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters, and importers conduct their business. *available at* http://www.wto.org/english/thewto_e/whatis_e/whatis_e.htm.

130. Jeffery, *supra* note 95, at 193.

131. *Id.*

132. *Id.*

Article 27 of TRIPS established that plant varieties could be patented.¹³³ This conflicts with the CBD because it does not mention benefit-sharing or any kind of protection of traditional knowledge.¹³⁴ Many developing countries, including Brazil, argue that Article 27 needs to be amended to include sharing of the benefits derivative of the patents from plants varieties.¹³⁵ Brazil also argues that the amendment should contain identification of the source, identification of the traditional knowledge from where the resources were obtained, and prior consent of the country.¹³⁶ According to Brazil these changes would help prevent biopiracy.¹³⁷

TRIPS undermines the CBD because Article 27 is incompatible with the benefit-sharing provision.¹³⁸ IPRs protection bars the transfer of technology.¹³⁹ Once a country retains the patent of a product, it will not share the information about that product.¹⁴⁰ As a result, the provider country will not be able to get recognition for the supply of the genetic materials and the knowledge of the traditional peoples.¹⁴¹

TRIPS have a negative impact on biodiversity conservation, because it allows patenting of life forms.¹⁴² It undermines the value of natural resources and traditional knowledge by placing more value on IPRs.¹⁴³ It changes the "socio-cultural context of conservation."¹⁴⁴

No amendments to TRIPS Art. 27 have been made as of this writing.¹⁴⁵ The bio-pharmaceutical and biotechnological industries have significant influence on how international property law will develop. They want to ensure the most profitability for the rights to the use of genetic resources.

133. *Id.*

134. *Id.*

135. HUNTER, *supra* note 69, at 1051.

136. *Id.*

137. *Id.* at 1052-1053.

138. *Id.*

139. *Id.*

140. *Id.*

141. Jeffery, *supra* note 95, at 206.

142. SHIVA, *supra* note 19, at 87.

143. *Id.* at 88.

144. *Id.* TRIPS impacts not only the ecology of species interactions as a result of the commercial release of patented genetically engineered organisms (GEOs), but also undermines rights of local traditional communities and their relationship to biodiversity affected by invasion of the GEOs into their environment, diminishing the community capacity to conserve biodiversity.

145. *Id.*

B. U.S. Patent Law

The United States Patent and Trademark law is frequently blamed for being responsible for some of the most controversial cases of biopiracy.¹⁴⁶ Under the international IPR framework, the TRIPS agreement was influenced by the U.S. interest in preserving its domestic patent law.¹⁴⁷ Developing countries accuse U.S. patent law of having a low standard with respect to foreign knowledge.¹⁴⁸ For example, under the novelty rule,¹⁴⁹ a person is entitled to a patent unless the invention was known or used by others in this country [U.S.], or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for the patent.¹⁵⁰ The rule only mentions foreign patents and printed publications. It does not mention foreign knowledge or use.¹⁵¹ The priority rule establishes that whoever is the first to invent has priority to patent.¹⁵²

Biopiracy allegations are premised on the fact that patents of genetic material are not inventions, because they are identical to the actual genetic resources itself.¹⁵³ For example, a dispute between the United States and India arose regarding the Neem tree.¹⁵⁴ The Neem tree only exists in India and is well known as the “curer of all ailments.”¹⁵⁵ The Neem tree has been used in India for over 2,000 years as medicine, pesticides, spermicides, toothbrushes and other purposes.¹⁵⁶ It is also considered sacred by Indian citizens.¹⁵⁷ In 1971, a U.S. timber company began utilizing the Neem seed to produce pesticides.¹⁵⁸ The company was granted a patent and subsequently sold its rights to an-

146. Cynthia M. Ho, *Biopiracy and Beyond: A Consideration of socio-cultural conflicts with Global Patents Policy*, 39 U. MICH. J.L. REFORM 433, 508-509 (2006) [hereinafter Ho].

147. *Id.*

148. Charles McManis, *Fitting Traditional Knowledge Protection and Biopiracy claims into existing IP and unfair competition framework*, reprinted in *Intellectual Property and Biological Resources* 451 (Marshall Cavendish International ed., 2004) [hereinafter McManis].

149. 35 U.S.C. § 102 (a) (1952).

150. McManis, *supra* note 148, at 452.

151. *Id.*

152. 35 U.S.C. § 102 (g).

153. Ho, *supra* note 146, at 449.

154. *Id.*

155. HUNTER, *supra* note 69, at 1046.

156. Sara Hasan, *The Neem Tree, Environment, Culture and Intellectual Property*, TED Case Studies, 2002, <http://www.american.edu/TED/neemtree.htm>. (last visited date).

157. *Id.*

158. *Id.*

other U.S. company, W.R. Grace.¹⁵⁹ W.R. Grace sued Indian companies for breach of patent law for making an emulsion extracted from the Neem tree also used as pesticide.¹⁶⁰

The novelty rule establishes that the invention must be “new.”¹⁶¹ W.R. Grace satisfies the “new” requirement because their finished product does not exist in nature.¹⁶² The rule also states that the invention cannot be a component of “prior art” or existing knowledge.¹⁶³ India claims that the U.S. statute opens the door to biopiracy and that the U.S. has to change the language of its patent law.¹⁶⁴ The suggested change is the recognition of foreign “prior art” that is based on the ancient practice of a country and deeply imbedded in its tradition, even though it has not being patented or published.¹⁶⁵ Oral information should have the same status as written information for purposes of the novelty rule.¹⁶⁶

Europe also had a patent on a method of controlling fungi on plants using extracted Neem oil, but revoked the patent based on the fact the fungicidal effect of Neem seed extracts has been used for centuries in India.¹⁶⁷ However, such a well-known fact would not cause the revocation of the patent in the U.S. because the government does not consider public use in foreign countries as relevant prior art unless such use is documented in writing.¹⁶⁸

The turmeric case is another example of India challenging a U.S. patent under biopiracy allegations.¹⁶⁹ Turmeric has been used in India for centuries as dye, cooking and medicine.¹⁷⁰ In 1995, a patent was awarded under the novelty rule to the University of Mississippi Medical Center for the use of turmeric in wound healing.¹⁷¹ India sued and the patent was revoked only because some written documentation was found.¹⁷²

159. *Id.*

160. *Id.*

161. Vandana Shiva, *The Turmeric Patent is Just the First Step in Stopping Biopiracy*, Third World Network, www.twinside.org.sg/title/tur-cn.htm. (last visited date).

162. *Id.*

163. *Id.*

164. *Id.*

165. *Id.*

166. *Id.*

167. *Id.*

168. *Id.*

169. Alyson Slack, *Turmeric*, TED Case Studies, 2004, www.american.edu/ted/turmeric.htm. (last visited date).

170. *Id.*

171. *Id.*

172. *Id.*

Brazil, India, other developing countries and NGOs have criticized the U.S. patent laws and their relationship to TRIPS provisions.¹⁷³ They proposed an amendment to TRIPS to include a provision mandating disclosure of the source of genetic material and traditional knowledge.¹⁷⁴ This disclosure mechanism in patent application would avoid the granting of patents for materials used in other countries.¹⁷⁵ The examiners would be able to establish if the material was prior art and therefore lacked novelty status.¹⁷⁶

The U.S. biotechnology industry has been very profitable under the protections of the current patent law framework.¹⁷⁷ It is very unlikely the traditional knowledge of useful genetic resources around the world is fully registered and publicized in writing. Therefore, the industry can continue its research and patent its findings both under domestic and international IPR laws. The simple solution of including oral information into the novelty rule that could help end biopiracy worldwide is unlikely to happen.

IV. DOMESTIC IMPLEMENTATION: COMPARATIVE LAW ISSUES

The parties to the CBD are required to find viable models for implementation of the CBD's objectives at the national level.¹⁷⁸ Brazil created a complex framework to implement the CBD's objectives and address biopiracy. However, the Brazilian laws are flawed and do not establish an equitable system for regulating traditional knowledge associated with genetic resources and, therefore, are not effective in combating biopiracy. On the other hand, developing countries such as Costa Rica, developed a more effective system to implement CBD's goals.

A. *Brazilian Legal Framework: Shortcomings of the Current System in Brazil*

One of the biggest challenges Brazil faces to combat biopiracy in the Amazon is the lack of strong legal instruments that would effec-

173. HUNTER, *supra* note 69, at 1052.

174. *Id.*

175. *Id.*

176. *Id.*

177. Amy E. Carroll, *Not Always the Best Medicine: Biotechnology and the Global Impact of U.S. Patent*, 44 AM. U. L. REV. 2452 (1995) (internal citations omitted) [hereinafter Carroll].

178. See Implementation Mechanisms, <http://www.cbd.int/convention/mechanisms/> (it provides information through a internet based-network).

tively regulate access to biodiversity.¹⁷⁹ There are however, a group of federal laws that complement the Federal Constitution.¹⁸⁰

The legal framework responsible for regulating research, biodiversity use, and benefit-sharing is extensive. All of the laws followed the ratification of the CBD as domestic implementation mechanisms. The most important regulations are: Decree 2.519/98, Medida Provisória 2.186-16/01, and Decrees 3.945/01, 4.339/02, 4.946/03, 5.439/05, 5.459/05, 6.159/07.¹⁸¹ This paper will focus on the Medida Provisória 2.186-16/01 (“MP 2186”) as the principal legal instrument addressing commercial use of genetic resources and traditional knowledge.¹⁸²

1. The Brazilian Federal Constitution

The Brazilian Federal Constitution (“Constitution”) is the country’s highest law and expresses the national principles and values regarding the conservation of Brazil’s biodiversity.¹⁸³ It recognizes that biodiversity belongs to the people.¹⁸⁴ The Constitution’s relevant articles establish federal guidelines for scientific research, the right to a healthy environment, environmental conservation, and protection of indigenous people and traditional knowledge.¹⁸⁵

The provision for scientific research is found in Article 218, which provides “the State shall promote and foster scientific development, research, and technological expertise.”¹⁸⁶ Section 2 requires that this research must focus primarily on the solution of Brazilian problems for the development of the Brazilian productive systems.¹⁸⁷ The right to a healthy environment in Article 225 guarantees to all Brazilian citizens “the right to an ecologically balanced environ-

179. NASCIMENTO, *supra* note 15, at 90

180. *Id.*

181. *Id.* at 89.

182. MP, *supra* note 5.

183. Robin L. Scott, *Bio-Conservation or Bio-Exploitation: An Analysis of the Active Ingredients Discovery Agreement Between the Brazilian Institution BIOAMAZONIA and the Swiss Pharmaceutical Company NOVARTIS*, 35 GEO. WASH. INT’L L. REV. 985 (2003) (internal citations omitted) [Scott].

184. *Id.*

185. *Id.* at 986.

186. Constituição da República Federativa do Brasil de 1988, art. 218 [Constitution of the Federative Republic of Brazil of 1988], available in English at http://www.stf.jus.br/repositorio/cms/porta1StfInternacional/porta1StfSobreCOrte_en_us/anexo/constituicao_ingles_3ed2010.pdf [hereinafter C.F.].

187. *Id.* § 2.

ment.”¹⁸⁸ This provision also incorporates the sustainable development principle and imposes on the government “the duty to defend and to preserve the environment for present and future generations.”¹⁸⁹ Section 1 states that the government is responsible for the preservation of the “diversity and integrity of the Country’s genetic patrimony” and for the supervision of “entities dedicated to research and manipulation of genetic material.”¹⁹⁰

Indigenous peoples’ right to land and natural resources is expressed in Article 231. It recognizes the “social organization, customs, languages, creeds and traditions” of Brazilian indigenous people and protects their interests in as well as their original rights to “the lands they traditionally occupy.”¹⁹¹ Section 1 explains that traditionally occupied lands are “those on which [the indigenous people] live on a permanent basis, those used for their productive activities, those indispensable for the preservation of environmental resources necessary for their well-being and those necessary for their physical and cultural reproduction, according in their uses, customs and traditions.”¹⁹² In addition to section 1 of Article 231, section 6 establishes that any exploitation of the natural wealth of these lands is “null and void” or has no legal effect, “except in the case of relevant public interest of the Federal Government, according to the provisions of a supplementary law.”¹⁹³ Accordingly, section 6 opens the door to legislation permitting the commercialization and access to the biodiversity of the land occupied by indigenous people.

The Constitution was adopted in 1988 and set federal standards for any laws that Congress enacts.¹⁹⁴ Under its provisions, the government has the responsibility to follow these standards for scientific development, conservation of biodiversity, and protection of indigenous people.¹⁹⁵ In 1994, the Brazilian government ratified the CBD and since then, Brazil has enacted various laws to implement the CBD into the domestic legal framework.¹⁹⁶ The Constitution and other laws created instruments and governmental institutions to regulate the country’s vast biodiversity.

188. C.F. art. 225.

189. *Id.*

190. *Id.* at § 1 (II).

191. C.F. art. 231.

192. *Id.* at § 1.

193. *Id.* at § 6.

194. Scott, *supra* note 183, at 985.

195. *Id.*

196. *Id.* at 987.

2. Provisional Measure and other Decrees

The Provisional Measure (Medida Provisória “MP”) is an instrument the President uses to address priority matters.¹⁹⁷ It is defined as a law enacted by the President when urgent and relevant matters need to be regulated without congressional authorization.¹⁹⁸ Article 62 of The Constitution provides that the MP has limited validity until Congress approves it to become law.¹⁹⁹ However, in 2001, Constitutional Amendment No. 32 changed this requirement by allowing the MP to be binding even in the absence of Congress’ action.²⁰⁰ When Congress acts, the MP is transformed into a Legislative Decree.²⁰¹

MP 2186 is a primary example of the Brazilian government’s attempt to regulate access to genetic resources and traditional knowledge.²⁰² The MP implements CBD’s provision establishing a country’s sovereign right to exploit its own resources, by defining genetic resources as “information of genetic origin from all or part of microbial, fungal, plant or animal species found in or coming from Brazilian territory, including the continental shelf and exclusive economic zone.”²⁰³

MP 2186 covers several issues and it is being criticized for being too vague and too broad regarding biodiversity conservation and traditional knowledge protection.²⁰⁴ Article 2 establishes that “the access to the country’s existent genetic patrimony could only be done with federal authorization.”²⁰⁵ Article 2 also acknowledges benefit-sharing.²⁰⁶ The problem is that MP 2186 is not clear on how the access and benefit-sharing will be accomplished.²⁰⁷

197. John Tustin, *Traditional Knowledge and Intellectual Property in Brazilian Biodiversity Law*, 14 TEX. INTELL. PROP. L.J. 131, 145 (2006) (internal citations omitted) [Tustin].

198. Ana Cláudia Manso S.O. Rodrigues, *A Medida Provisória não Convertida em Lei e a Edição de Decreto Legislativo* [The Provisional Measure not Converted into Law and the Creation of Legislative Decree], *Revista de Direito Público* [Public Law Magazine] 142 (2003) (Br.) available at <http://www.direitopublico.idp.edu.br/index.php/direitopublico/article/viewFile/506/511>.

199. *Id.*

200. *Id.*

201. *Id.* at 143.

202. Tustin, *supra* note 197, at 145.

203. *Id.* See MP, *supra* note 5, at art. 1 (I).

204. *Id.* at 146-147.

205. MP, *supra* note 5, at art. 2.

206. *Id.*

207. Tustin, *supra* note 197, at 147.

MP 2186 provides that commercial use of genetic resources or traditional knowledge requires access contracts.²⁰⁸ The contracts must contain a clause that involves “fair and equitable sharing” and must establish that access will only be allowed if there is a benefit in return.²⁰⁹ However, the MP is vague because it does not define “fair and equitable sharing.”²¹⁰ The MP does list what constitutes benefits, which are: sharing of profits; payment of royalties; technology transfer; licensing of products and processes without cost; and capacity building. Without the definition of “fair and equitable sharing,” it is not clear how “fair” the benefits listed may be.²¹¹

Accordingly, profits and royalties are some of the benefits recognized by the MP 2186. Article 33 provides that the payments of profits and royalties owed to the Federal Government shall be distributed to some federal agencies listed within the provision.²¹² It also mandates that such monetary resources shall be used for the conservation of biological diversity and for the capacitating of human resources.²¹³ However, since the parties seem to have freedom to contract and there is no requirement that all contracts must be made with governmental agencies, the profit and royalties do not need to be used towards conservation when contracts are made between private parties. Moreover, there is no existing agency that oversees the terms of individual contracts to ensure that the terms are fair and equitable.²¹⁴ Mechanisms to distribute benefits are also absent.²¹⁵

MP 2186 Article 7 defines “associated traditional knowledge” as the “individual or collective information or practice of the indigenous community or local community, with real or potential value, associated to genetic heritage.”²¹⁶ “Local community” is culturally distinct indigenous and quilombolas populations that maintain their traditional social and economic institutions.²¹⁷ The MP 2186 does not define “individual” or “collective” practices.²¹⁸ MP 2186 is also silent on who is

208. NASCIMENTO, *supra* note 15, at 90.

209. *Id.*

210. *Id.*

211. MP, *supra* note 5, at art. 25.

212. *Id.* at art. 33.

213. *Id.*

214. Tustin, *supra* note 197, at 148-9.

215. *Id.*

216. *Id.* See MP, *supra* note 5, at art. 7 (II).

217. *Id.* at 146.

218. *Id.*

responsible for indigenous and local communities to decide how to use their traditional knowledge.²¹⁹

The MP provisions on access to genetic resources mandate that resources existing in "in situ" conditions²²⁰ be provided only for Brazilian entities.²²¹ Therefore, a foreign company is required to partner with a Brazilian organization, which would be the controlling partner.²²² The MP also provides that access to a genetic resource needs prior informed consent ("PIC").²²³

Although the MP does not define PIC, it lists the parties that are authorized to give consent.²²⁴ The list includes the indigenous community involved, environmental protection agency, private property owners, the National Defense Council, and the maritime authority.²²⁵ The listing of parties helps; however, the lack of description of what PIC is causes confusion because it is not clear what members of the parties listed are competent to give effective informed consent, especially when it applies to traditional communities.²²⁶

After the President created the MP 2186, Congress enacted other laws regulating the commercial use of genetic resources and associated traditional knowledge.²²⁷ This type of legislation is called a Legislative Decree.²²⁸ Decree 3945/2001 created the federal agency called Genetic Resources Management Council ("CGEN") as required in Article 10 of MP 2186.²²⁹ CGEN has the authority to establish regulations for the genetic patrimony management, to create and maintain databases on traditional knowledge relevant to the conservation of biodiversity and to establish guidelines for the approval process for genetic access contracts.²³⁰ CGEN only has authority to oversee contracts where the federal government is a party; it does not have

219. *Id.*

220. MP, *supra* note 5, at art. 16. See CDB, *supra* note 3, at art. 2 ("In-situ conditions" means conditions where genetic resources exist within ecosystems and natural habitats, and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.)

221. *Id.*

222. Tustin, *supra* note 197, at 146-7.

223. *Id.*

224. *Id.*

225. *Id.*

226. *Id.*

227. *Id.* at 148-149.

228. *Id.* See Decree 3945/2001 available at http://www.planalto.gov.br/ccivil_03/decreto/2001/D3945.htm. (last visited)

229. *Id.*

230. *Id.*

authority to manage the “fair and equitable sharing” of private access contracts.²³¹

The MP 2186 provision on IPRs is very similar to the CBD.²³² Protection of traditional knowledge associated with biodiversity is awarded as long as it does not affect, damage, or limit intellectual property rights.²³³ Article 28 requires that access contracts carry IPRs clauses.²³⁴ In addition, Decree 5.450/2005 created administrative fines and penalties for the misuse of genetic resources or traditional knowledge.²³⁵ Some scholars criticize such provisions because they contribute to biopiracy. Once intellectual property is protected, patents obtained without contracts will preclude any kind of benefit-sharing.²³⁶ Moreover, administrative penalties are not enough to protect biodiversity.²³⁷ The only way to avoid biopiracy is the criminalization of this type of activity or effective bioprospecting agreements.²³⁸

The most prominent Brazilian newspaper, *O Globo*, printed an article acknowledging that the Brazilian government has its “hands tied” with respect to the threat of biopiracy.²³⁹ The Secretary of Biodiversity and Forests Ministry of Environment and CGEN’s Chairman, Bráulio Dias, admitted that the government’s hands are tied due to the escalation of illegal exploitation of genetic biodiversity, a practice known as biopiracy.²⁴⁰ According to Dias, the absence of a regulatory framework to curb this incalculable damage to the public and the environment make it impossible to stop biopiracy.²⁴¹ Currently, the government is limited to the Provisional Measure 2186, published ten years ago. For Bráulio Dias, the MP is “full of imperfections,” for example, it does not define how the royalties may be paid by the industries.²⁴² “This MP should no longer be in effect. Urge to be replaced by a law. . .we work with incoming orders to CGEN case-by-

231. *Id.* See Resolution 27, available at http://www.mma.gov.br/estruturas/sbf_dpg/_arquivos/res27.pdf.

232. *Id.* at 148.

233. *Id.*

234. MP, *supra* note 5, at art. 28.

235. Wandscheer, *supra* note 6, at 11.

236. *Id.*

237. *Id.* at 12.

238. NASCIMENTO, *supra* note 15, at 91.

239. See Emanuel Alencar, *O Governo Admite Estar de “Mãos Atadas” Diante da Ameaça de Biopirataria* [The Government Admits its “Hand are Tied” Before the Threat of Biopiracy], *O Globo*, Apr. 21, 2011, <http://oglobo.globo.com/economia/mat/2011/04/21/governo-admite-estar-de-maos-atadas-diante-da-ameaca-da-biopirataria-924295307.asp>.

240. *Id.*

241. *Id.*

242. *Id.*

case. The amount being paid by companies to the federal government is very low.”²⁴³ According to O Globo, more than 100 research institutions and companies in the areas pharmaceutical, food, agricultural, cosmetic, fragrance and new materials have already been notified to submit information and documents proving the legality of their activities on biodiversity elements in Brazil.²⁴⁴ Braulio Dias said “we must provide a return to society. The MP is very bureaucratic and does not create incentives for research. We have to punish, but also stimulate.”²⁴⁵

3. Bioprospecting Contract

Despite the existence of an extensive body of normative regulations regarding the access to biodiversity, there are many practical impediments to the appropriate enforcement of such regulations.²⁴⁶ The protection of genetic resources is therefore ineffective in Brazil.²⁴⁷

Before the enactment of the MP 2186, Brazil’s Association for the Sustainable Use of the Biodiversity of Amazonia (BIOAMAZONIA) entered into a three-year bioprospecting contract with the Swiss pharmaceutical company Novartis Pharmaceuticals (“Novartis”).²⁴⁸ Novartis agreed to pay BIOAMAZONIA \$4 million from worldwide sales.²⁴⁹ Novartis contracted for the right to create new products from the extracts of biological samples, and that they would have the exclusive right to use the extracts for a period of ten years after the product’s invention.²⁵⁰ BIOAMAZONIA in return would receive 1.6 million Brazilian reals²⁵¹ for each product clinically tested, R\$ 750,000 for each patent registered, R\$ 500,000 on the first day a product is placed on the market, and one percent of all royalties over a period of ten years.²⁵²

243. *Id.*

244. *Id.*

245. *Id.*

246. *Id.*

247. *Id.* at 90.

248. Ragavan, *supra* note 11, at 518.

249. *Id.*

250. Scott, *supra* note 183, at 979-980.

251. *Id.* See “The real (pl. *reais*) is the present-day currency of Brazil. Its sign is R\$ and its ISO code is BRL. It is subdivided into 100 centavos (“hundredths”). In Brazil, the decimal separator is a comma, and a period may be used as thousands separator, as in “R\$ 123.456,78.” http://en.wikipedia.org/wiki/Brazilian_real. See also Jeff Fick, Brazil Currency Market Stronger on U.S. Debt Deal (August 1, 2011), Wall Street Journal, \$1 = R\$1,5465, <http://online.wsj.com/article/BT-CO-20110801-707342.html>.

252. *Id.*

Opponents of the contract claimed that it would cause serious harm to the environment.²⁵³ They also claimed that it was a usurpation of traditional knowledge because did not provide for investment in conservation or compensation for the traditional communities.²⁵⁴

The BIOAMAZONIA-Novartis agreement violates many Articles of the Constitution.²⁵⁵ It violates Article 218 because the research is not focusing on Brazilian problems as the Constitution requires.²⁵⁶ The problem Brazil faces is the widespread depletion and exploitation of Amazonia's biodiversity and therefore any scientific research has to take that into consideration.²⁵⁷ Critics say that the BIOAMAZONIA-Novartis agreement allows for a large-scale form of biopiracy in the collection and exportation of some 30,000 biological samples, authorized by the government through executive decree.²⁵⁸

Moreover, the agreement does not add to the development of Brazilian science and technology, it impedes the growth of Brazilian research by removing the materials that could have been the subject of scientific investigations and, it prevents the training of Brazilian scientists in new techniques contributing to loss of job opportunities for the economic growth of the country.²⁵⁹ It also violates Article 225 because the agreement fails to safeguard the environment by allowing Novartis to remove 30,000 biological samples from the Amazon.²⁶⁰

After strong public opposition calling the BIOAMAZONIA-Novartis agreement a legalized form of biopiracy, the Brazilian government cancelled the contract.²⁶¹ Shortly thereafter, the President signed the MP 2186.²⁶² The vague language of the MP and its derivative Decrees scared the international community, which impeded the realization of other bioprospecting contracts.²⁶³ The result is an ongoing legacy of the illegal exploitation of the Brazilian natural resources.²⁶⁴

253. *Id.*

254. *Id.*

255. *Id.*

256. *Id.*

257. *Id.*

258. *Id.*

259. *Id.* at 990-991.

260. *Id.*

261. *Id.*

262. *Id.*

263. *Id.*

264. Charles Roland Clement, *Um Pote de Ouro no Fim do Arco-Íris? O Valor da Biodiversidade e do Conhecimento Tradicional Associado, e as Mazelas da Lei de Acesso: Uma Visão e Proposta a partir da Amazônia* [A Gold Pot in the End of a Raibow? The Value of Biodiversity and Traditional Knowledge Associated, and the Shortcoming of the Access

The problematic legislation is an obstacle to the creation of contracts that could actually benefit Brazil and stop biopiracy.²⁶⁵ If well established, bioprospecting contracts could require parties to set funds towards creating jobs for Brazilian scientists, compensation for traditional communities and, most importantly, set aside funds designated to biodiversity conservation.

B. Costa Rica Anti-Biopiracy Success Program: INBios

Costa Rica is a small Central American country, with a land area of only 51,100 square kilometers (0.03% of the planet's surface) and 589,000 square kilometers of territorial waters.²⁶⁶ Despite its small size, Costa Rica is one of the twenty countries with the greatest biodiversity in the world.²⁶⁷ There are more than 500,000 species found in the country, which represent nearly 4% of the total species estimated worldwide.²⁶⁸

To protect such rich biodiversity, Costa Rica had created a comprehensive legal framework for the conservation and sustainable use of biodiversity.²⁶⁹ Costa Rica is also a party to the CBD and had implemented its provisions into domestic law with special attention to the benefit-sharing provision.²⁷⁰

In 1989, The National Biodiversity Institute ("INBio") of Costa Rica was created to support the country's conservation efforts and to promote sustainable development.²⁷¹ INBio is a private, non-governmental, non-profit, public interest organization that works with different governmental institutions, universities, the private sector, and other domestic and international public and private organizations.²⁷² Its philosophy is to conserve biodiversity through study, research and improvement of the people's quality of life.²⁷³

Law: A View and Proposal from the Amazon], 3 *Amazônia: Ci. & Desenvol.* 180 (2007) (Br.) available at http://www.basa.com.br/bancoamazonia2/Revista/edicao_05/C&D_Vol_V_Potouro_fim_arco-ir.pdf.

265. *Id.*

266. INBio, Biodiversity in Costa Rica, http://www.inbio.ac.cr/en/biod/bio_biodiver.htm (last visited).

267. *Id.*

268. *Id.*

269. *Id.*

270. *Id.*

271. *Id.*

272. *Id.*

273. *Id.*

INBio is considered to have broken new ground for bioprospecting contracts.²⁷⁴ It established research agreements for the study of chemical substances and genes present in plants, insects, and marine organisms and microorganisms, which may be utilized by the pharmaceutical, medical, biotechnology, cosmetics, food and agricultural industries.²⁷⁵

The most recognized and publicized bioprospecting agreement is the Merck-INBio agreement.²⁷⁶ Merck is a U.S.-based pharmaceutical company.²⁷⁷ The parties entered into a contract in 1991 and subsequently renewed the contract many times.²⁷⁸ The agreement provides that INBio would allow Merck's access to "chemical extracts from wild plants, insects, and micro-organisms" in exchange for an up-front fee of \$1 million.²⁷⁹ The agreement also provides that Merck is required to build a facility and fund the education and training of local scientists.²⁸⁰ Merck had spent \$135,000 on equipment, the setting up of the facilities, and the training of INBio scientists in the extraction process.²⁸¹ Another advantage of the agreement is that INBio would receive 3% of worldwide sales from royalties on products developed in accordance with the agreement.²⁸²

The Merck-INBio agreement is a good example of a bioprospect contract, which the funds are used towards biodiversity conservation.²⁸³ The agreement stipulates that INBio contribute 10% of the up-front fee and 50% of any future royalties to the National Parks Fund to be invested in conservation.²⁸⁴

Although the Merck-INBio agreement is a good example of how bioprospecting contracts can help preserve biodiversity and promote sustainable development by empowering the local workforce and by creating well-established mechanisms for better distribution of funds, the Merck-INBio enterprise failed to take into consideration the role of traditional knowledge in obtaining the genetic material.²⁸⁵ Bioprospecting contracts should have clauses to recognize the traditional

274. *Id.*

275. *Id.*

276. HUNTER, *supra* note 69, at 1038.

277. *Id.*

278. *Id.*

279. Scott, *supra* note 183, at 996-8.

280. *Id.*

281. *Id.*

282. Ragavan, *supra* note 11, at 517.

283. *Id.*

284. *Id.*

285. *Id.*

communities' rights to biodiversity and their knowledge by providing a reasonable amount of compensation directly proportional to the millions of dollars made in profit for the use of genetic resources.²⁸⁶

Despite the shortcomings regarding compensation for traditional knowledge, the Merck-INBios agreement is a success because it generated incentives to benefit Costa Rica's environment, such as the creation of the Wildlife Conservation Law.²⁸⁷ INBio also entered into agreements with the U.S. biotechnology company Recombinant Bio-Catalysis, Inc., and also the U.S. computer company Intergraph Corporation. Both agreements led to improvement for the sustainable development of Costa Rica.²⁸⁸

V. PROPOSALS FOR BRAZIL TO STOP BIOPIRACY AND PRESERVE THE AMAZON'S BIODIVERSITY

Brazil should learn from its failed attempts to negotiate the use of its biodiversity. Drawing from India's experience in fighting U.S. patent laws, and from Costa Rica's successful bioprospecting contracts, Brazil needs to refine its goals toward biodiversity conservation, sustainable development, and protection of the traditional knowledge associated to the use of genetic resources. Brazil should continue its efforts to negotiate amendments to TRIPS regarding patents of plant varieties to include a disclosure mechanism.²⁸⁹

Additionally, Brazil should pursue better-drafted legislation that would set standards for the benefit-sharing provision of the CBD and the Nagoya Protocol, where a fair and equitable distribution of resources would promote Brazil's continued growth without environmental degradation. The new legislation should adopt the constitutional standards and create a new institution, or empower an existing one, with the sole responsibility of managing the bioprospecting contracts to ensure that they are in line with CBD's goals. These steps would ensure that the Amazon biodiversity would be available to future generations worldwide.

286. SHIVA, *supra* note 19, at 72-79.

287. Ragavan, *supra* note 11, at 518. The Wildlife Conservation Law requires agencies to negotiate bioprospecting contracts for the benefit of the environment. *Id.*

288. Scott, *supra* note 183, at 997.

289. Brazil has sent several proposals to the WTO and to the World Intellectual Property Organization (herein WIPO). See <http://www.wipo.int/portal/index.html.en> (search for "Brazil proposals").

A. *Improve Bioprospecting Contracts*

Bioprospecting is not new in human history.²⁹⁰ For millions of years, humanity has used natural resources to improve the way of life.²⁹¹ Bioprospecting has been defined as the exploitation and development of genetic material found in biodiversity for commercial purposes.²⁹²

Technological advances throughout the years had made bioprospecting a very profitable activity for industries.²⁹³ Behind its legitimate appearance, bioprospecting has been viewed as suspicious due to the claims of biopiracy against industries' activities in countries rich in biodiversity.²⁹⁴

CBD created the awareness for developing countries of their sovereignty rights over natural resources and the possibility of receiving profits generated by the commercialization of its genetic material by foreign industries.²⁹⁵ The best way to ensure an equitable and fair participation of the provider country is through bioprospecting contracts.²⁹⁶ Bioprospecting is as an incentive to developing countries to preserve biodiversity and improve traditional communities' way of life.²⁹⁷

Bioprospecting agreements that ignore conservation and traditional knowledge associated with the use of genetic resources violate CBD's end goals and facilitate biopiracy practices.²⁹⁸ An example is the BIOAMAZONIA-Novartis agreement.

There are many differences between Brazil's BIOAMAZONIA-Novartis contract and Costa Rica's successful INBio-Merck contract.²⁹⁹ First, no biological samples are removed from Costa Rica because INBio provides chemical extracts and not actual specimens to Merck, while Novartis was allowed to collect and export the specimens.³⁰⁰ Second, Costa Rica invests in hiring locals trained by Merck scientists to

290. Laird, *supra* note 10, at 22.

291. *Id.*

292. *Id.*

293. *Id.*

294. MICHELANGELO GIOTTO SANTORO TRIGUEIRO, *SOCIOLOGIA DA TECNOLOGIA: BIOPROSPECÇÃO E LEGITIMAÇÃO* [SOCIOLOGY OF TECHNOLOGY: BIOPROSPECTING AND LEGITIMATION] 115 (Centauro ed., 2009) (Br.).

295. *Id.*

296. *Id.* at 116.

297. *Id.*

298. Ragavan, *supra* note 11, at 518

299. *Id.*

300. Scott, *supra* note 183, at 997.

collect the specimens and perform all extractions in Costa Rican laboratories, which in turn creates new jobs for the Costa Rican economy.³⁰¹ Since Novartis would do all the work to extract the genetic material, no creation of new jobs in Brazil was necessary because the contract provided that the research would be performed in Switzerland without the need for Brazilian scientists.³⁰² Third, although BIOAMAZONIA intended to use some proceeds towards sustainable development, it has not done so in a concrete manner.³⁰³ Finally, the BIOAMAZONIA agreement did not establish mechanisms to set aside funds for biodiversity conservation.³⁰⁴ For all of these reasons, the BIOAMAZONIA-Novartis bioprospecting contract was considered biopiracy rather than bioprospecting evidenced in the INBio-Merck agreement.

Another good example of a successful bioprospecting contract is the CSIR/Phytopharm agreement. Phytopharm, a British company, entered into an agreement with the CSIR, a South-African research organization, to commercialize Hoodia, a plant responsible for suppressing appetite.³⁰⁵ For years, hoodia had been used by the San, an African traditional community.³⁰⁶ Due to NGOs' pressure and media interest, the CSIR entered into an agreement with the San to implement the benefit-sharing requirements of the CBD.³⁰⁷

Brazil should learn from its past failures and consider Costa Rica's and South Africa's models for future bioprospecting contracts. In adopting such models, Brazil should consider improvements such as addressing traditional communities' participation and providing them with adequate monetary compensation in exchange for their knowledge. Given that the use of genetic resources could generate multi-million dollar profits for the parties to the contract, some of the money should be directed to conservation of the Amazon.

301. *Id.*

302. *Id.*

303. *Id.*

304. *Id.*

305. Laird, *supra* note 10, at 27-28.

306. *Id.* The San are a group of marginalized people with a long history of oppression, persecution and relocation. See R.K. Hitchcock and M. Biesele, San, Khwe, Basarwa, or Bushmen? Terminology, Identity and Empowerment in Southern Africa (2001), available at <http://www.kalaharipeoples.org/documents/San-term>. (last visited).

307. *Id.* The San did not know that their knowledge for the use of Hoodia could be commercialized.

B. Strengthen Existing Legislation

Brazil is a developing country and therefore a major stakeholder when it comes to bioprospecting contracts that could potentially generate million of dollars to the economy.³⁰⁸ In order to raise credibility with the international community, Brazil has to improve its current legislation.³⁰⁹

Brazil is party to the CBD and to the Nagoya Protocol, and has implemented the access to genetic resources and traditional knowledge through the MP 2186.³¹⁰ In compliance with the MP, Brazil created the CGEN, which is the agency responsible for the evaluation of research projects related to genetic patrimony and traditional knowledge for scientific purposes, bioprospecting and technological development.³¹¹ However, there are other institutions accredited by CGEN that are also responsible for allowing research and access to genetic resources, such as IBAMA and the National Council for Scientific and Technological Development (CNPq).³¹² These institutions are able to issue permits for access to genetic resources.³¹³ However, a problem arises because this decentralized system makes enforcement very difficult.³¹⁴ The fragmentation of agencies makes the process more bureaucratic where many steps are necessary to acquire a permit.³¹⁵

According to existing laws, a company interested in research and use of Brazilian biodiversity should provide the necessary documentation before beginning research and also request authorization from the competent institutions.³¹⁶ However, when multiple agencies are authorized to oversee and enforce biodiversity research, it creates confusion.³¹⁷

In 2007, the Brazilian government created the Chico Mendes Institute for Biodiversity Conservation ("ICMBio").³¹⁸ ICMBio is under

308. Scott, *supra* note 183, at 998.

309. *Id.*

310. Fernanda Álvares Silva and Laila Salmen Espindola, Access Legislation on Genetic Resources Patrimony and Traditional Knowledge, 21 Rev.br. Farmacogn. 1 (2011) available at http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0102695X201100010001&lng=en&nrm=iso&tlng=en.

311. *Id.*

312. *Id.*

313. *Id.*

314. *Id.*

315. Tustin, *supra* note 197, at 149.

316. *Id.*

317. *Id.*

318. ICMBio, http://www.brasil.gov.br/sobre/geography/bodies/chico-mendes-institute-for-biodiversity-conservation-201cicmbio201d-1/br_model1?set_language=en.

the Ministry of Environment and has the responsibility to create policies for the sustainable use of renewable natural resources and support of communities located in federal conservation areas.³¹⁹ Moreover, it helps to recover degraded sections in protected areas, and may penalize those who do not meet the required measures for the preservation of nature or the correction of environmental degradation.³²⁰

Although Brazil created a reasonable legal framework in implementing the CBD's and the Nagoya Protocol's goals, the laws are vague and therefore need improvement. A good example would be a provision that centralizes the national biodiversity policies into the competence of one agency or institution. The law should have more specific and clear language to make the agency's work more transparent for the Brazilian public and for the international community.

The ICMBio, for example, could be assigned by law as a substitute for the BIOAMAZONIA, since the institution is already committed to ensure conservation and sustainable development. The ICMBio could be responsible for bioprospecting contracts following the Costa Rica's INBios model.

CONCLUSION

The Brazilian Amazon is the largest unspoiled tropical rainforest in the world. The conservation of its biodiversity is a priority for the Brazilian government and for the population in general, but especially for the traditional communities that inhabit the forest and depend on its natural resources to survive. The best policy approach to conserve Amazon biodiversity is to embrace globalization and promote sustainable development associated with the production and commercialization of products from the Amazon.

The Brazilian Amazon is also a matter of extreme significance for the international community since they view the Amazon as indispensable for a well-balanced planet and as the "world's lungs" because is a major carbon sink on the fight of climate change impacts.³²¹

Brazil can increase the economic benefits of the exploitation of the Amazon genetic resources without contributing to environmental degradation. The benefits need to be adequately shared to prevent biopiracy and intellectual property rights from endangering the Amazon biodiversity.

319. *Id.*

320. *Id.*

321. HUNTER, *supra* note 69, at 637. See Scott Wallace, *Last of the Amazon*, National Geographic, Jan. 2007, at 40-49.

In order to achieve sustainable development in the Amazon and to comply with CBD's benefit-sharing objectives, Brazil needs a new uniform legal framework with strong enforcement mechanisms to regulate bioprospecting contracts and protect the use of genetic resources and traditional knowledge associated for optimal environmental conservation.
