

The Other End of the Spectrum: Examining the Non-Trade Issues of Biopiracy

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I. INTRODUCTION

The late 20th century has been witness to the advancements in biotechnology.¹ Such evolution started the discourse on the benefits and dangers of biotechnology. As one of the oldest technologies in human history,² biotechnology is facing the same issues from the division between the commercial North and the biodiversity-rich South, and the apparent threats to ecological balance, biodiversity, benefit sharing, heritage, and indigenous knowledge since its discovery until its widespread practice today.

During the second half of the last century, biotechnology has extended to the innovation of genetic engineering.³ Thus, from mere cross-breeding

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1. Young-Gyoo Shim, *Intellectual Property Protection of Biotechnology and Sustainable Development in International Law*, 29 N.C. J. INT'L L. & COM. REG. 157, 171 (2003).
2. *Id.* at 170.
3. *Id.* at 171.

of plants, the technology has taken another development towards extraction of genes from one organic source and transplant to another organic material. In response to the issues of acquisition and commodification of organic materials, the legal systems concerning intellectual property, particularly the patentability of biotechnological creations, have simultaneously undergone reform.

Indeed, biotechnology promises scientific breakthroughs in food, medicine, cosmetics, energy, and ecology.⁴ Such promises, however, raise serious questions of sustainability and equality between the acquiring entity and the source community. Some even noted that the results of biotechnology might require a re-examination of existing legal definitions of life and humanity.⁵

On one side of the discourse, proponents of biotechnology advance that the perceived threats are exaggerated⁶ such that there is no real injury against the environment and the source of the raw materials. Moreover, they cling to the international efforts for the creation of uniform rules to govern both the acquisition and the use of the specimens, such as the Convention on Biological Diversity,⁷ the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement,⁸ the World Intellectual Property Organization (WIPO),⁹ and other regional instruments. Yet on the other side, critics raise the threat of biopiracy to biodiversity, indigenous knowledge, and other human rights are more apparent than the claimed benefits of such technology.

This Note seeks to emphasize the non-trade issues surrounding biopiracy and to highlight that an effective response would require integration of socio-environmental factors. Part II provides a background of biotechnology and a discussion on the distinction between traditional and modern biopiracy. Part III presents the existing legal responses against biopiracy and

4. See Young-Gyoo Shim, *supra* note 1, at 171.

5. *Id.* at 172 (citing Yvonne Cripps, *Patenting Resources: Biotechnology and the Concept of Sustainable Development*, 9 IND. J. GLOBAL LEGAL STUD. 119, 123-24 (2001)).

6. Lorna Dwyer, *Biopiracy, Trade, and Sustainable Development*, 19 COLO. J. INT'L ENVTL. L. & POL'Y 219, 224 (2008) (citing Jim Chen, *There's No Such Thing as Biopiracy... and It's a Good Thing Too*, 37 MCGEORGE L. REV. 1, 5-6 (2006)).

7. The Convention on Biological Diversity, June 5, 1992, 1760 U.N.T.S. 79, 31 I.L.M. 818 [hereinafter CBD].

8. Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, 1689 U.N.T.S. 299, 33 I.L.M. 1197 [hereinafter TRIPS].

9. Convention Establishing the World Intellectual Property Organization, July 14, 1967, 21 U.S.T. 1749, 828 U.N.T.S. 3 (amend. Sep. 28, 1979).

the pertinent provisions addressing biodiversity and the protection of traditional knowledge; and Part IV identifies the non-trade issues.

II. BIOTECHNOLOGY AND BIOPIRACY

A. *The Beginnings*

The Convention on Biodiversity 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.”¹⁰

The application of this technology is called bioprospecting.¹¹ It refers to “the practice of seeking out identifying, developing and redistributing the benefits of traditional uses of biodiversity.”¹² It has also been characterized as a form of intellectual piracy by collecting biological material for commercial use.¹³ Noteworthy results of biotechnology include gene therapy methods¹⁴ and other pharmaceutical breakthroughs and agricultural innovation.¹⁵

It must be emphasized, however, that the technology is actually a colonial by-product. It originated from the production of rubber in the mid-19th century from the wild trees in the Amazon basin in Brazil.¹⁶ The increase in demand for rubber resulted in the creation of centers “near-global monopoly” in the cities of Manaus and Belém.¹⁷

Consequently, upon commission by The Royal Botanical Gardens, Kew, Sir Henry Wickham collected nearly 70,000 seeds from near Manaus and shipped them to London.¹⁸ From these samples emerged the first rubber plantation in the British colony of Ceylon and in 30 years time the British broke Brazil’s monopoly on natural rubber. This was an incident of

10. CBD, *supra* note 7, art. 2.

11. Chris Hamilton, *Biodiversity, Biopiracy and Benefits: What Allegations of Biopiracy Tell Us About Intellectual Property*, 6 DEVELOPING WORLD BIOETHICS 113, 158, 161 (2006).

12. *Id.*

13. Science and Development Network, *Agriculture & Environment: Bioprospecting*, SCIDEV.NET, available at <http://www.scidev.net/en/agriculture-and-environment/bioprospecting/> (last accessed Feb. 20, 2009).

14. Young-Gyoo Shim, *supra* note 1, at 172.

15. *Id.*

16. John Tustin, *Traditional Knowledge and Intellectual Property in Brazilian Biodiversity Law*, 14 TEX. INTELL. PROP. L.J. 131, 133 (2006).

17. *Id.* at 133.

18. *Id.* at 134.

biopiracy against the Teatro Amazonas.¹⁹ During the 1960s, studies about the medicinal and agricultural use of plants by indigenous people paved the way for other scientific developments such as ethnobotany²⁰ and the advancement of biotechnology.²¹

Bioprospecting raised the issues of acquisition and use of plant genetic resources to develop new medical and agricultural products. As stated above, the technology has actually led into an examination of patent laws. Significantly, the TRIPS Agreement has reinforced the economic value of biodiversity by granting 20-year monopolies to investors in pharmaceutical or agricultural products.²²

In the 1980 case of *Diamond v. Chakrabarty*,²³ the U.S. Supreme Court ruled that an organism produced by genetic engineering is not excluded from patent protection. In fact, the Supreme Court recognized further development in genetic research. Thus, it said that,

[t]he grant or denial of patents on micro-organisms is not likely to put an end to genetic research or to its attendant risks. The large amount of research that has already occurred when no researcher had sure knowledge that patent protection would be available suggests that legislative or judicial fiat as to patentability will not deter the scientific mind from probing into the unknown any more than Canute could command the tides. Whether respondent's claims are patentable may determine whether research efforts are accelerated by the hope of reward or slowed by want of incentives, but that is all.²⁴

The historical feature of biotechnology, however, did not hinder its evolution towards what is now contemporary bioprospecting. Professor Cori Hayden describes this as the:

ambivalent promise of bioprospecting — a distinctly late twentieth century practice that stands at the very centre of contemporary contests over indigenous rights, corporate accountabilities, and ethical scientific research.²⁵ Furthermore, she explains, it is a new name for an old practice;

19. *Id.*

20. Dwyer, *supra* note 6, at 223.

21. *Id.*

22. TRIPS, *supra* note 8, art. 33.

23. *Diamond v. Chakrabarty*, 447 U.S. 303, 310 (1980).

24. *Id.* at 317.

25. Hamilton, *supra* note 11, at 164 (citing CORI HAYDEN, WHEN NATURE GOES PUBLIC: THE MAKING AND UNMAKING OF BIOPROSPECTING IN MEXICO 1 (2003 ed.)).

its newness is that the taking of these genetic resources now comes with a mandate to give back.²⁶

The appropriation and conversion of the organic materials have been the subjects of debate in intellectual property, while preservation of biodiversity and food security has framed the non-trade issues of biotechnology.

Advocates of biotechnology claim that its application to both crops and animals will improve the quality and quantity of agricultural products and ultimately improve food security.²⁷ They also claim that products of modern biotechnology may make greater contributions to the advancement of medical science so as to reduce and cure diseases,²⁸ such as heart attack, cancer, Acquired Immune Deficiency Syndrome (AIDS), and other blood diseases. Biotechnology is also deemed to make available cheaper medicines to developing countries.²⁹

Critics, on the other hand, claim biopiracy. Thus, from the “seed wars” in the 1980s as exemplified in the Amazon experience, biopiracy as the evil in bioprospecting arose. The term biopiracy was coined by Pat Mooney, Executive Director of ETC Group, formerly RAFI (Rural Advancement Foundation International) because of the question of ownership and other issues pertaining to the germplasm of the developing countries. Accordingly, biopiracy is broadly known as the misappropriation of “indigenous traditional knowledge.”³⁰

Some define biopiracy as “the use of intellectual property systems to legitimize the exclusive ownership and control as over biological resources and biological products that have been used over centuries in non-industrialized cultures.”³¹

A more particular definition provided by the Action Group on Erosion, Technology and Concentration (ETC Group)³² states: [Biopiracy is] “the

26. Hamilton, *supra* note 11, at 164.

27. Young-Gyoo Shim, *supra* note 1, at 175.

28. *Id.* at 176 (citing Sean D. Murphy, *Biotechnology and International Law*, 42 HARV. INT'L L.J. 47, 51-52 (2001)).

29. Young-Gyoo Shim, *supra* note 1, at 176.

30. Sivashree Sundaram, *Battling Bills, Beans & Biopiracy*, 15 ALB. L.J. SCI. & TECH. 545, 554 (citing AAAS Science and Human Rights Program, Report on Science and Human Rights, *Patents, Traditional Knowledge, and the USPTO: Clearing Up Some Misconceptions in Order to Stop Biopiracy*, available at http://shr.aaas.org/report/xxii/2_patent.htm (last accessed Feb. 20, 2009)).

31. Hamilton, *supra* note 11, at 159 (citing VANDANA SHIVA, PROTECT OR PLUNDER? UNDERSTANDING INTELLECTUAL PROPERTY RIGHTS (2001 ed.)).

32. The ETC Group advocates conservation of agricultural biodiversity and food security and evaluates the impact of new technologies on the rural poor especially focusing in Africa, Asia, and Latin America.

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.”³³ Recently, the Edmonds Institute³⁴ applied a working definition of biopiracy as “where there is access to or acquisition of biodiversity (and/or related traditional knowledge) without prior informed consent, including prior informed consent about benefit sharing, on the part(s) of those whose biodiversity (or traditional knowledge) has been ‘accessed’ or ‘acquired’, there is biopiracy — i.e., theft.”³⁵

The arguments of the critics may be summarized into the issues of indigenous/traditional knowledge, biodiversity, and sustainable development. Kohl identifies different sets of the critics:

The first set of biopiracy opponents act as advocates for indigenous peoples (“the indigenous people bio-opponents”) and believe indigenous communities deserve “equitable benefit sharing” from the profits on any products developed from indigenous knowledge.

A second set of biopiracy opponents objects to removing samples of any plant that is native to one region and modifying it to grow in another region. They believe each country has sovereignty over its native “germplasm” (citation omitted) (“the germplasm bio-opponents”).

A third group believes some knowledge or some materials are sacred and should not be patented or even researched (“the romantic bio-opponents”). This group includes those who believe traditional knowledge belongs to a local shaman or at most to a local community and such knowledge should remain secret from the rest of the world.³⁶

A fourth view is that traditional knowledge is already in the public domain, and no one should receive a patent based on traditional knowledge (“the no-patents bio-opponents”). Some no-patents bio-opponents would extend

ETC Group, History, *available at* http://www.etcgroup.org/en/about/History_of_etcgroup_page.html (last accessed Feb. 20, 2009).

33. ETC Group, Biopiracy, *available at* <http://www.etcgroup.org/en/issues/biopiracy.html> (last accessed Feb. 20, 2009).

34. The Edmonds Institute is a non-profit, public interest organization committed to the health and sustainability of ecosystems and their inhabitants. It has published reports and papers on biosafety, particularly the Manual for Assessing Ecological and Human Health Effects of Genetically Engineered Organisms.

The Edmonds Institute, About the Institute, *available at* <http://www.edmonds-institute.org/about.html> (last accessed Feb. 20, 2009).

35. Hamilton, *supra* note 11, at 150 (citing JAY MCGOWN, THE EDMONDS INSTITUTE, OUT OF AFRICA: MYSTERIES OF ACCESS AND BENEFIT SHARING (Beth Burrows ed., 2006)).

36. Maggie Kohls, *Blackbeard or Albert Schweitzer: Reconciling Biopiracy*, 6 CHI.-KENT J. INTEL. PROP. 108, 110 (2007).

this prohibition to drugs and crops derived from traditional knowledge or traditional crops.³⁷

Contrary to the assertion that biotechnology would ultimately promote food security, critics claim that while the monoculture of genetically improved crops may be more efficient in increasing food productivity, such commercial exploitation of agro-biotechnology may lead to diminished foodstuff productions.³⁸ Consequently, as genetically-engineered crops tend to be resistant to herbicides and insecticides, there is a great possibility of extensive use of such chemicals without regard to environmental repercussions.³⁹

Thus, a quite temporary surge of production may ultimately lead to the disruption of ecological balance and degeneration of biodiversity. In addition to environmental concerns are the unidentified hazards to human health. With respect to other application of biotechnology, other legal, moral, and ethical questions need to be addressed as in the case of cloning and transgenic techniques.⁴⁰

One of the illustrations of biopiracy include the development of the cancer-fighting medicines from the rosy periwinkle plant which reportedly increased the survival rate against childhood leukemia and is used to treat Hodgkin's disease.⁴¹ The American pharmaceutical company Eli Lilly patented the Vincristine medicine created from the plant without allocating profits to the indigenous group in Madagascar which originally utilized the medicinal component of the plant.⁴²

Another popular example is the Neem Tree grown in India. This was traditionally known as the "curer of all ailments."⁴³ American and Japanese companies obtained patents for various products from the tree, such as a toothpaste which apparently was a traditional use of the plant.⁴⁴ In response to the increasing number of patents on different uses of the tree, the Indian

37. *Id.* at 111.

38. Young-Gyoo Shim, *supra* note 1, at 177.

39. *Id.*

40. *See* Young-Gyoo Shim, *supra* note 1, at 178.

41. Dwyer, *supra* note 6, at 226.

42. *Id.* at 226 (citing Olufunmilayo B. Arewa, *TRIPS and Traditional Knowledge: Local Communities, Local Knowledge, and Global Intellectual Property Frameworks*, 10 MARQ. INTELL. PROP. L. REV. 155, 173, n. 108 (2006)).

43. Dwyer, *supra* note 6, at 226 (citing Herbal Extracts Plus, Neem Leaf, available at <http://www.herbaextractsplus.com/neem-leaf.cfm> (last accessed Feb. 20, 2009)).

44. Dwyer, *supra* note 6, at 227.

government successfully overturned a pesticide patent in 2005.⁴⁵ Other subjects of biopiracy include: the Mexican Enola Bean,⁴⁶ the basmati rice,⁴⁷ the Hagen abyssinica products (used by the Ethiopians for centuries),⁴⁸ the Indian turmeric,⁴⁹ the ayahuasca plant from the Amazon rainforest,⁵⁰ the Bolivian quinoa,⁵¹ and the hoodia of South Africa.⁵²

B. Traditional Biopiracy

Central to the traditional biopiracy debate is the drift between the biodiversity-rich South and the commercial North, which owns the capital and technology used in developing the former's natural wealth.⁵³ The South asserts "biopiracy" against the North on the basis of "unfair and one-sided patent laws and international agreements."⁵⁴ This assertion is not unfounded because it is the developed countries (the North) which actually profit from the development of organic materials.⁵⁵

This relationship raises two questions: (1) Should the country of origin of the samples benefit from the profits arising from the development of the organic material?; and (2) How the benefits should be allocated? The developers from the North seek free bioprospecting with the end of

45. *Id.*

46. Sundaram, *supra* note 30, at 556 (citing Leanne M. Fecteau, *The Ayahuasca Patent Revocation: Raising Questions About Current U.S. Patent Policy*, 21 B.C. THIRD WORLD L.J. 69, 84-87 (2001)).

47. Dwyer, *supra* note 6, at 230.

48. *Id.* (citing Kohls, *supra* note 36, at 114).

49. Dwyer, *supra* note 6, at 230.

50. *Id.* (citing Arewa, *supra* note 42, at 175-76).

51. Dwyer, *supra* note 6, at 230.

52. Pollyanna E. Folkins, *Has the Lab Coat Become the Modern Day Eye Patch? Thwarting Biopiracy of Indigenous Resources by Modifying International Patenting Systems*, 13 TRANSNAT'L L. & CONTEMP. PROBS. 339, 345 (2003).

53. David Conforto, *Traditional and Modern Biopiracy: Redefining the Biopiracy Debate*, 19 J. ENVTL. L. & LITIG. 357, 357 (2004).

54. *Id.*

55. According to Dwyer,

[t]he countries that benefit most from IPRs belong to the developed world; primarily the United States, member states of the European Union, and Japan. Even though many raw materials with medicinal uses originate in the developing world, profits from the commercialization of new products are granted to the industries in the developed world that perform research on those raw materials.

Dwyer, *supra* note 6, at 233.

developing and selling useful and highly lucrative products.⁵⁶ On the other hand, the developing countries of the South accuse these developers from the North of biopiracy.⁵⁷ Thus, simply traditional biopiracy is that which occurs “when the source of the traditional knowledge (i.e., an indigenous population) does not share the financial benefits of a traditional knowledge-based product that is patented and commercialized.”⁵⁸

C. Modern Biopiracy

In the midst of the debate between the North and the South is a reality that biopiracy should not be limited to trade issues, as in patent rights and misallocation of benefits, but it must be scrutinized also in its non-trade repercussions — on biodiversity and, ultimately, human rights.⁵⁹ Vandana Shiva, a famous Indian scientist and activist said that:

[t]he issue of the patentability of life is not merely a trade related issue; it is primarily an ethical and ecological issue intimately related to the social injustice of biopiracy. If implemented, the TRIPS agreement could have tremendous implications for the health of the environment as well as for the conservation of biodiversity.⁶⁰

The development of the non-trade issues of biopiracy may be traced from *Diamond v. Chakrabarty*,⁶¹ where the U.S. Supreme Court granted the patent over the genetically engineered oil-eating bacteria. In this case, the Court ruled that the organism was not a product of nature which was excluded from the patent law but that “the patentee has produced a new bacterium with markedly different characteristics from any found in nature, and one having the potential for significant utility. His discovery is not nature’s handiwork, but his own; accordingly it is patentable.”⁶² Said ruling is perceived to have expanded the coverage of patentability such that even genetically modified plants could be patented.⁶³

Thus, modern biopiracy can be characterized as a real threat to biodiversity, health, and food security. Although, it is eminent in the agribusiness industry, the possibility that it may permeate other industries pertaining to food and health is alarming. The failure of existing legal

56. Conforto, *supra* note 53, at 359.

57. *Id.*

58. *Id.* at 360.

59. Hamilton, *supra* note 11, at 160.

60. *Id.* at 162 (citing VANDANA SHIVA, *BIOPIRACY: THE PLUNDER OF NATURE AND KNOWLEDGE* 85 (1997 ed.) [hereinafter SHIVA, *BIOPIRACY*]).

61. *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

62. *Id.* at 310.

63. Conforto, *supra* note 53, at 370.

instruments to treat with equal force the trade and non-trade issues creates more anxiety to the biodiversity-rich countries.⁶⁴

Notably, the shift in addressing biopiracy from being a drift between two regions to a transboundary and global concern engages not only the acquiring and source entities, but more importantly, the consumer and the traditional farmer.⁶⁵ Hence, to look at biopiracy with a human rights and environmental perspective would facilitate the creation of a uniform code to govern biotechnology and patents.

III. LEGAL RESPONSES TO BIOPIRACY

A. International Covenant on Economic, Social, and Cultural Rights

The gravity of biopiracy has pushed international bodies to act in the form of binding agreements that will regulate applications of biotechnology and the commercialization of its products. In the International Covenant on Economic, Social and Cultural Rights,⁶⁶ the United Nations emphasized the right of all peoples to freely dispose of the natural wealth subject to the principle of mutual benefit and that such use shall only be as extensive so as not to deprive the peoples of their subsistence.⁶⁷

The provision speaks of any person, whether the indigenous communities or the modernized countries. Thus, it may be said that all have the right to use, with the corresponding obligation to preserve, that which is necessary for daily living and to share in the benefits therefrom. It must be noted, however, that the Covenant also recognizes the individual rights of inventors to benefit from the scientific innovation, thus:

Article 15

1. The States Parties to the present Covenant recognize the right of everyone:
 - (a) To take part in cultural life;

64. *Id.*

65. *Id.* at 360.

66. G.A. Res. 2200A (XXI), U.N. GAOR, 21st Sess., Supp. No. 16 at 49, U.N. Doc. A/6316 (1966) (Jan. 3, 1976).

67. *Id.* art. 1

2. All peoples may, for their own ends, freely dispose of their natural wealth and resources without prejudice to any obligations arising out of international economic co-operation, based upon the principle of mutual benefit, and international law. In no case may a people be deprived of its own means of subsistence.

Id.

- (b) To enjoy the benefits of scientific progress and its applications;
- (c) To benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.

Particularly, paragraph (c) embodies the accepted human rights standard — “the moral and material interests resulting from indigenous communities’ centuries-old scientific discoveries are entitled to protection.”⁶⁸ The Covenant further provides that State measures to protect the right to benefit from an invention should be undertaken in consideration of the conservation and development of culture. Therefore, there is an international commitment to harmonize technological advancement and preservation of culture and heritage.

B. Convention on Biological Diversity

In biopiracy, the developing countries are at the disadvantage. The massive exploitation of the latter's natural resources could mean extinction of species, and robbery of the indigenous peoples' tradition and heritage. To secure protection of such interests, the negotiations of a convention that will address the effects of biopiracy ensued in 1991 through an International Negotiating Committee formed by the United Nations. The negotiations highlighted the issues of economic and social development, poverty eradication and environmental protection.⁶⁹

On 5 June 1992, the Convention on Biological Diversity (CBD) was opened for signature at the United Nations Conference on Environment and Development.⁷⁰ On 22 May 1992, the final text of the Convention was adopted in Nairobi and entered into force on 29 December 1993. One of the concerns under the treaty was the relation of intellectual property rights to biological and genetic resources.

The CBD is considered the first international instrument to use an integrated approach to the conservation of biological diversity, taking into account its ecological, social, and economic aspects. It was an initial attempt

68. AAAS Science and Human Rights Program, *supra* note 30.

69. Hamdallah Zedan, Message from Hamdallah Zedan, *in* The Convention on Biological Diversity: From Conception to Implementation: Historical Perspectives on the Occasion of the 10th Anniversary of the Entry Into Force of the Convention on Biological Diversity I, *available at* <http://www.cbd.int/doc/publications/CBD-10th-anniversary.pdf> (last accessed Feb. 20, 2009).

70. CBD — The First Years, *available at* <http://www.cbd.int/doc/publications/CBD-the-first-years.pdf> (last accessed Feb. 20, 2009).

to reconcile the interests of the North and the South.⁷¹ The CBD seeks to attain the following objectives:

[t]he conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, 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.⁷²

Similar to the International Covenant on the Economic, Social and Cultural Rights,⁷³ the CBD recognizes the sovereign right of states to exploit their own resources, subject to environmental restrictions.⁷⁴

Under the CBD, “access to genetic resources shall be subject to prior informed consent of the Contracting Party.”⁷⁵ In accordance with its objectives, Article 16 (1) and (2) thereof state that the parties shall use technology in a manner consistent with environmental protection and require the enforcement of mutually beneficial sharing agreements, respectively.⁷⁶

71. Hamdallah Zedan, *Patents and Biopiracy: The Search for Appropriate Policy and Legal Responses*, 12 BROWN J. WORLD AFF. 189, 190-91 (2005) [hereinafter Zedan, *Patents and Biopiracy*].

72. CBD, *supra* note 7, art. 1.

73. International Covenant on the Economic, Social and Cultural Rights, Dec. 16, 1966, 993 U.N.T.S. 3.

74. CBD, *supra* note 7, art. 3.

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Id.

75. *Id.* art. 15 (5).

76. *Id.* art. 16 (1)-(2).

1. Each Contracting Party, recognizing that technology includes biotechnology, and that both access to and transfer of technology among Contracting Parties are essential elements for the attainment of the objectives of this Convention, undertakes subject to the provisions of this Article to provide and/or facilitate access for and transfer to other Contracting Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment.

Consistent with access and benefit sharing, the Bonn Guidelines on Access to Genetic Resources and Benefit-Sharing⁷⁷ were adopted in April 2002. These Guidelines were intended to provide a framework for parties in the formulation and implementation of their respective policies on access and benefit-sharing of resources consistent with the principles established under the Convention. Significantly, the Guidelines impress upon all the stakeholders their concurrent obligations of mutual benefit-sharing, biodiversity conservation, and respect for indigenous knowledge. Thus, the Guidelines serve to illustrate interdependence among the interested parties.

On the matter of recognizing the value of indigenous knowledge, Article 8 (j) of the CBD provides:

(j) Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices ...⁷⁸

In support of this principle, the Conference of the Parties to the Convention encouraged consultations among the indigenous communities in its COP 2 Decision II/12.⁷⁹ This was intended to identify the real concerns of the

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2. Access to and transfer of technology referred to in paragraph 1 above to developing countries shall be provided and/or facilitated under fair and most favourable terms, including on concessional and preferential terms where mutually agreed, and, where necessary, in accordance with the financial mechanism established by Articles 20 and 21. In the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights.

77. Decisions Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Sixth Meeting, *Access and Benefit-Sharing as Related to Genetic Resources — Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising Out of Their Utilization*, COP 6 Decision VI/24, Apr. 7–19, 2002, The Hague, UNEP/CBD/COP/6/20/Annex I at 262, available at <http://www.cbd.int/decisions/cop6/?m=COP-06&lg=0> (last accessed Feb. 20, 2009).

78. CBD, *supra* note 7, art. 8 (j).

79. Decisions Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Second Meeting, *Intellectual Property Rights*, COP 2 Decision II/12, Nov. 6–17, 1995, Jakarta, Indon., UNEP/CBD/COP/2/19 at 23, available at <http://www.cbd.int/decisions/?m=COP-02&lg=0> (last accessed Feb. 20, 2009).

indigenous peoples in order to achieve a more effective and holistic implementation of the objectives of the Convention.

Pursuant to Article 19 (3) of the CBD,⁸⁰ the Conference of the Parties to the Convention adopted on 29 January 2000 a supplementary agreement known as the Cartagena Protocol on Biosafety⁸¹ on 29 January 2000. The Protocol was intended to concentrate on the potential risks of transporting living modified organisms. It established an “advance informed agreement” procedure to guide countries in allowing entry of such organisms into their respective territories.⁸² However, the Convention is criticized for its vague provisions and ultimately for being inadequate to respond to the plight of developing countries against biopiracy.⁸³ It is also argued that the CBD’s inadequacy may be attributed to its being essentially a conservation treaty and not a trade or intellectual property system.⁸⁴

The Parties to the Convention which met during 20–31 March 2007, in Curitiba, Brazil, set a 2010 target to negotiate an international, legally-binding regime on access and benefit-sharing (ABS). The CBD’s approach clearly conflicts with the TRIPS Agreement⁸⁵ and with that of the Union

80. CBD, *supra* note 7, art. 19.

Handling of Biotechnology and Distribution of its benefits.

...

(3.) The Parties shall consider the need for and modalities of a protocol setting out appropriate procedures, including, in particular, advance informed agreement, in the field of the safe transfer, handling and use of any living modified organism resulting from biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity.

Id.

81. Cartagena Protocol on Biosafety to the Convention on Biological Diversity, U.N. Doc. UNEP/CBD/ExCOP/1/3 (Jan. 29, 2000), 39 I.L.M. 1027.

82. *Id.* art. 1.

In accordance with the precautionary approach contained in Principle 15 of the Rio Declaration on Environment and Development, the objective of this Protocol is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.

Id.

83. Conforto, *supra* note 53, at 382; see Dwyer, *supra* note 6, at 237.

84. Dwyer, *supra* note 6, at 237.

85. TRIPS Agreement, *supra* note 8.

for the Protection of Plant Varieties,⁸⁶ most notably because the CBD recognizes national sovereignty over Plant Growers' Rights (PGRs), while the TRIPS Agreement promotes private ownership of PGRs.⁸⁷

B. Agreement on Trade-Related Aspects of Intellectual Property Rights

The TRIPS Agreement was negotiated at the end of the Uruguay Round of the General Agreement on Tariffs and Trade. It is Annex 1C of the Marrakesh Agreement Establishing the World Trade Organization (WTO),⁸⁸ signed in Marrakesh, Morocco on 15 April 1994. It is the first comprehensive agreement to establish minimum, enforceable standards for the protection of intellectual property rights.⁸⁹ Participation in international markets launched by the WTO required the enactment of intellectual property laws in accordance with the TRIPS Agreement. The coercive enforcement of the provisions of the TRIPS Agreement was evident among Member States such that non-compliance with any of the mandates thereof triggers adverse reaction and possible sanctions.⁹⁰

Under the Agreement, the Member States can patent

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 ... and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced"⁹¹

86. The International Union for the Protection of New Varieties of Plants (UPOV), Welcome, available at http://www.upov.int/index_en.html (last accessed Feb. 20, 2009) ("UPOV was established by the International Convention for the Protection of New Varieties of Plants. The Convention was adopted in Paris in 1961 and it was revised in 1972, 1978 and 1991. The objective of the Convention is the protection of new varieties of plants by an intellectual property right.").

87. *Id.*

88. Marrakesh Agreement Establishing the World Trade Organization, Apr. 15, 1994, Annex 1C: Agreement on Trade-Related Aspects of Intellectual Property Rights, 1867 U.N.T.S. 154.

89. Simon Walker, *The TRIPS Agreement, Sustainable Development and the Public Interest: Discussion Paper 3* (International Union for Conservation of Nature (IUCN), IUCN Environmental Policy and Law Paper No. 41, 2001), available at <http://data.iucn.org/dbtw-wpd/edocs/EPLP-041.pdf> (last accessed Feb. 20, 2009).

90. Conforto, *supra* note 53, at 384 (citing Meetal Jain, Note, *Global Trade and the New Millennium: Defining the Scope of Intellectual Property Protection of Plant Genetic Resources and Traditional Knowledge in India*, 22 HASTINGS INT'L & COMP. L. REV. 777, 781 (1999)).

91. TRIPS, *supra* note 8, art. 27 (1).

but subject to exceptions imposed by Member States and public order or morality.⁹² Article 7 thereof emphasizes that the protection of intellectual property rights must be accompanied by a commitment to enforce mutual advantage to producers and users of technical knowledge.⁹³

The premium on protection of patent rights under the Agreement is believed to have aggravated intellectual property right problems.⁹⁴ The Agreement has also been criticized as tool for exploitation of the developing countries by the industrialized nations,⁹⁵ proof of which may be seen from the persistence of American lobby groups for policies that benefits the biotechnology industry and other patent-intensive companies.⁹⁶ Although such accusation may seem incompatible with the fact that a majority of the members of the WTO are poor countries, the reality is that those poor countries lack financial capacity to patent a product, or, if they could do so, enforcement of the patent against industrialized and powerful nations would seem to be illusory.⁹⁷

Critics also argue that the TRIPS Agreement is inadequate for failing to conform to the policies established by the Convention on Biological Diversity. In particular, countries like Brazil, India, Pakistan, Peru, Thailand, and Venezuela proposed a disclosure mechanism by which applicants of patents must reveal the source of the biological resource or traditional knowledge used. Other proposed amendments include submission of evidence of prior informed consent from the indigenous communities and from the authorities concerned.⁹⁸

Dr. Shiva has particularly characterized as adversative such concept of intellectual property rights under the TRIPS that “excludes all kinds of knowledge, ideas, or innovations that take place in the ‘intellectual

92. *Id.* art. 27 (2)-(3).

93. *Id.* art. 7.

The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

Id.

94. Hamilton, *supra* note 11, at 162.

95. Conforto, *supra* note 53, at 383.

96. *Id.* (citing Nabila Ansari, *International Patent Rights in a Post-Doha World*, 11 CURRENTS: INT’L TRADE L.J. 57, 60 (2002)).

97. Conforto, *supra* note 53, at 384.

98. Zedan, *Patents and Biopiracy*, *supra* note 71, at 197.

commons' — in villages among farmers, in forests among tribe people."⁹⁹ At present, the WTO acknowledges the necessity to review Article 27.3 (b) of the TRIPS Agreement,¹⁰⁰ and to examine its relationship to the Convention on Biological Diversity, which protects traditional knowledge and folklore.¹⁰¹

D. Other Responses

1. The World Intellectual Property Organization (WIPO)

WIPO is a specialized agency of the United Nations dedicated to forging a "balanced and accessible international intellectual property system, which rewards creativity, stimulates innovation and contributes to economic development while safeguarding the public interest."¹⁰² It was established under the WIPO Convention which was signed at Stockholm on 14 July 1967, and entered into force in 1970. The Convention was subsequently amended in 1979.¹⁰³

WIPO established the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC) in 2000 as a specific effort to look into the demands of developing

99. Dwyer, *supra* note 6, at 232.

100. TRIPS, *supra* note 8, art. 27.

Patentable Subject Matter

3. Members may also exclude from patentability:

- ...
- (b) plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof. The provisions of this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement.

Id.

101. World Trade Organization, TRIPS: Issues, Article 27.3b, Traditional Knowledge, Biodiversity, *available at* http://www.wto.org/english/tratop_e/TRIPS_e/art27_3b_e.htm. (last accessed Feb. 20, 2009).

102. World Intellectual Property Organization (WIPO), What is WIPO?, *available at* <http://www.wipo.int/about-wipo/en/what/> (last accessed Feb. 20, 2009).

103. The Assemblies of WIPO Member States adopted the Amendment to Article 9 (3) of the WIPO Convention in September 1999.

nations to preserve traditional knowledge.¹⁰⁴ Moreover, WIPO also recognizes that biopiracy is not only an economic issue but is also a threat to biodiversity.¹⁰⁵ Considering the effects of biopiracy to the indigenous communities and to the environment, the IGC has also encouraged regional discussion and evaluated case studies in view of the creation of a bidding treaty for the formal protection of traditional knowledge (TK).¹⁰⁶

2. The International Convention for the Protection of Plant Varieties

The International Convention for the Protection of New Varieties of Plants was adopted in Paris in 1961 and revised in Geneva on 10 November 1972, 23 October 1978, and 19 March 1991. Article 2 thereof obligated the parties to grant and protect breeders' rights.¹⁰⁷ It provides a *sui generis* form of intellectual property protection specifically adapted for the process of plant breeding and it also encourages the breeders to develop new varieties. It is supervised by the International Union for the Protection of Plant Varieties based in Geneva.

3. Other Legal Instruments

At present, there are regional responses to biopiracy such as the Andean Pact Decision 391,¹⁰⁸ the Andean Pact Decision 486 on the Common Intellectual Property Regime,¹⁰⁹ and the African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources,¹¹⁰ Regulations of the People's Republic

104. Dwyer, *supra* note 6, at 243 (citing WIPO, Substantive Patent Law Harmonization, available at <http://www.wipo.int/patent-law/en/harmonization.htm> (last accessed Feb. 11, 2009)).

105. Dwyer, *supra* note 6, at 243 (citing Madhavi Sunder, *IP3*, 59 STAN. L. REV. 257, 310 (2006)).

106. Dwyer, *supra* note 6, at 243 (citing WIPO, Intergovernmental Committee, available at <http://www.wipo.int/tk/en/igc/> (last accessed Feb. 20, 2009)).

107. Dwyer, *supra* note 6, at 235.

108. Andean Community, Decision 391 of 1996 (Common Regime on Access to Genetic Resources) (July 2, 1996), *Gaceta Oficial del Acuerdo de Cartagena*, Vol. XII, No. 213 (July 17, 1996).

109. Andean Community, Decision 486 of 2000 (Common Provisions on Intellectual Property) (Sep. 14, 2000), *Gaceta Oficial del Acuerdo de Cartagena*, Vol. XVII, No. 600 (Sep. 19, 2000).

110. African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources [OAU Model Law] (2000).

of China on the Protection of New Varieties of Plants,¹¹¹ the Draft India Seed Bill of 2004,¹¹² the Philippines' Seed Industry Development Act of 1992,¹¹³ among other domestic legal instruments against biopiracy. Generally, these instruments suggest national initiatives to facilitate the grant of prior informed consent and to set up terms of mutual benefit from the genetically modified products. They also propose the formation of regional committees for regional coordination and exchange of information.¹¹⁴

IV. NON-TRADE ISSUES

A. *Traditional Knowledge, Health, and Food Security*

The North-South dispute is basically rooted from the non-observance of the principles of justice and equity by the North in transacting with the South. The latter's aversion to the increased protection of intellectual property rights is thus founded upon the disadvantages: extinction of traditional knowledge, depletion of resources, and costs of displacement.¹¹⁵ The conflict involving traditional knowledge only affirms its value to both the industrialized nations and the developing countries. For the former, TK serves an economic value, while for the developing nations; its cultural and social value outweighs its utility.

The misappropriation of traditional knowledge has been met with different measures. One measure seeks to prevent the acquisition of rights over traditional knowledge, known as a defensive protection¹¹⁶ while the other measure consist of the establishment of specific rights for indigenous and local communities, or *sui generis* systems also known as "positive protection."¹¹⁷

111. Regulations of the People's Republic of China on the Protection of New Varieties of Plants, Decree of the State Council of the People's Republic of China No. 213 (Mar. 20, 1997).

112. The Draft Seeds Bill 2004 of India, *available at* http://agricoop.nic.in/seeds/seeds_bill.htm (last accessed Feb. 20, 2009).

113. An Act to Promote and Develop the Seed Industry in the Philippines and Create a National Seed Industry Council and for Other Purposes [Seed Industry Development Act of 1992], Republic Act No. 7308 (1992).

114. Zedan, *Patents and Biopiracy*, *supra* note 71, at 198-99.

115. *See* Dwyer, *supra* note 6, at 233-34.

116. Zedan, *Patents and Biopiracy*, *supra* note 71, at 193.

117. Krishna Ravi Srinivas, *Traditional Knowledge and Intellectual Property Rights: A Note on Issues, Some Solutions and Some Suggestions*, 3 ASIAN J. WTO & INT'L HEALTH L. & POL'Y 81 (2008).

For the first measure, what is proposed is “a certificate of source of traditional knowledge including evidence of the prior informed consent of the holders of the knowledge, and the recognition of traditional knowledge as ‘prior art’ accompanied with improved prior art — searching mechanisms.”¹¹⁸ There is yet to be a treaty imposing concurrent requirements.

The movement towards creation of *sui generis* systems was stimulated by the inadequacy of existing legal instruments to impose liability on biopiracy. At present, several countries such as India, Philippines and Peru have passed laws to establish *sui generis* systems.¹¹⁹ Members of the Working Group on Article 8 (j) of the Convention, such as the European Union, the Philippines, and Tanzania have recognized the necessity of incorporating the policies of the United Nations Declaration on the Rights of Indigenous Peoples¹²⁰ in *sui generis* systems¹²¹ as these “form[] the basis of cultural identity.”¹²² Such commonality promotes social cohesiveness which for poor nations becomes a mechanism for confronting poverty and social inequality. Thus:

Protecting TK in accordance with “customary laws” means respecting community worldviews, values and customs, as well as more rigorous ‘laws’ which may be enforced by traditional institutions (eg. councils of elders, spiritual leaders). In the holistic worldview of indigenous peoples, all components of heritage are an integrated and interconnected whole requiring equal protection. Rights over TK, culture, resources, territories and self-determination are not seen as separate; indeed the fragmentation of heritage and heritage rights is considered a major threat to its continued existence.¹²³

It took eight years for the completion of the draft of the Declaration and in 1993 it was subsequently sent to the Commission on Human Rights for approval. Thereafter, a Special Working Group was formed to prepare a final draft for submission to the General Assembly after thorough analysis and evaluation. More than 20 years later, it was adopted by the Council of Human Rights in Geneva. Afterwards, it was submitted for approval to the

118. Zedan, *Patents and Biopiracy*, *supra* note 71, at 193.

119. Srinivas, *supra* note 117, at 104.

120. G.A. Res. 61/295, U.N. Doc. A/61/L.67/Annex (Sep. 13, 2007).

121. See International Institute for Sustainable Development (IISD), *Working Group on Article 8 (j) Highlights: Tuesday, 16 October*, EARTH NEGOTIATIONS BULLETIN, Oct. 17, 2007, at 2, available at <http://www.iisd.ca/vol09/enb09395e.html> (last accessed Feb. 20, 2009).

122. Krystyna Swiderska, International Institute for Environment and Development (IIED), *Banishing the Biopirates: A New Approach to Protecting Traditional Knowledge*, GATEKEEPER SERIES 129, at 3 (2006).

123. *Id.* at 13.

General Assembly where an overwhelming majority vote of 144 led to is adoption on 13 September 2007.¹²⁴ Pertinent provisions of the Declaration state that indigenous peoples shall have the right to be consulted on matters affecting them, the right not to be deprived of their means of subsistence and development, the right to their traditional knowledge, and the right to the protection of the environment, among others.¹²⁵

124. The U.N. General Assembly adopted the Declaration on the Rights of Indigenous Peoples in a historic vote. The Declaration was adopted by a substantial majority of nation states, with 144 voting in favor, 4 against, and 11 abstaining.

U.N. Permanent Forum on Indigenous Issues, U.N. Declaration on the Rights of Indigenous Peoples: Adopted by the General Assembly 13 September 2007, *available at* <http://www.un.org/esa/socdev/unpfii/en/declaration.html> [hereinafter U.N. Declaration on the Rights of Indigenous Peoples] (last accessed Feb. 11, 2009).

125. See U.N. Declaration on the Rights of Indigenous Peoples, arts. 19–20, 24, 29 & 31. The pertinent parts of these articles read:

Article 19

States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them.

Article 20

2. Indigenous peoples deprived of their means of subsistence and developments are entitled to just and fair redress.

Article 24

1. Indigenous peoples have the right to their traditional medicines and to maintain their health practices, including the conservation of their vital medicinal plants, animals and minerals. Indigenous individuals also have the right to access, without any discrimination, to all social and health services.

Article 29

1. Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programmes for indigenous peoples for such conservation and protection, without discrimination.

Article 31

1. Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and

Biotechnology promises crops with substantially higher yields and nutritional content. Such crops tend to require less herbicide and pesticide because of genetically modified substitutes. However, heavy reliance on such technology for food production raises concerns on accessibility and adequacy of food supply.¹²⁶ First, the technology is easily available to farmers in the developing nations, such that only those financially capable of purchasing the genetically modified products could benefit therefrom. As such, the quantity of production might decrease to the detriment of the consumers. Second, food produced with the use of genetically modified organisms would expectedly command a high price which poor families cannot afford. In the end, the poor nations would be dependent on industrialized countries for food which traditional agriculture would have been able to adequately produce.¹²⁷

Moreover, there is an imminent risk of unidentified hazards arising from agro-biotechnology. Accordingly, a vicious circle of agro-biotechnology is predicted to take place: “GMOs give rise to a contaminated ecological system, the contaminated ecological system to contaminated agricultural products, contaminated agricultural products to contaminated food, and contaminated food to contaminated human bodies.”¹²⁸

B. Biodiversity

According to the Global Biodiversity Outlook 2 by the Convention, “[b]iodiversity loss disrupts ecosystem functions, making ecosystems more vulnerable to shocks and disturbances, less resilient, and less able to supply.”¹²⁹ Such results from monocultures in global agriculture and risks of biological pollution from genetically engineered organisms. According to the Overseas Development Institute, “[t]he existence of more extensive

traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.

126. Dwyer, *supra* note 6, at 231 (citing Chidi Oguamanam, *Intellectual Property Rights in Plant Genetic Resources Farmer's Rights and Food Security of Indigenous and Local Communities*, 11 DRAKE J. AGRIC. L. 273, 277 (2006)).

127. Dwyer, *supra* note 6, at 231.

128. Young-Gyoo Shim, *supra* note 1, at 206.

129. Secretariat of the Convention on Biological Diversity, *Global Diversity Outlook 2*, at 2 (2006), available at <http://www.cbd.int/doc/gbo/gbo2/cbd-gbo2-en.pdf> (last accessed Feb. 20, 2009).

intellectual property protection for plant genetic resources could in the long run have a substantial impact on global biological diversity.”¹³⁰

The inverse relationship between protection of intellectual property and preservation of biodiversity is magnified by acts of biopiracy. It is not difficult to see that biopiracy “continue(s) to jeopardize the achievement of environmental conservation, bio-diversity and sustainable agricultural practices,” in addition to the infringement of the right of indigenous communities and the general ethics of conservation.¹³¹

Biodiversity loss may either be by extinction or by genetic uniformity. These methods are specific types of what is generally known as genetic erosion — the depletion of the genetic gene pool.¹³² In extinction, the genes of individual species are lost, including reproductive and defensive attributes. Considering the proliferation of acts of biopiracy, this situation is materializing at an accelerated pace, causing an imbalance in the ecosystem.

On the other hand, genetic uniformity occurs in the production of plant varieties with the same genetic codes. The commercialization of seed cultivation, or what has been called the “‘impressively uniform’ genetic base,”¹³³ occurred in China, the Netherlands, Bangladesh, and Mexico, among others.¹³⁴ While there may be an increase in crop production, the disadvantage of concentration in varieties that share attributes is large-scale crop failure. For instance, varieties which may be resistant against pests may suffer from drought or disease, resulting in loss of supply.¹³⁵

C. Sustainable Development

In 1992, the United Nations Conference on Environment and Development made clear that environmental protection is “an integral part of the development process and cannot be considered in isolation of it.”¹³⁶ The

130. Gavin Stenton, *Biopiracy Within the Pharmaceutical Industry: A Stark Illustration of How Abusive, Manipulative and Perverse the Patenting Process Can Be Towards Countries of the South*, 26 EUR. INTELL. PROP. REV. 17, 23 (2004) (citing Overseas Development Institute, *Patenting Plants: The Implications for Developing Countries* (Overseas Development Institute, Briefing Paper, 1993)).

131. Gavin Stenton, *supra* note 130, at 23.

132. Lara E. Ewens, *Seed Wars: Biotechnology, Intellectual Property, and the Quest for High Yield Seeds*, 23 B.C. INT'L & COMP. L. REV. 285, 296 (2000).

133. Conforto, *supra* note 53, at 371.

134. *See* Conforto, *supra* note 53, at 371-72.

135. Ewens, *supra* note 132, at 296; *see* Conforto, *supra* note 53, at 371.

136. Report of the U.N. Conference on Environment and Development, Rio de Janeiro, Braz., June 3-14, 1992, *Rio Declaration on Environment and Development*,

Agenda 21 further states that the development and transfer of technology shall be made in pursuit of capacity-building for sustainable development. These principles only affirm the notion of sustainable development established in the Brundtland Report adopted by the World Commission on Environment and Development in 1987 to be that “meets the needs of the present without compromising the ability of future generations to meet their own needs.”¹³⁷

In sustainable development, the principle of “intergenerational equity” highlights the preservation of natural resources for the benefit of the present and future generations, as established in Principle 3 of the Rio Declaration on Environment and Development,¹³⁸ and the Brundtland Report, as stated above. Corollary, the present stakeholders in biotechnology should observe “intragenerational equity.” This responsibility requires effective response to the essential needs of the world’s poor, which is rooted on the improper use of the resources, both economic and environmental. Indeed, “[f]itting biotechnology regulation into the context of sustainable development is an important international goal, both from an environmental and economic perspective.”¹³⁹ However, the lack of a global consensus on the regulation of biotechnology hinders the global recognition of the concept of sustainable development.

The legal systems for intellectual property rights must not be enforced only as instruments for promoting private rights but moreso as tools for responding to socio-environmental concerns arising from biotechnology. Although primarily economic in nature, these laws may properly be considered as devices for protection of human rights in the “biotechnological millennium.”¹⁴⁰

V. CONCLUSION

The vastness of the earth’s sources is yet to be fully discovered. In fact, any discovery and invention which serves to enhance our daily living is an achievement of our generation. Moreover, the rapid evolution of a global village which incorporates scientific breakthroughs and technological advancements determines what constitutes a normal and advanced lifestyle. However, in the midst of it all, human rights inherent in every person remains intact. Positively, technological advancements and trade

Principle 4, U.N. Doc. A/CONF.151/26 (Vol. I) (Aug. 12, 1992) [hereinafter Rio Declaration].

137. Report of the World Commission On Environment and Development: Our Common Future, U.N. Doc. A/42/187/Annex (Dec. 11, 1987).

138. Rio Declaration, *supra* note 136; *see* Young-Gyoo Shim, *supra* note 1, at 216-18.

139. Young-Gyoo Shim, *supra* note 1, at 185-86.

140. *Id.* at 174.

improvements facilitate the re-examination of human rights. Thus, human rights obligations are primary and non-negotiable.¹⁴¹

The realities upsetting the global society call for the creation of a uniform set of norms that will address all the aspects of biotechnology — intellectual property rights, trade, environment, biodiversity, equity, health, heritage, and sustainable development. Thus, Vandana Shiva underscores that “the issue of the patentability of life is not merely a trade related issue; it is primarily an ethical and ecological issue intimately related to the social injustice of biopiracy.”¹⁴² Indeed, this era can be characterized as the biotechnological millennium. But that big step into the discovery of our planet’s riches requires as much commitment to the rights of every human person.

141. Cynthia M. Ho, *Biopiracy and Beyond: A Consideration of Socio-Cultural Conflicts with Global Patent Policies*, 39 U. MICH. J.L. REFORM 433 (2006).

142. Hamilton, *supra* note 11, at 162 (citing SHIVA, BIOPIRACY, *supra* note 60, at 85)).