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GLOBAL BIOPIRACY: PATENTS, PLANTS, AND INDIGENOUS KNOWLEDGE

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Summary: This book provides an overview of the legal and scientific concepts involving the appropriation of plants for biotechnological purposes. The book focuses on the tension between developing nations and industrialized nations as plant resources become the subjects of patents.

About the Author: **Ikechi Mgbeoji** received his Juris Scientiae Doctor degree from Dalhousie University. He is a law professor at Osgoode Hall Law School at York University.[2] He previously practiced civil litigation, patent law and intellectual property law. He has taught at the University of British Columbia, Vancouver. He is also the author of *Collective Insecurity: The Liberian Crisis, Unilateralism, & Global Order* and the co-author of *Environmental Law in Developing Countries: Selected Issues*.[3] He also serves as a consultant to the Environmental Law Center of the World Conservation Union. Mr. Mgbeoji has also been the recipient of numerous academic awards, including the Killam Scholarship and the Carl Duisberg Gesellschaft Award.[4]

Chapter 1 – Introduction:

- **Chapter Summary**: This chapter provides an introduction to the issues involved with "global biopiracy." It includes a broad overview of the debate between Western legal regimes and traditional notions of ownership in industrializing nations. This chapter also provides an outline of the organization of the remaining chapters.

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[2] Biography of Ikechi Mgbeoji, *available* at http://www.osgoode.yorku.ca/faculty/Mgbeoji_Ikechi.html.

[3] *Id.*

[4] *Id.*

- **Chapter Discussion:** The controversy regarding ownership of plant resources and the knowledge associated with such plants emphasizes the need for a standardized legal regime regarding intellectual property. At the heart of the debate is tension between Western "Eurocentric legal concepts" and the traditional knowledge of "Third World peoples."[5] The main objective behind the book is to contribute to an open debate about the role of traditional knowledge and the impact of a largely Western legal regime on such knowledge and people of the Third World. The relationship between patent law and indigenous peoples is characterized as "inherently predatory and harmful to the interests, worldviews, and self-determination of the Third World."[6]

Chapter 2- Patents, Indigenous and Traditional Knowledge, and Biopiracy:

- **Chapter Summary:** This chapter attempts to define the term "biopiracy" and what exactly is meant by traditional knowledge. It also discusses who is considered an indigenous person and who is not.
- **Chapter Discussion:** There has long been controversy concerning the ownership of plants and plant resources. The term that should be used to include plant resources is "traditional knowledge of the uses of plants (TKUP)."[7] This is a diverse and sophisticated term, which is often broadly defined and can include the medicinal, spiritual

[5] IKECHI MGBEOJI, GLOBAL BIOPIRACY: PATENTS, PLANTS, AND INDIGENOUS KNOWLEDGE 1 (University of British Columbia Press, 2006).

[6] *Id.* at 8.

[7] *Id*. at 9.

and agricultural uses of plants.[8] The term "traditional" is used in place of indigenous or tribal because the latter can be confusing, and "traditional" does not always denote indigenous.[9]

The debate about ownership of plant resources has become more heated as Third World countries become industrialized. Scholars have begun to decry the "overwhelming asymmetry" in the way patent regimes protect the intellectual property of industrialized nations while ignoring the rights of Third World citizens.[10] The term "biopiracy" originated from scholarship of Third World theorists who began to believe the industrialized world was pirating biological resources from lesser developed nations. The term denotes unauthorized commercial use without compensation to Third World countries where the resources are found. Mgbeoji compares the double standard in patent law today to medieval practices. He points to the example of a type of legume, called a cowpea, which was developed by Nigerian farmers. Because they did not publish their findings in an academic journal, a British scientist was able to secure a patent based on their invention.[11] Such examples are numerous.

Modern patent law finds it origins in 15th century Italy.[12] Patents are meant to confer special rights on inventors while excluding others from profiting from such inventions.

[8] *Id.*
[9] *Id.* at 10.

[10] MGBEOJI, *supra* note 5, at 11.

[11] *Id*. at 14.

[12] *Id.* at 16.

Patent law is Lockean in nature, as it is meant to reward a man for his labors.[13] Patent law also became popular with the rise of individualism and capitalism. However, inventions rarely come about as the work of one individual.[14] Competing philosophical theories also have had an impact on patent law. The modern-day patent system is rooted in ideas about individualism, incentives and labor theory. The patent concept quickly spread to other European countries. Patent theory continued to spread throughout the world, mostly through colonization and European influence.[15]

Patent law changed dramatically with the advent of the Industrial Revolution. As nations became increasingly competitive, it was important to exploit patents and inventions for national interests. It was around the late 18th century that the requirement for specificity emerged as central to patent law. The 1778 judicial opinion of Lord Mansfield in *Liardet v. Johnson* first described the requirement of disclosure consisting of "a technical outline and description of the invention."[16] It was also in this era that the granting of patents by the government (especially the British royalty) came under attack because many officials were bribed and granted patents for their own economic gain. Patent law became more complicated as scientific research increased. Patent law also attempted to provide clear definitions for words such as "novelty" and "invention" which were previously poorly defined and ambiguous.

[13] *Id.* at 17.
[14] *Id.* at 18.

[15] MGBEOJI, *supra* note 5, at 28.

[16] Liardet v. Johnson (K.B. 1778).

Modern patent law evolved dramatically as the result of competing state interests. As industrialized nations increased their influence over Third World countries, patent regimes in the lesser developed countries emerged to benefit foreigners (often from industrialized nations). As a result, these regimes often negatively impacted the country itself and its citizens. Scholar Paul Liu refers to this influence as "a strong invisible hand."[17] Oftentimes, these patent laws result in a net economic gain for the industrialized nations, and a net economic loss for the developing countries. Some scholars even blame the patent system for the slow rate at which these nations are developing.[18]

Patent law, while largely influenced by Western legal concepts, can differ from state to state. There has been some movement towards harmonizing patent law to satisfy the needs of many countries, but the interests of industrialized nations remain at the forefront of patent theory. Patent law is affected by competing government interests, but is also influenced by other entities, such as trade organizations and non-governmental organizations (NGOs).[19] Minimum standards for patent law exist internationally, as evidenced by Article 27 of the Trade-Related Aspects of Intellectual Property Rights (TRIPs) agreement.[20] This article provides that "patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an incentive step and are capable of industrial application."[21] However,

[17] MGBEOJI, *supra* note 5, at 35.

[18] *Id.*

[19] *Id*. at 42.

[20] Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1995, 33 I.L.M. 81 (1994).

[21] MGBEOJI, *supra* note 5, at 44.

nations can choose to exclude certain inventions, such as those that harm the public, types of medical treatments, and certain plants from patentability. Individual nations have the power to interpret the terms of such agreements in terms as broad or narrow as they wish. Agreements such as TRIPs have been criticized as instruments used to "secure enforcement of US intellectual property rights abroad."[22]

Chapter 3 – Implications of Biopiracy for Biological and Cultural Diversity:

- **Chapter Summary:** This chapter discusses the impact of patent law on plants and other natural resources. The author argues that the impact is mostly negative and a result of Eurocentric patent theories.

- **Chapter Discussion:** Plants have long been recognized as having scientific, medicinal, and even spiritual value. However, these types of values are often overlooked in favor of a plant's economic value. Agriculture constitutes a large portion of the world's trade. In fact, in 1989, agricultural trade amounted to $3 trillion.[23]

  Plants can have significance for many different religions. However, many religions, including Judaism and Christianity, are overwhelmingly masculine in nature. Likewise, scientific research has often been conducted by men.[24] The masculine and paternalistic nature of colonialism led to a general disdain for non-Western ideas, including notions

[22] *Id*. at 44.

[23] *Id* at 52.

[24] *Id.*

about plants and biological life. Non-Western theories were often dismissed as primitive.[25] Western religion also sees plants primarily as a resource for the benefit of human life. In this view, plants are sometimes simply "objects for human domination."[26] Many Western scientists only believe plants are useful with necessary modification and improvement by humans.

The quest for natural resources became increasingly important during and after the Industrial Revolution as corporations focused on maximizing profits, often at the risk of depleting resources. This quest for resources was a driving force of colonialism and imperialism. Because plant resources in particular are not evenly distributed across the world, the search brought the industrialized nations to lesser developed areas of the world, often in the Southern Hemisphere.[27] The colonial phenomenon also brought with it extinction of plant life never before seen. The rise of consumerism continued this trend. Extinction can also be attributed to explosive population in the last several centuries.

Agriculture has become a huge industry. Agribusiness, including seed supply, chemicals, machinery, distribution, processing, and retail of agricultural products continues to grow. However, as industries such as agribusiness and biotechnology grow, plant varieties continue to become extinct. Often, one variety of a plant will be considered the most commercially useful and will render other varieties essentially useless. For example,

[25] *Id*. at 57.
[26] MGBEOJI, *supra* note 5, at 58.

[27] *Id* at 60.

potatoes in the United States are mostly of one variety because large fast food companies and other corporations have deemed that variety the most commercially valuable.[28] In this way, commercialization has actually decreased biodiversity.

In the past, international environmental law has been ineffective in curtailing the extinction of plant varieties and the appropriation of plant resources for commercial gain. However, the most relevant piece of international environmental law today is the Convention on Biological Diversity (CBD). The convention members have joined together to "conserve biological resources, to use biological resources sustainably and to share equitably the benefits arising from the use of genetic resources."[29] While this is a worthy goal, nations may choose how exactly they will achieve it. The detailed plan for achieving the goal remains vague and undefined. However, the CBD attempts to increase discussion in the conservation debate and re-examine the extinction processes to develop a goal, which is capable of success.

Chapter 4 – The Appropriate Aspects of Biopiracy

- **Chapter Summary:** This chapter underscores the unequal relationship that exists between developing nations and industrialized nations, especially in regards to patents and biological resources. This inequality is mostly the result of colonialism and the movement of European ideas. Patent law is inherently sexist and paternalistic towards developing nations. This paternalism has allowed industrialized nations to take advantage of developing nations and appropriate biological resources for commercial use.

[28] *Id.* at 71.

[29] *Id.* at 76.

- **Chapter Discussion:** To add to the tensions between traditional knowledge and the Western, masculine legal structure, most innovations and improvements involving plants in developing nations have been provided by women. These women are in an especially difficult situation, because gender discrimination is likely in their own nations, and international patent theories only increase that discrimination.

  This structure emphasizes the inequality that exists between developing nations and the industrialized world. As discussed before, there exists an asymmetric movement of plants and resources between these nations. This movement is often rationalized with the argument that the movement of these resources to gene banks and other facilities in the industrialized nations is what is best for humanity.[30] At the same time, the intellectual contributions of developing nations are devalued.[31] This includes contributions to both the scientific and legal areas. Further, some patent systems have even been modified to lower the standards for patentability, which allows for the exploitation and appropriation of plant resources.

  The amount of resources that have been appropriated for commercial use in the industrialized world is staggering. For example, coffee, coca and corn are all native to developing nations, yet they make up a significant portion of Western diet and everyday life.[32]

[30] *Id* at 88.

[31] MGBEOJI, *supra* note 5, at 90.

[32] *Id.* at 92.

While scholars have decried the exploitation of the Southern Hemisphere for resources such as gold and silver, little argument is made about the appropriation of biological resources. The act of appropriating these resources has essentially been institutionalized by programs claiming to explore and improve agriculture throughout the world.[33] Seeds were often taken from their natural environments and came to be stored in the National Seed Storage Laboratory in Colorado. Similar facilities exist in nations around the world. Even international organizations headed by Western corporations or nations, have been formed to respond to calls to modify or end biopiracy have been ineffective.[34]

Thirty-five crops have been listed by the international community as "belonging in the global commons."[35] However, there is argument as to whether this list is sufficient. Likewise, some major food crops are not on the list, which may be an attempt by developing nations to keep certain crops out of the hands of the stronger nations, representing the increasing struggle for the rights over precious biological resources.

Chapter 5 – Patent Regimes and Biopiracy:

- **Chapter Summary:** This chapter explores different patent regimes and links them to the common movement of the European ideas regarding scientific discovery and patentability. This chapter argues that patent law in developing nations often reflects that in industrialized nations. Therefore, although patent law is usually a domestic affair,

[33] *Id.* at 106.

[34] *Id.* at 110.

[35] *Id.* at 117.

developing nations have passed laws that are similar to those in developed nations. These laws favor Western nations and corporations, while disadvantaging developing countries.

- **Chapter Discussion:** Although each nation has a somewhat unique patent system, these patents systems often interact with one another in the international arena. Some scholars argue that patent systems are simply incompatible with traditional cultures.[36] Patent law has been seen by some as predatory towards these traditional cultures. Even international agreements are often laced with Western ideas of law, patents and science. The impact of Western patent systems, especially of the United States, has been profound.

  Life forms have traditionally not been subject to patents. However, as science has advanced, it is possible to patent modified forms of biological resources.[37] Modern patent regimes have been modified to include these forms and so-called "inventions." These inventions, however, are often the result of only minor modification. Perhaps the most driving force behind this restructuring has been pharmaceutical companies. However, the idea that life forms can be patented has been disturbing for many scholars and human rights activists alike. This change in patentability has been supported by various United States court cases. In *Diamond v. Chakrabarty*, a case involving a new bacterium that was artificially created, the Supreme Court noted that because it was previously unknown to society, the bacterium could be patented.[38] In a later case, *Ex Parte Hibberd*, it was

[36] MGBEOJI, *supra* note 5, at 120.

[37] *Id.* at 122.

[38] Diamond v. Chakrabarty, 447 U.S. 303 (1980).

held that plants and tissues could be patented.[39] In fact, the United States has been the leading proponent of expanding property rights over plants.[40]

Critics argue that international agreements and directives, such as the TRIPs agreement, represent an attempt by the Northern, more industrialized nations to expand patentability on a global scale, mostly for their own economic benefit. Now, for a plant to be patented, "the article must be an invention, the invention must be new, the novelty must involve an inventive step, and, finally, the novel invention must be capable of industrial application and must also be useful."[41] These standards for patentability have been criticized as essentially facilitating biopiracy from traditional cultures.

Definitions of terms like "invention" and "new" continue to be inconsistent across the world. In addition, there is a fine line between the "invention" of new plants and the discovery of new plants. Some states, including the United States and Japan, fail to apply a global standard for inventions, and therefore, further disadvantage developing nations.

Biopiracy continues to exist and even thrive in part due to the naiveté of indigenous people and developing nations who are eager to do business with industrialized countries. Exchanges that are unfair to traditional peoples continue to be brokered. Because the standards for patentability have been lowered, Westerners often have little difficulty patenting something that may be in their possession, but was not directly invented or modified by them. Patent thresholds continue to be lowered in favor of legislation, such

[39] Ex Parte Hibbard, 227 U.S.P.Q. 443 (1985).

[40] MGBEOJI, *supra* note 5, at 125.

[41] *Id.* at 127.

as the U.S. Plant Patent Act, which contains no distinctive language as to what constitutes an "invention."[42] Many times, a plant will only be cosmetically changed, which can result in a patent for the party responsible for the cosmetic alteration. Plants from developing nations continue to be exploited by industrial nations through slight and mostly superficial modifications.

The double standard, however, continues to exist. For example, traditional cultures have developed thousands of different species of specific crops, but are construed as raw biological resources for the purposes of patentability. One practice that may have been used for centuries in a developing nation may be considered "novel" to industrialized countries, such as the United States. Additionally, items to be patented must also be capable of industrial use, which is largely a concern of Western importance.

Unlike plants, minerals such as gold and iron are not patentable. However, even patents on these resources are becoming more common. For example, in *Olin Mathieson*, a U.S. circuit court ruled that purified vitamin B12 was patentable.[43] Some Western scholars have tried to apply the argument that almost anything could be considered "natural." In his concurrence to the famous *Funk Brothers Seed case*, Justice Frankfurter said, "everything that happens may be deemed the 'work of nature' and any patentable composite exemplifies in its properties 'the laws of nature.'"[44] Arguments drawn from

[42] Plant Patent Act, 35 U.S.C. § 161 (1988 and Supp. 1996).

[43] Merck and Co. v. Olin Mathieson Chem, Corp., 253 F.2d 156 (4th Cir. 1958).

[44] Funk Brothers Seed Co. v. Kalo Inoculant Co., 333 U.S. 134 (1948) (Frankfurter, J. concurring).

such terms for ascertaining patentability could fairly be employed to challenge almost every patent."[45] This argument has been used to justify the patenting of plant resources.

Corporations have recognized the importance of traditional cultures to so-called advancements in science and medicine. In fact, some pharmaceutical companies spend money on finding people living in developing nations to explain the medicinal uses for plant resources. These companies then use the traditional knowledge to make new drugs using the plant resources.

There has been considerable backlash regarding the movement of plant resources from developing countries to industrialized nations without adequate compensation or patent protection. Some scholars argue that the increased patents will actually stifle scientific research and will only serve to spread Western ideologies at the expense of developing nations.

International law has been slow to recognize the problem of biopiracy. To date, there has been no movement to establish remedies for victims of biopiracy. Individual developing nations have begun to reformulate domestic laws to restrict foreign access to biological resources. While patent law is usually a product of a particular nation's society and legal system, the concept of patentability is largely a European idea. The patent laws of many individual nations reflect these origins. Only recently have international organizations such as the United Nations Educational, Scientific and Cultural Organization (UNESCO)

[45] *Id.*

and the World Health Organization (WHO) begun to call for increased protection of indigenous knowledge.

There has been a move towards cataloguing at least a portion of traditional knowledge in relation to plant resources. Scholars are encouraging this because most patent systems do not have any respect for oral knowledge regarding traditional uses of plants. However, even this movement can negatively impact traditional cultures because it implies that these people are illiterate and primitive. However, databases of such information could prove to be important in the future.

Patent law remains an instrument of the state, but many developing nations have been slow to modify laws in favor of their own cultures and citizens. If used correctly, patents can be useful in protecting a nation's resources from biopiracy. But these nations have not adapted their patent systems to adequately protect their interests. These states must reexamine the laws in light of social and economic interests.

Chapter 6 – Conclusion:

- **Chapter Summary:** This chapter reiterates many of the arguments of earlier chapters. It also explores the future of patent law on an international level and reflects on what could be positive changes to the law to protect the knowledge and property rights of traditional cultures.

- **Chapter Discussion:** Modern patent law has been modified over the years, which has only continued to encourage the appropriation of plant resources from developing nations. Proponents of patents claim that offering patents provides an incentive for

scientific advancement and improvement, which will maintain a certain level of food sustenance. However, continued industrialization has actually diminished the biodiversity, as is evident by the number of plant species that become extinct every year.

There has been some argument that the constant modification of plant resources affects the plant's resistance to pests and other dangers. Also, significant advances in plant technologies often lead to mass production of food crops before appropriate research has been conducted on the effects of modification. There are plenty of benefits of advances in biotechnology, but science should proceed with caution.

It is imperative that patent regimes take into account the effects of granting certain patents on the environment. Because patents are granted by individual countries, environmental effects are rarely considered. Ideas of caution have been incorporated into the Cartagena Protocol, which aims to "institute a regime for the safe handling and use of genetically modified plants and other life forms."[46] However, the impact of these directives is unknown because they are not binding on individual countries and are mostly theoretical in nature.

There has been a move in international law to recognize the importance of protecting human rights. The Covenant on Economic, Social and Cultural Rights provides that "the States Parties to the present Covenant recognize the right of everyone: (a) to take part in

[46] Cartagena Protocol on Biosafety, 23 February 2000, Report of Panel IV: Consideration of the Need for Modalities of Protocol Setting Out Appropriate Procedures Including, in Particular, Advance Informed Agreements in the Field of Safe Transfer, Handling and Use of Any Living Modified Organism Resulting from Biotechnology Diversity, UNEP Arguments for a Protocol Pursuant to Article 19.3 of the Convention, UN Doc. UNEP/Bio.Div.Panels/Int.4 (1993).

cultural life; (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."[47] The appropriation of plant resources can be considered both an individual and collective violation of these standards.

One of the biggest problems facing the modern evolution of patent law is inconsistency. Patent law requirements are often left to individual countries, and so there are differing levels of patent protection. The ultimate question for the international community should be how patent law can be restructured to provide the greatest benefit to society, rather than to individual, mostly industrialized nations. For this to happen, patent requirements should be more clearly defined. In addition, requirements may need to be reformulated to provide better protection to citizens in both industrialized and developing nations. While the struggle between these nations is likely to continue, a collective enterprise is important to sustain biological diversity and the ultimate survival of our society.

[47] International Covenant on Economic, Social, and Cultural Rights, 16 December 1966, 993 U.N.T.S. 3.