Biocolonialism: Examining Biopiracy, Inequality, and Power

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Abstract: Colonialism has for centuries been a driving force for territorial expansion and economic gains. In today's globalized economy, colonial exploitation continues in areas with great biodiversity through the taking of indigenous knowledge and biodiversity for profit, also colloquially known as biopiracy. Biopiracy is a practice of economic exploitation by powerful multinational corporations (MNCs) that take on the identity and power structures of nation-states, with established laws protecting the corporations that obtain patents or intellectual property rights more readily than the original indigenous knowledge holders. This type of 'biocolonialism' has been instituted through neoliberal trade practices and the whittling away of indigenous control over traditional knowledge. This is done on the premise that indigenous knowledge is communal, and not privately 'owned,' and therefore available to everyone. This interpretation of intellectual property rights has allowed MNCs to coopt indigenous knowledge for profit. Biopiracy can extend to multiple forms, including drug patents, agricultural gene manipulation, and genetic cell lines. This paper will review literature on biocolonialism and biopiracy examples to critique the practice and examine counterhegemonic praxes.

Keywords: Biopiracy, Biocolonialism, Intellectual Property, Indigenous Knowledge, Global Economy

Introduction: Political Structures Creating a Space for Biopiracy

Through examples of epistemic exploitation and a review of current literature on biocolonialism, this paper will highlight issues of indigenous knowledge and resource appropriation and how they relate to neoliberal economic practices. According to Lorenzo Veracini, the least visible types of colonial subjugation, like informal colonialism and trade imperialism, are the most resistant to change.[i] This is especially true for *bio*colonialism, which arises through the dominant discourse of neoliberal economic practices around the world. This form of colonialism is based on the exploitation and extraction of traditional resources and knowledge through western conceptions of property ownership. Neoliberalism has created a polarization in the world through conflicts between ethnicities and socio-economic levels, resulting in a dichotomy between the Global North and the Global South. Concepts of western legal practices, intellectual property rights, national property laws, and biotechnology innovations create a system of biocolonialism with the dominant North capitalizing on these policies and practices.[ii] This has adversely affected the Global South in many ways and acts as an ideology promoting profit and economic growth at the expense of the marginalized. The shift to neoliberalism has increased the divide between the developed and developing world and the "ideology of the market, and the omnipresence of market forces, have left an indelible mark on the western conception of knowledge."[iii]

Power is often in the hands of transnational corporations and lobbyist groups with the global economy becoming larger than individual nation-state economies.[iv] Cori Hayden theorizes that bioprospecting is "an important site for thinking about how neoliberalism works."[v] For Hayden, biopiracy is an institutionalized practice garnering transnational capital. In other words, the

opening of the market on biodiversity is argued to be both a development strategy and an argument for conservation within an economic framework. For example, in Peru, foreign corporations have filed more than 11,690 patents on natural resources traditionally used by indigenous communities.[vi] Corporate interest in medicinal plants and seeds stems from long-term economic goals. This example illustrates the current trend of outside transnational corporations showing an interest in traditionally-used medicinal plants and seeds. Within the globalized economy, free trade agreements create a power imbalance between multinational corporations (MNCs) and the indigenous communities holding traditional knowledges and resources. Since indigenous knowledge is disseminated among the community and no one person owns it in the western, legal sense,[vii] MNCs use bioprospecting projects in areas with rich biodiversity for future development of products.[viii] It has been found that bioprospecting success rates greatly increase with the inclusion of indigenous knowledge or local guidance. These endeavors are financed as exploratory enterprises to find aspects of biodiversity and indigenous knowledge as resources that can be patented and used for future development. Bioprospecting can be considered a form of colonization using a "knowledge-based economy" with profit sought through marginalized peoples and their traditional resources.[ix] But, according to Hayden, "[b]ioprospecting is the new name for an old practice: it refers to corporate drug development based on medicinal plants, traditional knowledge, and microbes culled from the "biodiversity-rich" regions of the globe—most of which reside in the so-called developing nations." (Hayden 2003, 1).

Bioprospecting can quickly lead to biopiracy, or the appropriation of traditional knowledge and natural resources without due compensation.[x] Biopiracy—and by extension, the intellectual property and patent system—is essentially a new apparatus of power used by MNCs. Bioprospectors make claims on biological resources based on the assumption that the resources are available and open to everyone.[xi] Initially, corporations present themselves as the protectors and innovators of these "universally" valuable resources. They claim that if it were not for their investments, the information and original sources might be lost. However, it was only after the development of international patents and free trade agreements that indigenous groups understood their exclusion from the economic yields gained by utilizing their knowledge.[xii] Essentially, biocolonialism, in the form of pharmaceutical and agricultural industry development by transnational corporations, is a "continuation of the oppressive power relations that have historically informed the interactions of western and indigenous cultures, and part of a continuum of contemporary practices that constitute forms of cultural imperialism."[xiii] More simply, it is a form of dispossession and conquest through the lens of neoliberalism.

Writing in 1993, Vandana Shiva published *Monocultures of the Mind: Perspectives on Biodiversity and Biotechnology*, which argued that the Global North was having a detrimental impact on the Global South's environment and traditional systems of food cultivation and societal relationships. She would later write *Biopiracy: The Plunder of Nature and Knowledge* (1997) further exploring the impact the North makes on the South through exploitative appropriation (biopiracy). Counterclaims made by researchers and corporations argue that bioprospecting is for the common good and it creates hybrid knowledges by implementing indigenous practices and knowledges into western understandings of capital.[xiv] But, authors writing about biopiracy continually highlight the colonial dynamics for marginalized or indigenous peoples through the extraction of knowledge or resources and hopes for altering the

power imbalance: "…indigenous activists, engaged ethnoscientists and legal scholars, and nongovernmental organizations have thus attempted to pry open the exclusive hold that Northern, corporate entities have had on intellectual property rights."[xv]

Indigenous knowledge is disempowered through its cooption by the MNCs and wealthy nation-states and then legitimized when attached to the legacy of western knowledge and technological advances. It is viewed as primitive, or localized, until MNCs produce wealth with what they have found. Through biopiracy and patents, the global "free" market allows these corporate practices to establish a form of biocolonialism, which becomes a continuation of previous imperialism as a technologically-advanced, biologically-controlled hold on indigenous communities. According to Shiva, "Biodiversity has been redefined as "biotechnological inventions" to make the patenting of life-forms appear less controversial."[xvi] Power for transnational colonizers, previously grounded in colonial assumptions of race, gender, domination, etc., is now based in the value of resources and knowledge under biocolonialism.

Biopiracy and the Power of Biocolonialism

Through biopiracy, outside corporations and nations can quickly take resources and secure their control through international intellectual property rights and patents. The legitimation for these corporations stems from this westernized, neoliberal economy and the reduction in trade barriers that benefits the wealthier areas of the world at the expense of marginalized peoples. Power over these populations becomes normalized as a conception of power over dominated subjects. Indigenous communities are generally smaller populations that remain on the margins within the nation-state until they are found to have economic value. Peripheral governance then becomes more pervasive in their lives under neoliberalism and the erosion of international trade barriers and increases in foreign investors. Under neoliberalism, market rationality is extended to all aspects of life. According to Wendy Brown, and her reading of Weber, there is nothing outside of the market. This is a system that allows for transnational entities to have greater control than individual sovereignties. The deregulation of the market, the elimination of tariffs and social safety nets, and an increase in the decimation of the environment and marginalized cultures are all hallmarks of neoliberalism.[xvii] When societies and their traditional resources are incorporated into the economy, they become a form of capital. Essentially, in relation to resources and traditional knowledge, neoliberalism's desire for profit creates a political tension between national interests and globalized capital.[xviii]

The politics of poorer nations are directly impacted by MNCs changing their food production practices, import and export expectations, and influxes of financial sources. Since the market is a constructed institution with no need for individual culture or states, it easily crosses borders and operates within the guise of liberal democratic frameworks. As Brown points out, "the economy must be directed, buttressed, and protected by law and policy as well as by the dissemination of social norms designed to facilitate competition, free trade, and rational economic action."[xix] These frameworks permit neoliberalism to recast ideas of equality and inequality into an economic rationality, with power structures put in the control of MNC boards and shareholders.[xx] The dissolution of trade barriers and the use of patents by the MNCs allows for economics to drive governmentality.[xxi]

Knowledge and resource cooption is not necessarily viewed by all as a stark contrast. As previously stated, those working on bioprospecting projects present the work as beneficial for large portions of the population. Cori Hayden presents an ethnographic study of a prospecting plant research agreement between Mexico's National Autonomous University (UNAM) and the University of Arizona in *When Nature Goes Public: The Making and Unmaking of Bioprospecting in Mexico* and describes the project "as members of a larger collaboration funded by the U.S. government's International Cooperative Biodiversity Groups (ICBG) program, UNAM researchers send extracts of Mexican medicinal plants to the pharmaceutical company Wyeth-Ayerst. In exchange they receive, from Arizona, minimal research funds and promises of a percentage of royalties, ten to twenty years in the future, should those companies develop a drug or pesticide based on Mexican specimens."[xxii] This project is meant to share benefits with the indigenous communities, but Hayden points out that as of the date of her publication (2003), this has not produced any profitable products. Hayden also outlines another ICBG project known as the Maya ICBG in Chiapas, Mexico, which was to split a small percentage of profits (in the form of possible royalties) with the community working with the ethnobiologists Brent Berlin and Eloise Ann Berlin based at the University of Georgia.[xxiii] The goal of the project was "designed to use Mayan folk knowledge to guide researchers to promising plants and microbes. These specimens were to be screened for their commercial potential by a Welsh biotechnology company, Molecular Nature, Inc."[xxiv] This project began in 1998, but was shut down in November 2001 due to claims of biopiracy and unethical practices.

A Brief History on Patents

There are parallels between current intellectual property rights on patenting both genetic material and biodiversity and the legal doctrines of early European colonialism in the Americas.[xxv] Alejandro Madrazo gives a differing opinion on the language used to describe biopiracy from other authors, stating that he does not believe these cultivations can be considered true piracy since "piracy is an illegal activity or an activity at the margins of the law, whereas modern bioprospecting is a practice that is enabled precisely by the specific rules of current intellectual property law."[xxvi] This raises an interesting point of what is *legally* allowable due to transnational property law. Currently, bioprospecting allows for indigenous systems of knowledge to become publicly available and enter "into the contested knowledge systems of colonialist corporations whose main concern is to privatize knowledge as patents on life forms."[xxvii]

The global demand for medicinal drugs has led to an increase in biopiracy in the Global South. Once companies find something they believe will be profitable, they want to patent it straightaway so that no one else can capitalize off it. Patents are an easily accessible source of income for those able to apply for them. In fact, patents act as an exclusive control on a product, and, when corporations hold patents on biodiversity, they are creating a monopoly on food and health.[xxviii] In some ways it is impossible for those in developing countries to compete with MNCs due to how patents and intellectual property rights are sustained. Since patents are held nationally instead of internationally, most patent holders tend to be from more developed countries. Because of this divide, it is possible to inflate the price of patented medicines so that corporations can make an even greater profit, which leads to more global inequalities.

Rich states can also pay for access to technology for research and resources to control epidemics and infectious diseases more readily than poorer areas of the world. With the establishment of

the World Trade Organization in 1994, international trade negotiations opened, and western notions of intellectual property rights took a firm hold in pharmaceutical research and development, increasing the strength of MNCs. This was classified under TRIPS, the Agreement on Trade Related Intellectual Property Rights.[xxix] TRIPS was negotiated at the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) and set the standard for member states to recognize the same intellectual property rights. This then meant that industries could bypass local patent law by registering their patents in the most favorable jurisdiction."[xxx] Before TRIPS, which set consistent requirements, intellectual property was considered a domestic issue with protections set on the national level. However, with TRIPS, transnational corporations are now much more successful at acquiring patents.[xxxi] For example, looking at the number of patents held at the end of the twentieth century, most were filed by the United States (41.8%) and Europe (41.95%).[xxxii] The TRIPS agreements and domestic patent laws, specifically US law, shapes international IPRs and show that the legal system is excluding indigenous or marginalized communities.[xxxiii] There has been a push for TRIPS, predominantly by the pharmaceutical industry, to restrict profit potential by indigenous communities. Corporations make minor genetic or chemical formula changes for their intellectual property claims and patents and can then claim their product is no longer directly linked to the initial source. Debra Harry has claimed that the main problem with biocolonialism is the "manipulation and ownership of life itself, and the ancient knowledge systems held by Indigenous peoples."[xxxiv] The problem stems from the belief that indigenous peoples are merely the holders, not owners, of communal knowledge. What are not considered are their territorial rights to the resources on their lands.[xxxv]

Power over Knowledge

Apparatuses of power can be institutional, political, or methodological and are constructed to have multiple effects upon society.xxxvi As stated earlier, biopiracy is merely a new technique of power exploited by rich multinational corporations. The western legal system and international intellectual property law have commodified indigenous knowledge and traditional resources.[xxxvii] By viewing biopiracy as a form of transnational governmentality, it is possible to see the commodification of biodiversity for the MNCs.[xxxviii] The constant privilege in the richer western countries alters their view of the world and allows them to perceive indigenous peoples and their resources as commodities. This privileged mentality is how the legitimacy of power is established: *We control your resources because we are more capable than you.* It is a deeply flawed logic; but it is a profitable logic.

The struggle over who owns knowledge and the related economic power is growing for transnational corporations. This stems from the fact that MNCs can continually grow in power and become economic driving forces. As Louis Pojman has pointed out, **"**unlike powerful people in a democracy, corporations are not accountable to a specific state. They are accountable only to their shareholders, who seldom are involved in day-to-day decisions."[xxxix] They are also given protection not afforded ordinary people through their infinite political and legal resources and act as decentralized global forces.[xl]

Intellectual Property Rights and Patents as Tools of Biocolonialism

Looking at the production of pharmaceuticals, we can see the importance of Intellectual Property Rights (IPRs) in the debate over the accessibility of indigenous knowledge to outside corporations and investors. IPRs impact many different fields: healthcare, biodiversity,

technology, human and cultural rights, research and development, and agricultural innovations; but, the international system that established international intellectual property rights was hastily organized and linked to trade agreements.[xli] Shiva claims IPR laws, under the development of TRIPS and the World Trade Organization (WTO), "have unleashed an epidemic of the piracy of nature's creativity and millennia of indigenous innovation."[xlii] Transnational corporations are taking advantage of slight "innovations" on traditional knowledge to maintain many of their IPRs.[xliii] Together, IPRs and TRIPS, work to suppress indigenous peoples' ability to control their traditional way of life. The regulatory system includes domestic laws of developed areas of the world, like the United States, Japan, and Europe, and broader international intellectual property rights agreements. These agreements resemble doctrines promoting colonialism since they are legal documents fostering the idea of ownership by the dominant colonizers.[xliv]

Attempts have been made to establish a declaration that would negate corporate intellectual property rights if public health issues were brought forward by struggling nations' governments.[xlv] But this does not address the issue of restoring indigenous intellectual property rights. Large pharmaceutical corporations in the United States and the European Union have used their vast corporate wealth to prevent the nullification of their IPRs. The inability to invalidate their IPRs means that pharmaceutical companies have ensured rigidity in the trade agreements and prevented generics from being manufactured. This has also ensured their continued *legal* right to Indigenous knowledge, if not an *ethical* right.[xlvi]

Patents are an apparatus of power with *universal* political and social consequences. Patent policies are developed in western countries but affect poorer, marginalized areas of the world. Unfortunately, there is no international governing body through which all patents are channeled, and they are granted according to individual national domestic laws. These patents are generally established in western countries like Canada, the European Union, and the United States. For all intents and purposes, pharmaceutical companies have more legal rights than people due to trade liberalization.

Patenting Indigenous Knowledge: The Pharmaceutical Industry and Neoliberalism

Patenting by western corporations of traditional knowledge and plants used medicinally is a highly controversial practice. Corporations can claim their patents are benefiting society since they are encouraging innovation; however, they are also taking away the autonomy of those who initially control the biodiversity or traditional knowledge.[xlvii] Despite the claims that bioprospecting is not actually theft—and only a gathering of resources that are available to all, and then deciphered by scientists back home—biopiracy, which stems from the initial bioprospecting endeavors, has become a lucrative market for pharmaceutical companies:

> Much of the knowledge of the use of plants for medical purposes resides with indigenous peoples and local communities. Scientists and companies from developed countries have been charged with biopiracy when they appropriate the plants or their compounds from the forests as well as the traditional knowledge of the community healers, since patents are often applied for the materials and the knowledge.[xlviii]

In fact, the high cost of drugs is defended as being a result of research and development expenses. However, very often, new drugs are altered only slightly from ones currently on the market. Pharmaceutical companies in wealthy nations are profiting off very little innovation and

monopolizing patents that prevent the manufacturing of generics by poorer countries since TRIPS includes medicinal drugs in their patenting rules and allows for a 20-year monopoly on patents, which is detrimental to developing countries unable to pay for them.[xlix] However, a compulsory license allows for a producer other than the patent holder to produce a generic and pay a royalty fee if it is deemed a necessary drug by a national government. This is coupled with parallel importing that allows a nation to look for the best price of the pharmaceutical sold in other countries and acquire it at the lowest price.[l] Unfortunately, cheap generics in countries like India and Brazil are coming under pressure from the larger pharmaceutical companies because they are losing profits.

Corporate Gene/Seed Manipulation

Beyond the pharmaceutical industry, other trends controlling international patents and intellectual property laws include gene manipulation of resources found during bioprospecting projects. Gene manipulation also presents specific problems for indigenous peoples and marginalized communities. The first problem is that the long-term effects on local crops and environmental systems are not yet fully understood and alterations to the local food systems can affect the community in unrealized ways. The second problem is that indigenous groups are not compensated properly for their involvement in the creation of new genetically-modified organisms based on their traditional knowledge and food sources. Companies then stipulate that their patents are on modified products. A third problem stems from ontological implications for indigenous communities when traditional plants are patented. According to Jeff Corntassel, a community's connection to its food sources and livelihoods is critical to their "*sustainable self-determination*."[li] This ability to be connected to localized food staples and their self-determination is greatly impacted by corporate patents.

Monocropping removes a more traditional model of diverse cropping in order to maximize the potential growing of a specific crop.[lii] This current trend to establish monocrops, or monocultures, means that a single agricultural crop is established and leads to ecological degradation. By simplifying the food sources and limiting resources, corporations are creating larger monocrop yields.[liii] These profit margins are greater for outside corporations that convince communities to plant a new food-staple crop created through their genetic modifications. But, the loss of biodiversity and indigenous knowledge related to local, traditional crops is a side effect of pushing for monocropping. Some communities are beginning to fight for their traditional foods to both maintain their cultural identity and heritage, and to protect the land. One such example is the White Earth Land Recovery Project (WELRP), which is seeking to reclaim and restore traditional lands and practices for the Anishinaabeg people.[liv] Another example can be found in Hawaii with plantation corporations removing taro, a traditional crop, with cane and pineapple since these are more profitable crops.[lv] Many in Hawaii are pushing back and trying to regain lands and traditional plants.[lvi] Despite some changes, monocropping is still a dominant practice throughout the world and relates to import/export trade agreements between nations and profitable yields for MNCs.

Patenting Cell Lines

Biopiracy is not limited to indigenous knowledge and traditional resources. It can extend to the genetic material of populations. And it is interesting to note that genetic resources are also subject to patent laws.[lvii] The Human Genome Diversity Project (HGDP) and the Human

Genome Project are two body-based research projects that take DNA samples from individuals and communities for profit or research.[lviii] The Human Genome Diversity Project (HGDP), dubbed the "Vampire Project," has not been received well by indigenous peoples and their advocates: with many issuing bioethical concerns:

> including informed consent, the possibility of commercial exploitation through gene patenting, and, …the Project's insulting rhetoric of extinction and preservation. It's scientific objectives—to trace the genetic heritage of humanity, to map histories of migration and exogamy, and potentially to contribute to future therapies of inherited diseases—were markedly at odds with the needs of disenfranchised indigenous peoples in the present day.[lix]

The concept of research under the guise of helping humanity is another iteration of biocolonialism for indigenous peoples being mined for DNA, with Linda Tuhiwai Smith calling this form of scientific research colonialism.[lx] Many of the issues indigenous peoples have with this type of research stems from three problems: 1) informed consent—are participants fully aware of what they are consenting to, how the samples will be used, or if the samples were used as the participant was told they would be; 2) community engagement—is the community involved in decisions about the use of their DNA; and 3) benefit sharing—does the community receive some benefit from participating either through compensation or through access to the results of the study?[lxi]

A specific example relating to the problem of informed consent is the study of the Hagahai people in Papua New Guinea.[lxii] They are an isolated tribe—not discovered by Westerners until the mid-1980s—who carry a gene that predisposes individuals to leukemia. The people carry a marker for a T-Lymphotropic virus that showed potential for a vaccine. The U.S. National Institute of Health attempted to obtain patent protection (US patent 5397696) for a Hagahai donor's genetic cell line for the Papua New Guinea Human T-Lymphotropic Virus (HTLV) variant in order to create vaccines to combat HTLV-related viruses[lxiii] This controversial patent brought up questions of whether the donors had given consent, understood the process of consent, or if the gene line could be patented by an outside company.[lxiv]

Current State of Biocolonialism

To date, the development of biodiversity and indigenous knowledge has been a profitable endeavor for both pharmaceutical corporations and companies that promote "natural" health products.[lxv] IPRs use trademarks and patents to imitate or replicate communal indigenous knowledge and resources. It should be mentioned that there is an important difference between patents and trademarks: patents offer a temporary twenty-year monopoly for the holder so that they can supposedly recuperate the cost of research and development and trademarks offer permanent protection to whomever holds the trademark: they "are deemed worthy of protection because consumers rely on them in product choices as they serve as marks of assurance."[lxvi] Indigenous knowledge is initially commercialized by the corporations and then deemed part of their property thanks to patents and trademarks. A lack of trade barriers and foreign need has guaranteed that the corporations and foreign investors will continue to profit from indigenous knowledge and environmental resources. Any disputes over ownership are usually resolved in favor of the wealthier corporations since they can afford court fees and litigation.[lxvii]

Prior to TRIPS, the Convention for Biological Diversity[lxviii] (CBD) was established in 1992 as an international IPR agreement to give some protection to indigenous people. The CBD has a provision that mandates source nations should receive some compensation or benefit for sharing knowledge and resources with corporations wanting to use the biodiversity from the Global South, however what this means in terms of practice is less clear.[lxix] The CBD does determine that,

> States have sovereign rights over their own biological resources" and that those resources are no longer freely available to others. Nonetheless, far from a multilateral effort to support conservation and the sustainable use of biodiversity, the idea that the CBD is trying to sell, it clearly promotes the concept of bilateralism in private access to biodiversity. These contracts or bilateral agreements, known as "bioprospecting agreements," confirm the fact that biodiversity is no longer freely available to others and is solely and exclusively available to a select few.[lxx]

It is interesting to note that the United States signed but *has not* ratified the CBD[lxxi] because it opposes the mandate for benefit-sharing with source nations.[lxxii] The United States does, however, fully enforce and follow the agendas designed by TRIPS and the WTO (entities that disregard anything outside of profitable trade agreements). Once again, the wealthy nations show they are more interested in the agendas of corporations than marginalized people.[lxxiii] Corporations use the fact that traditional knowledge is communal as a reason to *not* compensate indigenous peoples, siting the colonial assumption that it is "*terra nullus* – empty and free for the taking." [lxxiv] According to Madrazo, there is no longer a need to conquer along traditional colonial models, instead patents are used to control resources. This "replicates the colonial doctrine of *res nullius.*"[lxxv]

One might wonder how corporations are able to appropriate traditional knowledge and natural resources without the active participation of the developing countries' governments. It again comes down to financial resources and political sway of corporations.[lxxvi] Bioprospecting "commercially valuable genetic and biochemical resources and subsequently patenting them, depend on the knowledge of rural and indigenous communities that have established an intimate relationship with nature since precapitalist times."[lxxvii] Biopiracy becomes a political concept *because* it is "a mechanism for capitalist enrichment, ecocide, and the antithesis of sustainability… capitalist society depends on economic changes in markets (i.e. the profit rate)."[lxxviii] Corporate power over knowledge is assured because it can exercise hegemony through western legal frameworks and negotiations with developing governments that need to maintain good relationships with corporations.

Bearing in mind the increased call for indigenous rights, some corporations are seeking new ways of capitalizing without endangering their relationships with developing nations' governments. One such example of this benefit sharing agreement was the relationship between Merck Inc., a pharmaceutical company, and INBio, an NGO working in Costa Rica. Beginning in 1991, Merck Inc. paid an upfront fee and promised a royalty percentage for any product developments that may occur thanks to any collection of material in Costa Rica. This meant that Merck acquired exclusive rights to Costa Rica's biodiversity for development.[lxxix] This agreement, however, ended in 2015 with INBio's failure to fulfill its promises. INBio was required to return the biodiversity collection to the state. The specimens were passed to the National Natural History Museum.[lxxx]

TRIPS and patents, as Western controls over knowledge, are dangerous components of neoliberalism. For the richer developed countries, biocolonialism allows them to maintain control over these developing regions. Multinational corporations get caught up in competition for patents and profits to drive the economy. They are constantly seeking new forms of revenue generation, including an interest of some transnational corporations in germplasm collections. These collections are storehouses of genetic material for seeds and represent an expansive variation of biodiversity. Since the governments that have historically maintained them, specifically in the former Soviet Union and other areas hit hard by economic recessions, are no longer able to afford them, prosperous corporations are able to purchase them: "The pharmaceutical industry has benefited from this situation, especially US multinational corporations which are investing in the conservation of such collections on condition that they will be given access to them."[lxxxi] This access allows them to manipulate the genetic material and then patent it as being different from the initial source material leading to the greater likelihood of competition with other wealthy transnational corporations. There is a "classical conception and principle that competition, and only competition, can ensure economic rationality… [there is a] formation of prices which, precisely to the extent that there is a full and complete competition, can measure economic magnitudes and thus regulate choices. World biodiversity is currently controlled in two ways: *in-situ* (Protected Areas and as-yet unprotected regions of great biodiversity) and *ex-situ* (Botanical Gardens and Germ Plasm Banks)."[lxxxii] Since national interests do not strictly regulate ex-situ sources, it is easier to use patents and the free market to obtain them. The power still rests with transnational corporations who view indigeneity as a license to treat societies as commodities.

Counter-Hegemonic Possibilities

Considering the power and wealth of these transnational corporations, it is important to ask what recourses are available to protect traditional knowledge and resources for indigenous communities. The main entity protecting Indigenous knowledge and biodiversity, the Convention for Biological Diversity (CBD) does not afford many protections against TRIPS, which ignores indigenous rights.[lxxxiii] Although transnational corporations and wealthy countries are powerful, there are several examples of positive change for indigenous communities fighting against knowledge and resource cooption. Three important examples include: 1) Bolivia's "Agrarian Revolution" in 2006 which planned to return territory to indigenous communities;[lxxxiv] 2) the annual seed exchanges in Honduras between farmers of non-genetically modified seeds;[lxxxv] and 3) Kanaka Maoli activists challenging patent rights held by the University of Hawai'i of three taro varieties that are important in their ceremonial cycles and collective history and eventually ceremonially destroying the patents:[lxxxvi] ""the patents were publicly received by three representatives and then torn in half."[lxxxvii] However, more efforts are necessary to end the exploitation of indigenous knowledge and resources. This would include involvement in indigenous-led alliances and stronger domestic laws to protect against international patents.[lxxxviii] Communal indigenous knowledge needs to be shared on a multigenerational basis within the community to survive.[lxxxix] One such organization working to counteract biopiracy is the Indigenous Peoples Council on Biocolonialism. Founded in 1999 by Debra Harry, they work for the collective rights of indigenous peoples to protect traditional knowledge, genetic resources, and cultural rights against biotechnology.[xc] The need for self-sustainability hinges on the ability of indigenous peoples to use traditional knowledge and not be under the thumb of neoliberalism and its confining and self-serving patent and intellectual property laws. At the most basic level,

the communal rights of indigenous peoples need to be universally recognized in order to protect and neutralize the detrimental effects of corporate greed under neoliberalism.[xci]

Conclusion

Susan Hawthorne makes the claim that indigenous "communities are much more likely to lose not only access to their traditional knowledge but also control over how that knowledge is used, just as when the industrial revolution occurred the value of labor was alienated and the profits passed into the hands of the owners."[xcii] The western legal system and international intellectual property law has commodified indigenous knowledge and traditional resources. Biopiracy is an "aggressive instrument of corporate globalizers" who profit from knowledge appropriation and endanger "intergenerational sustainability" for indigenous communities.[xciii] It is important to understand the barriers that patents and intellectual property rights create for poor areas of the world. Employing theories on biocolonialism allows us to see how biopiracy has commodified traditional resources and indigenous knowledge by transnational corporations under neoliberal economic practices. The patent system seen today is a recreation of the colonial system of extracting resources of a marginalized group by a more powerful (or wealthy) entity.[xciv] This paper has highlighted issues with current practices and used examples such as the INBio debacle, the Human Genome Diversity Project (HGDP), and the Maya ICBG project, to illustrate the nuanced problems of indigenous rights. The control of indigenous resources and knowledge is wrapped up in colonial language and assumptions in the form of biocolonialism. Until indigenous peoples have greater control of their resources, MNCs and wealthy nations will continue to take advantage of the economic system.

Notes

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[xxx] Madrazo, 2013, p. 503-504.
[xxxi] Delgado, 2002.
[xxxii] Madrazo, 2013, 504.
[xxxiii] Ibid.
[xxxiv] Harry, 2011, p. 703.
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[xxxvi] Foucault, Michel. *Power/Knowledge*. Edited by Colin Gordon. New York: Vintage, 1980, pgs. 188, 194.
[xxxvii] Whitt, 2009.
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[xl] Ibid.
[xli] Muzaka, Valbona. "Developing Countries and the Struggle on the Access to Medicines Front: victories won and lost." *Third World Quarterly* 30 no. 7 (2009): 1343; Brown 2005.
[xlii] Shiva, 2007.
[xliii] According to the WTO, IPRs give an inventor rights over the use of his or her creation (https://www.wto.org/english/tratop_e/trips_e/intel1_e.htm).
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[lxix] Hayden 2003.
[lxx] Delgado, 2002, p. 300.
[lxxi] As of December 2, 2016, 196 parties have ratified the agreement. This includes the European Union, three non-UN states, and all of the UN except the United States according to Gloria Dickie's article, "The US is the only country that hasn't signed on to a key international agreement to save the planet." Quartz Media, December 25, 2016.
[lxxii] Hayden, 2003.
[lxxiii] Ismail and Fakir, 2004, p. 177.
[lxxiv] Ibid, p. 180.
[lxxv] Madrazo, 2013, p. 490. Doctrines on *res nulluis* become *terra nullius* when exploiting territory and resources that are taken from the colonized.
[lxxvi] Ismail and Fakir, 2004.
[lxxvii] Delgado, 2002, p. 299.
[lxxviii] Ibid., p. 299.
[lxxix] Ismail and Fakir, 2004, p. 190.
[lxxx] Hammond, Edward. 2015. "Amid controversy and irony, Costa Rica's INBio surrenders biodiversity collections and lands to the State." *Third World Network.*
[lxxxi] Delgado, 2002, p. 302.
[lxxxii] Ibid, p. 301.
[lxxxiii] Ismail and Fakir, 2004, p. 177.
[lxxxiv] As of 2016, the Agrarian Revolution under President Evo Morales has increased land ownership by women to 46%. The government is now focusing on local and food production and plans to invest $40 million in the industry (Dimitri O'Donnell, *Telesur* April 15, 2016).
[lxxxv] Groups like USC Canada are working with local farmers to diversify crop varietals and counteract the effects of monocropping (USC Canada. "Seeds of Survival in Honduras").
[lxxxvi] Corntassel, Jeff. "To Be Ungovernable." *New Socialist,* Issue #58 September-October (2006): p. 37.
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[lxxxix] Ibid, p. 118; Whitt, 2009, p. 219.
[xc] Indigenous Council on Biocolonialism, http://www.ipcb.org.
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