Understanding Subaltern responses to biopiracy propagated by global patent laws post 1994.

The research report is submitted in partial fulfilment of the degree of Master of Arts in International Relations in the Faculty of Humanities at the University of the Witwatersrand.

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Declaration

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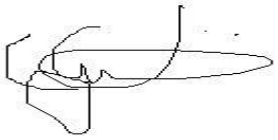
Signature  Date 02/ 06/ 2020

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Abstract

Indigenous knowledge is not primitive. Indigenous knowledge of biodiversity is not the common heritage of mankind, it is the common heritage of the community to which it belongs. Indigenous people own what they know. Central to the logic of colonisation is the claim of ownership, either through assertions of *terra nullius* land or through claims of discovery with total disregard and no acknowledgement of prior knowledge by local people (Mignolo 2009). Contrary to colonial notions of 'discovery', it was not the Spaniards who discovered the potato, it was the Inca in modern day Peru (Zuckerman 1999). The Spanish merely brought it back to Europe as a cheap staple that could feed the work force required for the industrial revolution. The scenario is similar for tobacco. It was cultivated for centuries before the arrival of Europeans in South America, in fact, James Cook was offered the tobacco to smoke as a gift by the local people who had been smoking it for centuries (Zuckerman 1999). After being introduced to Europe, the tobacco became a huge sales success and quickly became the largest export from South America fuelling colonization and the introduction of African slave labour to meet the growing European demand for Tobacco. Although the tobacco grew in their lands, it was no longer theirs, it was now the property of a western company such as Lorillard Inc. Their indigenous knowledge which introduced the tobacco to the Europeans was appropriated and exploited without any form of compensation to them or regard for the centuries of selective breeding and the cultivation they had done. Through an ecofeminist lens, this research will explore the subaltern responses to this expropriation of indigenous knowledge of biodiversity

Chapter 1: Introduction

The unfair expropriation of people's traditional knowledge for corporate benefit without regard, remuneration and consent from the holders of such knowledge is a form of piracy. When the pirated knowledge is knowledge about biodiversity, it is then referred to as biological piracy or biopiracy (Ojha 2014). Under direct colonialism this form of piracy was not only accepted, it was encouraged by European kingdoms who wanted to have the best botanical gardens for imperial privileges. In post/neo-colonial times, the direct looting of biodiversity and indigenous knowledge has sought a different justification and legitimation, different from the brute force and slavery previously employed. This justification for looting indigenous knowledge of biodiversity for corporate benefit without remuneration to the local people has found justification in the global patent regime with its Trade Related Intellectual Property Rights Agreement (TRIPS) which came into effect in 1995 under the nearly formed World Trade Organization (WTO).

Prior to the introduction of the global patent regime, many countries in the global south and even in Europe, did not have legislation that enabled the patenting of life forms. Intellectual property issues were issues related to copyrights and trademarks. As such, countries like India and Ecuador did not have legislation in place that could enable a corporation to own a patent for living organisms which have been the subject of evolution for millennia (Basheer 2018; Tanasescu 2013). However, the global patent regime which is modelled after the United States Patent law has changed that through multilateral legally binding agreements such as TRIPS which require states to pass or rectify legislation for the patenting of life forms under the claim of protecting intellectual property. There has been a push back by states in the global south against the global patent regime which legalizes and legitimises biopiracy. Countries in the global south have contested about the fairness of TRIPS in terms of trade as well as environmental protection. In 2001, in the Doha WTO ministers conference, the TRIPS council agreed to prioritise biological diversity protection in order to align TRIPS with the Convention on Biological Diversity (Fullas and Muchie 2013). However, the TRIPS agreement still does not prioritise biodiversity protection nor does it require companies to get consent from the state which the patent material originates from. Subsequently, TRIPs does not require companies to share benefits with local communities from which the knowledge was obtained hence, it is accused of not recognising indigenous knowledge (Fullas and Muchie 2013).This is what this research aims to explore; to understand subaltern resistances to biopiracy.

The global patent regime occurs under the global domination and disciplinary nature of capitalism. It represents capitalism's dispossession of the local commons. Thus, to understand its underlying logic, this research will explain how nature is commodified under capitalism and how globalisation has introduced disciplinary neoliberalism. All of this occurs under the narrative of development and the stripping away of people's commons. It will then trace the history of biopiracy from ethnobotany to bioprospecting. This research will then explain the rise of the global patent regime and its modelling after the US patent system as well as outlining the global patent regime and the failure of global agreements such as the Convention on Biological Diversity (CBD) in dealing with the problem. The case studies will serve to show the resistance strategies that have been used. This paper will use an ecofeminist lens. Ecofeminist literature from scholars like Vandana Shiva (2007), Maria Mies (2001) and others, have drawn parallels between the exploitation of nature's biological commons and the exploitation of women under androcentric capitalism. Ecofeminists have also been at the forefront of fighting against biopiracy and exposing its practices. Biopiracy is often presented as developmental. For example, when bio-prospectors have learnt of the medicinal properties of a certain plant from the local people, as they did with the ayahuasca and turmeric, they present that as a form of scientific development with commercial benefits. One then requires a form of theorisation that questions the fundamental basis of what is called development, ecofeminism offers the tools through which to question the basis of capitalist androcentric developments which exploits society, especially woman, and nature.

Chapter 2: Theoretical approach, literature review and Methodology

Theoretical approach

This research will use an ecofeminist approach to understand subaltern resistance to biopiracy. Ecofeminism belongs to the third wave of feminism which emerged in the 1990's as a critique of the inadequacies of the second wave and the westernization and liberalization of feminism (Thompson 2006). The first wave of feminism was mainly focused on suffrage. In the US it culminated into the 19th amendment to the constitution which enshrined women's right to vote (Curtis and Cardo 2018). However, the struggles that women of color faced, first as women and in particular as black women, initiated the second wave of feminism. It was focused on fighting discrimination on the basis of color and discrimination on the basis of gender (Curtis and Cardo 2018). Although ecofeminism gains prominence in the 1990's, the term was framed during the time of the second wave of feminism by the French author Francis de Aubonne in her book *Le Féminisme ou la Mort* (1974). She was raising an alarm about the exploitation of nature and environmental degradation warning that the earth is finite; it cannot be exploited eternally. However, myriad issues such as civil rights, gender based violence and women's reproductive rights in cases such as Roe vs Wade, were at the center of attention and ecofeminism did not take center stage in the second wave of feminism thus reemerging with the third wave. The third wave of feminism is characterized by different feminisms. This is because the third wave came as a result of radical, leftist and progressive feminists rejecting the idea that all women have the same experiences of exploitation, marginalisation, history and gendered poverty (Sharnappa 2016). The third wave was concerned with giving each woman a voice, not ideal type theorization. Thus, there are many different branches of ecofeminism ranging from materialist ecofeminism to postcolonial ecofeminism. However, ecofeminism emerges in the 1990's where there are other types of competing feminisms focused on development, these are branded feminist economics.

Feminists economics largely focused on the marginalization of women's role in subsistence production. Its role is to highlight the importance of domestic work and reproduction which are ignored by the patriarchal economic understandings. Thus, feminist economics is largely centered on the inclusion of women in the economy (Roberts 2015). This is characterized by the calls for more female Chief Operations Officers (CEO) and other senior industry posts as well as calls for

more women in political leadership. Feminist economics has a novel mission which is to show that mainstream economics has turned a blind eye to gender. Although accurately critical of neoclassical economics, feminist economics has focused more on inclusion rather than radical change (Perkins et al. 2005). At the heart of it is the maintenance of the capitalist system and the continuation of environmental exploitation under the illogical premise of infinite production in a finite planet. This is why Merry Mellow (2006) argues that feminist economics must transform into materialist ecofeminism. She believes that women need a feminist theorization that goes beyond women's exclusion from capitalists development and challenges the materialist and environmental basis of the development (Mellor 2006). Although feminist economics may fail to transform the system unless, it adopts a social and ecological focus, there are other forms of feminisms that not only justify but try to maintain the capitalist system. Neoliberal feminism represents that attempt to maintain the capitalist's system and justify its exploitation.

Feminism has not been spared from the encroaches of neoliberalism (Ghadery 2019). As more than just an economic ideal espousing a reimagined privatized state whose *raison d'etre* is the protection of capital, neoliberalism established itself as a political and social ideal (Price 2019). It espouses a way of life based on market principles (Rottenberg 2014). Thus, it has developed its own neoliberal feminism. Neoliberal feminism focuses on skills development and unleashing of women's entrepreneurial skills. For this kind of feminism, bioprospecting is acceptable as long as women are skilled enough to participate. Under neoliberal feminism, it is every woman's job to develop skills for herself for market participation as such, women who do not get such skills are blamed while they are victims of a society they did not create. Thus, the individualized nature of neoliberal feminism removes the women from the society and makes her an individual agent who must take full advantage of the market (Ghadery 2019). Thus, feminized exploitation is not regarded as a structural issue but as an individual issue (Ghadery 2019). Neoliberal feminism depoliticizes patriarchy, structural inequalities and exploitation as mere absence of skills in women while ignoring their fundamental basis (Ghadery 2019). Corporate interests through funded campaigns have invested a lot of money in branding their approach of so called women's empowerment and inclusion hence, neoliberal feminism has been referred to as 'transnational business feminism' (Roberts 2015, 209).

Sophia Price (2019) argues that this transnational business feminism or neoliberal feminism has in fact transformed into disciplinary neoliberal feminism. It is disciplinary in its ability to universalize its norms and create uniform global pathways to capitalists development (Price 2019). Drawing on

Foucault (1977) who argued that discipline is the technology of power that can coerce, self-regulate and control, Price (2019) argues that through the risk and incentive paradigm, disciplinary neoliberalism controls women's technology of power. It does this through implied punishment for not living up to neoliberal expectations such as not taking the entrepreneurial risk. Power is the ability to coerce without violence and neoliberalism coerces women to adopts its western, ahistorical and spatially irrelevant development models (Foucault 1977; Price 2019). This is transnational project led by large corporations, Non-Governmental Organizations (NGO) and the United Nations (Geniusz 2009). It espouses a disciplinary universalized development model that ignores the structural differences and historical differences in women's marginalization around the world. This type of feminism is also propagated by universities which participate in corporate philanthropy programs that aim at women's development in Business Schools and other academic programs that ignore the structural, historical and racial foundations of gendered poverty (Roberts 2015). Such a liberal approach which does not challenge the basis of 'development' is inadequate for a research that tries to understand subaltern resistances to biopiracy. This is because resistance to biopiracy challenges exploitation disguised as development regardless of the gender composition of the senior managers.

This is where ecofeminism differs from the other feminisms afore mentioned. Ecological feminism is a critique of how women and nature have suffered as a result of androcentric capitalism (Salleh 2014). Ecofeminism espouses a development paradigm that is not centred on the market forces of capitalism but one that aims at fostering the "decentralization of power, the local production system, and subsistence practices'' (Sharnappa 2016). It is also a study of how marginalized populations have responded to marginalization and the strategies they have used in fighting for what they feel is an infringement on their rights. This is the aspect of ecofeminism that this paper will utilize however, "The intellectual apartheid by which feminist writing is passed over as 'women's stuff' is not giving way yet" (Salleh 2017, 302). Ecofeminism is more than a lament for women's marginalization. It is a critical theory about the deconstruction of the systems of marginalization. When local populations resist against what they feel is pirating of their biological commons through patent laws, they are trying to deconstruct the global patent regime.

When India passed the 2005 Patent Amendment Act, it was women's movements that led the mass mobilizations against the act (Basheer 2018). Women make up the majority of the population and thus thy are able to organize large numbers also, they are amongst the poorest and most

marginalized people in India (Shiva 2016). Besides resisting the act on the basis that it would lead to expensive medications, there was also opposition on the basis that it disregarded indigenous knowledge of medicines such as *ashinishaabe* medicinal teachings. Thus, indigenous knowledge has been inextricably linked to ecofeminism (Basheer 2018). Shiva (2016) argues that this is because women's knowledge of medicines has been rendered indigenous and nonscientific making it easy for a company to get a patent for modifying medicinal plants that have been used for centuries.

Salleh (2017) argues that ecology, socialism, feminism and indigenous decolonial struggles are all part of what makes ecofeminism. She alongside Walter Mignolo argues that indigenous knowledge has been exploited without compensation (Mignolo 2009). Mignolo (2009) argues that this is because indigenous knowledge is not regarded as knowledge at all. It is regard as tales, fables and stories. Shiva (2016) argues that even indigenous knowledge of plant use for medicines is undermined as mere stories and superstitions until proven in a lab and then patented to benefit a particular company without recompense to the local populations. This is why Mignolo (2009) argues that the first resistance is not mass mobilization or protest rather, it is epistemological disobedience. This means to disobey what has been called knowledge by the global north and respect all sources of knowledges (Geniusz 2009). For Wendy Geniusz (2009), the global south needs to tell the global north that *Our Knowledge Is Not Primitive* ,as the title of her book suggests.

This is the heart of resistance to TRIPS. TRIPS is based on intellectual property. Intellectual property is based on what counts as knowledge. Salleh (2008) argues that industrialization marginalized tacit knowledge forms and as a result people lost a "sense of their organic nature" (Salleh 2003, 61). They also lose a sense of their spiritual nature. For example, some populations have a spiritual relationship with their environment. Trees, flowers, animals and rocks are sacred. When such plants are modified and patented, it is a patenting of people's spirituality. This is overlooked by the market forces. Ecofeminism brings to light these forms of resistance that other resistance theories which are market oriented ignore. Indigenous movements on 29th April 2008 led the first plenary discussion for the framing of the rights of mother earth in the Ecuadorian constitution (Tanasescu 2013). These indigenous groups in Ecuador have organized international conferences called the *encuentros* where they discuss, amongst others, conservation of biodiversity and impact of WTO intellectual property laws (Tanasescu 2013). These are ecofeminist led forms of resistance.

Ecofeminist Vandana Shiva argues that patent laws on living organisms such as plants undermines the years of growing and cultivating and breeding that indigenous people have done on the plant (Shiva 2016). Their labour is under looked because it does not directly benefit the capitalist market. Thus, ecofeminism draws parallels between the work done by indigenous people on plant growth, cultivation and breeding to the work done by women at home in the form of reproductive labour (Tamari 2010). Thus, ecofeminism challenges the bases of patent laws for living organisms. In her book, *Biopiracy; the Plunder of Nature and Knowledge,* Shiva (1997) argues that,

> *"Through patents and genetic engineering, new colonies are being carved out: the land, the forests, the rivers, the oceans, and the atmosphere have all been colonized, eroded and polluted" (Shiva 2016, 7).*

Ecofeminism has faced criticism from other feminist writers. Neelam Jabeen (2019) argues that ecofeminist writings have mostly come from western scholars. She argues that this has led to an ecofeminism that is not cognizant of the non-western experiences of women-nature paradigms. Hence she calls for a postcolonial ecofeminism (Jabeen 2019). She argues that because ecofeminist voices from the global south have not prominently featured in ecofeminism, that has led ecofeminism to present women as a one singular group ignoring racial, religious and cultural nuances that should be included in an ecofeminist dialogue. Thus, only through a postcolonial ecofeminism can the ‘double bind of postcolonial women’ be understood (Jabeen 2019, 355). These criticisms are valid but the emergence of ecofeminist literature from the global south, written by women with experience of the subject matter, allays such fears. Also, the focus of ecofeminism has been towards the global south by progressive global south feminists like Vandana Shiva (2013). Ecofeminism equally does not deny issues of religion or race. Although there is no one standard manual for ecofeminism, the most important things are the core values of questioning exploitation disguised as development, neoliberalism and the capture of feminism by forces that seek to maintain androcentric exploitation of woman and nature . For different women in different parts of the world, the most pertinent issues differ however, just because they differ, that does not mean they are not important.

Literature review

1. Capitalism and Commodification

Biopiracy is made possible by the commodification logic of capitalism. Nature and human beings are commodified as goods and labour whose value is not intrinsic but determined by the market. It is this commodification logic that has stripped plants and other genetic material of their intrinsic value hence, their protection is no longer based on their value *ipso facto* but based on proprietary ownership. Karl Polanyi detailed how this commodification occurs in his classical work, *The Great Transformation* (1944*)*. He traced the transformation of society from mercantilism to liberalism. He argued that production inevitable involves human beings and nature being rendered products to be traded in the market under conditions of supply and demand (Polanyi 1944). Human beings are traded as labour power which is regulated by wages while land is traded as rent (Gill 2007). Therefore, the prices of rent determine the value of the land while the price of labour determines the value of a human being, this is capitalism's commodification of humanity and nature. He had a dire warning that, "Commodity fiction disregarded the fact that leaving the fate of soil and people to the market would be tantamount to annihilating them" (Polanyi 1944, 137). The commodification of human beings and nature results in what Polanyi (1944, 15) calls 'fictitious' commodities. A commodity is something that was developed or produced so that it could be sold in the market however, land and labour do not qualify as commodities because; labour is intrinsically how people live while land is nature, neither was developed for the market and neither derives value from market productivity (Polanyi 1944). Although Polanyi differed from Marx in that he believed that capitalism alters society through commodification while Marx believed it was through exploitation, Polanyi still drew heavily on Marx (Selwyn and Miyamura 2014).

In her book, *Biopiracy the Plunder of Nature and knowledge (1997),* Vandana Shiva argues that the patenting of living organisms such as the germ plasm represents this commodification of nature. The fact that a company can have the right to control access to a living organism like a seed, is testament to how capitalism turns nature into mere products for sale. The commodification of nature is accompanied by the commodification of indigenous knowledge (Goyes and South 2016). Though such knowledge is not recognized as ‘intellectual’ by westernized standards who ignore it as folklore, it is appropriated at times and used as a basis for patents (D. Robinson and Raven 2017; Mignolo 2012). Thus, knowledge that used to benefit an entire community is appropriated and

privatized for the benefit of a single company. Bioprospecting which is the search of the commercial value of biodiversity represents this form of capitalist commodification. Bioprospecting sees that value of biodiversity as being determined by monetary value (Wynberg and Laird 2007). The process of bioprospecting equally commodifies indigenous knowledge of plants and their uses while using it to accumulate profit through the dispossession of local people (Goyes and South 2016).

This commodification logic of capitalism is done through the presentation of the markets as natural. Polanyi (1944) argued that this masks the fact that markets are capitalist's creation for the purposes of normalizing exploitation. Patel (2013) demonstrates this in his analysis of the Green Revolution. He argues that,

> *"In the case of labour, an abundant pool of landless people does not necessarily lead to lower wages. Contrasting agricultural wages in 1956–7 and 1964–5 in Punjab and Kerala, Bardhan (1970) found increases of 17% and 92%, respectively. These wage increases happened despite the fact that '30.90 per cent of Kerala's rural households were landless, whereas for Punjab and Haryana together it was only 12.33 per cent "* (Patel 2013, 26).

Patel (2013) demonstrates that the market logic of abundant labour inevitably leading to lower wages is not a pontifical truth. While Kerala had more farmers than Punjab, they earned more in Kerala because of the strong movements that represented farmers against the buyers of labour power. He is emphasizing the point that, "markets in which laborers sell their labour power are fought over, not naturally given" (Patel 2013, 26). He argues that this is equally true for land prices, they do not just increase naturally. He argues that the increase in land prices in India was driven up by the state as part of profiting from the green revolution and excluding small scale farmers for larger scale farmers. Thus, the state was actively involved in commodifying land and actively involved in the market in a way that favors the owners of capital (large scale farmers) over small scale farmers. This analysis by Patel (2013) confirms what Polanyi (1944) had argued. Polanyi (1944) rebuffed the idea of a self-regulating market arguing that the market is not free of the state. The state plays an active role but not for the entire benefit of society but for the benefit of the owners of capital. Hence when the market collapses the state is called upon to rescue it. The idea that an abundant availability of workers inevitably leads to low wages and the idea that land prices inevitable increase is part of the capitalist logic of the normalization of exploitation, this is what

Patel (2013) was showing. The domination of the markets by big corporations has had many catastrophic impacts. In India, the entrance of big seed corporations like Monsanto led the ordinary farmer to lose about $2.6 billion annually and from 1997 to 2007, more than 25000 farmers committed suicide (Mannathukkaren 2007).

In rural India, the green revolution was part of the financializing of rural life (Shiva 2016; Patel 2013). People who had relied on their own forms of ploughing and farming were suddenly made to rely on tractors, rollers, sprinkler systems and other equipment. This brought the farmers into the capitalist market and they became dependent on market prices and now market prices decided whether a farmer could farm, based on a farmer's affordability (Shiva 2014). Some fear that a similar scenario has occurred in health due to the 2005 patent amendment act. They fear that it gives power to corporations to modify indigenous medicines through patents thus making market forces determine access to medicine (Basheer 2018). Financialization of rural life is part of what Jason Moore (2011) calls the 'endless accumulation of capital' which is invariably the 'endless commodification of nature' (Moore 2011, 8). Not only is it an endless accumulation of nature but something else happens, socialized natures of farming gave way to capitalist's natures from which the farmers can no longer reproduce themselves except through the 'circuits of capital' (Moore 2011). Hence, 'social ecologies' like farming become 'capitalized ecologies' which are completely entangled in the reproduction of capital (Moore 2011). This also happens when biological commons are patented, they cease to be a social ecology instead they become capitalized ecologies owned by a few, benefiting a few at the expense of the subaltern. Thus, part of the intellectual resistance to patents, is the resisting of the commodification of nature.

Patel (2013) goes on to argue that commodification has transformed Non-Governmental Organizations (NGO) from being benevolent state petitioners for good behavior to being state surrogates. Drawing from Giovanni Arrighi's book *The Long Twentieth Century; Money, Power And The Origins Of Our Times (2010),* Patel (2013) argues that the changes in the behavior of NGOs is part of 'extensive and complex organizational capabilities to control the social and political environment of capital accumulation on a world scale' (Arrighi 2010, 15 quoted in Patel 2013, 43). This accumulation on a world scale according to Clair Cutler (1997) is propagated through international private law. Clair Cutler (1997) argues that in a capitalist driven world, international law has come to be dominated by private law. This disembedding of private law from public international law resulting in corporations that are not answerable to domestic laws but

subject to privatized international law. Private actors such as Multi-National Corporations (MNC) have pushed for a global legal regime where "decisions over production, wages, employment, working conditions, environmental standards and the like are being removed from national public policy-making space and relocating in private space" (Cutler 1997, 263). This is reflected in the fact that intellectual property laws such as patents are globally defined, monitored and controlled. That transcends any single state. For example, the 2005 patents amendment act in India was designed to keep India in line with its compulsory obligation under the World Trade Organization (WTO). Those obligations trump individual state consideration.

2. Globalization and Imperialism

Biopiracy is a global problem that scholars like Shiva (2016) and Ho (2006) argue is justified by international laws which transcend state laws. These international laws have been vastly spread through globalisation. The globalisation espoused by the Washington Consensus is characterized by what Stephen Gill (1998) calls *disciplinary neoliberalism*. This disciplinary neoliberalism is based on a strong state whose *raison d'eter* is the protection of capital and private property rights through the passing of laws and policies as well as the outsourcing of economic policy to independent central banks (Gill 2010; 2007). This requires the constitutionalizing of neoliberalism, in a process that Gill calls 'new constitutionalism' (Gill 2007, 5). It is the creation of a neoliberal constitution that protects private property rights, protects capital, and disciplines the state against any interference that may constrain capital while forcing the state, as a legal requirement, to protect the interests of capital. Since capital is mobile, cutting across borders, it requires assurances from host countries in the form of changes to domestic laws (Gill 2007).

These changes in the laws of states 'lock-in' neoliberalism such that even if another political party comes into power, it will first have to change the constitution in order to act against the interests of capital (Gill 1998). This confers citizenship rights to multinational firms with entitlements that mean that "the mobile investor becomes the sovereign political subject " (Gill 2007, 23). Investors do not want an international system characterized by anarchy, they do not want a global 'state of nature' thus, through international bodies they spread similar laws to all states around the world. Investor confidence is the key that drives the stock markets and if a state cannot ensure investor confidence, it is considered a risk to investment (Young 2000). Rating agencies monitor where it is best to do business based on whether there are laws that guarantee the capital of the sovereign investor. Thus states feel compelled to pass laws that favor capital in an effort to attract investors

(Gill 2010). The citizens and the environment suffer because of states pursuing neoliberal polices to attract investors. The global patent regime is presented through this paradigm of laws that harmonize global patents while ensuring the rights of the patent holders.

Drawing from the ideas of Foucault (1975) and Bentham (1791), Gill (2007) argues that globalisation is characterized by panopticism. Global trade institutions such as the World Trade Organization (WTO) , World Bank and European Union's Monetary Union demand state transparency for purposes of surveillance. Since these institutions are keeping a watchful eye, state behavior is then controlled in order to be aligned to their demands. Rating agencies which demand a full panoptic access to a state's economy are another means of this surveillance. Thus panopticism is the means of control through surveillance (Gill 1998; 2010). Surveillance capitalism begins with the surveillance of states and then the broader civil society. Gill (1998) argues that disciplinary neoliberalism tames the leviathan (state), it rewrites its own social contract and transfers sovereignty from the state to the corporation leaving states with imagined sovereignty. He argues that this is globally orchestrated through globalization's imperialism. Compliance with global patent laws is carefully monitored through this form of panopticism by the WTO, ensuring that member states disclose their patent laws or face economic sanctions and exclusion from world trade.

Foster (2017) argues that globalisation has been an imperial project shaped by institutions of global trade who pursue the interests of the Global North. This imperialism is played out in the United Nations Framework on Climate Change (UNFCC), Kyoto Protocol and the in the Conference of the Parties (Qingzhi 2017). This imperial approach to dealing with the climate crisis has prevented the forming of a vibrant climate regime with the immediacy and radical alterations that are needed (Foster 2017). The power and influence of capital drives the global agenda and derails much needed urgent climate action. Influential lobby groups that fund the election campaigns of politicians force those politicians either implicitly or explicitly to pursue policies that either deny the climate crisis, do nothing about it or go pursue technotopian solutions that put companies at the forefront (Foster 2017). The continuation of capitalists business as usual, infinite production in a finite world, has led to a crisis of civilization (Foster 2017). The global imperialism which underpins global relations is not cognizant of the metabolic rift between human beings and the earth that they are part of. Globalisation has served to spread this imperial relationship making it difficult to disentangle itself from it, thus imperial capitalist globalisation has made biopiracy possible and

legal. For example, all member states of the WTO must have adequate legislation that complements the requirements of the WTO (Zhou 2016). Failure to do so, a state may be subject to trade sanctions. This is an example of disciplinary neoliberalism which requires a state to change its laws under WTO rules. Although developing countries are given some time to adjust their domestic laws to meet WTO global trade standards, the ultimate goal still remains; a uniform global trade regime. This is heavily supervised through mandatory disclosers to institutions like rating agencies. This is also an example of panopticism as the WTO keeps a keen eye. This shows that not only is nature commodified, but that commodification is defended by globalisation. The language of globalisation justifies the commodification of nature by presenting it as development as ecofeminists have continuously pointed out.

3. Commoning and Indigenous Knowledge

The attacks against the commons as a form of communal ownership has enabled biopiracy and undermined traditional knowledge. This is because In a state and market-oriented society, it has become difficult to imagine anything outside the ownership of the Hobbesian leviathan and the propertied market. The idea of communal ownership and control seems to be an abstract utopian concept or an old communist idea (Bollier 2014). Themes such as the 'tragedy of the commons' have lamented the so-called 'death of the commons' (Cooke and Lane 2018). Yet, the reality is far more different than some have been conscious of. In his book, *Think Like a Commoner, a short introduction to the life of the commons* David Bollier (2014) argues that the commons never died, it just ceased to be acknowledged. He argues that two billion people around the world depend on communally owned farms, land and water supply for their sustenance and livelihood. The commons according to Bollier (2014) is all around us. Language is a commons. Nobody owns it, nobody can claim to have invented it, human beings evolve with it and use it as a means of communication, progress and all civility. Knowledge is another kind of commons. When stripped of its commons nature it becomes private property and of use only to a few. Indigenous knowledge is also a form of knowledge commons, according to scholars like Shiva (2016) and Bollier (2014) the indigenous knowledge commons is under threat due to patents that strip it of its communal form and privatise it for the benefit of single companies. When the sharing of indigenous seeds between farmers is forbidden by a state and rendered illegal by its laws, a seed commons is being taken away. This is because for centuries, farmers all around the world have been exchanging seeds with each other and in many developing countries, farmer to farmer seed transfers are what keep farmers

in the business. Even in the toughest years of economic hardship, farmer to farmer seed sharing helps to keep farmers from starving. This is stripped away if the only legal seeds are those sold in the market which are mostly patented seeds that a farmer must agree not to replant. This is why scholars (Ambang, Alloggio, and Tandlich 2019; Bsumek 1999; Hamilton 2006) argue that biopiracy strips indigenous people of their biological commons and replaces it with market forces

Bollier (2014) argues that open source software like Wikipedia, open licenses and broadcast airwaves are also commons. Commons can arise anywhere. Bollier (2014) argues that when communities decide to jointly manage a resource with equal access and distribution, that resource becomes a commons. Authors who argue for a commons thinking challenge proprietary based patent rights regimes. They argue that such a regime is based on the idea that only the state and the market can meet people's basic needs and organize society. Thus, a commons thinking argues that it is not only the state or the market that can manage resources, communities can still jointly manage, control and conserve.

Bollier (2014) points to the example of the Linus computer operation system. It is was initially developed as an open source operation system by Linus Torvalds. He then called on other software developers around the world to help in creating an operation system than can work on any computer. The project became a big success and a communally owned operating system was developed. This online collaboration brought together a large number of people to create a global online common. This shows that there is no blueprint for creating a commons thus, the commons should not be thought of as merely tangible resource or a commodity. It can be intangible. A commons is a resource owned by a community and shared constructively with a set of rules that communally govern it (Bollier 2014; Mies and Bennholdt-Thomsen 2001; Singh 2004). Whether that is knowledge, a software, an open site or seeds or land, for it to be a commons, it must be communally owned and communally administered through a set of principles that ensure continuity, accessibility and conservation (Bollier 2014)

Zhang and Barr (2018) argue that the term 'commons' has accumulated different meanings therefore they advocate the use of the term 'Commoning' in order to describe strategies that build the community and offer sustainable resource management. Unlike the noun commons, Commoning is a verb, it denotes joint communal actions towards environmental sustainability. Commoning is part of the alternative food networks rebellion against monocultural large scale producers in favor of small-scale producers who have relationships with their consumers (Zhang and Barr 2018).

Commoning is based on the idea of 'cognitive praxis' (Jameson 1991,3 quoted in Zhang and Barr 2018, 2). Cognitive praxis refers to a consciousness in one's actions such as in buying food (DeLind 2011). It means being conscious of where the food is produced, who is producing it and the socio-cultural dynamics behind that production. Commoning requires the reimagining of what food is, and advocates that food should be seen as a commons rather than a commodity (Zhang and Barr 2018). Commoning goes beyond a cognitive praxis in terms of food, it is also a civil society making process, what DeLind (2011, 79) calls "civic we-ness." Commoning challenges neoliberal conservation strategies that priorities a private property based form of conservation which sets a private game reserve or land for protection under one owner (Cooke and Lane 2018). Commoning best defines indigenous knowledge relationship with the commons because it makes the commons a living interaction that shapes and is shaped by nature in a communal way. Private-property centric conservation is based on the assumption that the one who has private rights will act benevolently and conserve whatever is within their property rights. This assumption is not different from the assumption that markets create a level playing field for everyone to participate and benefit equally. For a safe and Anthropocene centered conservation strategy and food production, Commoning proves to be the solution. However, patent laws take this away by giving rights to a select few for exploitation and monocultural production hence it is important to research the resistance to this patenting. A private property rights oriented form of conservation conflicts with the understanding of "ecologies as social natures that are geographically dispersed and temporally contingent" (Cooke and Lane 2018, 1715). It also makes conservation individualized and reproduces privatization (Cooke and Lane 2018). Such a form of conservation which prioritizes land titles goes against indigenous knowledge because it introduces a western concept of privatization while claiming to conserve and protect. This form of conservation is critiqued by subaltern theorizations.

Subaltern theories not only criticizes north-south relations but raises questions about whether academics, politicians and activists trained in western thought can truly represent indigenous people and the subaltern as a whole without codifying subaltern knowledges to fit the standards that have been set by their western training (Chakrabarty 2015). The subaltern should not be thought of as a sacrificial necro-idealist, but as an activist of change in challenging western thought and practice. For example, the term ‘global south ‘is itself a subaltern term that shows “subaltern positionality to neoliberal globalization” (Popa 2017, 763). The ‘subaltern’ in this research does not refer to the dead subaltern of necroidealism advocated by Chakrabarty (2015) instead, this

research adopts the definition of the 'subaltern' as "those whose perspective is repressed in the discourse of the dominant class" (Lanka, Khadaroo, and Böhm 2017, 1593). Defining the subaltern has been a contentious issue in the subaltern studies project and the two positions, that of the dead subaltern who cannot speak and that of the subaltern as the non-elite, have dominated the subaltern discourses. Stephen Legg (2016) is critical of this definition-debate which has obscured many important issues in the subaltern studies project. Legg (2016) argues that this over-emphasis on defining the subaltern has unfortunately been too central to the extant that some scholars have neglected the emancipation project that subaltern studies aims to advance. Thus, this research will not delve deeper into the definitional debates of who are the subaltern but will stick to the definition offered above. However, debates within subaltern studies do not end merely with the definition of the term. There are different subaltern theories with different conceptualizations of the term subaltern.

Subaltern cosmopolitanism advanced by scholars like Bogdan Popa (2017) are focused on studying the resistance to neoliberal debt as well as the biopolitics of debt guilt. For Popa (2017) the subaltern are the " people who live as non- or second- hand citizens in the global world" (Popa 2017, 762). Yet, Popa (2017) like many subaltern scholars does not answer the question of, who are those people? Is it everybody in the global south? Does debt and debt guilt affect women in the same way that it affects men in the global south? Are people of color affected the same way by neoliberal debt as white people? These are important question to consider yet, no paper or research can be able to answer all the complicated nuances of the term subaltern. Each subaltern theorist will focus on a certain theme and at times, that unfortunately homogenizes the 'subaltern' in the same way that at times Marxist homogenize the proletariat and at times feminists homogenize women. When postcolonial theorist used the term subaltern, it was in reference to the marginalized people of the global south (Legg 2016). Different postcolonial theorists have tried to problematized 'the people' or the 'subaltern' by focusing on different issues that affect gender, sexuality, race and class differently. In his study of how the Ndebele speaking Zimbabweans have used to internet to speak about the 1980s genocide, Mpofu (2015) refers to these people as the subaltern. For him, the subaltern are those people who have been excluded from power and marginalized in the economic system of the country. Although Mpofu (2015) admits that the subaltern is not a homogenous group, he does realize that an engagement with the different aspects of subalternity would not be possible in one paper. Thus, he chooses to define the subaltern by the characteristics of exclusion

from power and marginalization in economic activity. Mpofu (2015) argues that even when Antonio Gramsci coined the term 'subaltern' in reference to the Italian workers under the regime of Mussolini, the subaltern were not a uniform group. Yet, the characteristics that Gramsci highlighted were common for most of them. It was up to other organic intellectual to delve deeper and highlight those differences among the subaltern.

4. Understanding the History of Biological Piracy

Biopiracy in colonial times

The term 'biopiracy' was coined in 1993 by the civil society organization known as the Action Group on Erosion, Technology and Concentration (ETC Group), in their publication paper which they call the *communiqué* (Hamilton 2008). Ikechi Mgbeoji defines biopiracy as;

> "the commercial use of plants and traditional knowledge of the use of plants (TKUP) without (i) compensation, (ii) acknowledgment of prior intellectual input to the plants' improvement or the creation of TKUP or (iii) the informed consent of the owner(s) of the plants or practitioners of TKUP." (Epps 2007, 539)

This definition of biopiracy highlights that biopiracy uses traditional knowledge for commercial purposes without compensation, acknowledgement of prior knowledge and without their consent. Scholar and activist Vandana Shiva (1997), added another important dynamic to her definition when she defined biopiracy as,

> *"the use of intellectual property systems to legitimize the exclusive ownership and control over biological resources and biological products that have been used over centuries in non-industrialized cultures*" (Shiva 1997 quoted in Hamilton 2008, 2).

Shiva (1997) was highlighting that biopiracy is being justified through the intellectual property regime. She was highlighting that international organizations which control the global intellectual property regulation are responsible for the legitimation, justification and propagation of biopiracy in modern times. *Ipso facto*, biopiracy is not a new thing. It has old roots stretching back to ancient kingdoms and colonial states. It is, therefore, important to understand the history of this practice in order to understand how it has evolved over time.

Daniel Robinson (2010) traces the history of biopiracy to ancient times. He goes as far back as ancient Egyptian showing how queen Hatshepsut in 1482 BC sent her armies to collect the seeds

of an incense producing gum tree known as Boswellia. The tree was planted at Karnak in her palace and it became an Egyptian tree, imprinted in the hieroglyphs even though it was originally taken from east African tribes (Robinson 2010). There was no mention of the east African tribes in the hieroglyphs although they had natured and conserved the tree for generations before the Egyptian empire took it over. Robinson (2010) also traces biopiracy to Dioscoredes (40-90 AD) the Greek surgeon who is consider as the first botanist. He explored and detailed plants and indigenous knowledge all across the Roman empire. The knowledge was collected from the ordinary people, but it was kept as a privilege for high born education. Dioscoredes received the accolade of being the first botanist although he never developed the knowledge.

Biopiracy continued with the so-called voyages of discovery (Zuckerman 1999). In 1492 Christopher Columbus collected plants from Cuba and the surrounding islands of the Caribbean such as the Bahamas (Zuckerman 1999). Columbus went on to collect tobacco seeds and brought them back to Europe. Columbus was not alone in plant hunting; Marco Polo had done the same thing. The Europeans collected such plants as maize, potatoes, tomatoes, chilies, pineapples and others (Davies 1995, 41). The potato was such an important plant for the future of Europe that some historians argue that it contributed to the rise of the British Industrial Revolution (Moch 2017). The potato was cheap because it is easy to plant and does not require much cultivation. It served as an easily available stable food which sustained the work force that was needed in the industrial revolution in Great Britain (Zuckerman 1999). In fact, the potato played such a crucial role that Frederick Engels (1884) argued that its revolutionary impact was equal to the discovery of iron (Zuckerman 1999). However, unlike iron which has remained in the earth since its formation, the potato has been cultivated and bred by the indigenous people since time immemorial. Also, unlike iron, which was discovered, the potato was not discovered, it was simply taken from one part of the world to another.

Besides the potato, there was such a huge volume of plants coming into Europe that by 1682, John Ray published the *Methodus Plantarum* (1682), a book about the classification of plants (Ray /). The different European kingdoms were competing against one another on the amount of plants that they had brought back from what they called the ‘new world’ which they falsely classified as *terra nullius* which means nobody's land (Fitzmaurice 2007). The potatoes that they collected, the tobacco and all the other plants, did not just grow on their own, they were cultivated and bred by the local populations. The reason that the explorers (as they were called) took those plants was because they had seen them being used by the local populations. For John Ray (1682) the origins

of the plants did not appear in his classification. He never bothered to mention where the plants came from and in fact rejected the idea in plant classification. The plants were simply naturalized as though they inherently belonged in Europe. Those who read his books never got a sense that the plants were actually not from Europe and that they had been taken from indigenous people all around the world. All they got from his book was the mere classification without any thought for the indigenous population, of course he was never required to provide the origins of the plants since the land from which they came was classified as *terra nullius.* This was a blatant denial of prior knowledge that indigenous people had used in cultivating those plants.

This study of plant classification was further advanced by Carl Linnaeus (1707-1778) who provided a systematic classification of the plants that were being brought back to Europe. Linnaeus's disciples travelled to the places that previous explorers had visited so that they may study plants for the benefit of Europe. They did a study of these exotic plants by observing how the local people or savages as they called them, used the plant (Borch 2001). After a successful observation of how the local people used the plant, the Europeans would claim that they have discovered a new plant for the treatment of a particular disease (Zuckerman 1999). They would not mention that all they had to do was to just observe and write. They were claiming someone else's knowledge as their own. This was the formal beginning of appropriating indigenous knowledge for the benefit of colonizers. In 1874, Stephen Powers referred to the study of indigenous knowledge of plant species as aboriginal botany, by 1896, it had developed into a field called ethnobotany (Zuckerman 1999). These fields of study justified the appropriation of indigenous knowledge. They made it appear like a justifiable scientific inquiry for the development of Europe. When exploitative endeavors are justified through science, they become socially accepted because of the dominant power of the language of science.

The study of indigenous knowledge of plants took a new turn with the rise of pharmaceutical companies. These companies were set to follow on the footsteps of colonial power in expropriating indigenous knowledge without compensation. Unlike the voyages of discovery undertaken by Cook and others, pharmaceutical companies took on the voyages of research. The justification was no longer a discovery or Christianization of the barbaric world, it is now the scientific enlightenment of benighted people. Pharmaceutical companies through universities and research institutes began funding research into the commercial viability of plants. They were prospecting how the plants used by indigenous people could be commercialized and used for the large-scale manufacture of products. They called this action, bioprospecting. Walter Reid et al (1993,1)

defined bioprospecting as "the exploration of biodiversity for commercially valuable genetic resources and biochemicals" (quoted in Shiva 2007, 307).

Prospecting is an act used by oil companies when they want to find whether or not the oil or fossil fuel in a particular area is large enough and profitable enough to be drilled for commercial purposes (Neimark and Schroeder 2009). The fossil fuel then derives its value from its profitability in the market. However, plants do not derive their value from commercial profitability, their value is not determined by sales. This why scholar and activist Vandana Shiva (2007) argues that bioprospecting is an insufficient term and inappropriate for use in relation to living organisms. She argues that unlike fossil fuels which have remained in the earth for millions of years, biological substances have been cultivated, protected and utilized by many indigenous people for multiple generations (Shiva 2007). Plants have been bred over millennia by indigenous populations. They are the ones who have discovered how the plants can be used, they are the ones who have discovered which plants can be eaten and which ones cannot. Plants are part of their culture and their living economy. Bio-prospectors simply take this knowledge as though it is their own. They take this ancient wisdom as though they are the ones who have discovered it. Their only contribution is how to use the knowledge for large scaler industrial production. A similar stance is taken by Cori Hayden (2005) who also argues that bioprospecting is the greenification of what he calls "extractive colonialism" (Hayden 2005, 185).

The logic of bioprospecting is based on the idea of plants as the common heritage of mankind, free for the taking by anyone. This idea of plants as the common heritage of mankind was promoted by pharmaceutical companies and their research institutes to justify their intrusion into indigenous communities to study local plants in the areas (Peekhaus 2011). However, only the plants were rendered as a global commons, not the benefit that the companies were making from taking people's knowledge and turning it into a commercial product. Kloppenburg (2005) argued that plants come embedded with indigenous labour. This is due to thousands of years of plant breeding. He argues that even the earliest agriculturalists, those who used primitive tools, those who did not know anything about genetics, DNA or modern science, were engaged in some form of biological technology. After the harvest, the farmers would take seeds from the plants that produced the greatest yield and prepare to plant them for the following year while discarding those that had not produced enough harvest. This was a form of biotechnology because over time, the plant would come to be characterized by the best genes that yield the highest crop, can survive a pestilence and

can produce quality. The plants whose genes had not produced a sufficient harvest would be discarded and therefore genetically eliminated. This was a form of applied evolutionary science by indigenous populations (Kloppenburg 2005). Kloppenburg (2005) goes on to argue that this applied evolutionary science is what has sustained agricultural success and continuity for millennia. Thus, the plants that indigenous people use have not grown on their own, they have been selectively bred, hence such plants are intrinsically embedded with indigenous labour. Bioprospecting ignores this millennial collective innovation in favor of individual innovation by a company or scientist localized in a certain time and space (Shiva 2007). The case of Loren Miller vs the indigenous organization of the Amazon Basin demonstrates the lack of regard for indigenous labour that underpins bioprospecting. Loren Miller received a patent for a strain of the ayahuasca vine, a plant that is native to the Amazon (Fecteau 2001; Shiva 2007). The ayahuasca which means 'vine of the soul' has been used by traditional healers for millennia to treat illnesses, see visions, contact spirits of the plants and spirits of the dead (Fecteau 2001). It is an intrinsic part of worship to many indigenous people in Ecuador. In opposing the patent that was given to Loren Miller, Antonio Jacamijoy the then leader of the indigenous organizations of the Amazon Basin said that " our ancestors learned the knowledge of this medicine and we are the owners of that knowledge" (Fecteau 2001, 70).

In 1999, the US Patent and Trademark office officially revoked the patent on the basis that it did not meet patentable standards since it was not novel, there was nothing new which he had discovered, also it did not meet the standard of non-obviousness since for generations its uses were obvious among the indigenous populations for whom it is endemic (Shiva 2007). Although his was a victory for Jacamijoy and the people of Ecuador, there is not much to celebrate for those who call this action by Loren Miller biopiracy. This is because one has to ask, how was he able to even get a patent for such an obvious plant which is famously used in the Amazon Basin? Also, if the patent had not been opposed, Miller would have continued to hold the patent even though it did not meet patentable standards. Thus, critics of bioprospecting use examples such as this patent to show how the term bioprospecting is in fact a biological crime against local communities whose knowledge is commercialized without their consent or even notification.

There are numerous examples of indigenous knowledge of plants being exploited without opposition from the local people, the example of the *maytenus bechunin* is a case in point. The local Digo people in Kenya had used the maytenus for centuries to treat many kinds diseases and illnesses (Mugabe 1999). They had also used it to treat cancerous conditions. Although they did

not have the technology to diagnose cancer but when they came across incurable illnesses, they used the maytenus to manage that sickness. The National Cancer Institute (NCI) of the United States collected more than 27 tons of the shrub from the 1970's to screen it for potential use in cancer treatment (Mugabe 1999). Indeed the NCI found that the shrub produced maytansine which is a breakthrough treatment for pancreatic cancer (Mugabe 1999). There was no remuneration to the local Digo people through whom the NCI heard of the shrub and learnt of its uses (Mugabe 1999).

Biopiracy emerges as a concept to highlight and fight such practices. It first enters the Oxford English dictionary in 1993 (Rangnekar 2015). Since biopiracy is an ancient practice, why did it gain an ascendency of academic attention in the 1990's?

The 1990's saw the end of the protracted Cold War between the Soviet Union and the United States of America. The failure of Gorbachev's *perestroika* and *glasnost* policies to rescue the collapsing Soviet Union had finally led to its crumbling in 1989. This also represented a change in academic focus or something that Marek Kwiek (2015) calls a transition of academic generations. Scholarly articles and books are often dominated by the prevailing politics of their time and some things are neglected not because they are not important but because the times or the academic generation is currently focusing on something else (Kwiek 2015). So, the shifting focus away from the US and USSR tensions helped issues from the global south to gain academic recognition. The fact that biopiracy even became an acceptable term that academics like Vandana Shiva (1999), Bsumek (1999) and others could use, shows an anti-imperial literature in biological specimen emerging in the 1990's. Imperialism is sustained by the power to form narratives and the prevention of others from forming any other counternarrative (Ingram, Ingram, and Lejano 2019). The fact that scholars from the global south were able to reject the narrative of bioprospecting and replace it with a narrative of biopiracy shows an anti-imperial approach in literature emerging from the global south mostly led by ecofeminists.

Adding to this, Chris Hamilton (2008) argues that the term biopiracy gained traction in the 1990's due to the media exposure that alleged cases of biopiracy received. On the 27th of November 1995 the *New York Times* published an article on Patent number 5397696 on a Papua New Guinea human T-lymphotropic virus (Riordan 1995). The US National Institute of Health had patented a cell line in the blood of Hagahai people. The cell line in the Hagahai people contains a benign virus strain that in other people would normally result in leukemia virus but to them, it is simply inactive

(Riordan 1995). The story had earlier appeared in *The Independent* on the 19th of November 1995 and the article opened with this first sentence, "The US government has quietly taken legal possession of the genetic code of a living tribesman in a third world country" (Lean and Wilkie 1995). Such cases gained global attention. This attention transcended in questions about the way in which indigenous knowledge was being treated by the global north. Also, questions about how indigenous knowledge could be protected began to arise as the issue of patents and indigenous knowledge gained media attention. The media is a powerful tool with the ability to shape public opinion and control public debate. This is because the media, especially news media, is for a lot of people, their first source of information since social media was not a powerful platform in the 1990's. It is because of this powerful influence of the media that Hamilton (2008) argues that biopiracy gained traction in the 1990's due to media attention.

Beside the media attention that biopiracy received in the 1990's, this was also a decade when the biotechnology industry boomed. The biotechnology industry had earlier boomed with the Rockefeller foundation's genetically manufactured crops which led to the green revolution in places like India. However, with the subsequent decline in the success of the green revolution's seeds and the catastrophic social and environmental impacts that followed, the biotechnology industry took a decline. The rise in life patents as a result of the 1980 US Supreme Court case of Diamond vs Chakrabarty reenergized the biotechnology industry with new avenues of biological invention. Hamilton (2008) argues that Pat Mooney's 1979 book, *Seeds of the Earth* enlightened many scientists, scholars and politicians about the biotechnology industry. He quotes a critic of the book, Frankel who admitted that it is Pat Mooney's book *Seeds of the Earth* […] where many developing country delegates at the Food Agriculture Organization (FAO) learned of the whole topic of genetic resources" (Hamilton 2008, 7). This was coupled with a focus by the World Health Organization's (WHO) focus on new avenues of medicine. In the 1980's, the WHO was looking at ways in which herbs from traditional medicine could be incorporated alongside western allopathic medicine.

The failure of the green revolution had taught the developing world to better protect its seeds and its biological diversity. Thus, the new wave of biological and genetic engineering was received with much skepticism and fear by the developing world. The biotechnology industry thus faced opposition and accusations of biopiracy underpinning some of its practices. Also, the developing world had learnt that "[w]here as germplasm flows out of the South as the 'common heritage of

mankind', it returns as a commodity" Kloppenburg (quoted in Hamilton 2008, 7). This is the historical development of the practice and concept of biopiracy.

Methodology

This research is an attempt at understanding subaltern responses to biopiracy propagated by global patent laws. It seeks to understand the strategies, policies and laws that have their origin in the marginalized of society. Merriam and Merriam (2009) argue that there are two categories of research inquiry; basic and applied. Basic refers to that type of research whose main goal is to add to the body of knowledge concerning a particular phenomenon while applied research is aimed at improving practice and policies in a field (Merriam and Merriam 2009). This research falls into the first category of basic research because its main goal is to understand the phenomenon of biopiracy and oppositions to it. Although basic researches can ultimately have policy and legislative implications, what sets them apart is their initial purpose which in this case, is to understand how the subaltern have resisted biopiracy. To pursue this undertaking, the research question is framed as follows: *What strategies have been used by subaltern populations in the global south to resist biopiracy propagated by patent laws since 1994*. The way in which the subaltern has resisted biopiracy is the main object or variable of study in this research. Therefore, since resistance strategies are the thing being studied, they are the dependent variable. The nature of the global patent laws determines the type of subaltern resistance hence, global patent laws are the independent variable. The harmonized nature of global patent laws makes them independent of any one state hence, they logically serve as the independent variable.

The subaltern are people, they have emotions, beliefs and they attach certain meanings to what they do. When they resist biopiracy, there is meaning attached to that. For example, when the subaltern in India resist a patent for a neem tree, there is deep meaning attached to that (as this research will show) thus, a quantitative inquiry of the frequency of resistance or a tabulated formula would be inadequate in understanding those meanings hence, this research will use a qualitative approach. This is because the qualitative approach helps in understanding contextual perspectives of social events and human behavior while capturing all the nuances that numerical quantifications cannot explain (Merriam and Merriam 2009). Although qualitative studies are best suited for understanding meaning, they are also vulnerable to biasness, oversimplification and misinterpretation (Peshkin 1988). As a qualitative approach, this research aims at a rational way of interpretation, one that does not assume or exaggerate but lays the facts as the basis of

interpretation. The researcher takes the primary role of interpretation and analysis in a qualitative study hence, there is the possibility of subjectivities however,

> "*One ' s subjectivities can be seen as virtuous, for it is the basis of researchers making a distinctive contribution, one that results from the unique configuration of their personal qualities joined to the data they have collected*" (Peshkin 1998, 18. quoted in Merriam and Merriam 2009, 15).

This research cannot be able to analyse subaltern strategies for resisting biopiracy in the entirety of the global south. The global south is not only too big in terms of geography, it is also diverse and laden with many peculiarities that cannot be simplified to give one picture, as a result, this research will use two case studies as a sample for the global south. The case study method is chosen because case studies give the researcher an opportunity to focus on specific cases that exemplify the phenomena and research subject. Case studies provide boundaries, clarity and focus. It would not be pious nor workable to try and analyse each state in the global south but through case studies, the matter can be analysed in depth. Case studies do not require any particular method of data collection. The case study itself represents peculiarity and not the methods used to collect data hence through case studies that peculiarity is analysed in context. Since case studies are located within a certain context or geographical location, they make it easier for another researcher to replicate the study or to verify the findings.

This research focuses on two case studies; India and Ecuador. This research has chosen two case studies so that it can be able to have a more thorough introspection of its subject matter. Two case studies are manageable and are easily interpreted and they offer a good sample size. The two states were chosen because they are in the global south. The global south is not a geographical term but a socio-economical term that is used to refer to developing countries include those branded third world countries (Pandey 2013). The choice of a case study is determined by the research topic therefore, since this research is focusing on countries in the global south, India and Ecuador will be good research samples. These two cases represent the global south quite fairly. India is a fast-growing economy in the global south that seeks its place among the world's superpowers. According to scholars such as Destradi (2018), India has a foreign policy characterized by reluctance. Like other regional powers, India finds itself contradicted on whether to fundamentally change the global system such as the global patent regime or use it to its own advantage. India

represents those developing nations who have benefited from the neoliberal system while simultaneously being a victim of it. Indian companies have benefited from the neoliberal privatization of medicine yet, they have suffered at the neoliberal change of patent laws that make them vulnerable to outside competition. India had a process passed patent system that benefit Indian companies while simultaneously keeping drug prices relatively low however, the global patent regime requires that a state should have more than a process-based patent model but product patent as well (Sundaram 2014). India also represents the dilemma between ecological feminists, liberal feminists and fundamental religious feminists who advocate for extreme Hinduism. India has a patent history stretching to colonial times. Medicines and spices made India lucrative for colonial companies and the British colonial government introduced a patent act as early as 1856 (Baviska 2019). Post-independence India set up the Ayyangar commission led by Judge Rajagopala Ayyangar (Baviskar 2019). This commission was set up to investigate the patent laws in India and as well as who held those patents. The commission found that 90% of all patent were held by foreign companies (Basheer 2018). This shows that India has long had a vibrant patent critique with academics, NGOs and civil society coming together to force the government to change the old colonial patent laws. This makes India a good case study. Post 1994 India has passed the 1999, 2002 and the 2005 patents amendment acts in its attempt to keep up with its obligations under the WTO (Basheer 2019). These are the things that make India a suitable microcosm of the global south.

Ecuador has one of the world's highest concentration of biodiversity although it is no bigger than the US state of Arizona (Guevara et al. 2020). Besides that, Ecuador represents those countries in the global south where indigenous women have been at the forefront of ecological politics. The 2008 constitution was a culmination of the years that indigenous populations, especially indigenous women have called for the recognition of the rights of mother earth in the constitution. It was a watershed moment when a state enshrined environmental rights in its constitution. This law came about because of the vibrant environmental activism in Ecuador. According to article 72,

> *"Nature has the right to be restored. This restoration shall be apart from the obligation of the State and natural persons or legal entities to compensate individuals and communities that depend on affected natural systems"* (Tanasescu 2013, 855)

Thus, it can be argued that the Ecuadorian constitution provides a possible legal framework for challenging patents that do not restore nature or compensate communities who dependent on the natural systems. This makes Ecuador a good case study for the research.

The qualitative data required for this research was collected through document analysis. Documents are not only written papers but also visual, and digital materials as well as artifacts that represent forms of communication (Merriam and Merriam 2009). The search for documents and the types of documents used was guided by the research question. Events are documented and documented events that show indigenous resistance against biopiracy was used for this research. The documents were analyzed with an awareness that some documents like official press releases from government departments can be laden with political rhetoric and falsehoods. To verify the authenticity of the document claims and assertions, the research compared the documents with other information pertaining to the contents thereof. Particular emphasis was paid to primarily documents that detail firsthand information relevant to the time and place.

Secondary documents which detail events from an interpretative approach were used with a caution towards their potential biases. Besides the possibility of bias and propaganda, documents have other limitations such as being inadequate at times in describing an even in detain with the emotive force with which it occurred. This was best dealt with by considering multiple documents which detail an event from various angles with different nuances brought up. The understanding of biopiracy and global patent laws is best assessed through international as well as state documents like WTO guidelines which are readily available on the website of the organization. Patent laws are written as legal documents through acts of parliament and bills thus, analyzing them is best done through document analysis hence this was the method this research pursued. This research combined data collection with simultaneous analysis. Since the data was collected in line with the main research question, it was analyzed as it was being collected to avoid the data being overwhelming or repeating the same thing. The problem with documents such as academic articles that deal with biopiracy is that they lack examples and focus more on the theoretical underpinnings. This poses a challenge however, when the theoretical underpinning of academic articles is combined with an analysis of the work of NGOs and other movements, the challenge was handled. The research findings are based on the evidence that was assessed, this is to ensure internal reliability and the transferability of the research. The data was also assessed through multiple angles to ensure its reliability and the reliability of the research as a whole. Qualitative research is not about finding objective truths because interpretation, which qualitative research focuses on, is

subjective (Merriam and Merriam 2009). However, that subjectivity in interpretation is what gives a qualitative research its uniqueness.

Chapter 3: The global patent Regime

In the WTO intellectual property rights relating to living organisms are covered under TRIPS (Shiva 2016). TRIPS is modelled after the US patent system. Scholars argue that the US used its position as the sole global power in the 1990's (after the collapse of the USSR) to create a global patent regime with US characteristics so that it would be easier for US companies to maintain their global dominance in the international market. The global patent regime was presented as a measure to protect intellectual property, promote innovation and ensure transparency since a patent is a disclosure of how a product was made and how it differs from others as well as ensuring exclusive ownership and control. The United States Patent and Trademark Office (USPTO) defines a patent grant as, "'the right to exclude others from making, using, offering for sale, or selling' the invention in the United States or 'importing' the invention into the United States" (Dwyer 2008, 232). Before the TRIPS agreement, intellectual property rights were regulated by the World Intellectual Property Organization (WIPO) through international treaties like the Paris Convention on Industrial Property (Sundaram 2014). TRIPS emerged as more than just a treaty or convention but as an entire regime for regulating intellectual property including patents, therefore, this section will discuss the global patent regime and its role in biopiracy.

Patent regime modelled after the US patent system.

The second world war decimated many European economies, destroyed European industries and a lot of professionals were drafted in the army while many companies had a sole focus of providing what was needed in the war rather than products for civilian use. This left the United States as the sole global economic power. In 1941, Henry Luce, one of the most influential journalists of his time published an article in Life Magazine declaring the beginning of the 'American Century'(Meinderts 2019, 1). It was a time when the United States would shape the world after its own image and its own likeness. With the defeat of the Nazis and the road to recovery by European economies, the United States was well aware that Europe would go into a protectionist phase to help its war torn industries compete with the United States thus, the United States pursued an international agreement that would protect its companies from such tariffs, in 1947, the general agreement on trade and tariffs was signed in Geneva. However, the founding of GATT may have

gone a long way in protecting US companies from tariffs, but it did not protect their intellectual property. The US need a global patent regime to do that.

The United States had a well-established patent regime. As early as 1930, they had passed the Plant Patent Act (Fowler 2000). It was the first act to legalize the patenting of biological material (Fowler 2000). In 1970, the US passed the Plant Variety Protection Act which granted breeders patent rights over plant varieties that they had developed. Four years later, the Nixon administration with pressure from pharmaceutical companies sought legislation to impose penalties on any country that violated the intellectual property of US companies. Thus, in 1974 about twenty-one years before the Marrakesh Agreement that founded the WTO, the United States passed the 19th act of the 93rd US congress known as the 1974 Trade Act (Fowler 2000). The act is known for section 301 which gives the president power to impose trade sanctions on any country that does not have adequate intellectual property protection in its legislation or is unfairly trading with the US (Meinderts 2019). Section 301 gives the United States Trade Representative (USTR) the power to investigate a country's trade policies and if they do not meet US standards for intellectual property rights protection, such countries can be put on the 'watchlist' of states with potential intellectual property infringement (Ho 2006, 384). The USTR can also put states on another list called 'the priority list' if they are found to severely risk the intellectual property of US companies (Ho 2006, 384). The president can then impose trade sanctions on any state that does not meet the US intellectual property standard. The 1979 amendment to the act gave private companies or other private entities, such as interest groups, the power to formally ask the USTR to launch an investigation into the intellectual policies of states. The USTR would have to provide adequate reasons to refuse such an investigation request. This gave power to private entities to force the US government to investigate the policies of states and to enlist or even worse, impose sanctions on any state that did not adequately protect intellectual property (Ho 2006; Meinderts 2019). As further development to the US patent system, the US Supreme Court made a profound ruling in 1980. In a five to four ruling, the Supreme Court ruled in favor of the biochemist Chakrabarty who had been refused a patent for a living bacterium which he genetically engineered to eat crude oil (Kevles 1994). This infamous case of Chakrabarty vs Henry Diamond enabled the patenting of life forms or living beings.

Since TRIPS follows the US system which requires that for a patent to be granted, the invention must be new, useful and non-obvious. The most contentious of these requirements is that of being 'new'. What constitutes a new invention? This has been the subject of much debates in TRIPS agreements as each state has its own definition of 'new.' The US has a relative definition of what constitutes a new invention. In the US, an invention is new as long as it is new in the US and not documented in a foreign country. This relative definition of new was further enforced in 2000 when the US Congress passed section 102 of the US code regarding patent laws. Section 102 states that a person can obtain a patent grant unless;

"1.The invention was known or used by others in this country or patented or described in a publication in this or a foreign country before the invention thereof by the applicant for patent, or

2. The invention was patented or described in a trade publication in this or a foreign country or in public use or on sale in this country more than one year prior to the date of the application for patent in the United States" section 102 of the 35th code (grounds for patentability) quoted in (Shiva 2010, 503).

This makes it clear that unless the prior art is document in a foreign country, it is not counted as being known in the US. Just because the practice is obvious to the local population and has been utilised for millennia it can still be patented in the US as being novel. This has a significantly negative effect on traditional knowledge since much of it is oral and not document.

Unlike the US which has a relative novelty standard, the EU has an absolute novelty standard meaning that none can obtain a patent based on information that is known elsewhere in the world even if that information is not formally documented. For example, the European Patent Office (EPO) revoked a patent for the neem plant after a ten-year legal battle between the Indian government against the company W.R Grace and the United States Department of Agriculture (USDA) which jointly held the patent. Patent no 0426357 was initially granted in 1994 for a fungicide and insecticide derived from the neem tree (Hamilton 2006). The Indian government had argued that the patent was granted on grounds that were not new. For centuries Indian healers had written manuscripts about the use of neem as a pesticide as well as a fungicide (Shiva 2010). W.R Grace and the USDA argued that their product had new functions that did not match those of the original neem tree.

The Indian government had to obtain affidavits and interpret ancient texts to show that the knowledge of the neem trees' fungicide and pesticide properties was known, used and documented. This case took ten years to decide and the most important question was, what constitutes a new invention? As result of the judicial precedent proceeding from this case, the EPO now has an absolute definition of what constitutes a new invention meaning that an invention is new, if it is not known anywhere else in the world (Ho 2006).

There are obvious parallels between the US domestic patent law and the TRIPS agreements. As from 1974, failure to meet US intellectual property rights protection standards made a state vulnerable to trade and economic sanctions, by 1999, the TRIPS agreement was coupled with a similar threat to all states that did not meets its standards. The 1979 amendment to section 301 gave private companies power to compel the US government to investigate and impose sanctions on any country that did not provide adequate IP protection. The TRIPS agreement gave this power to companies around the world. The case of Chakrabarty vs Diamond enabled the patenting of living beings, article 27.1 of TRIPS stipulates that, "patents shall be available for any inventions, whether products or processes, in all fields of technology" (Correa 2019, 3). All fields of technology include biotechnology, microorganisms like fungi and bacteria and it also includes the human genes as well therefore, article 27 simply globalised what used to be a US policy

Failure of TRIPS to prevent biopiracy

TRIPS requires all signatory states to pass laws that extend "patent coverage into the realm of ownership and commercial control of DNA, molecular life, cells and other elements of biology and genetics" (Goyes and South 2016, 559). For example, prior to signing the TRIPS agreement, many countries in the global south did not have laws that enabled the patenting of biological and genetic material like the United States. However, as members of TRIPS, they are obliged to provide adequate legislation that makes such patenting possible. This is despite protestation from countries in the global south, for example the African Group representing African states has argued that,
''plants and animals as well as microorganisms and all other living organisms and their parts cannot be patented and that natural processes that produce plants, animals and other living

organisms should also not be patentable'' (Action-Aid 2002;2 quoted in Goyes and South 2016, 562).

These calls have gone unheeded because under the TRIPS agreement plants must be 'protected' or brought into the legal framework either through a sui generis mechanism of legal protection or through patents (Corson and MacDonald 2012). By privatising genetic and biological material, Corson and MacDonald (2012) argue that TRIPS was being used as a tool of enclosing the means of production for the purposes of capital accumulation. Many countries in the global south did not have patent offices that were advanced enough to verify the legitimacy of a patent application (Oke 2015). They did not have the personnel nor the skills to do a thorough check on patent applications hence they merely signed on and gave patent grants without any voracious background check. Also, they are reluctant to challenge unfair patents that have been obtained in foreign countries but based on the exploitation of their traditional knowledge due to the fear of upsetting their trading partners (Laurens et al. 2015). For example, the neem challenge was brought by scientist and activist Vandana Shiva and the government was hesitant because it did not want to upset the US and the EU.

The problem is that TRIPS has failed to prevent the attainment of patents for knowledge taken from indigenous peoples because TRIPS focuses on free trade and not biodiversity protection or indigenous knowledge protection. By its definition, a patent is granted for the purposes of giving exclusive rights to the inventor of a novel product (Dwyer 2008). It is the monopoly nature of a patent that proves to be problematic for collective biodiversity. It is also hard to justify monopoly of use for plants that have been the biological commons of communities. Thus, the nature of patents and the nature of traditional knowledge is inherently different. Traditional knowledge is understood (with bias) as a form of communal heritage, a common heritage that is communally shared, modified and developed while a patent is a recognition of individual effort, invention and monopoly of use. The TRIPS agreement is concerned with freeing the markets of signatory states and protecting intellectual property with a very narrow and western conception of what constitutes intellectual property. Countries that fail to open up the markets and protect the intellectual property could face trade sanctions that would have a devastating effect on any economy.

Also, what is problematic is the fact that matters which appear before the WTO's TRIPS council are matters that concern the violation of the TRIPS agreement not matters relating how TRIPS violates or trumps other international agreements such as the CBD. The US and the EU repeatedly reject subordinating TRIPS to the CBD arguing that TRIPS cannot be subjected to another global

agreement (Shiva 2010). This shows that trade agreements take precedent over environmental laws and environmental protection (Goyes and South 2016, 561).

The 1971 Strasbourg agreement concerning International Patent application established the International Patent Classification (IPC), The main goal of the IPC is the,

> "*establishment of an effective search tool for the retrieval of patent documents by intellectual property offices and other users, in order to establish the novelty and evaluate the inventive step or non-obviousness (including the assessment of technical advance and useful results or utility) of technical disclosures in patent applications" (WIPO 2005: 7).*

This agreement has dismally failed to protect the prior art of indigenous peoples.

Developed countries such as South Korea, Japan and the US argue that TRIPS should not be amended because it is a just the most basic agreement leaving the final decision to individual patent offices of states. They argue that an amendment of TRIPS would take power away from states and would thus violate a state's sovereignty. They also argue that to put so much requirements will make companies reluctant in applying for a patent and that would go against the very idea that underpins a paten which is technological innovation. This, they argue, would increase biopiracy since companies will be reluctant to pursuing patents. They also argue that this would put an undue burden on the patent offices who would be required to check if the information is correct. Patent offices would not be able to handle the administrative nor the financial requirements that such amendments would bring to a patent application (Corson and MacDonald 2012). TRIPS is further undermined by bilateral agreements between major economic players such as the US and the EU. They have come up with agreements known as TRIPS-plus agreements. These bilateral and multilateral agreements undermine any attempt to reform TRIPS because even if it was reformed, these agreements would make it difficult to trade with certain blocs such as the EU. For example, Colombia passed resolution 970 of 2010 (Goyes and South 2016). Under article 21 of the resolution, any person transferring a seed or selling or storing must be registered with the Agricultural Institute of Colombia and the registration costs about $683 in a country where the average wage is $298 (Goyes and South 2016). This has made the storing of indigenous seed illegal because they have not been approved by the state since it favors the genetically modified seeds. Colombia passed this resolution because it wanted to comply with the terms of a trade agreement that it has signed with the US and the EU. Failure to comply with this requirement, Colombia would face trade sanctions from the US and the EU. This is an example of what Karl Marx [1867]

(1967) called primitive accumulation which is removing from the producer (the farmers in this case) their means of production (seeds) thus making them rely on capital and market forces for their sustenance (Corson and MacDonald 2012).

TRIPS make it easy to obtain a patent. An individual or company can apply for a patent either at the national, regional or international level. Multilateral agreements at regional level such as the Patent Cooperation treaty which has 128 members, the Gulf cooperation Council with six members and the Eurasia Patent Convention with ten members, can all issue patents (Oke 2015; Correa 2019). Such Patents are then binding to all member states. Any potential trading partner must also abide by such patents. Companies can also use the Patent Prosecution Highway (PPH) (Müller, del Carmen, and Pérez Restrepo 2016). The PPH enables a company to get a patent in one state and use that positive patent application to get a patent in another state on the basis that the patent was already received by the company from a PPH participating state (Pitts and Kim 2009).That means that if a company receives a patent in a PPH participating state, it does not have to reapply for a patent in other PPH member states because the granted patent covers all PPH states. The PPH is supposed to facilitate free trade and save patent offices the time and money needed to verify a new patent.

Failure of the compulsory licensing provision

Under article 5 (a) TRIPS does allow for states to pass compulsory license laws. A compulsory license is a right given to a third party to exploit a patented invention in exchange for royalties (Thach and Marsnik 2009). The compulsory license is given to a third party if the government deems such action to be in the public interest. States do have laws that enable the government to give the compulsory license in cases such as health and food. Compulsory licenses are difficult to issue as they have to meet the strict TRIPS under article 31(b) which states that a compulsory license can be issued by the state if ,

"prior to such use, the proposed user has made efforts to obtain authorization from the right holder on reasonable commercial terms and conditions and that such efforts have not been successful within a reasonable period of time" or "in the case of a national emergency or other circumstances of extreme urgency" (Kehl 2002, 143).

although this provision exists, it is difficult for it to be exercised by developing countries. Firstly because they do not want to upset their trade partners who are essential for economic growth,

secondly there is no available third party to be given the license and even if there is such a third party, the threat of economic sanctions from western countries is enough to deter them (Oke 2015). Another reason the compulsory license tool is not used by developing countries is that they have already passed laws that forbid such actions. For example, it is in the national interest for local farmers to have seeds to grow. It is also in the national for farmers to share seeds. However, due to laws that ban the distribution, storing and planting of certain seeds (usually indigenous seeds) the national is interest trumped in favor of monopoly seed companies like Monsanto. Thus, many developing countries cannot use compulsory licensing due to the embedded neoliberal constitutions that they have. Wyatt (2015) argues that such biopiracy is supported by the legislative requirements that TRIPS demanded, justified by science and promoted by a biased media that has little regard for indigenous knowledge. The Convention on Biological Diversity arose out of the alarming rate of biodiversity loss and species extinction. The next section will analyze its role in the global patent regime.

The Convention on Biological Diversity

The Convention on Biological Diversity (CBD) was signed at the earth summit in Rio de Janeiro in 1992 by 156 states (Steinberg 1998). It is a legally binding document that obliges all signatory members to implement its resolutions. The three main objectives of the treaty are: firstly, biodiversity conservation secondly, sustainable use of biodiversity and its components and thirdly, a fair and equitable sharing of all the benefits that come from utilizing genetic resources (Steinberg 1998; Reimerson 2013). It was a response to the alarming rate at which biodiversity was being lost in the 1980's and 1990's. 27000 species of flora and fauna were going extinct annually in the tropics due to habitat destruction caused by farming, logging, housing and other commerce (Steinberg 1998). The CBD established the Global Environmental Facility (GEF) as a financing mechanism to help members implement the goals of the CBD. Rich industrialized countries pledged to financially support developing countries to protect their biodiversity and use it in a sustainable manner and the GEF would serve as the means of facilitating that aid. As a way of getting all the different states to agree to the establishment of the convention, the CBD avoided any form of strict and specific regulations with regards to the environmental and social issues that it had identified and instead opted for a weak set of goals and wishes (Steinberg 1998). This compromise left the CBD without any enforcement and regulatory capacity.

The pollination crisis is an example of the ineffectiveness of the CBD due to its regulatory incapacity. At the Sixth Congress of The Parties (COP6) to the CBD held at the Hague in 2002, scientists and pollination experts presented findings on the urgency of pollination prioritization. They expressed concern over the incredible loss of bees and other insects due to pesticides and toxic farming methods. The CBD congress then adopted the International Pollinator Initiative (IPI) to address the pollination problem looming in the worlds agriculture (Williams 2003). Paragraph 11 of the COP6 of the CBD calls on governments and organizations to put measures in place to deal with the pollination crisis caused by the loss of insects especially bees. All members states fully endorsed the IPI and pledged to apply its recommendations accordingly. According to the IPI's adaptive management strategy, members states of the CBD would ban certain pesticides that were catastrophic to insects, they would priorities indigenous pollinator skills and knowledge all in the name of sustainable pollination management. However, the pollination problem has now culminated into a pollination crisis.

The CBD was intended to pursue a non-imperialistic form of biodiversity protection. Non imperialistic in the sense that biodiversity protection under the CBD would not follow the Yellowstone model of privatized conservation that forces local people to abandon their lands and create space for national parks. However, the intention of the CBD and the actual requirements of it are not the same. The CBD, just like TRIPS, emphasizes the privatization of biodiversity and it does not recognize common property because it emphasizes the privatization of the commons through 'common monopoly rights' (Martin and Vermeylen 2005, 38). The CBD is in a state of self-dissonance; it is trying to promote the protection of biodiversity and equal sharing of benefits whist it simultaneously promotes privatization. While the CBD has advocated benefit sharing, the United Kingdom Commission on Intellectual Property Rights found that only about 0,001 % of profits from drugs developed from traditional plants have actually gone back to indigenous populations (Martin and Vermeylen 2005). The difference between TRIPS and the CBD is that the CBD emphasizes benefit sharing although it does not have the capacity to implement that.

The CBD is further weakened by the fact the US refuses to ratify it. The Clinton administration signed the treaty in recognition of the urgency to protect biodiversity, but it failed to ratify the treaty. The US senate during the administration of President George W. Bush refused to ratify the treaty of the basis that it put unfair limits on the biotechnology sector (Maris 2005). Although the US did not ratify the treaty, it played a significant role in its formulation as well as its underpinning

logic. The logic of the CBD is that biodiversity should be viewed through its market value and its ability to alleviate poverty. Privatization of biodiversity is presented as being instrumental to alleviating poverty. The problem with this logic which the US shares with other western countries is that it ignores the social, political and cultural foundations of poverty. Poverty is presented as a financial problem without acknowledging the nuances that underpin it. As Foster (2012) argues, strategies that believe in privatization of biodiversity as a means of creating profit for the poor, end up depriving the poor of their "means of livelihood" (Corson and MacDonald 2012, 269).

Corson and MacDonald (2012) are suspicious of the very fact that the CBD negotiations began around 1980 at a time that neoliberal capitalism dominated global politics and neoliberal solutions which promote privatization, dominated international agreements. Thus, they argue that the CBD came as a spatial fix to the problem of environmental awareness which threatened the interest of capital. With the 1968 rise in environmental consciousness, capital sought ways of controlling the environmental global agenda by appropriating the movement. The CBD proved to be useful as it gave capital the power to control the global environmental agenda through the CBD and its GEF funding mechanisms which require the privatisation of biodiversity as a basis for funding (Corson and MacDonald 2012). As a result of its focus on business interests, the 2006 COP meeting of the CBD concluded that states must,

> *"Encourage national focal points, where appropriate, to include private sector representatives on national delegations to meetings of the Subsidiary Body on Scientific, Technical and Technological Advice, the Conference of the Parties, and other intergovernmental meetings, and nominate them to participate in technical expert groups*" (CBD 2006, COP8 Decision VIII/17).

Such prioritisation of the private sector has rendered the CBD ineffective in fighting biopiracy. The secretariat of the CBD established the Business and Biodiversity Program which prioritises the 'businesses of conservation. In the 10th COP of the CBD, The Economies Of The Ecosystems Programme, initially designed by the G8 was formally adopted by the CBD (Corson and MacDonald 2012). Such programmes show that the CBD is being used as a tool of marketizing biodiversity, accumulation disguised as conservation. With all its shortcomings, perhaps one of the major success of the CBD was to change the colonial idea of 'the common heritage of mankind'. The developing world had learnt that "whereas germplasm flows out of the South as the 'common heritage of mankind', it returns as a commodity" Kloppenburg (quoted in Hamilton 2008, 7). Declaring states as sovereign over their biodiversity was a step in the right direction for the CBD

although that is undermined by the fact that the ‘sovereignty’ is subject to TRIPS and other international agreements that transcend any one state. Even the very act of declaring states as sovereign over their biodiversity was nothing more than giving states “what arguably was already theirs” (Dorsey 2004, 141).

Chapter 4: India

India is one of the most biodiverse areas in the world. Its biodiversity has sustained maharaja dynasties for centuries. India has about 81000 different species of fauna and 47 000 species of flora (Bhattacharya 2014). Beyond that, about 15000 species of flora are unique and found only in India (Bhattacharya 2014). This rich biodiversity has enabled many to survive in a state where about 70% of the population still depends on land-based occupations for its sustenance (Bhattacharya 2014). This is the living economy that enables many rural people to sustain themselves outside of market prices and forces (Patel 2013). Although India has vast biodiversity and natural wealth like much of the global south, it does not own a lot of biological patents. About 97% of biological patents are owned by western countries who only have about 10% of the world's biological wealth (Bhattacharya 2014). However, there has been a pushback from the local communities in India against the patenting of their biological diversity. This section will map some of the things that they have done to fight back against biological piracy.

From process to product patent (1970 Patent Act to the 2005 Patent Act)

By 1947 when Britain ended their colonization of India, the laws of India were still colonial laws. The patent law in operation at the time was the 1911 Indian Patent and Designs Act. The first major post-colonial patent law in India was the 1970 India Patent Act passed by the government of Prime Minister Indira Gandhi. The Ayanger Commission discovered that close to 90% of patents in India belonged to transnational corporations and thus they wanted to change the situation hence article 5(1) of the 1970 Patent Act states that. In 1994 India signed the TRIPS agreement. Article 65 of TRIPS gave member countries up to ten years to change the national legislation in order to fully comply with the TRIPS agreement. India took advantage of this and they took ten years before amending their patent act in 2005 to become complaint with TRIPS standards (Thach and Marsnik 2009). The 2005 amendment changed the patent laws of India from process patents to product patents (Sundaram 2014). This is because prior to signing the TRIPS agreement, India issued patents for processes and not for the actual product when it came to food and medicine. This move by India is credited with creating an enabling environment for the country’s pharmaceutical industry to grow as well as kept drug prices at a low. However, the 2005 amendment as well as the 2002 amendment to the 1970 Patent act were not enough to remove India from the special 301 list by the USTR because of section 3(d) of the 2005 amendment.

Section 3(d) of the 2005 Patent Act enables the Indian government to issue compulsory licenses and also forbids the filing of patent for new medicinal substances unless they vastly differ from the old patented material and show therapeutic efficacy (Baker 2015). This is meant to prevent patent greening; when the expiration date of a patent draws near, patent holders tend to reapply for a new grant on the basis of having invented something else that differs from their original patent. Often times such claims are only based a minor adjustment to the original product. India is trying to prevent this because it enables patent monopoly longer than the initial 20 years.

Like much of the global south, India has experienced the exploitation of its biodiversity through unfair patenting. The example of turmeric and other plants are simply too numerous to exhaust. Its healing properties were recorded by Sushrutha 500 years before Christ (Velayudhan, Dikshit, and Nizar 2012). Prior to Susrutha's texts, turmeric had been used for healing about 1000BC. However, in 1995 the US patent office granted patent no 5401504 to DR Suman Kas and DR Hari Cohli of the Mississippi Medical Centre for using turmeric to heal lacerations, abrasions, minor cuts and treat chronic wounds. These ancient Susrutha, Ayurveda and Sanskrit scripts proved that turmeric had been used in India for millennia to treat wounds. The people already had this knowledge thus the use of turmeric for healing was not novel. As obvious as this case may appear, it took a strenuous two years of legal battling to finally get the patent revoked by the US Patent Office. The US Patent Office recognized the prior art concerning this patent because of the written court evidence submitted by the Indian government through the Indian Industrial Research Organization (IIRO) as well as the Council for Scientific and Industrial Research (CSIR).

The Traditional Knowledge Digital Library (TKDL)

Fighting patents in the courts of foreign countries is a reactive approach. India sought a proactive approach to prevent such unfair patenting in future. Therefore in 2001, the Indian government together with NGO's embarked on the creation of the TKDL (Ganesan 2016). The Indian government hopes that through the TKDL it can be able to present traditional knowledge as prior art thereby stopping the obtainment of a patent. Without a clear demonstration of prior art by the patent applicant, the application process cannot be successful. Also, even if the patent has already been granted, if prior art can be demonstrated, the patent will have to be revoked. The CSIR together with the ministry of Ayurveda, Unani, Siddha and Homeopathy put together the traditional knowledge information from the scripts that the ministry already held as well as a search of other texts kept in Temples and shrines (Velayudhan, Dikshit, and Nizar 2012). This knowledge is

digitized in German, French, Spanish, Japanese and in English. The patent offices of Germany, France, Japan, the United states and Australia have all been given access to the database so that they can use it to check patent applications that may be derived from Indian traditional knowledge (Ganesan 2016).

Many religious texts that contain knowledge of the healing properties of certain plants are considered sacred by the practitioners of the faith and they are not shared with outsiders. It then becomes difficult to include these in the TKDL because of the difficulty is obtaining such knowledge. There is knowledge held by many remote communities who are equally reluctant to share it with outsiders. Other communities primarily pass down knowledge of plants and their uses through dance, music and storytelling. The Baiga community which is mostly found in Jharkhand as well as Uttar Pradesh and Madhya Pradesh, is well known for passing down knowledge through tattoos, storytelling as well as art performances (Godbole-Chaudhuri, Srikantaiah, and Fleet 2008). They transfer what they call sacred knowledge of the soil and plants through these cultural expressions. The problem is that they are equally reluctant to share it with non Baiga people as it is sacred to them.

The TKDL is indeed an ambitious project from the start because, how can one document the traditional knowledge of over one billion people in India? Even with half that number it would still be enormously difficult. Although about 30 million pages have already been compiled, this is a small sample relative to the enormous indigenous knowledge that the 645 tribes of India possess (Godbole-Chaudhuri, Srikantaiah, and Fleet 2008). Thus, the TKDL is a project that aims to prevent the most obvious biopiracy not all of it. The TKDL is trying to 'modernize' traditional medicine at a time in which it has received increased attention from the west however, can the TKDL protect the cultural sustainability that comes with indigenous knowledge?

The TKDL is part of a broader attempt to document traditional knowledge and prevent biopiracy. The Foundation for the Revitalisation of Local Health Traditions has been working with the Biodiversity Management Committee to develop what they call the People's Biodiversity Register (PBR). The PBR was set up as a result of the Biological Diversity Act of 2002 which mandated the setting up of the Biodiversity Management Committee to work with local people to document all the knowledge of biodiversity in the natural areas in India. The state of Kerala which is very rich in biodiversity has promoted the idea of documenting traditional knowledge. NGO's in Kerala such as the Kerala Shastra Sahitya Parishad together with the Kerala Forest Research Institute have

worked well with the local Kani tribe to advance the development of the PBR. The PBR is developed through the local government *panchayats* system. The *panchayats* are village administrations or local government which are enshrined in article 40 of the Indian constitution and all states are constitutionally obliged to ensure that its *panchayats* are resourced enough to function well (Baviskar 2019). This closeness to the community has enabled the *panchayats* to be an effective way of developing the people biodiversity register because there is direct communication with the people.

The government of Prime Minister Narasimha Rao had a long consultative process in its attempt to develop the PBR. Although the law was ultimately passed by the government of Prime Minister Atal Bihari Vajpayee, the groundwork for consultation was already laid by Rao's government. It was Rao's government that caved into pressure from NGO's who were calling for a law to protect India's genetic resources (Anuradha 2001). In May 1994, a formal proposal was sent to the cabinet to initiate the process of passing a law to protect India's biodiversity. The long consultative process culminated into the National Consultation seminar in June, followed by the Swaminathan Committee, and another national consultation seminar in 1998. Besides the national forums, what drove the discussions were the local forums. For example, The Technology, Information, Forecasting and Assessment Council led biodiversity documentation among, "the Munnars in South Bihar, the Bhils of Madhya Pradesh, and the Tharus of the Terai region" (Anuradha 2001, 25).

Navdanya, an NGO founded by Vandana Shiva was working in Utah Pradesh as well as other parts of India to document communal knowledge of biodiversity in community biodiversity registers as well as preparing contributions into the PBR. Navdanya went further than mere documentation and introduced the idea of a sovereign community over its biodiversity, something that came to be known as the *Jaiv Panchayat* (Zarro 2017). The Jaiv Panchayat was launched by a coming together of over a thousand villagers in Agastyamuni Village. These villagers came together fighting for their communal rights to their biodiversity as well as their knowledge thereof. This movement of Jaiv Pachayats has spread to other parts of India where villagers have declared their villages GMO free zones (Kothari 2019). The movement has now become part of a larger movement called Bija Satyagraha (Zarro 2017). Bija Satyagraha or the fight of truth is about resisting biopiracy and its exploitation of indigenous knowledge as well as patent monopolies. It is a subaltern women led movement fighting against the criminalisation of seed saving as well as farmer to farmer seed exchange. In 1999, Navdanya organised over 2500 different subaltern groups to conscientize the

people about biopiracy and the threat it poses for their biodiversity and farming (Zarro 2017). On the banks of the Sabarmati river in Ahmedabad in the state of Gujarat, the Society for Research and Initiatives for Sustainable Technologies and Institutions (Sristi) has been documenting a Communal Biodiversity Library through the Honeybee Network (a village initiative of biodiversity documentation) (Isaak 2016). The Kalpavriksh and the Beej Bachao Aandolan (Save the Seeds Campaign) built a register of indigenous seeds starting from 1995 as an attempt to preserve indigenous seeds at a time wherein many such seeds are becoming extinct due to the illegality to keep, share and plant them as a result of GMO multinationals with patented seeds (Anuradha 2001; Nordin, Hassan, and Zainol 2012).

Challenges to traditional knowledge documentation

Although the documentation of traditional knowledge goes a long way in proving prior art and stopping patenting on the grounds that it lacks novelty, there are other concerns that are brought about by such documentation. The first challenge is that knowledge which used to be in secret will now be put out in the open. Knowledge of healing properties of certain plants which used to be secretly kept by traditional healers will now be in the open. For example, knowledge held by the Brahmin caste among Hindus is considered the sacred wisdom of the divine. It is held as secretive knowledge of the enlightenment that belongs to those who have read the *upanishad brahmanak* (Velayudhan, Dikshit, and Nizar 2012). Publicization of this knowledge can spur a lot of interest, research and ultimately the very patenting it was trying to prevent (Masango 2010). Secondly, the is the issue of ownership. Without clear legal ownership enshrined in the constitution, this knowledge can be easily exploited for personal gain by those who have access to it. For example, in Ernakulam local healers were concerned that if they revealed all their 'secret' use of plants to treat illnesses and snake bites then they will be out of business (Anuradha 2001). If everybody knows how to use plants to treat themselves there will be no need for the local healer. As a response to this, the register there only documents that a particular healer can use a certain plant to treat a particular illness without stating how. The same protection has been given to the TKDL. Although it is shared with foreign offices, it cannot be used for personal gain by those offices, it must be used only in situations where a patent is being verified.

Biopiracy threatens the cultural sustainability of communities. When communities who have been sharing seeds for millennia suddenly find that such sharing is illegal, they not only lose

economically (as they will rely on the patent holder to buy seeds) but they lose culturally and spiritually as well. This cultural and spiritual aspect is neglected by western states. Christianity and Islam dominate western conceptions of spirituality. It becomes difficult to understand the spirituality that an Indian community attaches to a seed, a tree or even a stone. For example, in the Bay of Bengal in the state of Odisha (formerly Orissa), human sacrifices would be offered to the gods in the hope that the turmeric production would be plentiful (Velayudhan, Dikshit, and Nizar 2012). The human sacrifice in the festival of Kedu Jatra was changed to a cow sacrifice in 1845 and that sacrifice continues. Turmeric is so religiously important that sacrifices are being made to the gods for it. Turmeric powder is also used as the highest offering to the goddess during the Sakthi worship (Velayudhan, Dikshit, and Nizar 2012). This demonstrates the religious significance that people for centuries have attached to turmeric. Indigenous knowledge capitalism ignores the cultural and spiritual significance of plants and animals to local people. India has about 2 million different gods expressed in many objects. Thus, defending Indian plants and especially seeds from being destroyed through patents is also a way of defending the cultural sustainability of its communities as well as the 'ecological intelligence' of the country (Godbole-Chaudhuri, Srikantaiah, and Fleet 2008, 280).

Indigenous knowledge has received increasing attention from global institutions like the UN from the early 1990's to date. The WHO has prioritized the linking of traditional medicine with allopathic medicine. The 1978 Alma Ata declaration of the WHO called on member states to priorities the use of traditional medicine in health (Addae-Mensah et al. 2011). In the 1990's, under Secretary General Boutros Boutros-Ghali the UN funded a lot of programs aimed at studying the integration of traditional and allopathic medicines. This reached new hights in 2001 when the African Union (AU) and the UN declared the decade 2000 to 2010 the decade of traditional medicine (Towns, Mengue Eyi, and van Andel 2014). For a lot of people in India, traditional knowledge is their first and most affordable source of healthcare. Although the prioritization of Indigenous medicine is a good thing, it is being done in a capitalistic way. This capitalist way ignores the communal context of indigenous knowledge. It brings the language of profit, privatization, patenting and monopoly thus stripping indigenous knowledge of its own cultural, communal and spiritual epistemologies (Godbole-Chaudhuri, Srikantaiah, and Fleet 2008). Thus, indigenous knowledge is being popularized for exploitation and control and not for the public good. Patenting of the neem and turmeric are evidence of this phenomena.

At the time the Marrakesh Agreement was being signed, the Food and Agriculture organization (FAO) was reporting in 1996 that seed exchanges between farmers was still the primary seed supply for farmers in the developing world (Shankar, Bennett, and Morse 2008). FAO also reported that about 1.4 billion farmers depend of farm saved seeds. This fact failed to stop the patenting of seeds which makes farmer to farmer seed exchanges illegal. The National Research Foundation of the United states released a report in 1993 stating that 6000 apple varieties are now extinct in the US and that by the 1990's, just two apple varieties accounted for 85% of the apples in the market (Shand 1998). The report also stated that in the Philippines, thousands of rice varieties have gone extinct and that two green revolution patented varieties now account for 98% of all plant varieties in that country. This monoculture destroys hundreds of years of indigenous cultivation, breeding and farming. This risks the future of food security. One pest outbreak is enough to cause a famine. Besides a pest outbreak, for many farmers the lack of money to purchase the expensive GE seeds is enough to cause a famine. Terminator technology developed by Delta and Pine Land CO, developed a type of seeds that kills its seed such that after harvest, it cannot be replanted. Delta and Pine Land Co was purchased Monsanto in 1998 (Shand 1998).

Chapter 5: Ecuador

Ecuador is the 17th most biodiverse country in the world. Its special geolocation relative to the sea, Andean Mountains and the Amazon rainforest have made the country to be one of the most species-rich and biodiverse places on earth (Dorsey 2004). Such rich flora and fauna have made the country a hotspot for bio-prospectors. Due to this rich biodiversity, the medical, food and spiritual use and general sharing of plants in Ecuador transcends the arrival of the Spanish. For example, the Ecuadorian *yachacs* or traditional healers were aware of the healing properties of cinchona and they had been using it to treat malaria since time immemorial. The Spanish learnt from the indigenous people who freely shared their knowledge about the use of cinchona to treat malaria cases. As the practice of colonialism goes, the Spanish gave little regard to the traditional healers who had shared this knowledge with them. Their main focus was to be praised as having discovered the treatment of Malaria, such is the exploitative nature of colonialism. The colonial exploitation practiced by the Spanish has transformed itself over the centuries however, it still has the same characteristics of exploitation, marginalization, and legal control over other people's land. Even coming to Ecuador was not on the main agenda of exploration. It was the search for *Tierra Del Canelo* or Cinnamon Land that drove the Spanish into the upper Amazon Basin of Ecuador (Dorsey 2004). Colonial exploitation has not rid Ecuador of its rich biodiversity, Ecuador continues to be a rich hotspot for biodiversity exploitation and its fragile political system has made it extremely vulnerable over the years.

After the negotiated transition to democracy in 1979, Ecuador has had its fair share of democratic instability (Alberts 2008). Three elected presidents between 1997 and 2005 were removed by Congress before they could finish their terms in office (Torre and Lemos 2016). President Abdala Bucaran was removed by congress in 1997 on accusations of insanity and mental incapacity, three years later, President Jamil Mahuad was removed on a charge of abandoning his power and in 2005 President Lucio Gutierrez was also removed on a charge of abandoning power and responsibility as president (Torre and Lemos 2016). Ecuador saw relative stability when President Rafael Correa took office in 2007 and governed the country for ten years. It was under his administration that Ecuador went into a phase of constitutional reform. The process of drafting the new constitution involved about 1500 delegates, 1000 proposals from civil society and 10 roundtables organized by the national assembly (Torre and Lemos 2016). The new constitution was a product of action from

below, from the subaltern however. The state embarked on such a wide ranging consultative process as a result of pressure from civil society, mostly indigenous groups.

This new constitution introduced the concept of *samak kawsay* (*buen vivir*) or good living as the basis of development (Appe 2015). This was a revolutionary idea known as the *revolución ciudadana* or 'citizen's revolution' (Jefferson 2018, 19). The citizen driven constitutional reform challenges biopiracy because it disembedded the state from neoliberal laws that priorities development characterized by a liberalization and privatization. The CBD and TRIPS advocate for privatization of nature while the Ecuadorian constitution advocates for the rights of nature thus, under TRIPS, nature has the right to be owned but under this constitution, nature has the right to intrinsically exist. As a result of its revolutionary foundations, the constitution of Ecuador has prevented global seed monopolies from controlling the flow of seeds in the country as well as the criminalizing of indigenous seeds like in Colombia. Section 71 of the constitution states that,

> *Art. 71. – Nature, or Pacha Mama, where life is reproduced and occurs, has the right to integral respect for its existence and for the maintenance and regeneration of its life cycles, structure, functions and evolutionary processes. All persons, communities, peoples and nationalities can call upon public authorities to enforce the rights of nature. To enforce and interpret these rights, the principles set forth in the Constitution shall be observed, as appropriate. The State shall give incentives to natural persons and legal entities and to communities to protect nature and to promote respect for all the elements comprising an ecosystem.* (Republic of Ecuador2008)

A patent monopoly takes away seed ownership, but this section of the constitution enshrines seed ownership for the people of Ecuador. This is what they fought for in the process of constitutional development. Usually, multinational seeds monopolies like Monsanto prefer states to have laws that forbid the individual ownership of indigenous seeds. They want their patented seeds to be the only seeds in circulation. This constitution prevents that. Article 56 goes even further by forbidding the entrance of trans genetic seeds to Ecuador unless granted special permission for research by the president (Jefferson 2018).

Despite these achievements, the subaltern is not uniform in Ecuador, this can be seen amongst subaltern women. Ecuadorian women are still disunited. This disunity is an example of the complex differences among subaltern women not only in Ecuador but around the world. Afro Ecuadorian and indigenous Ecuadorian women have been systematically marginalized in Ecuador dating back

to 1857 when they were given less rights than their white counterparts of European ancestry (Roitman and Oviedo 2017). This racism has served to disunite Ecuadorian women with those who identify as mestizos being in favor of western style development while indigenous and afro Ecuadorian women oppose such a form of development. For mestizo women who have benefited from the colonial racial profiling, their fear is losing their ethnoracial capital (Roitman and Oviedo 2017). This shows that the legacy of colonialism and the racism that it advocated which continues to disunite the subaltern in Ecuador. It has not been easy for women of color as well as mestizo women and indigenous women to see themselves as one united group. Historical injustices, cultural differences and the politics of identity continue to disunite many women along racial lines. This shows the complexities and nuances between and among the subaltern. It shows that although these women form the subaltern group, there are still quite a lot of historical, sociological and even geographical differences among them. For example, Afro Ecuadorian women mostly live in Esmeraldas bordering Colombia (Glidden and Shaffer-Cutillo 2017). Esmeraldas is one of the poorest provinces of Ecuador and the Afro Ecuadorians who mostly live there are the poorest people in the country (Glidden and Shaffer-Cutillo 2017). The Black Women's Movements of Northern Esmeraldas has tried to raise these issues with the governing authorities as well as calling for international assistance for Ecuadorian black women. Race is a big factor of disunity and so is education. Educated women are better off than their uneducated counterparts. They experience oppression differently. Their education gives them opportunities in work and society that other women either, mestizo, indigenous or black would not have. Education is still a major problem especially for Ecuadorian indigenous women. Only about 65% of indigenous girls get schooled (Glidden and Shaffer-Cutillo 2017). Thus, indigenous women still face a major problem of literacy. There is also very little coordination amongst female activists as indigenous women, Afro Ecuadorian, and mestizo women feel as if they cannot be properly understood by the other (Glidden and Shaffer-Cutillo 2017). These are some of the things that foster disunity among Ecuadorian feminists. Also, Many Ecuadorian activists are reluctant to even call themselves feminists as the term is sometimes used to refer to *machista;* women's domination over men (Glidden and Shaffer-Cutillo 2017).

In 2017, the government passed a law allowing the entrance of genetically modified seeds for research purposes arguing that such a step is in line with article 56 of the constitution which allows such GMO seeds for research purposes. Opponents argue that this will ultimately undermine

section 401 of the constitution which declares the country free of GMO seeds (Jefferson 2018). This is because they believe that university research will lead to a recommendation of allowing GMO seeds to enter Ecuador (Jefferson 2018). This is because some of the research is western funded thus, it can make green revolution type recommendations that will ultimately lead to the patented control of seeds in the country (Jefferson 2018). These types of research initiatives are technotopian and not people centred. They espouse for technological solutions to social and political problems like hunger. If the research yields positive results, it may result in the prioritisation of GMO seeds at the expense of indigenous seeds leading to farmers dependent on market prices for their survival.

The 2008 constitution, adopted by 64% of voters in the referendum was a watershed moment for Ecuador as it passed one of the most progressive constitutions in the world (Webber 2011). What impressed many around the world was that the rights of *Pachamama* or mother earth are enshrined therein. The President of the Constituent Assembly, Alberto Acosta proudly declared that, "Ecuador's Constitution is the only one in the world with this characteristic" (Webber 2011, 10). Alberto Acosta being a professor and environmental activist went on to argue that the drafting of this constitution was not the act of a group of enlightened people, but the continuation of a process of building alternatives' (Tanasescu 2013, 824). This is a subaltern idea that comes from the indigenous people who have always held the idea that all nature is alive and that every rock, tree or mountain has a spirit of its own. The Confederation of Indigenous Nationalities of Ecuador (CONAIE) pushed for the inclusion of the rights of nature despite pushbacks from the government which was accused of pushing for development based on the extraction of Ecuadorian natural resources (Peña 2016). Organizations like *Fundación Pachamama* and Acción Ecológica strongly lobbied the constituent assembly to adopt the rights of mother earth and they even went further to provide the assembly with multiple written submissions showing the intellectual and historical roots of the idea of the rights of mother earth (Tanasescu 2013). For the indigenous populations, the rights of mother earth have been intrinsically linked to their way of life but, as a juridical idea, the rights of mother earth gains traction with social movements such as *Fundacio Pachamama*.

The government conceded to the idea of the rights of nature due to a fear of what Jeffrey Webber (2011,9) calls the 'new indigenous left.' A radical left opposed to privatization, extractivism and the commodification of nature by capital is nothing new in Ecuador. Torre and Lemos (2016) argue

that it was Ecuador's left that resisted neoliberal polices in the 1990's and subsequently led to the removal of President Bucaran. The left became even more radical when some of the leaders in CONAIE participated in the 2000 coup that deposed President Mahuad and replaced him with deputy President Neboa (Tanasescu 2013). although General Guittarez and the army failed to take power for themselves, the power of the indigenous movement CONAIE was made evident (Peña 2016). CONNAIE's participation was one of the reasons that the coup had extensive support from civil society. Thus, by the time the new constitution was being drafted President Correira and the PAIS Alliance Party understood very well the influence of the indigenous left in Ecuador. This is an indigenous left that had long formed *anti-biopiateria* groups to fight bioprospecting.

After the constitution was passed President Correia soon turned on the indigenous groups. He claimed that "we always said that the main danger to our political project, after defeating the right in elections, are the infantile left, environmentalists, and Indianists" (Torre and Lemos 2016, 229). This has led to the arrest of over 200 indigenous leaders, multiple arrests of protestors, jailing of journalists, disappearances of activists, as well as the arrest of union leaders like Mary Zamora of the teacher's union and many student leaders (Peña 2016; Torre and Lemos 2016). Some scholars have argued that this is the 'slow death of democracy in Ecuador' (Torre and Lemos 2016, 221). This slow death of democracy has been coupled with an attempt to reverse the environmental gains in the constitution by introducing certain laws and amendments that make way for genetically engineered (GE) seeds. The Organic Law on Agrobiodiversity, Seeds and Promotion Of Sustainable Agriculture paves the way for the introduction of GE seeds into Ecuador (Luxbacher 2018). The bill was initially brought before parliament in October 2016 by the Ministry of agriculture and Livestock as a way of testing GE corn in Ecuador and it was passed on the 1st of June 2017 (Luxbacher 2018). Despite this unfortunate turn of President Correa, the idea of the rights of nature enshrined in law has gained continued progress and it does not even start in Ecuador.

Although Ecuador was the first country to recognize the rights of nature in its constitution, the idea had already been implemented in Pennsylvania in the US two years earlier (Tanasescu 2013). Schuylkill County in Pennsylvania became the first county in the US to recognize the rights of nature in its municipal laws. About twenty other progressive counties across the US have followed Schuylkill but those municipal laws are trumped by state laws which prefer environmental regulation over rights of nature (Tanasescu 2013). The Ecuadorian constitution is based on this growing movement of the rights of nature. The movement has moved across the globe with Bolivia

passing the rights of mother earth Law 071 in 2010 (Calzadilla and Kotzé 2018). President Evo Morales of Bolivia invited social movements and other state holders to the first ever People's World Conference on Climate Change and the rights of mother earth which culminated in an agreement known as the Cochabamba Accord (Turner 2010). Living in harmony with nature as the rights of mother earth envisages, has been the lifestyle of indigenous people for millennia (Appiah-Opoku 2009). However, the rise of the radical left with renounces carbon capital and green capitalism has forced governments in South America and around the world to take the Rights of Mother earth seriously. In New Zealand, Prime Minister Jacinda Arden's Labour Party passed legislation giving legal rights to the Whanganui river in 2017 (Nuñez 2018). Solon (2018) argues that the rights of mother earth dialogue comes from a deep ecology that studies the fundamental and structural basis of environmental exploitation and not just mere mitigation of short term green capitalistic solutions. He goes further to argue that although the terms 'rights of mother earth' and 'rights of nature' are used interchangeably, they are not the same. The very idea of nature, separate from humans is an anthropocentric idea that separates humans from nature thus, the 'rights of nature' excludes humans from nature perpetuating capitalist exploitation (Sólon 2018). What is required is the rights of mother earth, the mother of all life therein, based on the idea held for millennia by indigenous people that all humans are one with nature. Thus, Solon (2018) argues that the rights of mother earth is a way of life not mere sloganeering. Evo Morales was criticized for using the language of the rights of mother earth without renouncing the big extractive projects that damage the environment and displace many indigenous people (Turner 2010).

As a result of being a member of the WTO, Ecuador like other developing countries has had to prioritize access to its vast biodiversity. The belief is that if the government welcomes investment from multinational firms it will be on the path of development. Some of these investments are in mining, oil extraction, farming, biofuels and pharmaceutical industries. These are investments that are disastrous to the future of the amazon and the biodiversity of Ecuador as a whole. Uzendoski (2018) argues that the capitalism that has dominated Latin America is inextricably extractive. As a result, investments often propose a form of development that can best be described as extractive capitalism. The language of development serves to mask the true nature of the extractivism. It uses the state to protect its capital as well as justify its conduct while excluding the majority of the people from benefiting from their naturally endowed wealth (Uzendoski 2018). This puts the state in a difficult position, multinational companies bring huge mining contracts promising to hire

thousands of workers. Since employment is always a priority to any governing elite, companies take advantage of it and pursuer industries which in the long run, are catastrophic for the environment. The Ivanhoe energy project in Napo was an example of this. The state granted a mining contract to Ivanhoe despite protestations from civil society and thereafter, Ivanhoe was granted a petroleum contract (Uzendoski 2018). The government defended these contracts arguing that they would create jobs and that they were part of the development of Ecuador. In the global south this occurs too often. Politicians in their desire to have a quick fix easily submit to multinational firms. This serves to disunite the state and the people because as the protector of private property, the state stands on the side of the private firms. Hence, coordination between the state and civil society groups ends up being weakened. However, despite these contradictions the Ecuadorian state continues to fight for the protection of biodiversity.

The National biodiversity Working Group is tasked with ensuring access as well as benefit sharing from the country's biodiversity (Dorsey 2006). Foreign bio-prospectors must leave behind a sample of what they have extracted in the country to ensure that there is benefit sharing from potential outcomes that the sample can yield. Dorsey (2004) argues that due to lack of regulation and capacity, this hardly ever happens. Civil society groups such as Friends of the Earth Ecuador have over the years protested to force the government to take such matters seriously but to little avail.

The Andean region has sought three things from the Intellectual property agreements

1. patent applications must disclose the origin of their genetic resource
2. provide any traditional knowledge associated with that invention
3. Present evidence for prior informed consent

The three goals reflect the agreements of. In 1996 CAN passed decision 391 which established a regional legal structure that deals with access to intellectual property of genetic resources (Helfer, Alther, and Guerzovich 2016). Article 7 of the decision states that;

> *'The Member Countries, in keeping with this Decision and their complementary national legislation, recognize and value the rights and the authority of the native, Afro-American and local communities to decide about their know-how, innovations and traditional practices associated with genetic resources and their by-products'*(Jaramillo 2019, 620)

Decision 391 was a positive step which led to more coordination by member states on genetic resource and traditional knowledge protection. It was also effective in assisting those states which did not have genetic resource protection measures in their constitution. A regional approach also enables the CAN states to speak with one voice, small states have more impact if they approach a matter as group then when they speak alone. Four years later in 2000, CAN passed decision 482 (Jaramillo 2019). Ecuador alongside other Andean states, has advocated for the amendment of the TRIPS agreement for patent grants. Ecuador argues that there must be sufficient evidence of benefit sharing before a patent can be granted. They argue that the patent applicant must disclose all traditional knowledge associated with the patent for a genetic resource. The patent applicant must also disclose all evidence of informed consent.

Chapter 6: Conclusion

This research sought to understand the strategies that have been used by the subaltern populations to resist biopiracy, the looting of traditional knowledge of biodiversity without compensation, consent and acknowledgement of the centuries of contribution that local people have made to the biodiversity. Under direct colonialism, indigenous knowledge of biodiversity was being looted through the voyages of discovery and then to ethnobotany and in modern times, through bioprospecting. Thus, biopiracy as this research has shown, is not a new phenomenon, it is the manifestation of colonialism by other means. Brute force under direct colonialism was the means of exploitation but in post/neocolonial times, the global patent regime has sought to fill the legitimation gap of indigenous knowledge expropriation. Thus, the subaltern resistance to biopiracy propagated by global patent laws is not an easy fight. The global patent regime is strictly enforced through international private law to the benefit of large corporations.

The case studies demonstrate that biopiracy is interlinked with compliance with TRIPS patent standards. Those patent standards are non-negotiable for any state that wants to be a member of the WTO as well as for any state that wants to do business with the rest of the global economy. Failure to comply with these standards results in trade sanctions that could cripple an economy and cause an uprising against the government. The 'private law' nature of these patent requirements means that, states are not in a position to hold a consultative process to find out what their people really want. The case study of India demonstrates this. The people led by women's movements protested the 2005 Patent Act amendment that was meant to make India TRIPS compliant. Thousands of farmers, rural communities and even Indian pharmaceutical companies rejected the amendment to move away from a process-based patent regime to a product-based patent regime. Their protestations fell on deaf ears. It was not up to the Indian government to decide nor was it up to the Indian people to choose, it was all about TRIPS compliance.

These corporations do not solely rely on the international public law to further their interests, they also use regional bodies as well as bilateral agreements. As argued, bilateral agreements between states or trading blocs such as the EU have the power to pass intellectual property standards. these bilateral or even multilateral standards go beyond the TRIPS requirements in their enforcement mechanisms and their punitive punishment for non-compliance. Being on the watchlist of the USTR is sufficient to force a state to go beyond the standards set up by TRIPS in fear of the power

of US sanctions. Thus, states change their national laws, criminalize indigenous seeds and legalize bioprospecting. This is demonstrated by Ecuador which has a progressive environmental constitution yet, due to growing pressure from global seed corporations passed an amendment in 2017 that legalizes the entrance of GMO seeds in the country.

The Ecuadorian constitution that respects the rights of mother earth proves that it is possible to resist biopiracy. Enshrining the rights of mother earth in law means that the earth; rivers, lands, tress, human beings and lakes have rights and cannot be treated as mere commodities to trade in the market. Part of the rights of a seed for example, is the right to exist. This is why unlike other developing countries which have criminalized indigenous seeds, in Ecuador that has not happened although indigenous seeds are under scrutiny and tight regulation by the government. Ecuador shows that a divided subaltern with multiple differences can produce a progressive constitution to protect its biodiversity. This is what ecofeminism enables one to understand. Ecofeminists can prioritize racial issues, in the case of Afro Ecuadoreans or indigenous issues in the case of the Indigenous woman but still be able to unite to protect the earth, the only known home for humanity. Although there are pushbacks from corporations and their lobbyists calling for the amendment of the constitution to allow for more extractive mining activities, logging and deforestation as well as the entrance of GMO seeds, ecofeminist have been able to reject such notions of capitalists extractivism disguised as development. Through ecofeminism one can understand that the entrance of GMO seeds would make a lot of women farmers marginalized as farmers and in particular as women farmers. This would make them dependent on market forces and many of them would have to leave farming.

India does not have a progressive constitution like Ecuador but has been reluctant over the years to fully become TRIPs compliant. This is because of the important subaltern voting block that rejects many of the requirements set forth by TRIPs. Ecofeminists movements have rejected the idea of criminalizing indigenous seeds thus, the state has resorted to regulation rather than outright ban. Importantly, The Indian case study shows that it is possible to resist biopiracy by using loopholes within the global patent regime. The TKDL has been a major success in protecting the indigenous knowledge of biodiversity that the people of India possess. It has made it difficult to obtain patents for knowledge gained from the indigenous people because that knowledge has been documented and stored thus the patent application cannot pass the test of being new. This has

inspired other countries in the global south to develop a digital library that protects their knowledge of biodiversity from being used for corporate benefit without regard and profit to them.

These case studies also show that the fight against biopiracy is made worse by the lack of international institutions with powerful enforcement mechanism to protect biodiversity and indigenous knowledge. The CBD has failed to be that kind of a mechanism. The CBD itself is subject to TRIPS. Biodiversity protection in the CBD is directly linked to development characterized by the privatization of biodiversity. The CBD lacks the enforcement power to fight against unfair patenting of indigenous knowledge. Its most important contribution was to promote informed consent from states before a foreign company can use its biodiversity and fair benefit sharing. Its other important contribution was to highlight that the biodiversity of a state is its sovereign territory thereby ending the idea that the earth's biodiversity was the common heritage of mankind while products made from that biodiversity are the intellectual property of one company.

Subaltern movements are at the forefront of getting governments to act. They are at the forefront against the onslaught on farmers and their seeds as well as the appropriation of indigenous knowledge. In Ecuador, subaltern movements pushed the government to amend the constitution and adopt the rights of nature. Although there is state regulation of indigenous seeds, they are not criminalized like in other South American countries such as Colombia. In India, subaltern movements have also fought for the right to own and share seeds. Although the majority of seeds are patented genetic modifications, many local farmers to continue to rely on sharing indigenous seeds. When this fails, it means they go hungry and others commit suicides on a staggering rate leaving their struggling husbands or wives behind. There is much to be done in the fight against biopiracy but the very fact that the issue is being debated means that the narrative is being shaken. The fact that scholars in the global south and beyond are writing on the issue means that it can no longer be avoided or ignored. Unlike the dead subaltern of necro-idealism, in the fight against biopiracy, the subaltern cannot afford to die.

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