

“Our libraries are dying”:

**Biopiracy and the social value of traditional medicinal knowledge
in Ecuadorian Amazonia.**

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Abstract:	<p>In a global social divide between modern and traditional, medicine has fallen into two sides. Still, much of modern medicine exists because of traditional medicinal knowledge, yet the latter is rarely given any recognition. Despite increasing juridical attempts to protect indigenous groups and their traditional knowledge from biopiracy, the issue remains prevalent. Therefore, this thesis looks at biopiracy of traditional medicinal knowledge beyond existing laws, and into its social value. This paper explores the relationship, and potential effect of an increased social value of traditional medicinal knowledge in regard to achieving greater social and environmental justice when bioprospecting. When doing so, this paper focuses particularly on indigenous communities in Ecuadorian Amazonia. Through deep semi-structured interviews of both indigenous and non-indigenous people across different professional fields, a diverse discussion is formed regarding the social value of traditional medicinal knowledge. The thesis presents the continued effects of age-old colonialism and injustice towards indigenous people, both socially and environmentally. It also reveals the complexity when people with two opposing worldviews are to collaborate, bringing forth the lack of, and pressing need for mutual communication and respect between bioprospectors and indigenous people to ensure the safekeeping of vital traditional knowledge for future generations.</p>

Keywords:

Biopiracy, Traditional Knowledge, Bioprospecting, Social Justice, Environmental Justice, Amazonia, Human Ecology

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1. Introduction

1.1 Prologue

It was first in high school that my Environmental Science teacher explained that 25% of the drugs used by Western medicine originate from rainforest plants, and that less than 5% of tropical plant species have been tested and explored by scientists (see Mongabay 2007). This was enumerated alongside a long range of other statistics including 1.5 acres of rainforest being cut down every second, the loss of countless species every year, and two indigenous languages being lost every month (Rain-Tree Publishers 2019; Newman 1994, 486; UN News 2019). While most of the class was ferociously jotting down the numbers to remember them for our upcoming exam, I remember gaping at the absurdity.

If we are dependent on the rainforest for our medicine, *why are we destroying it?* And why are we oppressing the indigenous people, those who hold *the very knowledge* about these natural medicines that we are *dependent* on? Years later, after further studies and several travels to indigenous communities in the world's biggest rainforests, I am still gaping at the absurdity. The complexity of the injustice towards indigenous people by large corporations such as pharmaceutical companies is both diverse and interconnected, yet is mostly discussed in terms of policy gaps and patent-wars. If large organisations such as the United Nations are working on these laws, *why don't we have the policies we should?*

Why are pharmaceutical companies, who many times claim that “unscientific” traditional knowledge is invalid, sending biologists to explore, *and take*, foreign plants and traditional knowledge? More importantly, would they do this to their European or North-American neighbours? Perhaps this is related to how we value the indigenous people, which in turn creates the basis for why we are morally able to take their knowledge, land, and sometimes even lives.

These are complex societal questions, and I do not assume I can answer them, let alone in a Bachelor level thesis. Still, I want to look at how people from different perspectives consider the social value of traditional knowledge, and whether greater awareness might provide more incentives that in turn promote continued generations of traditional knowledge systems, instead of its loss. Could an approach beyond the alienated justice system of countless clauses provide insight into achieving greater environmental and social justice when bioprospecting for medicine? With this being a Human Ecology thesis, I wish to raise a discussion not on law, medicine or botany, but on the importance of social value in a global society. This paper aims to provide insight to how a few people position themselves in this elaborate socio-environmental web intertwining nature and man.

1.2 Aim, Purpose, and Research Questions

With this thesis, I wish to contribute to a larger debate on biopiracy and how the social value of traditional knowledge and indigenous people relates to exploitation when bioprospecting for medicine; and to convey the importance of traditional medicinal knowledge as well as the mutual exchange between traditional and scientific knowledge systems.

By focusing on Ecuadorian Amazonia, the aim of this thesis is to explore how traditional knowledge has been appropriated, and to discuss how an increased social value of traditional knowledge can increase social and environmental justice when bioprospecting.

To be more specific, I will focus on the following two research questions:

1. What is the relationship between medicinal bioprospecting and traditional knowledge in regard to social and environmental justice?

and

2. How could an increased social value of traditional medicinal knowledge foster socially and environmentally just exchanges between bioprospectors and indigenous groups in Ecuadorian Amazonia?

In my discussion to answer these questions I will apply the ‘emic and etic’ perspective as well as the ‘us and them’ perspective. These analytical frameworks will be further explained and developed later in the text, as they gain relevance.

1.3 Key Terms and Concepts

1.3.1 Traditional Knowledge

‘Traditional knowledge’ refers to a broad and dynamic mental knowledge base that includes information and wisdom about local biological resources and their usage. Beyond practical knowledge about a species and its relationship with the surrounding environment, traditional knowledge also includes the belief systems of indigenous communities that are foundational for people's livelihood, health and environmental wellbeing (Bag et al. 2012, 8). In this thesis, my use of this term focuses specifically on the medicinal knowledge of indigenous groups that has to do with natural plants and has been passed down for generations. The word ‘traditional’ in this term does not necessarily imply an old or non-technical knowledge system, but rather emphasises the way this knowledge is created in a manner that reflects the traditions of indigenous communities that have been passed on by previous generations. Resultantly, traditional knowledge is collective by nature and often seen as the property of an entire community instead of a single individual (Ibid.). There are many other terms to describe knowledge systems that exist outside of the scientific medical paradigm, some of which include ‘indigenous knowledge’, ‘local knowledge’ and ‘ancestral wisdom’. I chose to use the term ‘traditional knowledge’ in order to emphasise the importance of tradition and generational knowledge in this system, and that this is also a living knowledge base that is not limited to indigenous people. Furthermore, this realm of ‘knowledge’ lies in contrast to ‘scientific knowledge’, where facts and beliefs are separated (Lerner et al. 2010, 46). For a comparison between scientific and traditional knowledge as the science of the abstract and of the concrete, see Lévi-Strauss (1966, 1-33). For the purpose of this thesis, traditional knowledge as an accepted knowledge system is the focus.

1.3.2 Bioprospecting

'Bioprospecting' is a term used for describing the search for plant-related substances that can be developed into marketable commodities such as pharmaceuticals, pesticides and cosmetics (Jordaan 2001, 79). Regarding the focus for this paper, the term will refer to medicinal bioprospecting, being the search for useful substances to create medicinal drugs. A clear example of bioprospecting has been pharmaceutical companies exploring "the natural biodiversity of developing countries, predominantly those bordering the Earth's equator, and native peoples' medicinal uses of plants" (Bates 2007, 963). In other words, this includes the search for traditional medicinal knowledge along with the biological substances. The bioprospecting process involves collecting, extracting, and screening samples of these biological specimens, where their genetic make-up is analysed and useful components isolated through chemical or biological processes. Whether the isolated components are used directly to create a new drug, or as a guide for creating a synthetic copy of the components for a drug, it is considered bioprospecting. While bioprospecting is done by both academic researchers such as biologists and botanists, private profit-based companies such as pharmaceutical businesses are generally more large-scale and therefore more notable (Ibid., 974).

1.3.3 Biopiracy

'Biopiracy' can quite simply be described as "the unauthorised use of traditional knowledge or biological resources", creating unjust bioprospecting (Aguilar 2001, 241). The term was originally coined by environmentalist Mooney (2000, 37-44) in the early 1990s, and has since been used within social and environmental rights movements. Commonly, the term has been used to critique multinational businesses such as pharmaceutical companies patenting and appropriating natural resources whose uses were discovered, developed and deployed by indigenous communities, without sharing the revenue earned out of its exploitation (Fredriksson 2017, 174-175; Efferth 2016, 167). Three characteristics of biopiracy are that it concerns genetic resources and the knowledge associated with it; it concerns resources collected from 'farming and Indigenous communities'; and it uses patents and other intellectual property rights (IPR) to control and monopolise such resources (Fredriksson 2017, 174). Most important to mention is that the holders of the traditional knowledge that are subject to biopiracy receive no, or unfair, benefits in exchange. Many researchers have argued biopiracy to be an extension and intensification of colonial exploitation that threatens the indigenous communities as well as their knowledge system (Ibid., 175; Bag et al. 2012, 9).

1.3.4 Social Justice

The Oxford Reference has defined ‘social justice’ as “the objective of creating a fair and equal society in which each individual matters, their rights are recognised and protected, and decisions are made in ways that are fair and honest”. Furthermore, according to the United Nations “we advance social justice when we remove barriers that people face because of gender, age, race, ethnicity, religion, culture or disability”, and “promote gender equality, or the rights of indigenous peoples and migrants” (United Nations 2020). This explanation emphasises the value of every individual, and that no person or group should receive special privilege at the cost of another’s rights. In this thesis I wish to avoid the philosophical discussion on the nature of justice regarding ethics, and instead focus on the concept of universal equal rights. Although this thesis will later develop the discussion on the social construct on what is considered ‘right’, the aim for social justice within bioprospecting plainly refers to the idea that inherent equal rights should be reflected in all parts of the world and not be limited to a certain population with biased social value in the eyes of the beholder. I use this term to emphasise this goal of fairness for all individuals in the world, therefore including those in remote societies such as indigenous people living in the Amazon rainforest.

1.3.5 Environmental Justice

Although there is not one exact agreed upon definition to the wide scope of ‘environmental justice’, an encompassing description by the *US Environmental Protection Agency* (EPA) states that “Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (Walker 2012, 8 ; EPA). Essentially, this means that everyone has the right to an equally healthy environment that is free from unfair exploitation. Evidently, this term is closely intertwined with social justice as its realisation requires equal social rights. In regard to this thesis, a fair exchange of traditional knowledge between bioprospectors and indigenous groups requires respect and benefits to both the individual as well as the environment they live in. Hansel from *The Pachamama Alliance* explains that “Issues that impact the environment have impacts on the people who live there as well” (Hansel 2018). Therefore, I have chosen to define both these terms and discuss them both complementarily throughout this thesis, judging that fair bioprospecting is in line with both social and environmental justice.

2. Background: The value gap

Traditional medicinal knowledge is a large and widely spread knowledge base with an estimated 80% of the world's population depending on it for primary healthcare needs (WHO 2019, 45). As new diseases and more people cover the planet, there is a naturally growing demand for medicine. Alongside this, a widespread increased interest in natural remedies has enticed pharmaceutical companies to further explore traditional knowledge (Jordaan 2001, 79). Currently, much of modern pharmaceutical medicine is already developed and based from plants discovered and used by indigenous communities as traditional medicine. Well-known examples from the rainforest include 'Tubocurarine', a muscle relaxant from the Curare vine that is often used in surgery, and 'Quinine', developed from the bark of the Cinchona tree to treat Malaria (Choi et al. 2006, 261; De et al. 2017, 162). Although these pharmaceutical developments can be seen as health victories, an issue arises when the economic benefits are not equitably shared (Aguilar 2001, 241).

As traditional knowledge systems have proven to hold knowledge beneficial to bioprospectors, there has been an increase in legal issues of knowledge ownership (Jordaan 2001, 11). It has created a large debate on whether and how to protect the intellectual property rights of indigenous knowledge practices (Jordaan 2001, 11). Many times, contribution by indigenous groups with their traditional knowledge and practices goes unacknowledged with little or no financial benefits returned for their contribution (Jordaan 2001, 91). Indigenous groups have many times expressed both the inadequate recognition and protection for their knowledge, as well as a lack of equitable benefits from its usage, making them subjects of biopiracy (Jordaan 2001, 77; Aguilar 2001, 241).

In response to this, several organisations including the World Intellectual Property Rights Organization (WIPO) and the United Nations are searching for ways to protect this knowledge within existing property laws (Bag et al. 2012, 14). The issue here is a seeming need for an alternative system adapted for the ownership of traditional knowledge. Many indigenous groups perceive the ownership of knowledge as antithetical and thus have a collective knowledge base that cannot be tracked down and appointed to a single person, thus not allowing for sufficient property rights (Jordaan 2001, 50; 53). Jordaan (Ibid., 50) writes that "Current Western jurisprudence is limited in its conception of intellectual property and it therefore needs to be expanded to accommodate indigenous knowledge system notions of ownership". She further explains the importance of intellectual property for a continued creation of ideas and inventions as it ensures benefits to the community itself, suggesting that if indigenous people do not feel integrity in their ideas, it will hinder continued development in traditional knowledge systems (Ibid., 51).

Since 1993 the *International Convention on Biological Diversity* (CBD) has worked to protect indigenous rights by forming opportunities for sustainable resource use and protecting biodiversity. However, this treaty was not signed by significant countries, including the United States. Another notable contribution is the 2007 *United Nations Declaration on the Rights of Indigenous People* (UN DRIP), a document focusing on the rights of indigenous groups to control their own traditional knowledge. Although this created a worldwide forum for indigenous people to voice their rights and injustice, the UN DRIP is not legally binding (Efferth 2016, 171). Also, *The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity* was adopted in 2010 and enforced 2014 as a supplementary agreement to the CBD (CBD 2015). This protocol includes rules to protect traditional medicinal knowledge and to compensate for this knowledge already patented or inappropriately used (Efferth 2016, 171). However, The Nagoya Protocol only requires the involved countries to respect the regulations, leaving each member state to decide if they want to regulate the

access and exploration of biological resources or not. This means indigenous communities are dependent on the legislators of their state to protect them, which many times does not happen (Fredriksson 2017, 179). Despite worldwide laws, the continued issue of biopiracy hints at a systematic social problem beyond juridical laws and agreements (Concha et al. 2017, 28).

Ecuador specifically has notable laws in their constitution regarding both indigenous rights as well as environmental rights. Both Article 83 and 84 in the Constitution of Ecuador enforces the recognition of indigenous people's rights, and promises to guarantee their complete dignity (Constitución 2008). In 2008, Ecuador also became the first country in the world to recognise the rights of nature in its constitution, declaring its right to exist, maintain and regenerate its life cycles, structure, functions and evolutionary processes (Ibid.; Agebjörn et al. 2016, 52). Although this might be considered progressive in theory, continued reports of social and environmental injustice in Ecuador suggests that here, too, there is something missing.

Furthermore, Ecuador is specifically vulnerable to exploitation due to its megadiversity, having more plant species per unit area than any other country in South America (Instituto Ecuatoriano 2016, 4). Ecuador also has large cultural diversity, and the Amazon region alone is made up of 11 indigenous ethnic groups known as 'nacionalidades' or 'nationalities', each having their own language, culture, cosmovision (worldview), and knowledge base (see Nacionalidades.). *The Confederation of Indigenous Nationalities of the Ecuadorian Amazon* (CONFENIAE) and *The Confederation of Indigenous Nationalities of Ecuador* (CONAIE) are local organisations working with these nationalities in the fight to achieve equality and justice. This struggle includes working for the indigenous collective rights of the Constitution being realised, as well as a fight against future exploitation, both of which would protect traditional knowledge in these communities (see Quienes Somos 2015). Although each nationality is different, the exploitation of traditional knowledge, often in the form of biopiracy, seems to be a universal struggle in Ecuadorian Amazonia.

The ongoing issue, as briefly explained above, is that biopiracy is grounded on intellectual property rights, which contradicts the indigenous worldview of collectivism and unity that can be seen in the nationalities of Ecuadorian Amazonia. 'Sumak Kawsay' is an indigenous worldview that "is built on social justice and ecological balance" (Agebjörn et al. 2016, 9). Sumak Kawsay holds closely to the concept that "we humans all need each other on this Earth, and we aren't just dependent on a healthy environment- we are also a part of it" (Ibid.). Patricia Gualinga, the leader for the Sarayaku community in Ecuadorian Amazonia describes it as "a life in harmony...the everyday life for all of us who are part of Mother Earth" (Ibid., 10). This goes in direct contradiction with the common eurocentric mindset of humans being separate to nature, which often seems to justify the exploitation of it. Furthermore, a central concept in Sumak Kawsay is that the land should be owned and used collectively. The private ownership of land is foreign to these indigenous groups who see it as a collective mission to care for the natural resources (Ibid., 41).

Intellectual property rights are formed on ownership law and is traceable back to colonial times (Agebjörn et al. 2016, 41). The patenting of intellectual property gives exclusive rights that are meant for the protection and privatisation of it. This becomes an issue with traditional knowledge as it is spread across many indigenous groups and in a society that generally wants to share their knowledge with others. For this reason, the patenting of knowledge and anything interwoven with life goes against the Sumak Kawsay principles (Ibid.). This creates a complex issue when non-indigenous people enter these communities to exploit the land and take knowledge, to later claim individual rights on it. In Ecuadorian Amazonia, this action of biopiracy clearly disregards the

worldview of the indigenous people. However, another layer of complexity is added when considering that if knowledge cannot be owned, it can neither be stolen. With this said, the access to territory, which includes all aspects of nature including the people themselves, is foundational for Sumak Kawsay as it cannot be practiced without it. Therefore, although territory should be collectively owned and administered, these indigenous groups need and rely on a healthy environment and their rights within them (Ibid.). Further development on this aspect can be seen in the discussion and analysis.

Moreover, today's globalised world has affected indigenous societies by creating an increased need to adapt to modern monetary and cultural practices. This process has led to the loss of unique indigenous knowledge and perspectives, a serious issue that has been under-addressed (Jordaan 2001, 18). As a result of a devastating history of immense oppression and loss of indigenous people, traditional knowledge about medicine and the natural world has been lost. This traditional knowledge has often been seen as inferior to a form of universalised knowledge based on Western scientific knowledge systems. Although this knowledge base is highly valuable, Jordaan stresses that a universal application of one knowledge base is faulty and has led to the destruction of traditional knowledge systems (Ibid., 49). This can be seen with traditional knowledge being commercialised in different areas, including the usage and patenting of indigenous sacred symbols as slogans and logos, degrading the knowledge as well as the indigenous people themselves (Bag et al. 2012, 14).

Evidently, the issue of biopiracy and the loss of traditional knowledge is complex in nature, touching on human rights as well as global health. With traditional knowledge being central in the healthcare of many societies, and with a substantial portion of existing pharmaceuticals being plant- and animal-based, the safekeeping of these biological resources and the knowledge around it is vital. Yet, since medicinal plant knowledge is usually passed on orally between generations, and only to one or few trustworthy people, important knowledge can be lost if someone with medicinal knowledge dies without sharing all their knowledge, or if it is forgotten (Jordaan 2001, 41). More so, if traditional medicinal knowledge is not recognised in modern society, the continued existence of knowledge and resources might end, meaning a loss of existing and living libraries that could possibly provide necessary medical solutions for generations to come.

3. Material and Methods

3.1 Method

Alongside studies of a comprehensive collection of sources, my research method for this thesis was *deep semi-structured interviews* (on this method see Bryman 2012, 468-497). I conducted five deep semi-structured interviews with different individuals across different fields. The interviewees selected were from a range of relevant fields, to create a discussion using different perspectives. The three non-indigenous interviewees all had some involvement within traditional knowledge, indigenous rights and bioprospecting. The two indigenous interviewees were from different communities and different professional fields, but were both familiar and involved in indigenous rights work. I deemed all interviewees relevant for this research topic as they each had knowledge and experience in these questions, and could offer different perspectives.

Due to the current Covid-19 pandemic, all interviews were conducted online via Zoom and lasted between 45 and 120 minutes. They were recorded and later transcribed. The three non-indigenous interviews were conducted in Swedish, and the two indigenous interviews in Spanish. I am bilingual in Swedish and English with experience in translation work, making these translations reliable. Furthermore, I have proficient Spanish skills and also took the help of a native Spanish speaker to ensure full validity in translations.

I had prepared custom questions that were particularly relevant to each interviewee before conducting my interviews. These questions were mainly customised according to the information I had on each individual's experience and knowledge base. Due to the contrasting lifestyles, experiences and perspectives, my questions to an indigenous person from Ecuadorian Amazonia were obviously different to those for a researcher in Sweden. Many questions were related directly to the issue of biopiracy and the social value of traditional knowledge in their particular field and personal worldview. With that said, I also had some questions that I asked every interviewee. These included their own idea of how a just exchange of traditional medicinal knowledge would look like, as well as their thoughts on how greater awareness might affect the social value of the knowledge itself. I judged these questions relevant to all interviewees in order to see clear similarities and contrasts in the perspective on this issue.

Furthermore, it is important to mention that I clearly communicated to every interviewee that my main goal was not to receive an answer to each question, but to hear their perspective and thoughts around this main issue. For that reason I stuck to semi-structured interviews, asked several follow-up questions, altered my questions where appropriate, and did not push for an answer they did not naturally have. I also focused on creating space for the interviewees to voice their thoughts that might have been unrelated to my research questions, to give me greater understanding for their perspective and lessen the chance for potential bias from my own limited worldview. With that said, I am aware of my own role as a researcher and interviewer, as well as the social conditions regarding my age, field of study, personal bias, trust, the language and any other factors that could impact my results. Although my questions were generally concrete and mostly related to events or topics with factual evidence, I also entered the realm of personal experience and theoretical situations that involved an individual's beliefs. While this was highly relevant for facilitating the discussion on traditional knowledge I had intended, the validity of these answers is highly dependent on the interviewee's willingness to open up. To assist with this, I asked questions on the individual's thoughts and ideas while avoiding to share my own opinion. Also, while the topics of

justice, human rights, colonialism and health are all quite sensitive, I stayed away from any highly sensitive questions that were not openly shared with me and would require a deeper level of trust that could likely not be built in a single interview (Seidman 2006, 95). Lastly, all interviews with following subjects were conducted once, and for the first time.

3.2 Interviewee Profiles

Bente Eriksen:

Eriksen, a 60 year old female, is a Botanist, holding a Ph.D., and is the current Director of the Botanical Gardens in Lund, Sweden. Her background is in Systemic Botany, and her dissertation focused on two different plant families growing in the mountains of South America, specifically in Ecuador. She has worked throughout South America but has spent most time in Ecuador working with the local plants and people.

Eslendy Grefa:

Grefa is an indigenous Kichwa woman from the community of San Juan de Pitua, located in the Pastaza region of the Ecuadorian Amazon. She is 29 years old and was born and grew up in her community, speaking her mother tongue. Currently Grefa is living in Quito, the capital of Ecuador, and studies Social Communication with specialisation in Investigative Journalism at university level. She is also working voluntarily as coordinator of Lanceros Digitales, an activist journalism platform for the Ecuadorian Amazon, represented by CONFENIAE. Her aim is to show the reality and struggle of indigenous communities in the Ecuadorian Amazon. Grefa was recently invited to the Swedish radio in an episode taking about the rise of traditional medicine in Ecuador as a result of the Covid-19 virus (see Sveriges Radio 2020).

Tanya Andersson Nystedt:

Andersson Nystedt, a 40 year old female, is a Public Health professional with a background in International Development. She is currently a doctoral student in Social Medicine and Global Health at Lund University in Sweden. She grew up in Mozambique, South Africa and Swaziland, and has lived several years in Malawi. There she has done considerable work within the HIV and AIDS sector, working with organisations like the United Nations and UN AIDS, with a focus on Gender and Human Rights.

Tulio Viteri:

Viteri is an indigenous Kichwa man from the community of Sarayaku, located in the Pastaza region of the Ecuadorian Amazon. He is 27 years old and is still living in his natal community of Sarayaku. Viteri is also studying Biology at the University of Puyo, with the aim of bridging indigenous and Western knowledge. He is very involved in the organisations of his community that focus on indigenous resistance and rights, and was also recently involved in a workshop organised by the Sarayaku community to monitor the diversity of the local flora and fauna.

Ulf Johansson Dahre:

Johansson Dahre, a 61 year old male, is associate professor of Social Anthropology at Lund University. With a background in law and Human Rights, he continues his work and research with Human Rights and indigenous people. He was part of starting the International Work Group for Indigenous Affairs (IWGIA) in Lund in the 90's, and has done extensive work with indigenous groups and different aid projects throughout his career.

4. Findings

4.1 Results: The Interviews

4.1.1 Getting to the Roots

When digging deeper into a social value system, the natural aim is to reach the roots. The imbalanced power relations that pave way for marginalisation of societies goes back far in time, and proves itself relevant for this topic. Ulf Johansson Dahre is quick to draw a connection to the 500 years of colonialism preceding modern day biopiracy. He explains that indigenous groups have always had knowledge that has been desired by foreigners who wish to profit from it. In the Amazon, he explains, indigenous groups are particularly vulnerable to this biopiracy as they live in an extremely rich land of medicinal plants and other resources attractive for pharmaceutical companies and such. This, he continues, dates back to the first conquistadors in America searching for resources and knowledge in the local populations. This has kept going, and botanist Bente Eriksen describes the large expeditions sent from the United States to South America in the early 1900's with the purpose of finding and gathering medicinal plants. She explains how many kilograms worth of leaf material was sent back to the USA for analysis, and is convinced the indigenous people of South America did not receive any financial compensation.

“It has been a constant dilemma for indigenous groups to have been regarded as primitive while also having knowledge that we obviously deem valuable”, says Johansson Dahre. Similarly, Eriksen highlights that “We need to see the people that have given us these opportunities”. However, Indigenous groups have been seen as an obstacle for development, Johansson Dahre explains. He develops this argument with the example of the murders in the Amazon region in the 60's. As a result of indigenous people opposing certain changes, the Brazilian government started a type of assimilation project that was “basically genocide”. “If we have a society where we think it's obvious that one should receive royalties or credit for their knowledge, this should naturally include these people too”, he says. Currently though, he continues, many people are trying to wiggle around this, to see indigenous groups “as a form of separate category that doesn't have the same natural rights as any other inventor in our part of the world”. In similar terms, Eriksen says that indigenous groups are not counted into the same category of society, which has therefore created an imbalance in human rights.

Like Johansson Dahre, Eriksen voices her dismay of an old value system that views indigenous people as primitive, and believes it still sits very deep in many people's way of thinking. She clearly states the importance of changing the common attitude that indigenous people do not need to be considered, and instead treating all people with the same value regardless of where they are from. This reality is reinforced as Kichwa Tulio Viteri stressed that: “We need to maintain mutual respect without violating any individual, without hurting anyone. I can be happy without hurting the nature or another person”.

4.1.2 Social Justice and the Law

Johansson Dahre explains the large amount of juridical aspects around biopiracy. He explains how the law tries to mirror the current social conditions with societal norms and development, but that it doesn't always reflect the reality in a sufficient way to hinder negative things from happening. With this he agrees that the law has not reached the root of the issue. He describes that normally an inventor of something will at the very least receive royalties for selling their invention or a patent. In these cases, he admits, indigenous groups are usually completely deceived. Viteri explains that many times, these laws are written by people who have not lived in the place and do not know the reality. "They make a law from their own perspective, and these laws should be written by people that have felt this reality... the laws are written by people that do not even want to feel this other reality". This, he means, creates a barrier that limits the other person from creating a more relevant law process.

The hinder regarding the legal protection from biopiracy can often be traced back to the knowledge being collective. Johansson Dahre explains that traditional knowledge in indigenous groups is mostly considered collective, whereas other inventions and brands are usually based on individual rights. The law requires an individual to be identified and apply for patent rights. With Johansson Dahre's long experience in the field he explains how indigenous groups have been fighting for collective knowledge rights for the past 20 to 30 years. This regards everything from medicinal plants to cultural music and dance that is used by a large part of the world without paying royalties or even giving credit to the creators for it. Our Western juridical system acknowledges the individual as the inventor, but a lot of this traditional knowledge is built over generations, and it is very difficult to identify the inventor for medicinal knowledge that has been used for hundreds of years. This has been an ongoing struggle, he explains, where the United Nations as well as the American human rights organisations have been working to create collective knowledge protection. "Still, there has been an obvious gap in the law that has allowed for exploitation from many different directions".

Kichwa Eslendy Grefa shares an experience from when she was just 10 years old. An organisation came to her community, San Juan de Pitua, and did tests on their ginger and many other plants their grandmothers knew about. One day, she says, the project just disappeared and she later heard they had gone back to Europe and already made medicines to cure sicknesses using their plants from the Amazon rainforest. They patented it, she says, "They stole this knowledge". Although Grefa does not know the name of this organisation, she clearly remembers the experience, and the lack of communication with the community. This is a continuing struggle, "that someone can come and take the wisdom of the grandparents, our libraries", she says. Both Grefa and Viteri, from different communities, shared their disappointment with the patenting of ayahuasca, a sacred medicine for many indigenous Amazonian people. Viteri explains that the traditional knowledge is transmitted by word and has not been systemised as its understanding "requires enough meditation and a lot of respect for nature". Biopiraters, he says, "breaks this understanding and tries to take the knowledge to take advantage of it and generate the economy, when in reality it is to disrespect the norms of the indigenous communities". Patenting the traditional knowledge, like they did with ayahuasca and other natural medicine, he says, breaks our norms and beliefs. He uses the example of ayahuasca to show that this is not just happening in Ecuador, but has affected the whole Amazon region. However, Grefa shares that the usage of ayahuasca also requires the traditional knowledge around

it. “The one who knows how to use this medicine knows that it has a magic”, one that requires traditional spiritual knowledge for the medicine to have effect. “This is what we need to hold onto, the ancestral wisdom of the medicine” (Grefa).

Although biopiracy is still very current, small changes are being seen where some indigenous communities are learning the Western juridical system, and using lawyers to help them in court. “There is a growing understanding that one way to protect yourself from this abuse is to do the same as everyone else, be knowledgeable in law and defend yourself in court.” (Johansson Dahre). Still, in the Sarayaku community, that is unusually developed in this aspect from having won a previous environmental court case, Viteri explains that the community’s law knowledge is only basic. He goes to say that these juridical questions were not discussed much before, but are starting to be central and their council governor of Sarayaku is working with these things now-“But it is a gradual process”. Ecuador has a very advanced constitution in terms of both indigenous rights and environmental rights. Johansson Dahre enthusiastically brings up the rights of nature that has been added to Ecuador’s constitution. He explains the importance of this, that “we have come to the point where we realise we cannot do whatever we want for as long as we want”. As the same time he acknowledges its difficulty, and believes there will always be pirates of different types to steal and take for an economic market. “But this allows the state to control it in some way, but maybe it’s not always they can or want to” (Johansson Dahre). Confirming this, Viteri shares that while Ecuador is very advanced in its laws, it often doesn’t work in practice. The laws on Sumak Kawsay are many times misinterpreted and appropriated by the state, mostly because they fail to understand it (Viteri). Viteri tries to explain that the Ecuadorian government tries to bring this concept to their reality, when Sumak Kawsay is according the life experiences of us indigenous people. “I have the concept that every alternative cannot be the solution for the whole world, but it can be as solution for those who live in this reality”, “This is what happens with the capitalist system, it works in some places but you cannot go and say it will work everywhere. In another cultural context, another environment, with different people” (Viteri). Due to the polarity of these two worldviews, he means, the Ecuadorian government fails to implement the traditional knowledge of indigenous people into a practical law.

4.1.3 Responsibility

There is a general consensus with all interviewees that both the giving and the gaining of traditional knowledge requires responsibility. However, Johansson Dahre believes pharmaceutical companies seem to be the most obvious with dodging this responsibility while simultaneously exploiting the knowledge. Although, he clarifies, anyone trying to use any type of knowledge, whether it is for research or commercial purposes, has the responsibility to inform and receive consent. Social Medicine practitioner Tanya Andersson Nystedt explains that bioprospectors not only have a responsibility to the environment they are taking from, but also to the communities living that live there and hold that knowledge. Andersson Nystedt has often worked with a human rights based approach in her fieldwork in the medical field but explains that pharmaceutical companies often have an extreme amount of power in comparison to other actors from the Western world. Pharmaceutical companies, she means, often fail to cooperate with other organisations working with the communities, that want to ensure their ethical responsibility as foreigners is being met.

Eriksen also agrees that there is a huge moral responsibility that one’s work environment is not one of exploitation. She explains the need to evaluate whether the company they work for or with is ethical, and if not to take personal responsibility and find something else. There is no world,

Eriksen says, “where you should reject that responsibility when working in this field”. One way Johansson Dahre suggests responsibility could be taken is that the bioprospector must ensure the indigenous community they are working with has a legal representative. This, he means, would hinder pharmaceutical companies and other bioprospectors from luring indigenous groups into unjust legal agreements that they might not fully understand.

This responsibility can also be to ensure indigenous groups have capacity and space to represent themselves, Andersson Nystedt explains. She describes the importance of the indigenous and local people’s own voices and interests to be heard in every room where decisions are being made. In her work with HIV in Southern Africa, she highlights that the people actually living with HIV, “should be helping make decisions that will be important for how their lives will look”. To be inclusive in these decisions is a moral responsibility, she means, but also a prerequisite to ensure decisions are actually favourable to many (Andersson Nystedt). Johansson Dahre supports the same view and has done extensive work with the International Work Group for Indigenous Affairs (IWGIA) in this manner. “The reason I joined IWGIA is because it is an organisation that helps lift up the indigenous people themselves, that we shouldn’t talk for them but make space and forums for indigenous people to participate in contexts like the United Nations. We shouldn’t be the ones talking.” (Johansson Dahre). Viteri shakes his head and says “it is obvious it should be this way”. “When you haven’t felt what we feel then you don’t identify with us to be able to say what is happening. When there is a direct representative he will say the right things”, he adds. Grefa shares the same opinion: “They should not speak for us. There is no space left for us to express ourselves.”

4.1.4 Understanding and Awareness

Grefa describes that understanding the situation is vital for changing it. She tells stories of foreigners coming to her community to make films to show her community to the rest of the world. She explains that these foreigners would give them some money and stay for one to three weeks. “They feel like in one to three weeks they can understand what it’s like to live there”. She even says there are people with indigenous descent in Ecuador that are not living in the communities but are digitally sharing the traditional knowledge such as the medicine, and even songs, legends, and practical skills such as making canoes and traditional bags. While she does not mind them sharing knowledge, she criticises that many people sharing this knowledge “have always missed researching and understanding the depth of it to inform well”. She explains that many people inform about their experience from a single moment of participating in a community, and do not fully understand it.

Throughout the interview Grefa repeats that every nationality is different and has a lot of knowledge unique to them. However, she explains that Wikipedia pages on the Kichwa nationality and others have confused the different cultures, languages, words and cosmovisions that are different in respective nationalities. She believes it is only the people who know the reality that should be writing about it. “Maybe they did it...with good intention so the world will know about us but they have missed a lot of investigation and understanding you’d get from coexistence with the nationalities” (Grefa). She believes this false information tarnishes the image and wisdom of the indigenous people. Regarding biopiracy, Grefa states that bioprospectors should “come first and foremost with the intention to learn and understand before the intention of taking, selling, or bringing their own knowledge”.

Viteri explains how his university is trying to incorporate a little traditional knowledge into his biology classes. He explains that he recently had a course on ‘ancestral knowledge’ that attempted to include some indigenous Amazonian knowledge, but that it was very superficial. “You can’t just read it in a few textbooks and then know ancestral knowledge” (Viteri). He adds that his teacher is a Western person and while he has some knowledge from research, he has not lived the reality and therefore shouldn’t be teaching about it. Viteri’s aim with his studies is to “learn the biological concepts and complement them with the ancestral knowledge”. He wants to use this to confront extractive companies such as loggers and oil companies that come to the communities and only see value in the land itself, and not the flora, fauna, and natural medicines. Viteri believes that with sufficient biological answers of why we must protect this life, he can defend the rainforest. He understands that although the indigenous communities have a lot of traditional knowledge about medicine and their plants, the lack of scientific terms and concepts to convey the knowledge stops the companies from valuing it. “So I will try to complement these ideas and argue why it is important to protect nature”, he states.

The interviewees all agreed that greater awareness could increase both the social value of traditional knowledge and improve the issue of biopiracy. Johansson Dahre believes awareness is the very problem. “People are being exploited due to a gap in knowledge, laws, social views and in racism. We shouldn’t brush off the fact that indigenous people have been subject to these things for 500 years” (Johansson Dahre). Andersson Nystedt agrees on the importance of awareness and believes that the world is becoming increasingly homogenised and could greatly benefit from learning the knowledge as well as the lifestyle of indigenous communities. Eriksen adds that “If one understands how valuable this is, the products coming from the rainforest for example, one might get the desire to preserve the rainforest and the knowledge around it”. However, she believes that although we are a globalised world, we are not created to be able to understand and resonate with people in a different part of the world. This, she means, might hinder the awareness that sparks active decisions to help and change the situation (Eriksen).

4.1.5 Traditional Knowledge and the Practical Social Value

The traditional knowledge in the Ecuadorian Amazon is vast and deep. Grefa explains that while some knowledge is general, all the 11 different nationalities of the Ecuadorian Amazon have their own knowledge on specific medicinal plants that can, for example, cure a snake bite. She describes a plant she knows about that can be prepared and used immediately for this, meaning one does not need to wait over an hour for an ambulance to bring you to a hospital. By that point, she emphasises, it might be too late. Grefa highlights that traditional medicinal knowledge tends to serve the communities more than any pharmaceutical medicine would. Regarding the current Covid-19 pandemic, she explains that pharmaceutical medicine has served near nothing to the nationalities, but they have been dependant on the traditional medicine prepared by the *jachak*, or plant medicine healers. She even adds that people outside the nationalities are asking indigenous communities about their cures for the Corona virus. Grefa was sick herself, but claims to have healed using natural medicine and has thus received many questions from non-indigenous people wanting her to send these plants to them. The different nationalities are trading and sharing which plants have worked for them without any money, and even hospitals have started implementing these cures. “There has been indigenous people that have been working in the hospitals and thanks to them some people that have been hospitalised have been saved” (Grefa). She explains that “This has improved and allowed for more value of this knowledge in the time of the pandemic”. “There is a great growth in the people from the city that want to come to the communities to cure

themselves”, but the communities have needed to close themselves to be protected from any spreading of the virus. “Various of our elders have died in this pandemic, various wise men. So we have lost great knowledge from this, our libraries are dying in this pandemic. But thanks to the natural medicine some elders have been able to keep living from the virus” (Grefa).

From a different perspective, social medicine practitioner Andersson Nystedt explains that although traditional medicine has a lot to contribute with, it can also have the opposite effect. She shares that many traditional healers in Southern Africa lack knowledge in hygiene and infections which has led to a spreading of HIV. With that said, she acknowledges that these healers often have a lot of knowledge on nutrition that can be helpful to the people. Most importantly, she describes, the indigenous people have a very strong trust for the traditional medicine that is lacking in Western medicine and must be considered in her field. She explains how traditional medicine and healers are often their “way into the communities, to gain trust and meet their medical needs”. For that reason, she believes, most people in Social Medicine have more respect for traditional medicine than others in the general medical field. She sees a large split between Western medicine and traditional medicine, possibly because “doctors have attended university for seven years, and many other steps to get there. That is not to say traditional healers haven’t also had their journey but it will often not come with a diploma. They have a high status inside their community but not outside. I think the difficulty is that Western medicine is evidence based”. With that said, she continues, the evidence built on natural plants by pharmaceutical companies is often based on information received from the indigenous communities (Andersson Nystedt).

Grefa explains that traditional medicine often serves the indigenous people better than Western medicine. She describes how the Ministry of Health in Ecuador has sent Western pharmaceutical medicine to the communities, but that the indigenous people do not want it. “Why would they want to inject something that makes them sick right after, and it doesn’t even cure them?” (Grefa). She goes on to tell a story where a practicing nurse came to her community and did not have the same traditional knowledge their midwives have, and the woman giving birth that the nurse has helped ended up dying. She explains that currently, some nurses are bringing this traditional knowledge of the indigenous midwives to the hospitals in Ecuador. However, she explains, these people have learnt from their grandparents and do not have a university degree that will allow them to work in a public institution as a doctor or nurse.

The lack of respect and social value of traditional knowledge has always been a hindrance for the indigenous people (Grefa). Grefa confirms that while the wise elders are recognised by the people of the community, the state neglects them. “I believe that the elders knowledge surpasses common knowledge out there but the state will not recognise it because the state has always tried to discriminate and diminish them. I think it’s time that our elders are acknowledged for their wisdom and knowledge” (Grefa). Viteri says that “ancestral knowledge has always been valid but not valued, and so that’s why I started studying biology to see if I could change that.” He believes that if the traditional knowledge of the Amazonian nationalities is supported with scientific knowledge, it can increase in value. Contrastingly, botanist Eriksen believes there is probably a lot of traditional medicine that is false. Yet she clarifies that if people have traditionally used a certain plant for something, it is a good place to start and find out what inside it is working. “If you don’t find something, you don’t”, she shrugs, “but then you at least don’t have to test 300,000 plants for everything”. “I think we should always use traditional knowledge as a starting point, otherwise we know nothing” (Eriksen). She explains that the Malaria medicine had a starting point in traditional knowledge, and strongly believes we should use indigenous people’s extensive knowledge when

finding medicine. However, Eriksen describes her work in teaching pharmacists in the role of plants in medicine. She explains that with a majority of all medicine being based on plants, its role is vital but due to the “long distance from the leaf on the tree to a medicine...natural medicine hasn’t been counted as real medicine” (Eriksen). Still, Eriksen says that she personally values and respects traditional medicine and believes all botanists she knows does so too.

4.1.6 Future generations

Grefa believes that the insufficient incentives and unfair treatment of biopiracy is affecting the willingness of future generations to keep learning their traditional knowledge, and develop new knowledge. She explains that the indigenous youth are often more interested in earning money. She explains the growing need for money in the communities and that “we need to figure out a way to earn money without falling into the temptation that other leaders have fallen into and that is to sell out land to be exploited” (Grefa). Viteri is also worried about the future generations and that traditional knowledge will be lost if it is not passed on to them. He explains that the traditional knowledge is transmitted orally during daily life activities, and as the kids are nowadays attending schools they are no longer part of all these everyday activities. Before, he explains, children would learn how to get medicine from the forest, they would learn about the trees, and how to hunt. “Now we are learning Western knowledge and we are losing the traditional knowledge”. With this said, Viteri explains the importance of this education using the example of the indigenous people learning Spanish to communicate and defend themselves against exploiters. “So it’s about trying to stop a system that is crushing us, but at the same time not disconnecting ourselves into a traditional world”.

Both indigenous interviewees explain that the growing accessibility to social media in the communities is affecting the youth positively, but also negatively. Grefa says that “it has been a very necessary tool to inform and to visualise the conflicts and problems we have inside our territories, but there is also a problem there, that the youth are using social media more for games and to look at things that will not strengthen them or help us with these things”. She even explains how technology has driven some youth out of the communities and into the cities to rob money or sell their natural resources just to buy a phone and have access to internet. Several communities have been taking Balsa wood from their forests, damaging the environment, and selling it at very low prices to do so. With this phones and all the games, she says, the youth are ruining their thoughts and no longer learning the traditional knowledge they would if they were out in the rainforest with the elders (Grefa). Viteri claims the effect of the technology depends on the individual. Still, he describes how the rapid rise and access to technology in the Amazon as well as the rest of Ecuador, has shocked many and has not allowed people to adapt and learn to use it in a positive way. He explains that in his community, Sarayaku, they are actively working to maintain the traditional knowledge, but that this is very dependent on the community. He explains that there are neighbouring Kichwa communities that are losing the social value of traditional knowledge and trying to leave to learn the Western system. This includes losing the language, “and the foundation of a culture and its knowledge is to maintain the language. For this reason, I speak Kichwa” (Viteri).

4.1.7 Internal exploitation

Johansson Dahre explains biopiracy and exploitation is not only the result of international foreigners coming to the Amazon, but also from inside the states themselves. He explains that many times Western anthropologists have written about Brazilian anthropologists and biologists that have been part of the extraction and exploitation of indigenous groups in the Amazon. He clearly argues that internal exploitation is often just as active and should not be overlooked. Using the example of the current Brazilian Bolsonaro, he shows how internal governments have been very clear with their desire to develop the Amazon, saying that “for them it’s just an entire natural resource”.

The two indigenous interviewees confirm this and explain that biopiracy in the Ecuadorian Amazon is not just from foreigners, but also from inside the country. Viteri uses the example of the Ecuadorian Constitution to explain that “The Constitution guarantees that the indigenous have their rights and everything but in the practical moment this is not what’s happening in Ecuador. Here in Ecuador there are people that are trying to take advantage of us”. Grefa adds to this with a current example of the Covid-19 pandemic, where non-indigenous people in Ecuador have tried to sell their plants. She explained that the traditional plant medicine has been helping non-indigenous people, and the indigenous groups have been giving it to them for free. However, when the indigenous people were in need of pharmaceutical medicine, they needed to pay (Grefa). “We should at least have some kind of financial reward for those who make these natural medicines”, she means. In this pandemic, “This government has totally discriminated us. We haven’t had doctors that have been able to enter the communities so we have had to keep living with our natural medicine” (Grefa). While she says that she is happy to share, she explains it was a “hard hit” because despite their medicinal plants, they were not deemed worthy of mutual help. “What use is it to us to give for free and save people that don’t want to value us, just discriminate us? In the end our medicines are very cheap for them, but we cannot buy the pharmaceutical medicines. We need to sell four or five bunches of bananas to afford it” (Grefa).

Furthermore, in cases when natural resources and access to traditional knowledge have been sold, Johansson Dahre, Andersson Nystedt and Eriksen agree the money often does not reach the communities themselves. “But it should, it’s their knowledge”, Eriksen adds. She explains that the government in Quito isn’t indigenous people living in the nationalities, it is the people living in the land that has the knowledge and therefore those who should receive incentives (Eriksen). Andersson Nystedt agrees the indigenous people should get the incentives, but adds that “unfortunately they rarely have a lot of power against their government”.

4.1.8 Sharing, Collaboration and Mutual Exchange

Despite this discrimination and injustice regarding biopiracy, the two indigenous interviewees stress their willingness to share the traditional knowledge. Grefa explains that anyone coming to her community to learn from them will be warmly welcomed. “The communities will never push you out or leave out a stranger, you will be part of the family” (Grefa). She says that if bioprospectors come to her community they willingly share their traditional medicinal knowledge as it can serve someone else. Unfortunately this often leads to biopiracy and she adds that “this is also the lack of knowledge from us because we share the knowledge”. Still, she emphasises that the change should not be from the indigenous people withholding knowledge, but from the bioprospectors treating them with more respect. Grefa means that it is important to share more with the indigenous people about the outcome of their research, and “how they were helped so [the indigenous people] could

get some recognition that their medicine it is helping”. Similarly, Viteri points out that “many people come with the only interest to research and extract the knowledge without giving credit or valuing the knowledge. This is very negative”. However, Viteri does not mind if a researcher comes and takes a sample of a plant to make a new drug and they come back and show their research discovery and share their new knowledge. This, he means, is a way of giving back. “Knowledge is universal”, he argues, “People try to classify themselves as Westerners and indigenous while I hold the concept that we are all just citizens of the world, and this is just a false division. So if there can be a benefit from sharing the knowledge we should. If it’s done respectfully, for me it’s good” (Viteri).

Grefa goes on to explain that traditionally the communities will share resources freely without prices or money, but that recent years has increased the requirement for money to sustain themselves. Still, she highlights that money is not the only necessary exchange for the communities, but can also be done through other help and initiatives in the communities. “We see these types of projects where foreign people have come to support without money or knowledge. We hope these projects will keep coming, we want to stop the mentality that without money you can’t do anything. I can’t deny that in some way it’s true that money helps, but it’s not true that without money you can’t do anything”, she emphasises (Grefa).

The willingness to share traditional knowledge was also shown as botanist Eriksen described a research trip to Ecuador. “When I explained that I was a botanist and was gathering plants they would show up an hour later with all the plants they knew about and explained their use. People were very willing to share their knowledge”. She adds that “Americans and Europeans have always been going out in the world and dominating and taking things for themselves, and the local people have mostly been very nice and helpful. But often they haven’t received more than a smile in return. It is very unfair”. Grefa confirms this by saying: “The indigenous communities will always be open to sharing our knowledge, to help, but we give everything we have and get nothing in return”.

All interviewees were asked the same question of: *In your eyes, how would a just exchange of traditional medicinal knowledge look like?* Johnsson Dahre states that the most obvious start would be that the indigenous people are treated the same way as everyone else. “In all research we talk about informed consent, so it’s only fair this is applied here too” (Johnsson Dahre). He adds that there are laws that should be followed, and that it is only fair that indigenous groups have access to collective knowledge rights and financial benefits as well. Andersson Nystedt says that “Knowledge is hard to put a price on. But one would hope that most things within health would be open-source, where we all openly share what we know. But of course, pharmaceutical companies don’t work this way.”. She adds that regarding the sustainable use of natural resources, she believes the indigenous people should be in control or take part in how much is extracted and what the exchange looks like. Eriksen believes a just exchange would include a collaboration with the indigenous people, listening to them. She mentions the importance of a contract that states if bioprospectors find useful substances that they must ship their final medicine or another fair exchange to the indigenous communities. Grefa would like to see projects where women in the community take part in handling these exchanges and are given complete disclosure on how their knowledge will be used. “A fair exchange is reciprocal. Where the people who want to invest and work with this type of traditional medicine can work together with the women or men that know about these plants. And we get knowledge about where and how this will be commercialised, instead of them robbing it” (Grefa). Viteri shares that “a fair exchange could be that the people coming to do research and learn our knowledge also need to teach us how they are researching and

what they know. The population on the other side of the exchange should also learn the other type of knowledge. It would be better if there could be a mutual conversation about these things in equality, and not just one-sided where they take from us” (Viteri).

Many interviewees showed interest in the idea of greater collaboration and the bridging of Western and traditional knowledge. Viteri believes we should not try to limit ourselves to one side but instead learn to take the positive things from each culture, in this case being medicinal practices. He says “we should be conscious of the value these knowledges systems have and try to understand it, but not take the knowledge and own it. We should respect what is diverse”. Viteri explains that many people are intent on defending a single argument of one truth, but that diversity encourages a mutual discussion. “When we talk together, we learn from each other and this is very necessary to understand each other” (Viteri). Andersson Nystedt adds to the importance of diversity, explaining that “we need to understand that the people who know their situation best is those living it. It’s not possible to say something has worked well in one place and assume it will in another. One needs to understand and conserve the knowledge that exists in each reality, while simultaneously finding the solutions that work practically”. She explains that the development paradigm is seeing a shift from a one-sided push towards scientific Western knowledge, to more participatory methods that listen and focus on traditional local knowledge (Andersson Nystedt). Furthermore, Grefa excitedly shares that CONFENIAE is currently working on an indigenous hospital that will allow ancestral knowledge to be practiced. This would create opportunities for the wise elders of different nationalities to go and share their knowledge in a different way, and help many more people (Grefa). Overall, the interviewees seem hopeful to bridge knowledge systems in a globalised world.

4.2 Analysis and Discussion

The first thing I gathered from conducting these interviews was the remarkably contrasting worlds between the indigenous interviewees in Ecuador and the academics in Sweden. Naturally they all had different beliefs and experiences, but at the foundation of all the interviews, there was a clear 'European' perspective or worldview, and similarly, a clear indigenous one. This comes as no surprise when familiar with the well discussed 'emic' and 'etic' perspective. The terms, first coined by Kenneth Pike in 1967, put words to the rather inevitable contrast to the perspective of an outsider versus an insider within a certain realm, in this case being the indigenous communities of Ecuadorian Amazonia. Pike (1967, 37) explains that "the etic viewpoint studies behavior as from outside of a particular system..." and "...the emic viewpoint results from studying behavior as from inside the system". Fetterman (1998, 19-20) explains the importance of the emic perspective to attempt understanding the reality of a social group, yet he clearly states that "no study can capture an entire culture or group". Taking the emic perspective when dealing with the issue of biopiracy allows for indigenous voices to be heard, a prerequisite to achieving social and environmental justice. In the interviews, both Johansson Dahre and Andersson Nystedt acknowledged that the indigenous people should, and must, represent themselves so their own opinions are voiced. Still, the interviews with the non-indigenous people consisted of discussion regarding what the indigenous people should receive from a non-indigenous perspective. This is expected as we are all products of our own culture and worldview, and will naturally bring that with us when we are faced with new people and situations. It is also acknowledged that outsiders, here being the non-indigenous, tend to skew results toward the etic perspective (Darling 2016, 7).

However, Fetterman (1998, 23) emphasises the importance of staying far from ethnocentrism, which is the imposing of one's cultural values on another culture with the assumption that one is superior to the other. This can be applied directly to the case of bioprospectors coming to indigenous communities in search for medicine while plainly disregarding the indigenous people living there, their traditional knowledge, and their land. I argue that there is two obvious cases of ethnocentrism in the issue of biopiracy. The first is the practiced belief that Western scientific medicine is superior to traditional medicine, which thereby diminishes the value of traditional knowledge and the indigenous people holding it; and the second is the ethnocentrism displayed when looking at the issue and potential solution of biopiracy solely through an etic perspective. Perhaps both of these cases might be improved simply through more effective communication between the bioprospectors and indigenous people to better understand their realities, desires, and needs. However, despite today's globalisation, there seems to be a general trend in humans to relate themselves to the world and divide themselves into 'us' and 'them'. 'Us and them' as an analytical term is used widely in ethnicity research, but can also be applied here (for more on the ethnicity perspective, see - Eriksen 1993). This perspective, where the 'us' refers to a group over here, and 'them' to the group over there seems straightforward in relational terms, but might contribute to the deepening split between human groups. I argue that the issue arises when the 'them' becomes a small, oppressed group that doesn't share the same value as the 'us'. Naturally, the lack of understanding between different groups, in this case being indigenous communities and foreign bioprospectors, would only increase this divided dynamic, supporting the need for communication even more.

With this said, the existence of contrasting worldviews of an outsider (being the foreign bioprospectors), and the insider (being the indigenous people), should not be fully neglected as both are vital for understanding a complex issue where these two worlds meet. As mentioned earlier in

the background of the thesis, the indigenous worldview goes completely against the Western-made concept of biopiracy in the first place. As interviewee Viteri expressed, to patent traditional knowledge "...is to disrespect the norms of the indigenous communities", as an individual cannot take ownership of collective knowledge. In response, it is important to question: *If knowledge can't be owned, how can it be stolen?* While I would argue that the feeling of betrayal is universal, regardless of language, ethnicity or worldview, the concept of biopiracy would be simply a Western construction. That is not to say it is a bad thing, as we are talking about biopiracy as a way of achieving justice for these people. Although this particular indigenous worldview might not agree that knowledge can be owned and therefore stolen, the Sumak Kawsay model, and many similar ones, have an expectation for every individual to contribute in the society. So, if a bioprospector takes and does not contribute with anything, they are performing injustice, whether we call it stealing or not. But the reality is that in order for me to talk about biopiracy, that I out of my worldview judge a relevant discussion in ongoing patent-wars, I must look at it from an outsider, or etic, perspective. I believe it is the only thing I can possibly do as I could never understand wholeheartedly a system that is not mine, and where I am not one of them, ruling out an exclusively emic approach (Darling 2016, 7).

Furthermore, it is important to acknowledge that the people performing biopiracy are those part of a society with ownership rights and a modern juridical system, whether this is within Ecuador or internationally. For this reason, speaking in terms of biopiracy and the stealing of knowledge is an etic perspective, that an outsider living in that system might better understand. For example, it seems easier for someone in a European pharmaceutical company to grasp that they should not steal another human's knowledge, over the idea that they must contribute and act in harmony with Mother Earth. One can argue that the entire fight against biopiracy takes an etic perspective in itself, no matter how closely an individual or organisation is working with the indigenous communities in Ecuadorian Amazonia. As Fetterman (1998, 22) argues, we must understand the emic perspective, but perhaps assume the etic perspective to make sense of the situation. Still, as the issue itself involves two overlapping worldviews it proves significant to understand and apply both emic and etic perspectives when analysing just exchanges of traditional medicinal knowledge between bioprospectors and the indigenous people. Whether it is me as a human ecologist analysing this issue, or a bioprospector negotiating the terms for it, an outsider conducting research in indigenous communities is responsible for gathering local perspectives to inform the researcher (Darling 2016, 15). This brings up the important point of taking responsibility when the outsider is a privileged person, or backed by a privileged nation, in this very unbalanced world. Bioprospectors often have the upper hand of an unfair power-play, where the indigenous communities are rarely informed on the ongoing projects, or granted an opinion on it. This leaves the evident responsibility of the privileged outsider ensuring both a socially and environmentally just exchange when bioprospecting, rather than contributing to other case of biopiracy.

Another important point for analysis in these interviews is the indigenous interviewees' evident desire that foreigners attempt to understand them and their entire reality, instead of picking just one 'piece of the puzzle' - that is, their medicinal knowledge. This seems to be both a question of respect, as well as an actual necessity to understanding the use of a natural resource. As explained by the interviewees, bioprospectors often come in search for a medicinal plant, and seem uninterested in the traditional knowledge around it. This is understandable considering the contrasts of traditional medicine to modern medicine, where the latter must anyway go through a series of laboratory studies. Still, it is paradoxical and even counter-productive to fully neglect the knowledge behind a plant that has been gathered by people living and using it for generations. As

Eriksen explained in her interview, if people have traditionally used a certain plant for something, it's a good place to start and find out what inside it is working, to save extensive resources on testing every plant that is found. This brings back the need for understanding the emic perspective, that is when a bioprospector attempts to understand the traditional knowledge behind a medicinal plant, regardless of the scientific process it might go through later. Understanding the context and reality of the indigenous people also includes understanding the importance of this traditional knowledge.

Independent of the debate on how a mutual exchange between bioprospectors and indigenous communities could look like, it is important to discuss the practical importance of the knowledge. Jordaan (2001, 31) explains that traditional knowledge is a diverse field closely interrelated with biodiversity through medicinal practices and plant knowledge. Also, as shown through the interviews, traditional medicinal knowledge has kept many indigenous, and non-indigenous people alive. In a world where economic privilege often determines our access to essential health, traditional knowledge is a way for less-economically privileged people to stay healthy. Furthermore, as Grefa claims in her interview, traditional medicine is not only more trusted in the community, but also generally works better for them than modern medicine. Here, we can see another case of the 'us and them' perspective, where the indigenous groups often see themselves as a collective 'us', and are sceptical to the foreign 'them', and 'their' medicine. She explains how several indigenous communities in Ecuadorian Amazonia have found plant species that help fight the current Covid-19 pandemic, and many who have survived because of it. She even states that non-indigenous people and hospitals are asking for this knowledge to help them as well. While stressing that I am no medical expert, there is definitely reason to be curious at knowledge that has helped, and is helping, innumerable amounts of people stay healthy without access to modern pharmaceutical medicine. Yet, as with everywhere in the world, elders are still dying in the communities, resulting in a significant loss of this traditional knowledge. Or as Grefa so eloquently put it, "Our libraries are dying". An increased awareness for the value of this traditional knowledge might be key to increase social justice, as well as encouraging the safekeeping of this knowledge for future generations, rather than the destruction of it.

Beyond medicine, the traditional knowledge of these indigenous communities also hold immense local environmental knowledge that has protected the Amazon rainforest for countless generations. Jordaan (2001, 31) explains how serious the erosion of this environmental knowledge is for the well-being of nature, meaning that the traditional knowledge "is a commodity that should be treasured and not exploited". Moreover, it becomes necessary to grasp the value of the indigenous people living with the land and caring for the Amazon rainforest not only to achieve a healthy climate, but also for continued advancements in the pharmaceutical industry. Newman (1994, 479) emphasises that pharmaceutical companies are continually searching for even more species for medical potential, especially in tropical regions, and that "as mass deforestation of these areas forces countless species into extinction, specimens yet to be analysed for their pharmaceutical potential will be eternally lost". Some of the thousands of species threatened by extinction potentially hold valuable pharmaceutical potential, such as cancer-fighting compounds (Newman 1994, 487). Resultantly, the loss of these species does not only lessen the likelihood of finding cures for these horrible diseases, but it also translates to an estimated loss to the pharmaceutical industry of 15 billion US dollars (Ibid.). As Luis Macas, from the *Scientific Institute of Indigenous Cultures* (ICCI) in Ecuador powerfully puts it, "We're killing ourselves in the process. The death of nature is the death of humanity. This is what we have to think about and reflect on." (Ross et al. 2014, 242). Perhaps greater awareness of the importance of this traditional knowledge keeping generations of humans and natural species alive might encourage bioprospectors to tread more lightly and ensure their research is done in a socially and environmentally just manner.

Furthermore, this discussion could not be ended without commenting on the essential social value of traditional knowledge. Sufficient evidence in the research and interviews of this thesis provides basis for arguing that biopiracy is partly a result of poor social value of traditional knowledge, as well as the indigenous people that hold it. As social value is subjective, it can also be changed. It might therefore be relevant to question why the 'Western' or more modernised view on issues such as intellectual property rights, medicinal practices, and even cultural constructions regarding societal and environmental development is often what 'goes'? Or as Jordaan (2001, 53) puts it, "whether a Western view should dominate and in the process dismiss alternative cultural perspectives". At the very least, one can argue that if what is considered morally 'right' and 'just' in Western terms apply to 'us', it should also apply to 'them'.

Interestingly enough, regarding the interview question on what a just mutual exchange of traditional knowledge between bioprospectors and indigenous people would look like, it was the non-indigenous interviewees that emphasised tangible and monetary incentives. While both indigenous interviewees admitted a growing need for money to sustain their communities, their primary vision had more to do with receiving respect and recognition. As Hornborg (2010, 18) puts it, "for the indigenous people the rights over traditional knowledge is not just an economic issue but also an important symbolic question that includes the right to respect for their cultural identity". This is not to say financial rewards for sharing knowledge would not be appreciated, but to highlight that on top of traditional knowledge lacking sufficient economic value, it also lacks sufficient social value. Despite both indigenous interviewees expressing their desire to share knowledge and help others, "putting traditional knowledge to the service of humanity does not signify that these have to be handed over free of charge and without any recognition whatsoever" (Aguilar 2001, 249). Instead, changes should be made to uplift social and environmental welfare, as well to equally distribute the benefits of economic growth, rather than to exploit (Jordaan 2001, 53). The difference in worldview is obvious, but there is also a choice to either respect and consider these differences, or to encourage continued social and environmental injustice. Also, the obvious differences between these two worldviews can be viewed as an opportunity for people of opposing knowledge systems to learn from each other. After all, there is surely something new to learn, whether it is the indigenous medicine man, or the Western doctor that is the 'insider' to be studied. So, perhaps the aim for all foreign researchers, whether bioprospecting or not, should be to strive away from a complete 'us' and 'them', but rather towards a collective us. As regardless if we cannot put ourselves in someone else's world, we can respect and learn from it.

5. Conclusion

5.1 Summary of Answer to Research Questions

In the aftermath of extensive research and deep interviews, it is clear that medicinal bioprospecting is closely interrelated with traditional knowledge in the form of biopiracy. This stealing of traditional knowledge around medicinal plants is often done in a way that harms both indigenous people, their knowledge, and the land they live in. Therefore it can be clearly stated that bioprospecting, when resulting in biopiracy, represents both social and environmental injustice. However, the discussions formed from the five interviews conducted, as well as other research on the topic, support the idea that an increased social value of traditional medicinal knowledge could encourage this socially and environmentally just exchange of knowledge. In the case of Ecuadorian Amazonia, it is clear that many bioprospectors neglect understanding the indigenous people and their traditional knowledge, thereby rejecting its value before even gaining insight to the goldmines it might contain. It is also evident that in the Amazon region, the poor social value of traditional knowledge, and indigenous people themselves, stems from a long history of oppression and power abuse. The destruction of indigenous people, their knowledge, and their land are all closely interlinked and together form the social and environmental injustice we currently see in biopiracy, as well as in other forms of exploitation. The findings of this thesis support the idea that the issue of biopiracy in Ecuadorian Amazonia goes beyond insufficient laws, and into the deep jungle of socially constructed value. It therefore proves necessary to understand the responsibility of being an outsider looking into this injustice and that we, regardless if we are bioprospectors or not, dare to discuss and communicate our role to ensure we are acting with respect and righteousness to protect the rights inherently belonging to indigenous communities. Lastly, a closer look at traditional knowledge in this thesis has shown that there is definitely reason to be curious and committed to protecting the ancient wisdom that our modern knowledge system could potentially learn from.

5.2 Contribution of the Study

The topic of this thesis is vast and deep, and a whole lifetime could be spent researching on the complex interplay between the two worldviews of the bioprospector and the indigenous person. If time were to allow, it would have been both interesting and beneficial to conduct more interviews across even more fields. More interviewees from each field, and from a greater range of countries, could have taken this project from a discussion between individuals to more general evidence of perspectives from certain fields. Furthermore, the inclusion of interviewees from pharmaceutical companies, as well as from leaders within Ecuador would have expanded the perspectives and given more insight to the issue of biopiracy in Ecuadorian Amazonia. However, since time was limited, this thesis might serve as a doorway into a deeper study on the value of traditional knowledge. It would be very interesting to research further into how a bridging between traditional and modern knowledge bases would look like practically.

6. References

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