DEFORESTATION AND ENVIRONMENTAL DEGRADATION IN INDIGENOUS BOLIVIA: A GENDER-BASED APPROACH TO RISK ASSESSMENT AND MITIGATION EFFORTS IN THE CHIQUITANO FOREST

by

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The proliferation of environmental disruptions and extractive industries in the Bolivian Amazon are having drastic effects on the forested ecosystems of the region, putting additional pressures on an already disadvantaged indigenous population to negotiate dwindling resources. Industrial agriculture and cattle ranching, natural gas extraction and mining are some of the environmental pressures impacting the size and wellbeing of the Chiquitano forest, which is home to a range of indigenous groups. Indigenous women of the Chiquitano forest face the brunt of environmental challenges due to existing gender dynamics and community structures that make them responsible for resource collection and reliant on the resources most threatened in order to fulfill their community roles. Climate change only compounds this effect as drought makes forests more susceptible to fires growing out of control and more challenging for plant life and freshwater sources to survive. Through the firsthand testimony of Chiquitano indigenous members and sourced literary review, this paper seeks to examine the ways in which gender roles in Chiquitano culture uniquely positions women to bear the brunt of human-driven environmental degradation, and identifies potential solutions to both lessen such harm and more evenly distribute attention to such issues.

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"A convincing case can be made that participation by women is the missing key element in finding solutions for the financial, environmental, and military problems that underlie the instability of our world and the questions of survival or sustainability. Valuing girls is like valuing trees. It's good for them and for the planet."

-Jean Shinoda Bolen, *Like A Tree: How Trees, Women, And Tree People Can Save The Planet* (xviii)

INTRODUCTION

The Monkox people are an indigenous group of about 88,000 (Fernandes Silva and Moreira de Costa) that reside in Lomerio in the Bolivian lowlands in the southeastern part of the state. They are important to the cultural diversity of Bolivia and represent an important case study of indigenous Americans fighting for complete political, social, and economic autonomy. The condition of the community now is rooted in early Spanish colonization of the Bolivian State, and the close to 100 year occupation of Jesuit missionaries in the region. After the expulsion of the missionaries, haciendas and rubber plantations dominated the landscape and oppressed indigenous inhabitants until they were phased out in the mid-twentieth century. What has been prevalent since has been a series of movements that have worked towards an autonomous state for the Monkox people.

Today, the Monkox and other indigenous groups in Lomerio face contemporary struggles of neoliberal policy and extractive industries infiltrating a sacred land which native Bolivians have been stewards for and relied on for the continuation of their cultural livelihood. Industrial agricultural industries, mining endeavors, and the development of oil and natural gas pipelines have all been major influences on the deforestation of the Chiquitano dry forest, the home of the Monkox and other tribal groups. They have also contributed heavily to the pollution of local water systems that tribal groups rely on as the primary sources for their community.

Women in Bolivian indigenous communities, including the Monkox tribe, hold roles that are completely dependent and interlinked with the natural resources of the region. As mothers and keepers of the household, women are responsible for the sourcing of freshwater used to care for children, cook, clean dishes and clothes, and give to the livestock they own. They also are responsible for collecting materials from trees and other plants that may be used medicinally, or

in the making of products like cosmetics and tinctures to be sold for local profit. There is hope looking forward, despite existing challenges, to empower indigenous women in their craft and mitigate environmental degradation in the region.

METHODS

For this study, I will be engaging a combination of primary and secondary sources to identify information and claims, analyze it, and draw conclusions. From the synthesis of firsthand encounters of Chiquitano tribal members and extensive literature on environmental degradation in the Chiquitano Dry Forest my research will draw connections between community roles for indigenous women and the loss and/or contamination of environmental resources.

Because there are existing published interviews with Monkox and other Chiquitano indigenous members, I will utilize their storytelling and cultural descriptions in order to piece together a current understanding of their lived experience in relation to their environment. I also will be pulling information from an interview I conducted in March of 2023 with Judith Chuve Parapaino, who lives in Lomerio and is on the board of directors for the Monkox Indigenous Women's Organization. She offers a strong, descriptive profile of the state indigenous women in Lomerio today, and hopeful signs of progress towards the future.

My secondary research will consist of a combination of literature review and examinations of other media which touch on such topics such as indigenous Bolivian culture and experience, extractive industry data, biological and social understandings of natural resources, and more. These sources are a large combination of scientific and scholarly articles, news

reports, non-profit missions, governmental documentation, and video record of relevant information.

BACKGROUND: From Conquest to Hacienda

Spanish Conquest

Although Spanish conquest of the Americas had a massive impact on existing indigenous communities in the fifteenth and sixteenth centuries, it left a less significant mark on the populations in Eastern Bolivia. Conquistadors arrived in the region from Paraguay in 1559 and established the state's capital of Santa Cruz de la Sierra, where it remained for 45 years before being shifted west to where it exists now (Riester 17). The conquistador Nuflo de Chaves, who is remembered as the founder of the city, coined the term "Chiquito" (translated to *little ones*) to describe the indigenous people of the region due to the size of doors at the entrance of their huts (Jesuit Missions, *Wikipedia*). By using such ill-informed reasoning, the term glazed over the reality that there were "more than 40 ethnic groups with different languages and cultures living in the region known as the [Gran] Chiquitania" (Jesuit Missions, *Wikipedia*). The tribes in the region were under Spanish influence during the period that the capital functioned in the San Jose de Chiquitos región, but once it was moved they returned to a condition of relative freedom until the arrival and occupation of Jesuit missionaries.

Jesuit Occupation

In the quest to evangelize the Americas, Spanish Jesuit missionaries turned their attention to indigenous members of the Chiquitania region, who were initially welcoming towards the Christians and their values. The Jesuits established the first mission (or *reduction*) with the Chiquitanos in 1692 and went on to organize nine more in the next 75 years (Riester 18) where

Chiquito emerged as the standard language that blended the wide range of languages used by the different tribal groups in the area. In these reductions, indigenous community structures were reorganized into groupings of a few thousand members each with a chief positioned as a representative leader of the community. The chief's role was primarily symbolic in these spaces, as the missionaries held almost complete economic, political, and religious control over the reductions and used the chiefs in order to distill their will and influence. Dynamics of labor exploitation began to proliferate during this period, as indigenous Bolivians were simultaneously inducted into Christianity and forced into production processes meant to benefit Europeans abroad. Prayer and work were what deemed worthy life in the gospel of the Jesuits as loom-based weaving, iron tools, cattle raising, and more efficient methods of agriculture were introduced to communities (Riester 18).

What came to be the ten reductions that comprised the Chiquitania region were most populated in the Nuflo de Chavez province, in the San Javier and Concepcion missions. Monkox community members describe how their ancestors fled Jesuit rule in these areas, "..because they demanded forced labor, as if they (the indigenous Bolivians) were slaves" (Garcia). The place they fled to became known as the Ancestral Territory of the Indigenous People of Lomerio and sits now in the Nuflo de Chavez province as the cultural center for the Monkox people. The Jesuit missionaries were expelled from the Chiquitania in 1767 after the king of Spain signed a decree banishing members of the Society of Jesus from Spanish territories in South America (Gott 202), but the legacy that remained left the Chiquitano population vulnerable to further labor and land exploitation. It is important to understand the history of Jesuit and Spanish occupation in order to recognize the beginnings of the next wave of indentured servitude for the Monkox, and recognize similar patterns of colonization in land occupation and exploitation in

the region today. Anthropologist Erland Nordenskiöld summarizes the legacy as follows: “The Jesuits protected the Indians from other whites, but divested them of their freedom and made them so dependent that after the expulsion of the missionaries they were easy prey for unscrupulous whites. Actually they set the stage for the extinction of many Indian tribes" (Nordenskiöld 186).

Haciendas and the Rubber Boom

Once the last of the Jesuits had left the reductions, the indigenous members of the Chiquitania were left open to further exploitation from colonizing powers and local governing bodies. The running of the missions was turned over first to priests and then to public officials, who established a civil authority and utilized the governing structure left by the Jesuits (Pena et. al. 22). From Santa Cruz, mestizos and European settlers began expanding into the missions, either pushing indigenous members out or homogenizing them into their agricultural pursuits as low-wage laborers. Community leaders sold large portions of missionary land to incomers from Santa Cruz, but because there was so much land available, these landowners gained their wealth from the size of their cheap workforce (Vadillo 291) and could “sell them along with the land” (Peña et.al. 22). It was during this period that a number of indigenous members fled the missions and settled in smaller camps, including what is now Lomerio, the center of the Monkox population.

These agricultural production centers increasingly dominated the missions as indigenous people became trapped in servitude to landowners, and created greater economic dependence amongst the population. It came to a peak in 1880, when American chemist Charles Goodyear discovered a way of cooking and treating latex from rubber trees that made it a product with a variety of potential uses (Survival International). With the invention of the tire in 1888 and the

mass production of cars in the United States in the following decades by Henry Ford, rubber became a high-demand commodity. Rubber trees grew primarily in the Western portions of the Amazon rainforest, reaching into the Chiquitano forest and putting a target on the backs of already-exploited indigenous workers in the region. Many Chiquitanos fled where others had already been to isolated but free communities, including Lomerio, but the Rubber Boom and mestizos found them there and forced them into servitude on rubber plantations. Historical accounts of conditions for indigenous workers on these plantations account horrific and inhumane treatment of slaves, who were forced to work day and night without food, tortured for the amusement of plantation agents, and killed as food for the dogs (Hardenburg 213-214).

Personal accounts of Monkox tribal members today tell a similar story of abuse as they recall what their parents and community ancestors went through during this time. Asunta Jimenez, a Monkox member of the Puquio village, recounts how foremen forced the Chiquitanos to tap 200 rubber trees a day each, and beat those who did not meet the quota. She says that "There in the rubber plantations there were no husbands, only demons (foremen)" (Jimenez). Another member of the village, Alanzo Supayape, describes how his parents remained trapped by the foremen because they were given food, clothes and soap which were charged to an account managed by plantation authorities to which indigenous slaves were always indebted (Supayabe).

The memory of these atrocities rests heavily in the memory of the Monkox and other indigenous tribal members in the region whose ancestors were enslaved and forced to work. The Bolivian Revolution of 1952 was a turning point in the liberation of indigenous Bolivians, as they gained the right to vote and were granted land rights through the agrarian reform law, which also dissolved haciendas and allowed for those who worked the land to own the land (Sagra).

This in combination with revolts on haciendas and rubber plantations and the Agrarian Land Reform of 1953 triggered a slow but meaningful shift in land autonomy for the Monkox and other indigenous Bolivians. What the Rubber Boom left behind though was an introduction of the global market to the environmental resources of the Chiquitano forest, and to forms of labor and land exploitation that are extremely prevalent today in other extractive industries.

LAS MUJERES: Subsistence Producers and Social Reproducers

Medicinal Plants of the Chiquitano Forest

An essential tribal role that indigenous Bolivian women have historically served and continue to dominate in is that of plant gathering. More specifically, Monkox women in Lomerio are primarily responsible for extracting surrounding plant materials that may be used for medicinal purposes, such as Copiaba, Babassu, and Kutuki (Porro). The practice of using these natural resources, as well as other regional plants, for wellbeing and healing purposes is deeply rooted in the ancestral consciousness of the Monkox people and their situation in the Chiquitano forest. It is important to recognize the ways in which this practice has been in part responsible for the survival of this indigenous culture through the disease and plague brought to the community by European colonizers, and therefore how women as harbingers of this ancestral knowledge and practice have maintained the livelihood of the Monkox people. These three plants are found throughout the Amazon region, and each have an array of properties that culturally position it as an everyday part of Monkox existence.

Babassu

The babassu palm (scientific name *Attalea speciosa*) is a tree native to the Amazon biome that produces a coconut-like kernel with oil enclosed beneath the shell (Talbot). The oil is the

primary component utilized for healing, including but not limited to: blending it with sugar and consuming it to eliminate parasites, applying it topically to the head to aid during headaches or in the presence of dandruff, covering physical wounds, and mixed with boiled guava leaves to help with a cough (SIREJ). The oil is recovered by collecting the seeds, breaking them open and pulling out the solidified oil that rests in the middle.

Copaiba

The copaiba tree (scientific name *Copaifera*) is a genus of tree that grows mainly in South American rainforest and dry rainforest ecosystems, although there are also a few species found in the African Savannah (de Trinidae et.al.). The one specific to the Chiquitano forest is in the legume family and has "oil that flows through the heart of the tree" with a wide range of medicinal properties, including anti-inflammatory agents, pain-relief and healing (Coimba Molina et. al. 6 *transl.*). A study from 2012 on the anti-inflammatory characteristic of copaiba oil reveals that it has the potential to preserve neural tissue in the body by regulating the inflammation that occurs when the central nervous system is damaged (Guimarães-Santos et.al.), suggesting the product has the capacity to mitigate the damage caused by neural diseases. In order to harvest the oil, the tree must be tapped and drained.

Kutuki

The kutuki herb (scientific name *Picrorhiza kurroa*) is a small root whose consumption was abandoned more recently by young generations of the Monkox tribe due to its bitter taste, but was recently rediscovered during the onset of COVID-19 due to its medicinal abilities (Inturias et.al. 53). Kutuki is used to remedy cold and flu symptoms after being prepared by soaking it in alcohol or infusing it in water with other medicinal plants (Inturias et.al. 54). The ancestral knowledge surrounding the potential of the kutuki herb lies so deep in Monkox culture

that it is what community leaders turned to when treatment for the COVID-19 virus was slow to reach indigenous Bolivians. President of the Autonomous Advisory Council (CAA) Maria Chore Oliz explained how “To counteract the disease we use kutuki, copaibo, masiaré, matico, creole lemon and paradise. They are natural remedies and were used by our grandmothers and grandfathers” (Oliz). It was critical during the peak of the COVID-19 pandemic that the Monkox tribe utilized healing practices that were accessible and long understood within the community because it took a long time for tests and vaccines to come from Santa Cruz. Lomerio authorities believe it was herbal medicine that got their people through the first wave of the pandemic (Andrada and Villca Mitma).

Producing Natural Resources for Market

Extending beyond the medicinal properties and their roots in indigenous Bolivian culture, these plants have come to be an economic opportunity for the Monkox tribe. Babassu, copaiba and kutuki can be sold in their harvested form (oil or root) or combined with other ingredients to make other marketable products. In Brazil, babassu kernels are one of the primary non-timber exports of the country, but record comes from corporate extraction processes and does not account for the large number of agro extractive communities that harvest cusi oil and kernels on a smaller scale, such as in Lomerio (Porro).

Babassu

The diverse structure of the babassu nut encourages a wide variety of uses. The oil inside has a variety of cosmetic applications, such as soap, balms and lotion (Mountain Rose Herbs), or sold individually for direct application. The oil is also edible, and can be used in cooking or in the production of babassu coconut milk (Porro). After extracting the oil, the leftover husks can be turned into a charcoal product and used locally to produce energy or sold for profit (SIREJ).

There is existing practice of tree husks being used as a building material, but there is no existing literature on whether the community has chosen to market this use of the material.

Copaiba

Copaiba could be considered similar to cusi oil in its potential uses, especially as it relates to inflammation in the human body and immune system activity. The suggested effects of copaiba oil from indigenous medicinal practices are anti-inflammatory, antitumor, able to treat syphilis, bronchitus, and ulcers amongst other benefits (Paiva et.al.), indicating that there is high potential for its adoption in Western medical industries. There has also been research conducted on the antibacterial properties of copaiba oil which suggest it may be an effective agent in developing products such as biodegradable packaging that prevents fungal production in stored foods (Morelli et.al.). Currently, the Monkox tribe profits from copaiba oil through its addition to creams or other oils in order to hydrate the skin (Perfil de Mercado).

Kutuki

The Kutuki does not appear to have been as widely in production for profit until recently, when an infusion was developed in Lomerio that seemed to diminish the symptoms of COVID-19 for affected community members. There is only one health clinic in the village, and during the peak of the pandemic it would take many days for COVID tests to get to the city of Santa Cruz and results be returned to indigenous residents. This in combination with the extreme delay in the Bolivian government's development of an action plan to support indigenous Bolivians (over 3 months after the start of the pandemic) forced the Monkox and other tribal groups to take healthcare into their own hands (Chambi). An infusion of paradise leaves, honey, matico and kutuki was developed by the Monkox family of Juan Parapaino, which worked so well at remedying the cold-like symptoms of the disease that it became requested throughout the

community. At the time of the article in 2020, 2-liter bottles of the kutuki infusion would sell for about $14 USD (Chambi), but Parapaino had plans to increase the accessibility of the syrup to children and improve the packaging. This case study demonstrates just one potential for kutuki as a profitable resource for the Monkox people, but other options could be developed with additional resources, like scientific research and monetary backing.

Indigenous Women and the Extraction Process

Indigenous women dominate the extraction and refinement processes of babassu, copaiba and kutuki resources, although the scale of their work is largely under-reported (Hecht 317). One survey conducted on babassu extraction in the Amazon found that female indigenous members conducted the bulk of the collection, processing and selling of babassu product, with 57% of women being responsible for breaking coconuts alone, as opposed to 31% broken by families and 12% in groups (Porro). The collection process includes wandering fields, which women may do in groups of three to five (González-Pérez et.al.), and gathering fallen babassu nuts or using the sharper end of a babassu palm branch to prod at the nuts until they fall (SIREJ). Judith confirmed that the collection of seeds is normally done by women, and that they offer a source of income to the family (Chuve Parapaino *trans*.). Once collected, the nuts need to be cracked in order for the oil to be extracted. This may be the most labor-intensive portion of the process, and has generationally been a means of economic and cultural survival maintained by female members of the tribe (Porro).

It is unclear based on existing literature whether women are dominant in the extraction process of copaiba oil, but it does seem as if they are primarily responsible for the processing of the oil into cosmetic products which provides funds for family and community livelihood. Many accounts from the resurgence of kutuki in Lomerio during the first wave of the COVID-19

pandemic reference the importance of healer women's ancestral knowledge in the process of developing the root into a medicinal infusion. One Monkox healer, Doña Juana, explains how she developed her infusion with natural resources that she knew held properties that could heal symptoms of a cold (Inturias et.al. 55).

These means of collection and production stand out as woman-dominated. It speaks to the way in which resource gathering and processing, whether for local use in medicinal and healing spaces or to be added to goods produced to sell, is gendered and therefore disproportionately impactful when these processes are challenged. Without the ancestral knowledge held by elder women in the Monkox tribe, or the practical knowledge of female babassu nut crackers and copaiba tree tappers, the economic and physical well being of community members would be in jeopardy. One indigenous woman from the Chiquitano forest explained how there is a barrier to market in the requirements by the Bolivian government register a product, including "..having a laboratory where products such as shampoos are produced, but our organization lacks an adequate environment and the money to pay for the cost.." (Yopie, Interview with Mara Hindery-Glasinovic). She explains that they may sell their cosmetic products at local fairs, but accessing a greater consumer base has proven more challenging given the resources the Monkox tribe has at their disposal. Beyond this, the form of resource extraction these women take part in is considered a part of "non-extractive economies" as defined by The Bolivian Parliament of Nations and Indigenous Peoples of the Amazon, East, and Chaco of Bolivia (Bolivian Parliament of Nations and Indigenous Peoples of the Amazon, East and Chaco). This means that the natural resource is harvested in a way that does not put the resources at risk of depletion, which promotes overall forest health and allows for an ecosystem to remain balanced.

Collection and Use of Water

The role of collecting potable water is especially relevant in communities that do not have access to irrigation systems or nearby freshwater sources. Globally women spend 200 million hours annually on water collection for their communities (UNOOSA). This is the case in Lomerio, where a variety of freshwater sources serve the different tribal groups of the village. The Paurumanka and el Curichi springs are two assets that have never run dry since indigenous settlement in the region, and in combination with the various rivers that run through the area the Monkox and other Lomerio communities are sustained (Inturias et.al. 82). The Monkox people show their respect to the nature spirit (called *jichi* in Besiro) Nixhix by honoring the water sources that surround them, by pulling from it sustainably and keeping it clean (Inturias et.al. 82). The way in which the contamination of water sources affects women is twofold, as they can be described as "subsistence producers and social reproducers" (Rodriguez Fernandez) in their community.

Collection

The activity of water collection is a major "subsistence producing" activity that indigenous women in Lomerio and throughout Bolivia are responsible for and expected to maintain as it contributes to their tertiary roles as mother and housekeeper. Collecting water can be the first thing indigenous women do in the morning, waking up as early as 5:00 a.m. to travel to the nearest watering hole and gathering water in a bucket to bring back to the house for dishes (Rodriguez Fernandez). When local sources are contaminated, it requires them to travel further to find sources that have not yet been polluted, or are at least safe enough to use in washing dishes or clothes. One indigenous Bolivian resident, Doña Victoria, explained how, "It is obvious that we women have the worst part in this contamination because we are the ones who have to find new ways to obtain water to give to our children.." and how, "We carry water in

buckets, and we tell our kids not to wash their faces, we are always on alert" (Rodgriguez-Fernandez). These trips can put women in danger, both in the short-term risks of falling or stepping on large thorns (Rosinger et.al.) and the long-term effects of fatigue, chronic pain, or physical stress during pregnancy (Geere et.al.). There is also an embodied mental toll placed on the indigenous women that stem from mechanisms such as the constant stress of uncertainty, concerns over water-borne illness, and frustration over restricted autonomy (Wutich at.al., 2020). The further the trip is to get water, the more exacerbated these effects can be.

Water Uses and the Impacts of Contaminated Water

The roles of Monkox women that deem them "social reproducers" are inherently water-centric (Rodriguez Fernandez), and therefore put them at the forefront of water politics and dispossession. By "social reproducer", I mean that women are held primarily responsible for furthering the indigenous cosmovision through their beliefs, behaviors, activities and relationships that are "directly involved in the maintenance of life on a daily basis, and intergenerationally" (Bhattacharya). These tasks include caring for children, taking care of household tasks such as washing dishes and clothes, cooking for the family or greater community, and caring for those who may fall ill. As mothers and child rearers, indigenous women must ensure that there is potable water available for their children to drink, to wash their hands and clean their bodies, and to cook the food that their kids can consume. The reality is that, as of 2017, only 25% of Bolivian households had basic handwashing facilities in their home (access to soap and water) and over half have no hand washing facilities at all (UNICEF 37). In addition to this, 33% of rural areas in Bolivia relied on surface water (lakes, ponds, rivers and springs) for drinking water, and 54% of rural areas had no sanitation facilities at all (UNICEF 38 & 128). The consequences of not having a great enough access to potable water are physically

and psychologically numerous. Children particularly could be at a greater risk of dehydration and diarrheal diseases by drinking contaminated water, which could in turn lead to increased malnutrition (Rosinger). Women and girls may face exacerbated challenges in managing their menstrual cycles if they do not have adequate sanitation facilities, putting their health at risk. The demands of locating and providing clean water can put excessive stress on women in the community, and we know from the allostatic load model that chronic stress exposure can lead to physiological dysregulation in the body that can make populations for vulnerable to non-communicable diseases like hypertension and stroke (Guidi et.al.).

There is also the impact that contaminated water has on the ecosystem which serves indigenous populations. Residents in rural areas will use local water sources to water gardens or larger agricultural plots and to give to their livestock. If the waters that run along farm plots are polluted with crude and heavy metals from local mining or with chemicals from industrial agriculture upstream, those will have a negative effect on the productivity of indigenous agricultural plots and all other plants that pull water from that source (Rodriguez-Fernandez). It also puts at risk the ability to raise livestock, such as cows, who are able to provide a number of resources through their meat, milk, and hydes. Without clean water to provide them, they could not survive and their resources for the community would be lost.

A Project of Hope

In spite of this, there have been some wins in recent years regarding increased access to drinking water and sanitation services for the Monkox tribe. During the peak of the COVID-19 pandemic, there was great fear in the community around contracting the disease, and as result many families stayed in their house for up to two weeks at once. There were dangers associated with people gathering around shared spigots to wash their hands as social distancing was greatly

encouraged, so the necessity for individualized water sources was heightened (Andrada). In this particular community in La Asunta, women were transporting water from sources between two and three kilometers away on foot or with the help of a donkey, but the project conducted by the nonprofit Indigenous Navigator installed plumbing that pulled water from a replenishing lagoon and delivered to households in the community (Andrada). The pump uses solar energy to function, and members of the village have done their part to ensure deforestation does not take place near the lagoon, so the project remains ecologically sustainable and could be used as a model for future irrigation projects in the Chiquitano forest. This has since taken a huge burden off the shoulders of Monkox women who reside in La Asunta, who previously had faced the daily struggle of water sourcing.

THE ENVIRONMENT: Deforestation and Extractive Industries in the Chiquitania

The Chiquitano Dry Forest sits in the eastern portion of Bolivia in the lowlands and stretches over the border into a small portion western Brazil. It exists in a climactic transition zone between an entirely deciduous southern portion to semidecidual in the north, with the zones dependent on rainfall (Killeen et.al. 206). The bark of the most populous trees in the neotropical seasonal dry forest is very dense, giving the forest a high economic potential despite the costs of accessing such a dense and isolated region (Killeen et.al. 206). Because of its geographic distance from urban centers it saved the region from earlier projects of deforestation and industry, but investments in industrial agriculture along the fringes of the forest and mining and logging moving towards the interior are threatening both the Chiquitano dry forest and the indigenous inhabitants. Judith described this forest during my interview with her as “Our big

house where we all live with our customs" (Chuve Parapaino *trans.*), illustrating that beyond its ecological significance, it is culturally necessary for indigenous livelihood.

Industrial Agriculture

History

The primary driver of deforestation in the Amazon biome today is the clearing of forest land for cattle ranching and mechanized agriculture (Killeen et.al. 207; Müller et.al.). Cattle ranching was first introduced to the region with the settlement of Spanish Jesuit missionaries during the 17th and 18th centuries (Tonelli), although their occupation didn't bring on the development of agribusiness. That came along during the 1960's when the Bolivian government expanded the production of domestic agriculture east in order to increase meat production and decrease reliance on imports (Arrieta et al.). Medium to large scale ranches and agricultural plots continued to multiply, clearing large swaths of forest in the eastern lowlands to make way for grazing fields and plantations. In the 1980's, Bolivian policy opened the country's economy to the foreign market in a way that implanted mechanized agriculture into large agricultural operations (Müller et.al. 4). It was from this point on that the country saw a steady rise in rates of domestic deforestation, which have been most prolific in the Bolivian lowlands and remained above 0.5% a year since 2006 (Killeen et.al.).

Soy and Beef

As the global population grows and increasingly migrates to urban spaces, demand for food and other agricultural products grows with it. A recent New York Times report concluded that, "As in previous years.. most forest loss in the tropics was driven by agriculture (in 2020)" (Fountain), as land is cleared to make way for crops like soy, sugarcane and rice. Forested lands are often cleared by cutting down all of the trees from a large area and burning the remaining

ground cover (called *slash and burn* land clearance), but in some events the fires can get out of control and clear even greater sections of forest (Jasser et.al.). One instance of this occurred in 2019 when the burning of land cover in the Bolivian Chiquitania burned three million hectares of forest as an out of control slash and burn process in order to clear land for agricultural use (Nunez del Prado Alanes).

The primary crop of the industrial agricultural sector in Bolivia is soy, which is grown some for domestic and foreign consumption but mostly as feed for cattle. Almost 70% of the land for soy production in the region is controlled by just 2% of soy producers, and 80% of the soy that is grown is exported globally (Nunez del Prado Alanes). One popular method of growing soy is through monocropping. This consists of planting an entire field with just one crop on the same plot of land year after year. The high concentration of one plant that requires a certain set of nutrients strips the soil of these features, weakening the ability of the soil to support the plant and forcing farmers to use pesticides and chemical fertilizers in order to sustain their agricultural yield. These chemicals, if sprayed, can travel through the air for miles and trigger negative health effects in nearby populations. In addition to this, they can be leached from the soil in water runoff and make their way into local waterways that are used as freshwater sources by rural and indigenous populations. The model for growing soy is not structured to support local or regional development, but rather to gain the maximum profit in the shortest time possible without regard for soil regeneration or environmental degradation (Urioste 443).

The growing global demand for beef and cow products has resulted in a large increase in cattle ranching in the Global South. Between 2000 and 2010 alone, the conversion of forest land to grazing pastures accounted for over half of the total deforestation in Bolivia (Müller et.al. V, 2014). Two drivers of this increase are urban population growth and international investments in

agribusiness, which often comes from Brazil (Müller et.al. 17, 2014). The Chiquitania region has the highest rate of deforestation caused by cattle ranching in the country, where many of the farms are large scale and owned by only a few farmers or a corporation (Müller et.al. 13, 2014). Because cattle in Bolivia and on ranches around the world can consume soy products as feed, the increased production of one encourages the increased production of the other. There is a catch-22 that lies in replacing beef consumption with meatless alternatives though, as many of these alternatives (mainly tofu and tempeh) are soy based. This means that even if you may not be encouraging beef production, your investment in soy products is more concentrated. A large contributor to the deforestation of lands for conversion to pastures is the few, large scale forest clearings done illegally by a few ranchers, clearing thousands of hectares at once (Müller et.al. 53, 2014). This shows a potential for deforestation mitigation in more strictly enforced land clearance laws.

Natural Gas Extraction

Another driver in deforestation and environmental degradation in Bolivia is the extraction of oil and natural gas from forested land. The department of Santa Cruz is second in the nation in export revenues from natural gas (Urioste 439), and indigenous communities located in the path of gas pipelines or directly atop deposits are dispossessed due the efforts of an industry which functions for individual profit rather than regional development (Webber 234). In 1997, American energy company Enron sought approval for the construction of a natural gas pipeline through eastern Bolivia, called the Cuiabá pipeline (Langman), which was later protested by the Chiquitano people during construction in 2000. The indigenous peoples of the Chiquitano forest reached an agreement with Enron to receive compensation, but only fractions of what the company had promised actually made it to the people. One of these was a number of cattle,

which the Chiquitano did not even have the land to host. Despite this, there are many efforts from the indigenous groups to learn how to use existing legal frameworks to support themselves and their claim to their territory (Hindery 7). The deforestation that occurs during the installation of the pipe is a catalyst for further deforestation practices that are opened up in the process. Trees must be eliminated to make way for roads, airstrips, and therefore pipelines developed for natural gas transport are often associated with moderate deforestation in initial stages (Hindery 141) What often follows though is continual illegal deforestation which people access by using the paths carved by the pipeline. This is the combination of mining, logging, hunting, and clearing for agriculture that in each event only clears more space for others to come and do the same. The presence of the pipeline triggered the use of extensions of the pipeline in order to power other industrial projects in the Chiquitano forest, such as siphoning of gas by the Don Mario Gold Mine (Amazon Watch). Impacts of this extensive use have included water and air pollution, soil and wetland degradation, and the disruptions of rural communities by the activities of the workers' camps (Hindery 134). The small amount of reforestation that did take place after the pipe was initially installed did nothing to mitigate the damage that had been done, both environmentally and in terms of rebuilding a barrier to protect the forest from poachers and loggers. The challenges from this pipeline are ongoing, as of 2022 finance company J&F invested in the development of four more gas power plants in Cuiaba (Maia).

Mining

The key case study for mining in the Chiquitano forest is the Don Mario Gold Mine, funded by Canadian company Orvana Mineral Corps. During the development of the mine in 2002, a large amount of deforestation took place in order to clear space for the mine and its operating components. This included the freshwater reservoir, tailings pond and processing plant,

as well as the workcamps and airstrips to access the mine (Hindery 210, Subterranean Struggles). Although the project was approved for 36 hectares of clearing by the San Jose de Chiquitos Forest Operating Unit, it cleared roughly 47 hectares of forest land (Superintendencia Forestal, 2002). The project later cleared an additional 150 hectares of forest in the Don Mario district along the road to the mine (Hindery 210, Subterranean Struggles). The installation of the Cuiaba gas pipeline enabled the mine to remain active due to the power it was being provided, and although the deforestation that was conducted by the mining project itself was limited, it created space for loggers, hunters, and ranchers to illegally invade the forest and clear it further. We see this same pattern with the installation of the pipeline where the first stages of forest clearing for the installation of a development project in the forest has a synergistic effect on other land access projects. In the case of Chiquitano forest, the clearing for the mine or the pipeline doesn't stop once the installation is complete, but rather triggers the exploitation of land by other actors who as a composite make a large impact on the state of the forest.

In addition to the threat of deforestation, mining poses a massive threat to freshwater systems in the Chiquitano forest. The tailings pond is tested in a few sections for chemical pollution, but is not adequately monitored across the production range of the gold mine (Hindery 214, Subterranean Struggles). There is great concern amongst the Monkox and other tribal groups in the forest regarding the leaching of chemicals from the tailings pond and other mining facilities into ground and surface water. These chemicals include mercury, arsenic, cyanide, and lead, which can poison human and animal populations and destroy plant life by leaching into the soil (Hindery 214, Subterranean Struggles). There have also been documented cases of hazardous chemicals spilling from mining vehicles that race through the forest on developed mining roads. One Chiquitano community member reported an incident where a child came

across a barrel that had fallen from a mining vehicle and was leaking an acidic chemical and producing a toxic vapor cloud (Hindery 214, Subterranean Struggles). Beyond the deforestation of indigenous land and the pollution of freshwater sources that indigenous peoples rely on for survival, the activities of workers operating vehicles and spending time in worker's camps has a direct impact on the indigenous population in the forest.

In Their Own Hands

The lack of accountability from the mining company and broken commitments made to the Chiquitano community regarding environmental protection measures to be followed by the project has made it challenging for indigenous people to represent themselves and hold the corporation accountable for the damages they have caused. In spite of this, there has been an encouraging development in the sovereignty of indigenous people in the Lomerio region. The nonprofit CEJIS (Center for Legal Studies and Social Research) established a system to help empower local people in the Bolivian lowlands to conduct environmental surveys and monitor development and infrastructure projects that may threaten indigenous populations (CEJIS). One of the community leaders in Lomerio was offered a spot amongst other social environmental monitors of lowland forests who use cell phones equipped with a GPS app in order to track down environmental concerns that have been detected previously by satellite. Young and old folks work together on these monitoring teams, as the younger members have better knowledge of the technological aspects of the system and older members have stronger lay of the land (Praeli). It is also important to note that in some communities as much as 50% of the monitors are women. The teams keep track of fires in their territory, as well as freshwater surface levels, mining and oil activities, and illegal land encroachment (Praeli). One monitor from the Totoca community in Lomerio explained that he joined the monitoring system because he and his people were faced

with miners that came into their territory without prior approval (Praeli). In combination with the training monitors receive regarding Bolivian land treaties, laws, and agreements has been empowering indigenous peoples to find a renewed sense of management over their territory.

Indigenous Land Rights in Bolivia

Although there is an extensive history of land policy in Bolivia regarding ownership rights and indigenous autonomy, the election of president Evo Morales in 2006 appeared to be a turning point in the fight for indigenous territorial sovereignty. Morales was Bolivia's first president of indigenous descent, and as such he made commitments early in his presidential term to redistribute land to poor and indigenous Bolivians and reduce poverty (Britannica). In 2009, three years after the election of Morales, the administration passed through a national referendum a new Bolivian constitution with declarations regarding the rights of indigenous nations. These included, "rights to autonomy and self-government, to culture, to recognition of their institutions, and the consolidation of their territories (Bolivia 2009: Article 2)" with a central focus on efforts towards decolonizing the state (Postero, 2). These articles were revolutionary and offered promises of self-determination for indigenous groups, but the actual follow through, enforcement, and conditionality of such have proven to be far less than initially stated. The reality is that the Morales administration carried out such declarations "..in performances of a state-controlled version of indigeneity that legitimizes state power" and allowed "..indigenous local autonomy rights under a liberal government in which the central state retains decision-making power over most significant matters, especially as regards the extraction of natural resources" (Postero, 4-5). This makes matters regarding deforestation of indigenous lands by external actors especially challenging, because when the state is faced with the choice between resource extraction and infrastructure development for profit, or indigenous livelihoods, the

record has proven the former to be favored. Therefore, indigenous states have been forced to continue fighting for a realized decolonization where they have control over their resources and who can access them.

Climate Change

Every factor I listed above has a direct relationship with global climate change, either in how global warming is influencing systems or how systems are contributing to the addition of greenhouse gasses into the atmosphere. Judith explained during our interview that the frosting of the forest has become a big challenge to the bounty of their forest resources, explaining that, "Plants no longer bear much fruit and due to frost their fruits suffered damage.. seeds in poor condition rot quickly" (Chuve Parapaino *trans.*). This is just one example that illustrates a much more imminent threat to not only the Chiquitano Dry Forest, but to ecosystems around the world.

I. Industrial Agriculture

Today industrial agriculture is proving to be a large contributor to GHG emissions around the world. The Agriculture, Forestry, and Other Land Use sector (AFOLU) is responsible for about ¼ of total anthropogenic emissions (IPCC 816) . The direct contributors to this include: the fuel burnt to power machinery used in industrial agriculture, the processing of food, and the transporting of food around the world. The indirect contributors include the production of nitrogen-based synthetic fertilizers that are used to encourage plant growth and the large-scale breakdown of organic matter through field tillage that releases carbon dioxide into the atmosphere (Capra). There is also a major contributor in the emissions that come from slash and burn agriculture, which uses the burning of organic material as a land clearing practice and releases large concentrations of carbon dioxide. Cattle ranching is also a major contributor to greenhouse gas emissions, as just one cow can produce between 154 and 264 pounds of methane

a year (EPA, 2020). Methane is the second most concentrated greenhouse gas in our atmosphere, but it is much more damaging than carbon dioxide due to its warming potential. Emissions from this process also come from the infrastructure involved in meat processing, as well as transport worldwide.

As much as these are contributing factors, they are also experiencing increasing challenges due to the rise of global temperatures, increasing extreme weather events, and more frequent droughts. Monocropping as an industrial farming practice makes the soil weak, and therefore it is challenging for plants to stay rooted in the event of high winds or a storm. These events are becoming more frequent with climate change. Rising temperatures will pose a greater challenge to plants enduring such consistent heat, and will also expand the range and consistency of insects, weeds, and diseases that threaten crop health (U.S. Global Change Research Program 197). In response to this, farmers are pushed to exercise the use of more pesticides and chemical agents in their farming, which further deteriorates the soil and continues the cycle of emissions. Decrease in rainfall as an effect of climate change increases the threat of wildfires, which threaten crops and contribute to GHG emissions (EPA, 2022). Drought can also reduce the availability of water to use for crop production, a challenge that is compounded by temperature increase because plants will require more water to survive (NIDIS).

Livestock, like crops, are facing very similar problems related to global warming and other symptoms of climate change. According to the IPCC 2023 report, cattle are predicted to experience “extreme stress” due to high temperature and humidity from roughly half of the days of the year to everyday throughout the year (Gilbert et.al.). Decrease in availability and access to potable water make it harder for cattle to survive, and their grazing lands face a similar threat due to drought (NIDIS). The pests, parasites, and microbes that infect cattle at smaller rates now can

become more imposing threats to herds as temperatures increase (U.S. Global Change Research Program 198), and with this the potential for zoonotic diseases to reach human populations also increases (U.S. Global Change Research Program 201). This threat is multiplied when cattle are raised and bred at large scale in "factory farms", as they are packed close together and have a weakened immune system due to overexposure to agricultural chemicals and stress from long periods of confinement.

II. **Natural Gas and Mining**

The effects of natural gas extraction and mining activities on the release of greenhouse gasses are extremely direct. The process of extracting and operating on oil and natural gas prior to consumption for fuel is the largest source of methane production from the energy sector due to factors such as gas leakage, components that release methane during operation, and a lack of adequate control devices for emissions during processing (IEA). Venting and flaring, which is the controlled combustion of natural gas and its direct release into the atmosphere, is also a major contributor during the production process and releases large concentrations of methane directly into the atmosphere (C2ES). Although the emissions from burning natural gas for fuel are much lower than those from coal and oil, it does release nitrogen oxides which can trigger smog accumulation and trap heat and pollutants in the air (Union of Concerned Scientists). The land clearing required for drilling is also a component in carbon emissions that come from deforestation and facility construction.

Mining endeavors, but specifically gold mining, creates a devastating amount of chemical pollution that infects ecosystems and challenges local communities whose environmental resources are threatened by such contamination. In terms of emissions, carbon dioxide is the primary greenhouse gas released during the gold extraction and refinement process. In 2019

alone, almost one ton of CO2 was emitted per ounce of gold produced (S&P Global Market Intelligence). The Don Mario Gold Mine is an open pit mine, and open pits emit more greenhouse gasses than closed pits, and almost double the amount of CO2 (S&P Global Market Intelligence). Beyond emissions, the waste from mining often leaches into surface water systems and soil, poisoning plants and wildlife alike (Earthworks).

There is no feasible effect that climate change has on natural gas extraction and mining projects that is not completely superseded by the damage these industries cause. If drought, atmospheric temperature increase or extreme rainfall poses a challenge to energy or gold corporations it is besides the point, as fracking and open pit mining releases such a magnitude of greenhouse gas emissions that their challenges are supportive to the environment.

There are such a number of primary and secondary effects of climate change that it is challenging to capture the magnitude of global warming as a threat to forested ecosystems. The burning of the Amazon will be one of the greatest sources of damage to continue plaguing the region, and it is because of global warming and reduced levels of rainfall. What would be small and controlled burns will, like in the case of 2019 where three million hectares of Chiquitano forest were consumed by fire (Nunez del Prado Alanes), become uncontrollable wildfires that swallow large portions of tropical dry forest territory. This could lead to habitat fragmentation, threatening the concentration of biodiverse communities and further exposing isolated portions of forests to land clearing (legal or illegal) for industrial agriculture and infrastructure, as well as hunters and poachers (Steininger et.al.). As trees come down and plant life deteriorates due to the change in ecosystem structure, carbon is emitted into the atmosphere. Just between 2000 and 2010 alone, an average of 93 million tons of carbon were emitted per year from land use changes in the Chiquitano forest, up from the period 1990-2000 where an average of 63 million tons was

emitted (Anderson et.al.). Not only is carbon released during this process, but trees as carbon sequestration systems are no longer contributing to the uptake of CO2 from the atmosphere, exponentiating greenhouse gas concentrations. The list could go on, but it is important to consider the implications of climate change in human-driven deforestation.

THE IMPACT: Movements looking forward

As we consider this dynamic of indigenous women being especially challenged by the consequences of deforestation, there is an opportunity to explore movements forward. There is the question of what can be done in order to empower women socially and economically so their community roles may not fall so dependent on environmental resources. Then there is the question of what can be done in regards to mitigating deforestation and environmental degradation in the Chiquitano forest so that the livelihood of indigenous members (and of the greater ecosystem) can be supported.

Las Mujeres

The form of environmental extraction that Monkox and other tribal groups utilize for economic and social profit in the Chiquitano forest utilizes non-timber forest products, or NTFPs. These include "..herbs, grasses, climbers, shrubs, and trees used for food, fodder, fuel, beverages, medicine, animals, birds and fish for food, fur, and feathers, as well as their products, like honey, lac, silk, and paper" (Husen et.al.). The oil from babassu is only collected from the almonds that are dropped from the tree, copaiba oil is extracted from trees by tapping them, and kutuki is an herbal root that is pulled from the ground. None of these harvesting methods threaten forest vitality or the balance of the tropical dry forest ecosystem. In this sense, the investment into NTFPs can be considered a form of forest conservation. This is because, rather

than chopping down large sections of forest in order to build economically profitable infrastructure, investments are being made into collecting other natural resources that can benefit communities while maintaining the health of the forest. One chief member of the USDA Forest Service explained how, “The harvest of specialty products like medicinal herbs.. creates jobs, boosts rural economies, and meets growing market demands” (Christiansen).

The monetary investment in cusi and cocaiba oil from consumers beyond the local indigenous Bolivian community could do a lot to benefit the Monkox people.
Right now, work is being done to link female producers of these oils and their subsequent products with companies in the United States that could support indigenous communities in the harvesting and production process, and connect them with markets to enhance economic prosperity. At the University of Oregon, student group SIREJ is working in collaboration with Bolivian NGO CIPCA (Centro de Investigación y Promoción del Campesinado) in order to connect indigenous women’s co-ops to buyers (SIREJ). This work is supported by one study conducted on the possible benefits of NTFP processing and partnership establishment as they relate to indigenous Amazonian communities. The results indicated that groups that established the business partnership but didn’t utilize the offered production support experienced the most positive outcomes in terms of economic well being (Morsello et.al.). The addition of processing, storing, and packing NTFP products for indigenous groups actually decreased economic and sociocultural wellbeing, indicating that if processing support is offered caution must be taken to adhere to the needs of indigenous producers (Morsello et.al.).

There is also high potential for the kind of interventions that we see being made by some NGO’s and other organizations that are connecting indigenous tribes with resources that support or empower their communities. Like the water infrastructure project led by organization

Indigenous Navigator and NGO *Fundacion Natura* that installed a drinking water system in the La Asunta tribe in Lomerio, the investment in small-scale development projects in indigenous territories that can result in considerably beneficial results. Deforestation is taking profitable resources away from tribes in the Chiquitano forest who harvest from them sustainably, so reforesting areas with trees such as the babassu and copaiba could encourage women to continue producing products from their oil and making money to support themselves. Water access is also a key support point that needs to be developed further. Plumbing connecting water sources to villages through pipelines and powered with renewable energy sources like solar panels can improve quality of life for women and allow indigenous members to remain where they have established residence rather than being pushed to urban centers in order to survive.

Judith explained how she is seeing hope for the women in her community through "stepping stones", where, "The rights of women (are being) taken into account in different spheres or levels, from the family, community, territory, municipality.." (Chuve Parapaino *trans.*). The visibility and active support of indigenous women is a key factor in enabling their social liberation. With increased funding, these women could have more autonomy in how their products are handled and access to a greater range of tools to grow their production range. This money could also go towards supplementing the work that goes into caring for children and tending to the home. If Monkox women have enough money to purchase potable water from nearby stores rather than taking the great time and energy to collect it everyday, it could have enormous potential to emancipate them from the stress and dangers of water acquisition.

The Environment

The approaches towards mitigating environmental degradation in the Chiquitano dry forest are potentially more obvious, even if their implementation strategies are not. It is safe to

say that industrial agriculture is one of the largest contributing factors to deforestation in the Amazon biome, and therefore any efforts towards reducing the establishment of massive cattle ranches and soy fields would have a positive effect on the health and density of the ecosystem.

This could be influenced at the governmental level through rethinking the ways in which Bolivia opens themselves up to the global economy. In 2013, Bolivian officials adopted the policy "Patriotic Agenda 2025" which set the goal of transforming cattle ranching into an intensive industry and tripling the population of cattle to two cows for every Bolivian resident (Nunez del Prado Alanes). President Luis Acre added to this target with his four-year plan established in 2021, which offered plans to raise over 18,000 heads of cattle a year in the country and export 30,000 tons of processed meat each year (Mendoza Gumiel et.al., 126). This has been encouraged by what is referred to as the "incendiary package", which is a set of legislation that has legalized large-scale deforestation, land clearing through burning, and forgiveness of debts given to those who clear lands illegally (Nunez del Prado Alanes). The Bolivian government needs to reconsider their goals regarding the cattle industry and its expansion in forested areas across the country. Laws regarding land clearing should be repealed, and replaced with strict, enforced limits on the level to which ranchers can expand their production of cattle. Illegal land clearing, which is prominent and highly unregulated, needs to be monitored and mechanisms established to punish those who are participating in such activity.

At an even larger scale, there are choices we can make as consumers connected to a global capitalist system in order to reduce our influence on extractive industries. Buying food produced locally takes profits away from large agribusinesses who operate in lesser developed countries such as Bolivia without consideration for the wellbeing of local citizens or local ecosystems. Reducing consumption of animal products in combination to this reduces one's

carbon footprint further and in turn takes from personal additions of greenhouse gas emissions into the atmosphere. The more people challenge corporations who profit from indigenous land in this way and through the promotion of local farms and other food operations, the greater the impact that will be felt by industrial farming and ranching businesses. As a consumer, the same goes for purchasing products such as gold that was extracted from other countries using methods like open-pit mining that have detrimental consequences for environmental systems that surround extraction sites.

The infiltration of oil and natural gas industries into Bolivia needs a much stricter system of enforcement in order to limit the rate of fracking and pipeline construction in the nation's forests. It was in part the responsibility of the World Bank that Enron, Shell, and other oil corporations were able to infiltrate Bolivia's energy sector and establish production sites (Hindery 28). It was the World Bank that, in 1993, made strong movements towards the privatization of the hydrocarbon sector in the state through tax reforms, loans, and neoliberal agendas (Hindery 28-29). This in combination with supporting laws that helped fund private transnational energy corporations created an "enabling environment" that greenlit projects on Bolivian land, including in the Chiquitano forest (Hindery 30).

There have also been pressures from the International Monetary Fund that have contributed to the excessive privatization of oil and natural gas industries. In the 1990's, the IMF set a 5.5 percent deficit target for the Bolivian state to meet, and the pressure to cut the deficit by a quarter billion dollars encouraged the government to look at taxing foreign oil producers. But the state's oil and gas minister, who had already agreed to a plan to ship oil and natural gas to California deemed the tax proposal "impossible", so the president removed that possibility from the table (Shultz and Whitesell). It continues to be the pressure of the IMF that does not give the

Bolivian government the space to move away from neoliberal policy and investments in private energy sectors.

In order to slow the expansion of natural gas and oil production in Bolivia, organizations like the World Bank would have to refocus their investments away from non-renewable energy, and towards industries that focus on forest conservation and indigenous community support. The challenge here is that the World Bank functions with the goal of making money, and these investments are people and environment focused, rather than profits to be made. But if these investments were made by the World Bank, it could do a lot to further environmental and social wellbeing, and in turn uplift the economy. The IMF in turn would potentially do less to pressure the state to lessen their deficit, and the government wouldn't have to take such drastic financial measures.

CONCLUSION

Although my research was isolated to one region in the Amazon biome in Eastern Bolivia, the patterns that were brought to attention do not exist in a vacuum. Deforestation, extractive industries and climate change are impacting people everywhere, but especially in indigenous and rural communities in developing countries and especially women in these communities who are disadvantaged to a greater extent because of their gender. Spanish colonialism and the subsequent era of the rubber boom set the stage for extractive industries to infiltrate rural Bolivia and positioned forested lands such as the Chiquitano region to be further exploited.

Now we see mechanized agriculture, natural gas extraction and mining causing major disruptions in the Chiquitano forest as lands are cleared for farming and grazing fields, paths are

cut for pipeline development, and mining chemicals leach into soil and water systems. The trees that are cut and the waters that are polluted are primary resources used by the Monkox and other tribes in Lomerio in order to make money for the community and sustain their cultural livelihoods. Because it is primarily the responsibility of women in these communities to collect water and use it to take care of children and the household, as well as collect medicinal plant resources and produce products from these resources to sell, they are the ones who are faced with the greatest burden when these resources are threatened by deforestation and chemical pollution. Climate change is an overarching factor that continues to exacerbate the contributors to environmental degradation like slash and burn land clearing methods and the pollution that comes from overuse of chemical pesticides and fertilizers. This is because global warming is causing droughts that make it easier for controlled burns to become uncontrolled forest fires, and the rise in regional temperatures is making it more challenging to grow crops and raise livestock.

There are spaces to empower indigenous women in Bolivia through the economic investment in non-timber forest products and connecting female producers with larger markets for their products. Mitigating deforestation and environmental degradation in the Chiquitano forest is possible at a number of levels, from governmental policy changes that move economic investments away from industrial agriculture and cattle ranching, to global consumer shifts away from products extracted from or produced in regions where indigenous territories are being threatened. This project is for the liberation of indigenous women, the empowerment of indigenous cultural livelihoods, and for the protection and restoration of forested landscapes.

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