Extractivist Relationships: An Exploration of Public Health in a Community Impacted by Lithium Mining

Maren A. Luján Aranda

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James Pfeiffer

Jonathan Warren

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Abstract

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Maren A. Luján Aranda

Chair of the Supervisory Committee:

Dr. James Pfeiffer

Department of Global Health/Department of Anthropology

As Lithium Transnational Corporations (TNCs) enter into northern Minas Gerais, Brazil to begin mining, tensions in the small rural town of Araçuaí have risen as local activists raise concerns about the health, social, and environmental impacts of these new endeavors. These impacts are of critical concern for Public Health operating in the area but it is unclear what role they play in the mining discourse, and if and how governmental political and economic priorities have shaped the public health response. From January to June of 2025, ethnographic researcher resided in this area to learn more about the local politics, contextualize this discourse within broader global interests for lithium, and assess the role of Public Health and its capacity to address health impacts. Over the course of this research, it was clear that any opposition to the new lithium mining would be silenced and apprehensions would be dismissed, at the individual level but also through systematic and institutional barriers. Within the Public Health system, the lack of capacity to address or even monitor for these impacts raises concerns about the long-term welfare of the community and presents a myopic view of environmental health. More significantly, this research brings attention to the ways environmental racism operates not only on a Global scale, but also how it operates locally through a silencing of traditional and racialized communities.

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Introduction

From January to early June 2025, I lived and researched in a small rural city in the north of Minas Gerais, a newly identified hotspot for lithium mining. Myself being from oil country in Texas, I've been intrigued by the question of a "just transition"[1] and what justice might look like as we seek to prepare and adapt to the ever-increasing impacts of climate change. As a Medical Anthropology and Public Health student, I've been interested in applying this question to Public Health's (capitalized here in reference to it as an institution) and by extension government's accountability responsibility and accountability to individuals' and communities' wellbeing. Given the origins of climate change, colonial relations, capital accumulation, exploitation of resources, I'm interested in how governments' political and economic priorities, to encourage lithium mining in this case, influences Public Health's role at the local level.

I was specifically referred to Araçuaí because of the recent interest in lithium discovered in the region and the arrival of several mining operations. The licensing procedure for lithium mining in this area has been, by local accounts, fast-tracked and setup to be self-regulating, regarding both health and environmental impacts. This has resulted in conflicting accounts between local community members and the currently operating mining company. Through this research, I found examples of how systems can operate to silence and obscure the negative health and social impacts of lithium mining in the region; calls to address the ongoing impacts by citizens and activists have been systematically silenced at various levels. Additionally, I present concerns with the local health system's capacity to address, prevent, or attenuate these health impacts, and I argue that this speaks to political and economic priorities and how the Public Health system has been structured by them.

Background

A Green Transition

The term "just transition"[1,2] arose in the 1980s in the US when labor unions began seeking redress for workers of polluting industries impacted by new environmental regulations. This work involved calls for investment in alternative industries and nowadays alludes to broader discussions regarding societal level impacts of a low-carbon transition for countries, communities, and the most vulnerable. However, discourse today recognizes that a transfer to low-carbon technologies does not automatically address global injustices related to energy production and climate change impacts. [2]

More recently there have been discussions, primarily in the Global South, regarding a new wave of "green colonialism" and the ways in which what has been dubbed "clean energy transition" or "green transition" repeats historical colonial and racist harms:

> *"This decarbonization of the rich, which is market-based and export-oriented, depends on a new phase of environmental despoliation of the Global South, which affects the lives of millions of women, men, and children, not to mention non-human life… In this way, the Global South has once again become a zone of sacrifice, a basket of purportedly inexhaustible resources for the countries of the North."*[3]

Primary concerns include these "sacrifice zones" and questions about who benefits from new industry for alternative energy and who bears the costs.[3] Deivanayagam et al. [4] draw further attention to the global inequities implicit in this discussion. The Global North is most responsible for greenhouse gasses due to a culture of accumulation which has led to worldwide climate change, but those that will suffer the strongest effects are communities in the Global South. Additionally, the Global South faces pressures from the Global North to develop more slowly or reduce their populations to face climate change challenges. All the while, colonial legacies of destruction and exploitation of land and peoples continue along with the exclusion of Global South actors and indigenous populations from international climate-related decisions.

In Madagascar, a racialized[5] country already experiencing global warming, heavily indebted, and dependent primarily on informal labor, researchers found severe disruptions to rural communities caused by rare earth extraction, referring to elements deemed critical for a green transition.[6] Researchers documented possible radiation exposure, water pollution, and long-term health impacts. They also found governmental complicity and corruption as well as loss of livelihood and access to existing resources, such as forests and ocean, for community members. The divergence in salaries and benefits to employees also created a social disruption between workers and local community members and those that benefitted from employment were also placed in precarious economic situations, afraid to speak out against the company.

> *"When we talk about the mining industry, there is a gap. This gap is called an asymmetric situation. Why is it asymmetric? We are talking about full business potential. We are talking about a million-dollar profit. And importantly, your neighbour is very poor." – Mining Worker*

The study identified several common impacts in the three separate communities researched, including original promises of infrastructure, jobs, and money but in practice exacerbated widespread poverty, relocation and threats to local cultures, unjust and unequal compensation, coupled with the loss of resources for which there is no

monetary compensation; additionally, due to land tenure laws, many were systematically denied any compensation for the land they lost due to mining activity. These are Global South communities that are already more likely to be impacted by climate change primarily caused by the Global North. Communities may find themselves without recourse to deny the assistance offered by mining companies, as transnational corporations (TNCs) entering vulnerable communities may fill in the gaps unmet by the state. Additionally, resistance is actively repressed and becomes more difficult over time.[6]

These disruptive and destructive methods of extraction have been challenged however, and originating in Indigenous resistance, the term "extractivism" has been conceptualized as the over-exploitation and appropriation of natural resources. [7] [8] Extractivism necessitates control over a specific natural resource, for example oil or lithium, ultimately resulting in its exploitation; once extracted, mined products are exported, their value is transferred elsewhere, and only negative externalities remain as well as a void of the mined resources.[9] Ye et al.[9] discuss how extractivism is situated within a globalized capitalist political-economy and not limited to a specific type of resource, "…It resides, instead, in *control*, and in *resource-mining*." They stress that extractivism refers to an economic system that is patterned in a specific way: benefits are concentrated while costs are externalized, it depends on the intertwining between state and private capital, infrastructure and chains allow the flow of resources from poorer areas to wealthier ones, wealth is primarily concentrated, it does not result in material reproduction, it creates "booms" or windfall-profit, results in barrenness, and is constituted by and deepens inequities. [9]

Connections to Health

In their discussion "Connecting the right to health and anti-extractivism globally," authors Arteaga-Cruz, Mukhodpahyay Shannon, et al. [10] discuss the ways in which views of "development", progress, and modernization have pushed a particular paradigm for a vision of development in which the extraction and acquisition of natural resources by private business is key. Since the 1970s, neoliberal principles have dominated economic policy and ideation, with a focus on market principles for development and a vision of the state as a facilitator for market deregulation and capitalist accumulation. However, public health activists argue that a pursuit of extraction to fulfill ideas of "development" and "modernization" has rather resulted in poorer health outcomes, broader acquisition of natural resources by large corporations, and the subsequent dilution of people's rights.[10]

While governments may claim that these neoliberal pursuits are in support of social development, i.e. the exploitation of natural resources, oil, mining, forest devastation, etc.,

which are then used to finance public health programs, this presents a false dichotomy between environmental protection and social well-being.[10] For example, Canada, a welfare state, ensures a redistribution of wealth through universal health coverage, but it is argued that this obscures the ways in which communities, particularly Indigenous communities who primarily steward these natural resources and environment, have been compromised in order to maintain the dominant (economic) system. [10]

> *"A coercive state enforces an extractivist model of wealth generation that relies heavily on capitalism, colonialism, police and military force, and authoritarian repression of Indigenous communities and anyone else who interferes with the process of extraction of natural materials to derive profit from the environment."*[10]

In India, indigenous communities impacted by uranium mining faced increased rates of cancer, birth defects, miscarriages and sterility. In these cases, health is being "undone" in pursuit of economic growth or national energy needs.[10] Additionally, there are questions about the disposability[1] of certain communities in favor of others, primarily those who will gain access to benefits from extractive practices, communities that will not need to challenge their consumption or lifestyles in consideration of those in impacted landscapes.[10]

Authors argue that the current hospital-centric curative model has done nothing to address local health problems, rather it has ignored unequal development. An example of oil mining in Ecuador in indigenous territories illustrates how a curative vision of health was emphasized with the expansion of public health services, however incompatible it was with a state system that prioritized profits, ultimately undermining population health in the area.[10] In their discussion on the impact of extractive industries on health, Schrecker, Birn, and Aguilera[11] present a possible hypothetical in which in an ideal situation revenue from extractive industries is redistributed equitably to improve living conditions, they conclude that ultimately the realities of the extractive sector is such that it is linked to a myriad of negative health effects including workplace exposure, environmental contamination, dispossession of traditional communities, loss of livelihoods, and even violence against objectors.[10] This view of Public Health as a system that functions to manage, to a questionable extent, the negative impacts of a neoliberal extractivist economic model of state-making, taking on a more curative model rather than a preventative role, is one seemingly incapable of challenging the "undoing" of health.

Historical figure within Public Health, expert and professor C.E.A. Winslow, described public health as "The science and art of preventing disease, prolonging life, and promoting health through the organized efforts and informed choices of society, organizations, public and private

[1] In a personal note, people are not disposable.

communities, and individuals."[12] However, it is critical to consider how this science is socially and historically determined and institutionally organized within culture.[13] Critiques of existing models of public health led to health reforms in 1970s Brazil with the Collective Health movement, meant to be a more democratized process. As cited in Osmo & Schraiber[13], Schraiber (2008) discusses how the field of Collective Health was aimed at reforming two major elements of the existing health model. The first, a criticism against a health needs/assistance medical care model that was rooted in biomedical, liberal, and a privatized model of service (one in which only upper classes had access) and of a public health/sanitation model based in education with a liberal and individualized orientation to prevention. The second, was a criticism of the techno-scientific aspects of the health field and its resulting alienation. While there is not one agreed upon definition of Collective Health, ultimately the field encompassed the following, was meant to represent only a piece of the broader health field, be interdisciplinary, and focused on social science and health administration questions, such as planning, policy, and management. This included a study of social processes that structure health and disease, analysis of practices regarding health promotion and disease prevention, and the support of healthy systems and policy. L'Abbate[14] in their discussion on collective health argues further that "…without transforming the daily practices of health service professionals, there will be no changes in the way these services operate, in the sense of guaranteeing access, quality and resolution, in health care for the population." They argue for a less bureaucratic public health, one in which individual's subjectivity and autonomy are respected and even promoted. As a method for transformation, Abbate advocates for *socioanalytical* (institutional) approach within institutions to transform work processes better suited for their needs, one that is more innovative and productive.[14]

In their article, "Breaking free from tunnel vision for climate change and health" authors Deivanayagam and Osborne[15] discuss the ways in which climate change and public health discussion has (hyper)focused on emissions, a downstream impact of climate change without further analysis of the ways in which corporations have extracted from communities with governmental support. They highlight how those in impacted communities have long experienced the rising air pollution, health harms, and ecological violence even if Global North professionals may not have always been aware. They argue that Global North "experts'" stories have dominated the public health discourse which has manifested as a form of epistemic injustice, or a negation of local knowledge and experience. While the article focuses on presenting alternative economic models, they do include in their discussion radical rethinking of public health work and transformational projects, including those focused on social mobilization and solidarity; work carried out by organizations such as "Civic Square," where they focus on creating spaces where communities can imagine and build alternative paradigms that are rooted locally and connected globally. [15] Additionally, Deivanayagam et al. "Racial justice

necessitates repairing the harm through equitable distribution of the costs of adverse effects of climate change and resources to address climate change." Authors urge the health community to pursue reparative justice efforts, such as debt cancellation, give land back, and divest from extractive industries.[4]

Research Praxis

In their seminal work, "Contrarian Anthropology," anthropologist Laura Nader[16] encourages their fellow researchers and students to pursue studies of power. They cite indignation and interest as a critical component of doing critical research. They also cite the lack of knowledge on every-day institutions that direct so much of our lives. They posit: "What if, in reinventing anthropology, anthropologists were to study the colonizers rather than the colonized, the culture of power rather than the culture of the powerless, the culture of affluence rather than the culture of poverty?" Nader specifically alludes to the democratizing effects this type of "studying up" can have, but first, we must understand how bureaucracy works. However, they also note some critical barriers to this work, particularly, a refusal from those in power to be researched and observed. They call for creativity in methodology in order to address more pressing human concerns.[16] Additionally, Agard-Jones, in building from Dr. Michel-Rolf Trouillot's scholarship analyzing the ways by which global power systems manifest at the local level, investigates the continued impact of colonial histories on the body and the embodiment of marginalization through the intrusion of toxic chemicals in formerly colonized and actually polluted Martinique. In both of their scholarships, we are challenged to reconsider a looking *from* rather than at, and analyze power from this local perspective, acknowledging how central those on the margins are for social analysis.[17] Lastly, a consideration of research extractivism guided the ethics of my work. "Similarly, researchers can mirror the practice of commodity extractivism by extracting resources like knowledge, wisdom and stories in the form of data from communities." In their analysis on research extractivism, Jamie Gorman encourages researchers to consider their positioning within a 'knowledge economy' and emphasizes the social construction of scientific knowledge. They instead ask researchers to consider who the research exists for and to what end and to practice deep relational accountability; their own research employed both dialogical (rooted in conversations and active engagement) and diachronic (committed over time to people and places) processes in their work alongside anti-fracking communities.[18]

For this research, I chose to employ a grounded theory approach given my uncertainty with conditions in Araçuaí and my desire to allow the research to speak for itself, rather than impose my hypotheses on the situation. A grounded theory approach calls for continuous analysis of one's data, allows for multiple sources of information and data gathering practices, and encourages categories or groupings of the data to emerge from the data itself in order to study

and compare the relationships between these categories. A grounded theory approach to methods allows for a focused research experience, one in which a clear research goal and ongoing analysis drives continued data collection.[19] The combination of a grounded approach and more traditional ethnographic methods, such as participant-observation, merges the data collection and analysis processes by allowing for ongoing data comparison against emerging theories. This allows for greater focus and organization of the ongoing research as well as facilitates the progression from data description to theory and abstraction and reinforces a focus on social processes rather than descriptive research. [20] Additionally, I chose to include an institutional ethnography approach as well in order to ensure I was orienting my work towards the areas in which power is maintained and reproduced. Institutional ethnography is founded in the understanding that the local is shaped by institutions that act on individuals in ways not always known, this method works to map the ways in which institutions are coordinated by a ruling class. Institutional Ethnography focuses on individuals' lived experiences but explores broader ruling relations that drive behavior; analysis of texts and mapping these institutions allows for a fuller understanding of how institutions structure individual experience.[21]

Research Aims and Objectives

With this in mind, my research centers local actors and the Public Health institution in Araçuaí to learn what studying up from a local perspective might reveal about how local politics and economic priorities shape health and well-being locally and how this might be linked to broader political-economic priorities on a global scale. This research focused on three main social spheres: community members, the Public Health system, and governance.

My community-based investigation prioritized community members' perspectives including 1) thoughts on the latest mining operations, 2) perceptions of the health and social impacts of this mining, 3) perceptions and relationship to Public Health, and lastly 4) perceptions of governments' responsiveness to any concerns.

At the Public Health institutional level, I prioritized 1) Public Health's functionaries' relationship to community, including their responsiveness and their interactions with community members, 2) their thoughts on addressing health and social impacts of the lithium mining as functionaries of Public Health, 3) technical processes and procedures to address health and social impacts of the lithium mining, including health monitoring, and lastly, 3) I investigated influences of political and economic priorities and ideologies on the structuring of local Public Health work.

Lastly, by considering political actors and other government functionaries, I sought to 1) investigate the relationship between governmental actors and community members (in broad terms), including responsiveness and types of interactions, 2) learn about governmental responses to mining issues and concerns, both in rhetoric and in action, and in public and in

private, and 3) situate the local politics within a broader political-economic context, with consideration of state, federal, and global priorities.

By focusing on these three priority focus areas, I hoped to be able to answer how Brazilian priorities including local, state, and federal political and economic concerns are potentially structuring and limiting Araçuaí's Public Health's ability to address local health and social impacts of the current lithium mining.

Methods

Applying practices from a grounded ethnography and institutional ethnography approach, I used a combination of methods, including participant-observation, informal conversations and interviews, and document review. Additionally, research orientations of studying up and research extractivism guided my sampling and ethics throughout my time in Araçuaí. This variety of methods allowed me to gain a broader perspective of the region and informed my final analysis.

Research Site

Araçuaí is a small rural city in the northern region of Minas Gerais, within the mid-region of the Vale de Jequitinhonha; a region that has been characterized historically as the "Valley of Misery" and more recently the "Valley of Lithium" to which local communities will respond back that they are proudly the "Vale do Jequitinhonha." In a city of ~35,000 people, a 10-hour bus ride from the capital of the State, I arrived in early January with an intent to stay for approximately two and half months but due to unforeseen circumstances extended my stay until June.

Although there has been a Brazilian company (CBL) exploring lithium in this area for the past 30 years, the latest incursion of lithium mining in the Jequitinhonha Valley has spurred social upheaval in the area and of note much, if not all, of this latest wave of lithium exploration has been fueled by the Global North's demand for lithium batteries and new technology to address climate change priorities.[22] But this type of extraction and exploitation is not new to the area. As referenced by Souza in their analysis of the "regionalization" efforts, a colonial legacy of seeking precious gems, eradicating local indigenous people and the abuse of enslaved peoples from Africa would create the foundations for the ancestral colonial societies of this region. Following the *Guerra Justa* (Just War) to exterminate indigenous people, land would be parceled out to successful colonial captains and survivors of brutal wars would be incorporated into this society as squatters, artisans, and rural workers; marked by the fact of being "marginal," they would later become targets of 20th century modernization efforts and agribusiness transformations.[23] Eucalyptus is one of the evidences of these trans-national and industrial

efforts. Current day Araçuaí is made up of mostly people that identify as "pardo,"[24] a mixed racial identity of White, Black, and/or Indigenous ancestry, approximately 65%, according to more recent census records[25]. The region is home to many Indigenous communities, such as the Pankararu, Maxakali, Arana, Pataxó, and "quilombos"[26], historically established communities of formerly enslaved Africans and Afro-Brazilians that fled and resisted slavery, but although the State of Minas Gerais is home to the third greatest number quilombola residents, 135,310 according to the 2022 census, approximately only 4% of all quilombolas live in state official demarcated territories.[27] 2010 census records also show an approximate level of illiteracy as 15% for individuals older than 15 years of age and about 36% of the population lacking completion of primary school. I would also very quickly learn that many of the wealthier families and professional class in the town were children of the *fazenderos*, estate or plantation owners, and direct descendants of the colonial captains who had originally received the land from the Portuguese crown.

From January to June, I resided in Araçuaí to learn more about this community and integrate myself further into the local discourse. I primarily utilized ethnographic methods, including participant observation, daily conversations and dialogues, and focused conversations with key figures (described in more detail below). As part of this approach, I participated in daily life, community events, mobilization efforts; I also met one-on-one with key individuals, dialoguing and discussing a variety of themes with individuals regarding the introduction of lithium mining, health, and governance. Regular note-taking of every-day activities lend to much of my analysis for this research. Over the course of these five months, I also traveled intermittently to the regional capital, Diamantina to meet with my collaborators and research hosts at the *Observatorio*, at the *Universidade Federal dos Vales do Jequitinhonha e Mucuri (*UFVJM), a local research collective addressing mining impacts. I worked alongside local researchers from a variety of disciplines to learn more about the ways in which organizers at the academic and institutional levels collaborated with local activists to combat further exploitation. Working in Diamantina, also provided me with the opportunity to meet with regional institutional actors such as level public health actors and Public Ministry officials. Later on, I would also have the This exploratory research will inform future intervention-oriented doctoral research as I plan to incorporate more transformational methods, such as collective research, social mobilization efforts, Participatory Action Research (PAR) methods.

I also had the opportunity to work more closely with a rural community that sits at the base of mining operations and is currently being surrounded by these operations. This community, technically a part of a sister municipality Itinga, along with a local environmentally protected area, *Área de Proteção Ambiental*, known by its initials, the APA (Ah-pah), within Araçauí became major foci of my research, primarily because of the mobilization and activism to defend these vulnerable areas. Up to today, an internet search of the APA will bring up recent political

debates regarding attempts to reduce the protected area. In May, City Council would vote 9-2 to approve the measure to reduce the APA.

Additionally, in my research of Public Health as a system for the purpose of this research (capitalized to emphasize this distinction), I refer and focus on Public Health as a governmentally funded and promoted institution, including a range of national, state, regional, and local levels of implementation but typically operating within a centralized national system. In Brazil, Public Health efforts originate within their national Ministry of Health but is heavily decentralized and local institutions depend on state and municipality funding. Local institutions also incorporate community advisory components[28] and I will refer to this committee as the Community Health Council throughout.

Participant-Observation

This ethnographic work used participant-observation methods, which included touring the town, attending cultural events, attending councilmember meetings, visiting several local health centers, participating in protests and manifestations, and accepting invitations to visit outlying communities. Applying a grounded theory approach, I attended events as opportunities arose and as my research data led me to additional research questions. Through this process, I engaged with many of the lead mobilizers, NGO leaders, local community leaders, health workers, those directly impacted by the lithium mining, as well as every-day residents not as actively engaged in the discourse. While I did not meet directly with many lithium workers, for a variety of reasons including lack of access to workers and much hesitation from workers themselves to speak with me, I did overhear several labor concerns from family members, from those retired from the industry, and from other community members which I have incorporated into my analysis as appropriate.

I specifically met with public health workers at the local clinic level, municipal planning level, as well as the regional epidemiological level. I also had the opportunity to meet with several councilmembers and interact with government workers, functionaries, and politically-engaged influencers. I was a regular attendant at weekly council meetings. Through this approach, I was able to observe and track the nuanced ways in which individual agency, structure, and social situation shape institutional practice.[29]

Informal Conversations[30]/Interviews

Promptly after arrival, I realized that my original plans for semi-structured interviews would not be conducive to learning more about the very broad and abstract research questions I was trying to answer. While I had initially planned to complete 15 semi-structured interviews, I instead ended with several recorded conversations with a variety of participants and from conversations held in a variety of settings, sometimes with more than one participant. Some

discussions were more formal, and controlled, while some felt much more open. However, in all of my one-on-one conversations with participants, my position as a researcher was clearly established and many of my discussions actually begin with a deep explanation of my research goals, methods, and positionality. By the end of my visit, I completed approximately 30 more formal, dedicated, or scheduled interviews, not including additional informal conversations. I selected interview participants based on emerging data and questions and as individuals were available to meet with me. Not all individuals that I approached for an interview agreed to meet with me and not all were available to meet with me. I met for more formal interviews with about eight different health workers from clinical to municipal and regional administrative levels, five Indigenous and Quilombolo leaders, three different political figures, one public functionary outside of health, two religious leaders, two NGO officials, three Public Ministry officials, and five local professors. However, this does not appropriately reflect the number of informal and impromptu conversations I had over the span of my five months which provided me the richest of information, which additionally included, taxi drivers, store owners, a large number of activists and researchers, a key conversation with a director from Sigma, etc.

These conversations primarily focused on the politics of the day, the ways in which lithium mining was being managed, and relevant or important health and social issues. While my initial proposal imagined asking more about lived experiences during COVID-19, I ultimately dropped the topic and only completed one in-depth interview on the subject with the doctor that had been primarily responsible for managing the outbreak in the municipal area. Two of my interviews were conducted in the regional capital of Diamantina and one in the State capital of Belo Horizonte as the opportunity and interest arose. While targeted interviews with the research collective did not occur, I learned much about their work, processes, and goals, through regular team meetings and interactions.

For institutional analysis of Public Health (capitalized here to provide clarity between the concept of ‘public’ health vs. the institutional efforts of Public Health) the ethnographic component of this work prioritized meeting with workers within Public Health and specifically those that managed administration and planning. I also prioritized meeting with other public functionaries and political figures; many accepted my invitation for interview, and while no one directly declined, several accepted but then did not respond to follow-up regarding time or location. I did not attempt to hide the focus of my research and my questions in these conversations were fairly direct and focused procedures, practice, barriers to their work or priorities, and finally local politics; I was pleasantly surprised by what I felt was people’s willingness to engage with me on these difficult questions.

Document Review

As a part of this research and my interest in institutional ethnography, I identified and reviewed local policy documents related to health and the reduction of the APA. This included public health planning materials, public health constitutional mandates, and conference materials related to health priorities and issues in Araçuaí. As part of the *Observatorio* and a local activist group chat, I also received a large amount of research articles, social media posts, news articles, and internally shared documents were incorporated into my data analysis. Most critically, local, state, national, and global level news articles regarding lithium mining, national policy, mining policy, and *green alternatives* informed my understanding of the broader political-economic context.

Analysis

My research methods and analysis founded in grounded theory,[20] facilitated my continuous reflection on my existing notes and data and building research findings to continually update my interpretation and analysis, which then informed further research. I regularly took notes during participant-observation activities and interviews, whether recorded or not from which I would then complete more detailed daily note-taking and which incorporated more reflective commentary. From this daily reflective practice, I continued developing my considerations and ongoing research questions. Key documents, such as those shared in the *Observatorio* group chat and news group chats and social media sites, were stored and tracked in a separate spreadsheet for reference. My reflections on these documents were also incorporated into my daily note-taking practices. Additionally, given my orientation for engaged work, regular checking-in with participants on my findings also informed my ongoing research plans and analysis; I would incorporate these check-ins into informal conversations or even in more formal interviews. Regular reflection of past events, interviews, documents, and notes led me to my final theme of "silencing." From there, a simplified thematic coding for instances of silencing led to my ultimate analysis. I was ultimately dealing with the lack of attention to mining and its impacts, so this absence of information also became a targeted pursuit for me. Lastly, public presentations of my key findings and allowing participants to elaborate or correct my findings also assisted in ensuring that my analysis resonated with local experiences.

Findings

Over the span of five months, I had the opportunity to engage with a variety of local actors, attend many political events, and participate in many mobilization efforts. At several points, several friends asked if I had expected to find so much activity in this small town, and I truly had not. In an attempt to best summarize my work, I'm focusing on two main spaces in which the

debate over mining was felt most strongly, the first is in the rural community of Poço Dantas, that is sat at the base of Sigma's lithium mining and feeling the impacts most directly and secondly, in the events and debate surrounding a proposal to reduce an environmentally protected area, *Área de Proteção Ambiental* (APA) likely to make space for the latest lithium mining company, Atlas. From there I highlight the ways in which discussions regarding mining and actors that pushed for any redress or prevention of mining impacts were systematically silenced. I look particularly at how individuals are delegitimized, but also how specific public institutions, including governmental, health, and research can also act to obscure the negative impacts of lithium mining in this area.

Visiting Poço Dantas Piauí

Poço Dantas Piauí is a small rural community on the outskirts of Araçuaí, about an hour north. To arrive there, one has to travel the previously heavily potholed highway which a friend of mine commented on its resembling the surface of the moon. A resident shared the embarrassment of having such a poorly maintained highway as the entrance to the city. I was told that Sigma, the new Lithium Company, had been denied mining rights in the municipality of Araçuaí, in the APA, several years back (for further context, this occurred during the previous political administration) and as retaliation, when the State arrived to repair the old highway, they only extended it as far as the border between the Araçuaí and Itinga, leaving the differences between the roads conspicuous. The potholes have now been filled, but the highway itself has not been renewed as was the case for Itinga so the road remains bumpy and uneven. People I have asked mentioned it was ultimately repaired by the city. For context, Sigma transports their lithium north through Bahia to a port and so their mining shipments do not enter Araçuaí.

Image 1 View from Poço Dantas

Turning into the road that ultimately leads to Poço Dantas Piauí, one must travel around the entire Sigma operation; a highway that once used to travel directly to this community, now about 85 families, where residents could once walk to the main highway, continues to be redirected and expanded as Sigma grows their operations. In addition to a constant sense of surveillance because of the encircling aspect of this operation, this has also left this community in more precarious conditions, particularly when it comes to health emergencies. As I will eventually present at a public audience in March for Sigma's licensing process to further expand, families here receive weekly messages to announce detonations at which point many might prepare themselves in their homes, by closing their doors and windows. But most of these houses do not have a barrier between their walls and roof and dust undoubtedly filters in. Additionally, walls are cracking and many are not finding a way to protect their homes, some have given up on making any repairs or improvements. Residents have now been told by the company to stop using the river they used to rely on and they now receive monthly deliveries of potable water to the *caixas de agua* (water containers) given by Sigma. There are community projects, a new school, but the students come tired due to the constant sound of machinery day and night. Their highway has moved and grown. A mountain of *rejeito*, or mining waste, continues to grow as well and the community is being surrounded, they are no longer able to get to a health clinic by foot. Perhaps initially they had an opportunity to leave, but by now their land has been devalued, they would likely not be able to sell it to move away. Their gardens are

beginning to die, accounts of asthma, among children and adults, are growing as are cases of bronchitis and pneumonia and according to the community, at least one person has died.

During a public audience, I along with residents and other activists and researchers will report this all back to Sigma, stressing how projects meant to benefit communities such as the funding of the arts, is still not a response to these health and social issues. Development has been promised, but the lithium is exported, profits are exported, and the top jobs are for professionals, majority foreigners. Rent costs have increased as has cost of living, money going to these cities lack transparency on how they are being used, that they will complete their mining but the waste will remain. The question I pose to them is, "what is their plan for this community?"

Critical to this discussion is an understanding that Poço Dantas is a racialized, rural, and lower-income community, where many supplement their wage-income through sustenance farming, i.e. they are dependent on land; additionally, many of the local residents have taken jobs at Sigma. And although not recognized as an official quilombo there is a clear understanding that Poço Dantas is a traditional community,[31] one that depends on their lands for social, cultural, and economic reproduction. The community is also ancestrally linked to quilombolo and indigenous populations, although they may not qualify for formal state recognition due to requirements requiring historical claims to land, a barrier for populations that faced historical relocation to meet labor demands.[23] The visual is clear, Sigma, a Canadian multi-million-dollar company, run by White-presenting Brazilians[32] among other nationalities, located their operations at the doorstep of a racialized, historically marginalized, and vulnerable community with continuous plans to expand in the same area.

The Reduction of the APA

Almost simultaneously, there are also growing tensions in the urban area of Araçuaí. In early February, surprising many, the local mayor submitted legislation to the City Council under the heading of *urgência/urgentíssima*, very urgent urgency, to reduce the APA area due to several reasons including a municipal boundary dispute with a neighboring city Caraí to the southeast of the city. The claim was that the APA boundary cut off 86.66 hectares from the neighboring municipality, but that in order to return this territory, because the APA had been determined by elevation metrics, the entire APA would need to be adjusted (reduced) from a measurement of 500 meters to 575 meters.[33] This label, typically reserved for emergencies or crises, reduces the regular legislator process to 30-days. At this 30-day mark when a vote was expected, a sub-group of city-councilmembers, mostly politically aligned with the mayor, instead announced that they had met with the mayor and were able to encourage him to remove the procedural requirement of *urgência/urgentíssima*. While city council members seemed to take much of the

credit for this move, it seemed obvious that this was in large part due to much public attention and pressure on the issue by activists demanding a more measured response.

Over time, the discussion would move from Caraí's municipal rights, to proper management of the APA, and finally to a focus on the property rights of the *fazenderos* and *proprietarios*, land owners, who have implicit interest in selling off this land to the latest mining company Atlas. For context, a third group, *moradores*, residents or dwellers, of the APA played a much smaller role in the political discourse although a major concern for activists. Regarding local surprise and concern regarding the urgency of the proposal, activists would uncover that the mayor's notice came within a 30-day notice to secure mining licensing rights by Atlas and that the original notice from the neighboring city, Caraí, happened to coincide with the initial exploration in this area for lithium, in November of 2024. Local activists consistently mobilized to protect the area and in April, the Public Prosecutor, who happened to be in the city for Sigma's public audiences denounced the process by which city council members were going about voting this legislation in, with no environmental study, no informed consent, and rushed public audiences. However, in early May a majority of City Council voted to approve the reduction of the APA by ~8,000 hectares[33,34] from the original 87 that had been noted as belonging to Caraí and would be signed into law May 27, 2025 by the Mayor.

Theme: Systematic Silencing

Through this research, I identify four main areas or processes by which discussion and those discussing the negative impacts of lithium mining were, and continue to be, systematically silenced, including through ad hominem attacks, through bureaucratic and political processes, through health administration processes, and even through research processes. Over the course of my time in this area what most stood out to me were the ways in which mining was an ever-present topic but concerns or broader discussion of lithium mining and its impacts were silenced, avoided, or "what-abouted," the benefits of the new mining were consistently presented as a response to proposed discussions about the negative impacts. At times, people felt like they couldn't trust others with their concerns, and in many other ways, people were purposely silenced.

Suppression of Local Actors

On several occasions I witnessed examples of those with power and status question speakers that spoke against mining or highlighted the negative impacts the industry would bring or was already effecting. Many times, people's and groups' intents or priorities were questioned and delegitimized as a way to reduce any productive conversation towards resolution.

After two public audiences with Sigma, the newest and most prominent lithium mining company in the region, I approached the Director leading the event to ensure I had their correct

title and possibly ask for an interview. I did not expect them to be so open to discussing with me, but they had seen my presentation the previous night and I believe wanted to respond to the "*provocação"* (provocation*)* I had presented. We had a lengthy chat and while there were many things we did not agree on, I was most struck by our discussion on the future of the community of Poço Dantas. When I further inquired 'why not just move the families? It would be a win-win for everyone.' They discussed how the families were simply *incomodados,* or inconvenienced, by the new mining, because they had previously been used to having more tranquility in the area. I asked if they would be willing to live there, at the base of the mining, and their response was a flustered "no" with excuses on why they couldn't, followed by a prompt change of focus. They dismissed the complaints by discussing how it was always the same small number of families or individuals who brought up these issues and asked for compensation. I mentioned that I had actually visited several of the families and that there seemed to be more than just a couple of families anxious about the situation, to which their response was that the families never told them during their biweekly community meetings. When I tried to discuss how power relations might impact their dynamic, I felt resoundingly dismissed. Overall, throughout this conversation, I felt a direct invalidation of my research and findings as they questioned the validity, generalizability, and statistical significance of my work. They ultimately recommended I seek out statistical health data (instead) or, as another staff member would mention, historical health data. I left with a clear impression that they did not care to engage with my findings, much less those complaining about the mining impacts.

In a separate discussion with a councilmember, regarding the reduction of the APA, I asked about their response to the mobilization done by local NGOs, researchers, and others and all the issues they had brought up regarding the interest to introduce mining to the area. Their response focused on the lack of legitimacy of these groups and how these groups had received external funding to mobilize and as such were bought off in some way. I mentioned that Sigma was also providing funding to many local organizations and that many would stand to benefit from an introduction of mining to the APA area, as an example of the nuance that might need to be considered when discussing external funding, but they seemed unwilling to engage in that conversation and changed the focus. Several times, they referred to the *leftists* and their political views and how they insisted in bringing mining to the discussion when it had nothing to do with the topic; when I tried to ask directly about the issues that these *leftists* had raised, such as 'what if these lands do get sold to mining interests' I received a wry smile and lack of direct eye contact as they responded that they had no further information with regards to that issue, and seemingly, no curiosity to pursue it further. They asserted that what people chose to do with their lands was their right and that any government regulation on that account would constitute a dictatorship.

Similarly, local mobilizers, activist ONGs, and presumed *leftists* are equally silenced. By the simple act of disagreeing or challenging the politically dominant narrative, they are easily dismissed as contrarians by political leaders in support of mining, "they oppose everything." As such, the concerns and issues they bring up do not warrant nor deserve further inquiry. They can easily be dismissed as insurgents or agitators, and more strategically, be politically positioned as anti-progress and anti-development.

Politics, Government, and Governance

This dismissal of local mobilizers extends to government processes in the ways in which councilmembers with opposing views treated and responded to critiques. Additionally, governmental procedures, public audience processes, justice processes, public meetings, also served to silence or dismiss critiques of the mining process.

In multiple council members meetings, those who presented critiques were treated disrespectfully, questioned, and invalidated. In one specific reunion, leading up to the first original vote to reduce the APA, a professor from the local research institute (IFNMG) presented environmental and ecological data to show the existence of many natural springs in the area and how reducing the APA could jeopardize them. In response, a councilmember asked where the professor was originally from, to which the professor responded that he was in fact from a different Brazilian State, but that he had worked in the area for many years and had married and was raising his children in Araçuaí. When this line of questioning was reprimanded by the vocal mobilizers, this councilmember then proceeded to emphasize that he only meant to highlight how many individuals who had lived their entire lives in the area had invaluable knowledge on the area [implying the lack of relevance of the presented study]. However, they would later add that they had lived [in Araçuaí] their whole life and did not know that about the APA.

At a later public audience and continued discussion regarding the reduction of the APA, as activists continued to bring up concerns about mining in the region and after hours of debate and public commentary, an external consultant brought-in to discuss the environmental context and the APA's hydrological system based on available reports, eventually commented on how the issue of mining had not been presented to him in the original documents he was asked to assess and that he thought it warranted a dedicated conversation. This dedicated conversation was never followed-up on, not by legislators nor by dedicated public functionaries.

Mining licenses are issued at the State level and while previously industry had the benefit of managing their own environmental licensing by funding their own environmental impact studies and setting their own mitigation tactics with little built-in government oversight, recent federal policy ruled for further flexibilization of environmental policy.

> *"The license may be issued upon a self-declaration of adherence and commitment by the entrepreneur, with the requirements pre-established by the licensing authority."*[35]

This has allowed for mor flexibility of the licensing process in a very pro-business move. This policy specifically targets industry that is seen as engaging in "green" practices, to allow them less restrictions with their licensing. Additionally, public audiences for this licensing process are not guaranteed, they must be requested within a specific time-frame after companies' have requested formal licensing. In order to request a public audience, individuals must be regularly monitoring these licensing notices. My understanding is that for Sigma's first license, there was no public audience; for this latest request, to expand their operations, the State Public Ministry, which currently has two legal claims against Sigma one of which due to a discrepancy in their environmental study regarding the distance from the mining to a registered Quilombo, was already monitoring the situation and was able to put in a formal request in time. Another councilmember that was also monitoring the situation, mentioned they were prepared to put in a request, but would have had to gather signatures because she would not be allowed in her formal role to put in this request. However, even with legal claims against Sigma and the lack of Free, Prior, and Informed Consultation (FPIC) processes, I had been told that there was no real way to halt the mining while the judicial proceedings played out.

Even during the public audiences, while the Public Minister emphasized that the point of the public audiences was to redress any environmental or social impacts, much of the public commentary line-up was Sigma employees and Sigma direct beneficiaries. It was rumored that Sigma had asked them to attend and praise the company. At the end of the first public audience in Itinga, the Public Minister reminded everyone again that although we all appreciated the benefits and improvements Sigma brought to this community, the real point of the meeting was redress for the presented negative impacts. However, the research presented by the Public Ministry were surveys completed at the family level, social research conducted by social researchers.

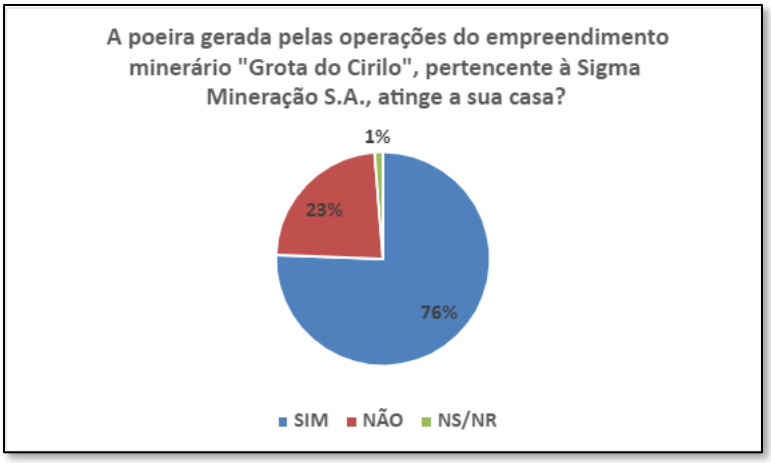

Image 2 Example Survey Question: Does the dust created by [Sigma] operations... affect your home?

The above image presents an example of the survey conducted, and the result of 76% of these families responding yes to the question of whether they were affected by the dust.[36] But, Sigma's own environmental engineers and scientists had presented their own studies regarding air, water, and noise pollution rates, which had all been calculated using special machinery and which showed rates of pollution within the accepted limits. Later on, my discussion with the Director would demonstrate for me how willing they were to dismiss these findings of this social research given Sigma's own engineering data, ultimately dismissing the lived realities of the 82 families surveyed[36]. The succeeding weeks, Sigma would clip and post videos taken from the public audience, publishing complimentary comments on their Instagram channel.

The day after the second Sigma public audience, there was a public dispute between the regional Public Prosecutor and City Council during a public commentary meeting regarding the reduction of the APA. The prosecutor entered into a heated argument with councilmembers after they disregarded the prosecutors' comments by emphasizing that the prosecutor was an outsider, implying that he was not qualified to speak on the issue. The prosecutor admonished the city council for their xenophobic remark as well as for the process by which they were carrying out the entire legislative process and mentioned that he would be issuing legal claims against them. Specifically, because the City Council should have never have accepted the proposed legislation as very urgent urgency, there were was no environmental impact analysis and much less public presentation of its findings. Quilombos and Indigenous communities with special rights to "Free, Prior, and Informed Consultation" had not taken place and that the actual public audiences that had been held had been farces. I thought that this might lead to a longer and better organized legislative process, one that might even allow for an environmental impact assessment, however, upon my returning to the city after an extended trip to the US, a judge had thrown out the claim and a vote had been taken by City Council. They had voted 9-2 to approve the reduction of the APA.

In discussions with Public Ministry, it was clear that they are understaffed and are tasked with managing several cases at a time; they lamented that unfortunately the judicial process was inevitably a long-term one. The process by definition dealt more with impacts after the fact and unfortunately, protections and wins were not always guaranteed. I couldn't help but connect this with recent news I had seen about the Mariana dam victims who were receiving compensation now 10 years after a mining waste landslide.

> *"R$35,000 [$6.5K USD]. This is the value, 10 years after one of the greatest environmental tragedies in Brazil, and maybe the world, offered to the victims of the broken Fundão dam in Mariana. R$35,000. Less than the price of a new car. Less, much less, than the value of a destroyed life."*

In 2015, a mudslide of mining waste broke through a local dam and washed the town of Mariana away, killing 19 people, destroying entire districts and compromising the local river for miles.[37]

While specific populations do have additional legal protections, which was in fact one of the legal standings for the legal claim against Sigma, that they failed to complete FPIC with the neighboring Quilombo of Bau, as mentioned previously, this recognition is granted by the state and is typically a long and difficult and contested process, especially when it is tied to a request for land. The primary issue is that traditional communities must demonstrate a direct connection to the land and/or a history of connection to a traditional community. However, due to a history of colonialism, indigenous genocide, slavery, wage-labor, and decades of state repression, many communities were uprooted from their ancestral lands and many lost or had to strategically erase their Indigenous or Black heritage.[23] Locally, the Arana Caboclo have been waiting for decades for official recognition and only this year will they receive dedicated land. People from Poço Dantas ask me if I know when they will receive a response from Sigma and the Public Ministry informs me that they will have a meeting later in the summer of 2025 with Sigma, in which the company must respond to all the concerns that were brought up during the public audiences; meanwhile, mining continues in Poço Dantas.

Public Health Administration

In my original research question, I focused on community members' perspectives of Public Health and this came out very strongly when I first began my investigation. It was clear that Public Health in this community equated to *Sistema Único de Saúde* (SUS), universal healthcare available to all citizens. SUS, implemented in 1988 as a democratizing process following the decades long dictatorship, does in fact incorporate a broader field of service such as sanitation and public policy, as detailed below by Fiocruz, a leading public health quasi-governmental foundation:

> *"In addition to the democratization of healthcare (previously accessible only to certain groups in society), the implementation of SUS also represented a change in how the concept of health was interpreted in the country. Until then, health represented only a "non-disease" scenario, meaning that efforts and policies implemented were limited to treating the occurrence of illness. With SUS, health began to be promoted and the prevention of diseases became part of public policy planning."*

The core of my research in fact focused on the prevention and public policy portion, not so much the direct healthcare services, although over the course of my time here, I learned how intertwined this direct healthcare was with my research questions. In attempting to research what might constitute an epidemiological crisis or trigger a response, I attempted to find the local health workers that dealt directly with Poço Dantas' health. A clinic worker informed that in fact they had noticed higher rates of respiratory problems from people traveling in from that area. I asked at what point might cases trigger a broader response, past individualized medical treatment, but their answer was a vague, 'it's not at those levels yet,' with no clear answer on what would trigger further action. I followed-up by asking, if it did become a larger issue, what would be the response? The health worker lit up and answered that fortunately, the local mayor had a close connection with the company and they would be able to take the issue up with them.

Through searching health data records, I learned that there were a set list of diseases and/or conditions that required "compulsory notification." This list was developed with input from the municipalities and States, but were ultimately ratified and set at the federal level; these were diseases or conditions that had to be reported to the city epidemiologist. Within this list, was pneumoconiosis, pneumonia brought on by environmental factors often connected to occupational risks, which I thought might be a valuable indicator, because since my arrival I had been informed by community members that the CBL operations, 30 years of mining, had led to various worker deaths and health and lung problems. I was surprised to find only one report of pneumoconiosis for the entire municipality and only in 2024; apparently monitoring of workers' health was a recent focus and addition to the compulsory list. More interestingly, in looking at mortality rates by profession, I found no reference to mining at all, only to *garimpeiro* work, small-scale traditional mining. Given the number of workers at CBL in comparison to *garimpeiros,* I did expect to find more cases of mining accidents or deaths, but was surprised to find no reference to it. In discussion with the local epidemiologist, I learned that deaths were coded by their basic cause, any aggravating factors, such as respiratory problems would not show up in these health reports. I would also learn later on that these worker health reports were a newer addition to reporting procedures and that even now, many clinicians were not

necessarily prepared to follow-up on possible cases of work accidents. Ultimately, I had no easy way to assess if life expectancy had been reduced due to work in these mines.

In separate discussions with health workers, those who might be most responsible for crises and surveillance, we discuss the set categories that they monitor, primarily transmissible diseases, and how even for outreach in rural areas, they area already understaffed and overworked. I ask directly about mining impacts such as environmental issues, e.g. access or quality of water, preventative work, or other health and social impacts, such as respiratory problems caused by the mining, and they mention that they simply do not have a system in place to address those issues, nor funding or capacity. In another private discussion with a different health worker, I ask if they think this is work government is responsible for and if they the health workers could or should be responsible for addressing. She agrees that Public Health is governance and that this is critical work for them to address.

In discussion with a health administrator, where I specifically ask about relationships with other functionaries, such as Environment functionaries, they mention that it has already been hard enough to work with them and they have already had to take on duties that are meant to be covered by this separate entity; in general there does not seem to be much collaboration between the two entities (and I was never able to get a response from their administrator). This administrator mentions that it's hard when you have talented people managing these administrations but then are limited in what they can do politically. The leads for these public offices are political appointees and as such 1) may align politically and agree with the political administration and 2) may feel some pressure to ensure that their work continues to fall in alignment with mayoral priorities.

In a final presentation to the local Community Health Council, where I discussed the direct, indirect, and possible future impacts of the mining, as a way to instigate discussion and collectively develop strategies for preparing for and addressing these issues strategically, I received responses from those most politically connected in the group, a political leader and close family member of the mayor as well as a health administrator, each responding respectively, that there were many benefits coming in from the mining and that the lithium being mined was necessary for our daily lives, the technology we were currently using, our phones, and also, used for life-saving technology which extended life. Later in this same meeting, they would discuss the growing rates of homelessness. The political leader would lament that they couldn't forcibly remove them because they were impacting the look of the streets. They discussed how public policy couldn't resolve the issue, if they provided housing to one, the next day there would be three more asking for housing, the answer was to encourage the families to take care of their loved ones. I mention this last anecdote as an example of how political views shape health response, poverty and homelessness is presented as an individual

or family problem, not something for the government to step in to address and if it were to address it, if they had the right, the preferred method would be forcible removal.

Research

Lastly, in considering and analyzing the ways in which local communities are silenced, this also warrants introspection and self-analysis of how our own research can oftentimes do the silencing or obscuring. This can manifest in the ways we develop our research goals, structure our research questions, the populations we choose to study, and more significantly, those we don't choose to study. As part of my analysis, I also considered the way my own research and that of my colleague's served to silence or conceal the impacts of lithium mining, even if unintentionally.

Traditionally, the role that anthropologists have played in this area has been one of cultural inquiry, focusing on traditional communities and ancestral knowledge. While much of this research has been beneficial for official state recognition and land assignment, this in a way can also be seen as state-making process which lends legitimization to these communities; those that do not receive recognition, are unable to access additional services and protections. The role of the researcher then becomes one of a state actor, funded by academic institutions to facilitate state legitimacy for indigenous or quilombos, a process that is drawn out, difficult and not guaranteed. Even when populations do receive recognition, their rights are not guaranteed, I was informed that the state had cut access to specialized healthcare, Subsistema de Atenção à Saúde Indígena (SasiSUS), for Indigenous individuals that did not reside in *aldeias*, typically the areas demarcated by the state as indigenous land. Essentially, those that resided in urban areas or who had not received official land were delegitimized and their rights restricted.

During my time here, I met so many researchers traveling in and out of the region, there was a constant stream and a lot of research interest in the area. When I first arrived, I questioned whether my work was contributing anything new or if should leave this research to the more than fully capable Brazilians researching in this area (as part of a reflexive praxis, I continue to question my role and future endeavors in the area). Ever present in this question is the legitimizing role of the professional who must witness events first-hand, in order to lend validity to the experience, a form of maintaining epistemic injustice. I stressed to my local contacts that I wanted to be cautious and strategic about entering rural communities and they seemed to resonate with my reasoning that many communities had been studied but had had little to no access to any research findings. In my interviews, I would always end with an offer to answer any final questions individuals might have and very often individuals would specifically request for a return of the findings. One group shared that there had been countless researchers that came but then would leave without any final accounting of their work. While I'm sure that these individuals have contributed to the ongoing academic discourse, it's hard to defend excluding

those who directly contributed to the work and who are directly impacted by it. I ultimately feel that to enter a community is to enter into a relationship and partnership, one with obligations and accountability.

And, I continuously questioned my own research priorities. While I did care to study health and social impacts, I was more interested in the response to these impacts and what it might ultimately reveal about political and economic priorities. And although the end goal is to encourage more health institutional actors to become more involved in addressing the issue, at times it felt like a disservice to the activists and to community members that may have prioritized other research goals, health issues, or other aspects the lithium mining impact. When I initially sought to learn about people's perceptions of their public health system, most people's interactions and understandings of SUS was dependent on their access to healthcare, for which there was much also much to study and question, particularly a lack of access to secondary care and the growing trend towards privatizing the system. I was regularly referred to clinics and hospitals for my research and I struggled to present my goals and methodology. I vacillated between discussing health administration, health governance, health systems, but ultimately landed on encouraging participants to think about broader health and social impacts and how public health workers and government were responding to them, or not.

Discussion

On May 12, during the City Council meeting, following the vote to reduce the APA, the second vice president read out from the previous meeting notes referring to a community video that was shown after the vote and the words of a local activist:

> *"...I am very sad that I was not [allowed] to speak right before the vote. Our people have been going through a process of silencing for many years. Our right to speak has been constantly denied and I have once again felt this. Our people from traditional communities are tired of coming to this house. When we talked about the dredges in the river, in this very Chamber, I stood up to speak and brought a bus full of people from the community… On that day, the environmental committee was chaired by Mr. Marcos Vinícius. When I tried to talk about the dredges, the secretary interrupted me, saying that it was the company that should be speaking and that the people should be quiet. This caused such a great revolt among the residents that the meeting had to be suspended. They were outraged by the oil from the dredges leaking into the river. I don't know if you remember this, but I remember very well [councilmember] Roger's fight against the dredges. I followed that fight closely. So, when they say that we don't protect the river I can say this clearly: we do protect Araçuaí, but*

unfortunately the government itself silenced the communities when they denounced what the dredgers were doing. This is disrespectful to those who live up there in the Chapada do Lagoão area. I have nothing more to say, it has already been voted on. And once again our people were silenced. Why? Whether they like it or not, they acted in good faith, they knew very well what this was about. Therefore, I have nothing more to say. I also want to say that I don't only represent the [Quilombo] Córrego do Narciso, I also represent villages, indigenous peoples, and other communities that entrusted me in this role of representative. Unfortunately, we feel censored. We had no real participation in the process and were silenced, even though we clearly knew what the speech was about and what its purpose would be."

- Lucas Martins Pereira, Movimento dos Atingidos por Barragems (MAB)

This research sought to make connections between local political and economic priorities on the administration and operation of Public Health, particularly with regards to addressing the health and social impacts of the latest lithium mining. What I found was a system that was not only not prepared to deal with the current and impending health and social impacts, but a system which existed and operated within a broader social climate that systematically silenced and obscured any discussion of these impacts.

The Burden of Evidence

In their analysis of "cancer villages" in China, authors Lora-Wainwright and Chen[38] highlight the ways in which communities impacted by pollution face critical barriers to establishing direct health effects from exposure, including a multiplicity of factors that contribute to health issues, the fact that epidemiology depends on longer timeframes, is not conducive to singling out factors, and sample sizes may be too small for significance, additionality, causality or correlation is difficulty to assess especially at the local level. Villagers in these communities faced constant legal and political constraints to regulation and redress. However, villagers were able to assert themselves through the use of citizen-science or popular epidemiology, by calling media attention to their plight, connecting with "experts," researchers, journalists, NGOs, publicizing "cancer lists," lists of those that have died due to cancer, and ultimately applying continuous pressure to government.

Not all cases were successful nor did all these villages receive full compensation even when they were more successful, but their refusal to be silenced was instrumental in governments' recognition of these villages even with what was termed "unscientific" practices: "Despite attempts to silence contestation with reference to science, recent

levels of contestation (and the government's recent recognition of the existence of cancer villages) suggest that cancer villages are a social and political fact which cannot be dismissed with reference to narrow standards of evidence."[38] I would like to call attention to the inordinate amount of demands this puts on villagers to collect evidence, to mobilize, and to demand restitution, processes that can last decades. Although some cases have been successful, it seems unlikely that most of these locations have been able to garner enough attention to lead to a positive change. Overwhelmingly, a high a burden of proof was weaponized against these villagers to avoid redress and in many of these instances, local governments continued to enable industry to continue their polluting.

As in the case of Araçuaí, I have seen the dismissal of evidence not deemed scientific enough, including my own ethnographic work and the Public Ministry's social surveys. Additionally, Sigma has benefitted from the lack of cohesion within Poço Dantas due to the subtle intimidation of workers and residents which impacts their abilities to mobilize collectively. This small town has also faced challenges in garnering media attention and many within the neighboring city of Araçuaí don't even know about what goes on in Poço Dantas. The public audiences provided an opportunity for residents to speak about their experiences, but they were easily crowded out from signing-up to speak by Sigma employees and other direct beneficiaries.

Even in my own work with the research collective, as I assisted in developing further proposals for future research, there was a heavy demand for quantifiable data and an ability to demonstrate impact. This became difficult because as I discussed previously, health data records were not easily utilized for this end nor existed to monitor these specific impacts. The selection of research sites was also heavily influenced by a desire or need to demonstrate causality either for obtaining research grants or for future legal claims, meaning, the already impacted site of Poço Dantas was not an ideal candidate for a long-term longitudinal study.

Missing in Lora-Wainwright and Chen's discussion was the role of Public Health. While, some references are made to epidemiological practices, or health data, there is little said about public health workers and the role they play; there is no mention of public health, nurses, or epidemiologists in the article even as authors discuss the praise-worthy measures villagers pursue to investigate their own impacts. Essentially, Public Health and health data seems absent in the ongoing discourse regarding the latest regional wave of lithium mining.

On Witnessing and Silencing

In recent years within Anthropological research, the idea of *witnessing*[39,40] has surged in interest. While more traditional anthropological research may have asked for objective detached research, this witnessing, demands instead a morally-committed and dedicated observer. The anthropologist is not only responsible for truth-telling practices but is also directly accountable, but even more critically, the anthropologist is implicated in the things they bear witness to. What is stressed in this challenging of more traditional anthropological relationships with communities and research is the responsibility that stems from observing, the affective dimension of witnessing, and how the actual witnessing is only one practice in a series of practices.[41]

This however, places the anthropologist in a central figure with the authority to speak for or about others. In their discussion on 'witnessing, Chua, questions the centering of the anthropologist. Presenting examples from their own research, they discuss how the development of a specific narrative and call to action, built from a Western-centric perspective, can develop limited views that obscure nuance and complexity as in the case of preserving the Tapanuli orangutan; villagers living in the area were excluded from conservation discourse, the primary focus being the extinction narrative that had been formed and promoted for international attention. She refers to these actors as *witness-saviours* from the Global North and how the use of technologies of revelation, referring to visualizations, science articles, and social media, strengthens Western science's ethos of empiricism and positivist authority. She contrasts this to local Bidayuhs' belief in spirits and the ways in witnessing, acknowledging one's role in the process, and call to action reflect instead mutual accountability and lacks the moral assuredness and certitude implicit in more traditional conservation discourse.[41] Chua further encourages us to question our roles and obligations:

> *"Put differently, rather than simply asserting that anthropologists have a particular duty to be/bear witness, perhaps we need to ask both more basic and more complicated questions – such as who or what invested us with this duty, what and how we can or are expected to witness, what witnessing might conceal, and whether witnessing is always necessary or desirable."*[41]

With my own research, I confronted questions about my own positioning in this community, in activist circles, in political spaces; I questioned my social obligations along with my academic obligations and the tensions and conflicts therein. These questions came up most powerfully when early on in my stay, I was asked by local activists to present my research during Sigma's public audience. Three months into my work, I felt unsure of what I would be able to speak on behalf of Poço Dantas but simultaneously, this was a tangible support I could provide. However, the subsequent dismissal of my research was a strong reminder of the reigning authority of

empirical and positivist evidence, a constituting of what counts as valid witnessing. Even my privileged positioning as an academic, professional, or American speaker could not disarm this dominant discourse. I don't mean to imply that my privilege appropriately authorizes me over others, much less those that have lived these experiences, but rather that in attempt to leverage this privilege in support of those that have been silenced, even these privileges were not enough to challenge dominant capitalist and extractivist narratives and prerogatives; however, this is not an invalidation of all social research, many anthropologists and social scientists have been employed in support of these mining operations, it is a particular and contextualized dismissal of a counter-narrative. Chua asks: "What does our witnessing conceal?" Many anthropologists have written about marginalized communities for decades, but what might be concealed is the broader context in which our work exists, such as the prioritization of theory over practice.[39] Additionally, the extractivist nature of anthropology has resulted in publications and professional accolades which are then recycled for further academic work and inquiry and rarely, if ever, brought into relation with those we write about. Thomas asks her peers, "will we, in the end, make anthropology useful?"

I am drawn to the idea that there is a privilege in deciding what to witness and what can be dismissed. Comparing my own decision to choose not to enter all communities specifically because of the obligations I felt were inherent in witnessing and my concerns with my capacity to manage these expectations, I connect this to city councilmembers choosing to not engage with activists' claims about the reduction of the APA. More than a difference in values, or perspectives, was an outright refusal to entertain the concerns brought up during multiple public audiences and public commentary sessions. My interpretation is that to even entertain these concerns would be to lend credibility to these concerns and require action, action that perhaps councilmembers for political or personal reasons are unwilling to take. In discussion with the aforementioned councilmember, I finally get the councilmember to answer my question regarding possible mining entering the APA area, "…but what if, mining did enter the area and the rural community were impacted?" They affirm ardently "I would fight to protect anyone impacted by the mining." In a later conversation, they would lament the use of public resources to build a highway to facilitate mining interests in the areas, work enacted and funded by the executive; I was surprised by this stance given their seemingly public support of the executive. I pressed them on this issue, but they maintained that there was nothing too be done, that local exploitation for global interests was simply the way of the world.

I also connect this to Sigma's reluctance to engage with the community of Poço Dantas' complaints. After heavy reflection on possible reasons for Sigma's unwillingness to address the concerns of Poço Dantas residents and in an attempt to think like a business,

I concluded the following: to engage or lend any credibility to these claims may 1) require action on part of the company, and while this may be a small footnote in their budgetary registers, by taking action, 2) this may imply a (legal) responsibility or accountability for these complaints, which 3) could set precedent for future legal action for compensation from other impacted communities. This refusal to witness I would further connect to individuals' unwillingness to discuss the negative impacts of the lithium mining while uplifting all its benefits, both locally and globally, 'this will provide lithium for batteries for electric vehicles!' There were the individuals that refused to meet with me one-on-one, a mayor that refused to be seen in public, and political figures that refused to engage in good faith public discourse. I connect all of these to a broader climate of silencing, embodied by an unwillingness to engage and much less take responsibility.

Who Gets Silenced?

This research initially prioritized studying the ways by which the Global North imposed exploitative processes within the Global South to address the impacts of climate change caused by a culture of accumulation, such as with lithium mining. However, even at the local level, there is clear evidence that not all have been impacted equally and that those impacts have followed once again clear colonial patterns. Jameela Joy Reyes, a climate justice lawyer, calls attention to the internal colonialism, by which dominant groups within a nation are able to exert control over more marginalized groups; they connect this to green colonialism in which the same exploitative colonial patterns are repeated when environmental initiatives are primarily located in indigenous land without consent, under the guise of sustainability.[42]

> *"…by colonialism, [we are] not referring solely to the 'historical' concept of colonialism or the imposition of the coloniser's socio-cultural and economic systems over time. Instead, this article expands the definition to include its spatial dimensions: the expansion and control of territory that marginalises and subjugates the colonised society's indigenous knowledge, identity, and traditions. This dual manipulation of space and time solidifies power structures and inequalities that perpetuate long after the formal process of colonial rule ends."*[42]

Developmentalism and Traditional Communities

Developmentalism, or the Developmentalist State, as an ideology took root in much of Latin America around the 1930s and had consolidated by the 1950s. This ideology refers to the role of the state to ensure development through the harnessing of business and industry, the primary goal being economic development.[43] This economic development would then allow for further funding of health and education.[44] Industrialization was seen as the solution to poverty and

underdevelopment.[43] Contrarily, the community of Poço Dantas and the *moradores* of the APA depend primarily on subsistence farming, or *agricultura familiar.* Many of these communities had previously sustained themselves by balancing small-scale *garimpo* work along with their homesteading and other wage-labor, local or otherwise. By developmentalist standards and in alignment with colonial legacies, this more traditional existence would be posited as the antithesis of the states' view of progress and development. By extractivist and capitalist perspectives, the value of land or a resource is in its exploitability, by which standards these rural communities living off this land would be failing to make proper use of the land. This is evidenced in the ways small-scale *garimpo* work has been made illegal while large-scale mining operations receive incentives and credits for their operations. In Poço Dantas, many families have already been pushed to the point where they have left their rural homes and moved to the urban areas of Itinga or Araçauí, but not through any formal compensation processes; they have had to personally bear the financial cost of this move along with the loss of their community, culture, and tradition.

Environmental Racism

These rural communities not only face marginalization for their traditional practices but these traditional practices become shorthand for racialized practices. In their research regarding the silencing of intersectional identities in the creation of a homogenous region "Vale do Jequitinhonha," historian Lauanda Lopes de Souza draws attention to this making invisible of the racial characteristics through a discourse of impoverishment. Poverty in the Vale do Jequitinhonha became a euphemism for racial minorities which allowed for a dismissal of racism as an explanatory factor for inequity[23] More recently, there have been calls for individuals to identify as Indigenous or Black, to do away with the colonial aftermath of the term "pardo" that often times ignores the ways inequity or racism operates in Brazil.[45] Many traditional communities are historically linked to Indigenous and Quilombolo ancestry but are inherently seen as low-income and stigmatized due to their dependence on manual and agricultural labor and poor access to high-paying wage-labor; although individuals within the communities may not be individually racialized, the community itself becomes a racialized subject solely based on its positioning in comparison to an urban core or a *fazendero* class.

It is within this context that we might consider the ways in which environmental racism[2] operates in this region. Environmental racism has been classified as a sub-type of structural racism which has looked at the ways in which different communities are treated with regards to either receiving more "health-protective infrastructure" or receiving polluting infrastructure, such as highways or industry. In the US, this has taken the form of formerly red-lined communities, disproportionately being impacted by more polluting infrastructure.[46] In a recent

[2] Has also been identified as "Environmentalism of the Poor" in some Brazilian references.

meeting where, recognized, Quilombo Córrego do Narciso do Meio demanded a solution to the lack of water they had been experiencing for the past 30 years, the response from a public functionary was to emphasize that there were 84 other rural communities that also lacked access to water. This community stands kilometers away from a dam that was constructed decades ago to retain water in the area and while a farther rural community has received plumbing and access to this water as well as newly built dam for their agriculture, this community continues to go without. It is critical to note both the interplay of race as well as the differences in the two communities' use of land, the community that resides further away, I was led to believe, primarily cultivates pasture for their cattle, in comparison to Córrego do Narciso de Meio that primarily relies on subsistence farming.

In this same meeting a health public functionary would stress an upcoming Development project to establish a cultural center in the small town in order to preserve local history. I found this ironic juxtaposed with the discussion of how many community members had had to leave the area due to their lack of water. Locating this within an even broader context of the relationships between industry and rurality, an *Observatorio* representative states, "What Sigma consumes in one month would be enough to supply approximately 54,000 families. It's such an absurd impact." While traditional and racialized communities struggle with a lack of water supply for their livelihoods and must constantly fight to preserve their traditional ways of living, lithium mining industry in receives a seemingly endless supply of water for their water-intensive operations.[47]

In their analysis of the 2014 (and ongoing) lead water crisis in Flint, Michigan, Robinson (2018) emphasizes the various and historical contributing factors that led up the crisis and eventual poisoning of the primarily Black and largely lower-income community. A long history of under or complete lack of industrial regulation and pollution of the Flint River produced the conditions for the crisis, however, government decisions were ultimately responsible for the poisoning of the population, although they have subsequently attempted to evade blame for the crisis. Robinson describes how even voices representing the Flint population within this government system could not necessarily effect change and calls for communities to make their voices heard in response to environmental injustice. However, they do note the irony of those with the least agency needing to organize for government to respond to their needs. Robinson cites author Laurent (2011) discussions of four goals for community empowerment, but I call attention to a particular point I find most critical and most difficult to achieve: "the public's contribution must be able to influence the regulatory agency's decisions." In a system driven by economic exploitation of nature and humans,[48] one in which particular voices are silenced, the power of amplification and grassroots pressure might be the most critical but is extremely difficult to obtain.

Additionally, clinician, Salas [46] reflects on the ways pollution and health impacts caused by environmental racism can go undetected in clinical diagnoses. More troubling, Salas notes that even should they be able to apply a secondary diagnosis of environmental racism to clinical cases, their tools to address these issues are limited. However, they emphasize that clinicians should take on systemic issues: "It has never been more important to recognize that upstream policy decisions have long-lasting health and equity ramifications." They call for innovative and interconnected solutions along with policy change.[46] As presented above, the local Public Health system faces severe gaps towards addressing either short or long-term impacts of the lithium mining in the region. Even when public health functionaries individually express interest in addressing these negative impacts, there is lack of capacity given system constraints such as staffing, financing, and monitoring systems; the tools do not exist and much less a toolbox to equip.

In 2023, Araçuaí registered the hottest day in the record of Brazil, coming in at 44.8 degrees Celsius (112.64F) [49] and the heat only continues to intensify as rain becomes sparser. Unfortunately, Poço Dantas and the broader Araçuaí region are a continuation of a long colonial legacy of resource extraction to meet Global elite interests. The water-intensive mining of lithium will be shipped elsewhere for processing, and then go to serve electric vehicle needs in the Global North. What will be left behind are *buracos*, pits or holes, and the long-term environmental, health, and social impacts of this extractive process. From the community level, to the clinical care level, to global processes, environmental inequity calls into question how we go about ensuring health for all.

Alternative Futures

Local Indigenist scholar and life-long activist Geralda Chaves Soares usually begins her recounting of her work at the point she returns back to the region to work with the Maxakali, around the 1970s. She shares that, 'back in that day, people couldn't even say that they were Indigenous.' There was so much stigma and bias against Indigenous populations that Indigenous populations had to actively silence, obscure, and even erase their history, culture, and traditions. Gera now proudly shares the wins for Indigenous rights, not only the more recent social movements regarding taking pride in one's Indigenous roots, but also a reclamation of their ancestry, active movements to reclaim land, and growing pressures for state recognition. Indigenous communities continue to fight for their rights and for recognition and Gera connects to a history of resistance and struggle, "there's no way to ignore this history of struggle that incited mobilization efforts." I share this anecdote in recognition of the power of resistance and the possibility of alternative futures we might not be able to imagine in this moment.

Local activists have other visions for mining in this region as well as different relationships to energy resources they would like to see enacted. Activists from MAB have proposed a Popular

Energy Project, the development of democratic and popularly controlled institutions to decide national energy policy. This work would also call for public participation by way of public audiences, conferences, seminars, etc. A major goal of this movement would be transition from a market-based energy model to one based on energy as a fundamental human right. Additionally, in this framework, energy resources would be public, working conditions would a priority as would be impacted communities, human rights, and the environment.[50] In this model, lithium would become a public resource managed through public participation, with the hope that this would result in additional localize benefits, more ethical exploration practices, and proper compensation of locally impacted communities.

Image 3 Sigma Public Audience - Protest Posters

Alternative futures are possible and through deep engagement and open discussion, we may collectively find solutions worth pursuing. In one of my final community meetings I attended in Córrego do Narciso do Meio, the task that was put in front of public functionaries was to find solutions. Regarding access to a local health clinic and the fact that many from the community could not easily access the closest clinic, the Municipal Health Secretary was challenged to consider alternatives. Community members had a wealth of ideas to address the issue of health access, such as incorporating a small patient room into a new cultural heritage center, but what was being demanded was the will of local government to act in support of their community.

While we face severe barriers to enacting change, such as financial barriers, infrastructure barriers, systems processes, and sadly political will, I do believe it is critical to continuously pursue solutions in a collective manner and to continue to apply pressure on our public institutions to do the same.

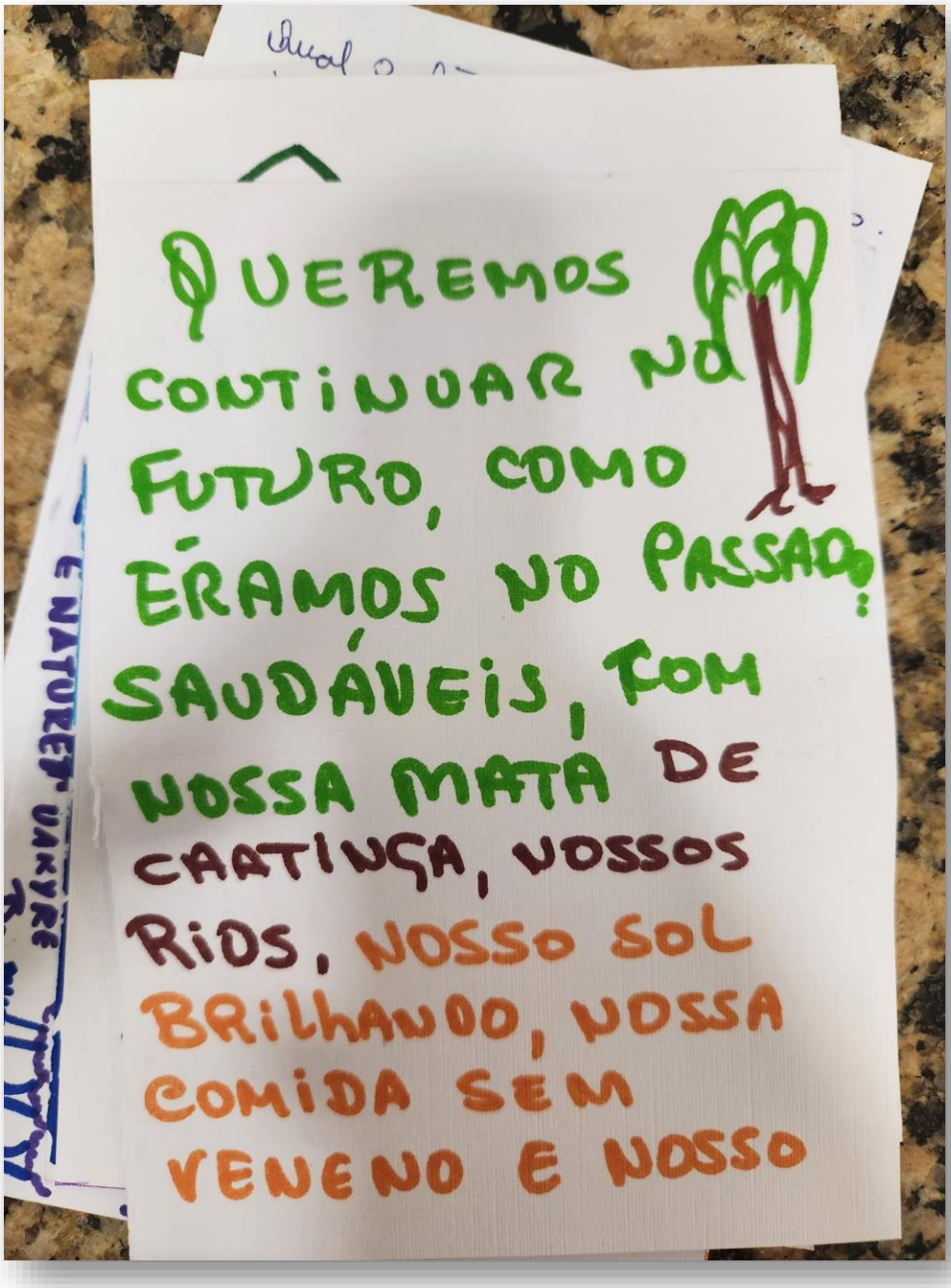

Image 4 Alternative Futures - Ideation Activity

Limitations

While I have an advanced understanding of Portuguese, it is still a foreign language for me and accents from region to region vary. There is much that I missed to comprehend not only due to the different cultural context, but also due to language differences. However, what I present here has been triangulated and presented back to my host community for additional feedback. All translations are my own with assistance from software such as Google Translate and online platform Linguee.com which provides translations within literary context.

For this work, I have sought to protect specific identities while not making invisible the ways in which power, powerful structures, and individuals within these systems operate. Where appropriate and possible, I note general characteristics of the individuals I spoke with and the context in which it was discussed. I try to present a larger, although undeniably incomplete, picture as I believe that what people say can only be reliably studied in the broader context as well as validated by their actions. I also made a choice to not focus on the silencing enacted by industry in the area. I felt that the silencing was self-evident and I ultimately wanted to draw attention to the public spheres that I felt were primarily accountable to impacted communities.

Though this work focuses on institutional actors and power structures, I would like to leave very clear that this is community is one of strength and resistance, a refusal to be silenced, to be overlooked, or to be sacrificed. I believe that many times in research and academia, we operate under the guise of 'what is not written' does not exist, but I want to be clear that my focus on institutional processes as opposed to focus on activist movements in the region is not an attempt to obscure their work, but rather a refusal to engage in more voyeuristic and extractivist natures of anthropology, to refuse to lend more state visibility to activist's strategies and actions, and lastly, to provide research that would be more helpful to them rather than an interpreted reflection of their own work.

Lastly, this research brings up questions about "reality" and whose voice, or truth, *counts* [note here on our cultural connection between quantification and veracity]. While I gathered most of my information from community members, there are many issues they raised which could never be fully *confirmed* via official documentation. That there is a lack of access to documentation or proofs of corruption or state violence does neither neutralize nor disqualify it. My argument here is that these rumors and accusations situated in context warrant further discussion and investigation. What I found instead was a process that demands full and expert documentation, legal counsel, and years, if not decades, of mobilization from the most vulnerable for possible future redress.

Gratidão

This final report was unable to capture the wealth of information that was gathered over the span of five months in Araçauí and I apologize to my participants for any critical information they feel has been left out. I am deeply grateful for all the support, time, resources, etc. provided to me during this research and most appreciative of the welcoming community I found in Brazil. I hope to continue this work in the years to come and to continue to lend my support as possible to the region.

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