What Does it Mean to be Green?

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

How many green things do you own? Not green the color but the idea, as in sustainable, environmentally friendly, or reusable and recyclable. The idea that consumers have a choice to spend money on a product that is better for the earth has gained popularity ever since the mid 2000's (Dutz and Sharma, 2012) but how do we define green? We have already said it's not a color, but is it a company's net emissions? Is it the material construction of an item? Is it the way in which an item is gathered? The answer is that it depends. Companies have the luxury of deciding their own definitions of green, and most choose the one that makes them look best and makes them the most money (Dietz, 2022) (de Freitas Netto, et al,. 2020). In fact, consumers are willing to pay an average of 27.6 % more for an "environmentally friendly" product (Walk-Morris, 2023). One thing most companies can agree on, though, is what green *isn't*. Very few corporations include the working conditions or the health of their employees in their definitions of green, and the cost for this is human life (Lyatuu, 2021)

Just as "green" marketing has grown in popularity, so has the push for sustainable production (Staniškis, 2012) (Repetto, 1987). Resource extraction for precious metals like cobalt, lithium, and gold have all grown exponentially in the past decade (Yu, 2024) and show no sign of stopping. But while the efforts to improve this industry, including the introduction of "model mines", their results have been mediocre (Calvao, 2021, p. 4-8). In severe but well documented cases, around 1% of the total workforce in the resource extraction industry (REI) die annually (Arvidsson, et al., 2022). Few occupations on the planet experience this level of workplace fatality, and none are as poorly compensated as the employees working in less-developed countries (Farnham, et al., 2020). The profits from these exploitations routinely go to large transnational corporations (TNC) who operate in areas with corrupt governments and little to no

worker protection laws (Freeman, 2010). These same corporations are the ones empowered to create their own definitions of green, undermining both the mistreated workers, but also the ill-informed consumers. In this paper, I argue that a global set of standards should be introduced that encourages financial transparency and ecological stewardship around resource extraction. Furthermore, I assert that significant changes to the REI may be necessary to promote ethical behavior and treatment of workers.

International guidelines that accomplish these goals have been proposed, such as the International Standards for Resource Extraction Engineers (ISREE) (Litvinenko, et al., 2022, p. 4-8). But the lack of widespread adoption suggests that a more comprehensive approach applied at multiple levels across the industry is necessary to improve safety and equity in operation. Such a system requires both punitive and incentivizing measures as well as understanding of the ongoing operations of the REI. Furthermore, it is worth considering how the exploitative relationships within the REI developed so that similar relationships do not develop as the world continues to try and decarbonize and electrify. By examining the history and current state of the REI, more well-informed recommendations and insights can be made. Acting both retroactively and proactively to amend and dissuade these subjugative relationships is a necessary step. Furthermore, if nothing is done to change the current system it is highly likely that the increased demand for resources will further drive the industry to exploitative measures.

Part One- Sociotechnical Analysis of the Resource Extraction Industry

To contextualize and enumerate the actors involved in the REI, actor network theory will be used. Actor Network theory, as described by Bruno Latour in *Reassembling the Social* (2007), is a method to connect human and nonhuman actors involved in a system. In the case of resource extraction, relevant actors and relationships include those between workers, governments, and corporations. Additionally, it is vital to consider how the resources themselves and change these relationships and the potential of regulatory bodies to influence this dynamic. By contextualizing the relationships between these actors, a better understanding of the power dynamics between them. Furthermore, the insights gained using ANT help to elucidate current controversies and potential stabilization within the network.

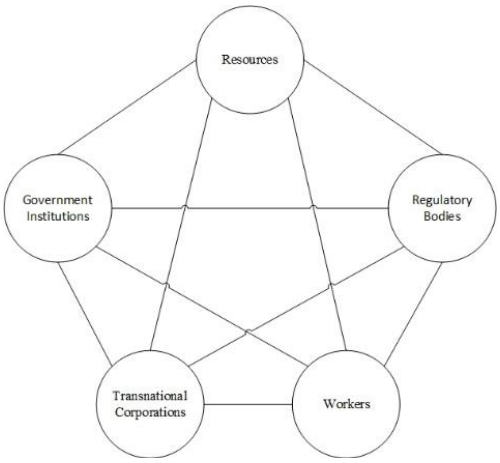

Figure 1: Actors Involved in the Resource Extraction Industry

The ANT analysis of major actors in resource extraction begins with an examination of how the sinister systems around resource extraction came to fruition. For most of human history, resource extraction relied on small scale groups of workers and easily accessible resource deposits (Reed, 2002). As such, the labor associated with these operations was often locally sourced and provided direct access to those in charge of the operation. However, as industrialization occurred the world became radically more integrated and interdependent, this change heavily affected the REI. The advents of vertical integration, economies of scale, and other emergent industries necessitated a rapid increase in the supply of resources (Frickel and Freudenburg, 1996). To accommodate this larger scale operations in more remote areas had to be developed, marking a shift away from small scale extraction of accessible resources. This growth continued for much

of the 19th and 20th centuries, as did the globalization of resource networks to provide cheap and steady supply of raw materials the world over (Stearns, 2020, p.221-237). In the last 40 years another shift has occurred.

In the wake of the second world war, many developing countries pushed for the democratization of their own governments (Hadenius, 1997). While this did encourage development in some areas, countries rich in natural resources found themselves unable to manage the logistics of a democratized government, and many fell into the hands of military leaders (Reed, 2002, p.204). These leaders often take advantage of their country's natural resources, both personal and material, by either outsourcing extraction to TNC's who hire impoverished locals to take care of the "dirty work", or by setting up state run corporations that do the same. These relationships have endured and the ties between corporations and corrupt governments of these nation states have solidified (Reed, 2002, p.208). The effect of this is that both the resources themselves and the labor to extract them are egregiously misused.

It is also noteworthy to consider not only the relationship between governments and TNC's but also that of the companies and their workers, since they are the party undermined by the relationship. Generally, work in the regions where the REI operates are severely impoverished and destitute in terms of available work (Nehf, 2020). This limits the options for locals to earn a living, leaving many with no option except to work in resource extraction. In some cases, it is common for the management of these workplaces to offer predatory loans or other services to employees to deceive them into continuing to work. The lack of standards and regulations for workers in these regions gives employees no recourse and no protection from these business practices. The same can be said for the resources themselves. Many of the mining and extraction operations are conducted in such a way that the area is irrevocably damaged. The

ecological impacts generated by the carelessness of these operations will take hundreds of years to remedy as it stands now, and the problem is ongoing (White, 2013).

There are potential solutions to both the humanitarian and environmental crises. One promising solution would be the implementation of a set of guidelines that imposes limitations on the methods used in the REI, as well as guaranteeing a minimum quality of life for those employed by the industry (ISREE). The challenge with creating regulations like this is that there are no real institutions to enforce it, and in many cases, it is difficult to pin responsibility onto a single party. However, the global push for initiatives like the UN's Sustainable Development Goals provides both funding and expertise to ameliorate problems like this (United Nations, 2015). Taking this one step further, developing nationwide or global criteria for marketing products as sustainable can help discourage profiteering in the REI. While there are industry specific nonprofits to certify sustainability such as Sustainable Coffee Challenge for coffee or Fairtrade America for cloth, there is no such group for resource extraction. These organizations act as independent auditors and advocates for the overseas producers of specific products and in turn, certify the sustainability and ethics of the process, which helps justify a higher price for the product (Sturzenberger, 2021). If such a group were to police the conditions in the REI, it is likely that consumers would be better informed about the products they are supporting. Even better would be to incentivize corporations to produce goods with a certification with reduced import/export tax rates or something similar. By having guidelines to protect the environment, the worker, and the consumer, the REI industry would be encouraged to operate ethically.

Part Two- Case Study of Resource Extraction in the Democratic Republic of the Congo

The Democratic Republic of the Congo posses the most valuable natural resources of any country on the planet. 70% of the world's cobalt supply is located there, as well as coltan, gold, oil, and diamonds (UNEP, 2022). These resources are estimated to have a value of twenty-four trillion dollars (EU GSP, 2023). Yet, the Congolese people who live atop a literal goldmine remain among the most impoverished on the planet, with the Human Development Index (HDI) placing them at 180 of 192 countries in the world. The DRC represents an unfortunate but accurate reality of the impact unethical resource extraction can have not only on individualized communities, but on an entire nation.

The DRC is also in the process of transitioning from "Artisanal" or locally sourced mining from accessible mineral deposits towards mechanized production to meet worldwide demands (Calvao, 2021, p. 1-2). Unsurprisingly, this shift brought about foreign interest in Congolese resources and corporate "oversight" to mining operations. However, this change did not go unnoticed. In a 2016 report by Amnesty International titled "This is what we die for" many of the human rights violations occurring around these artisanal mines were exposed as were the companies and government officials responsible for them. Eight years after the initial release of this report, only marginal actions have been taken. The involvement of the REI has only continued to grow in the DRC despite global attention of countless nonprofits, journalists, and volunteers. Nonetheless, the Congolese continue to have their resources pillaged without compensation with no end in sight. Thus, it is worthwhile to consider how the "dirty work" continues to occur, and what can or could have been done to stop it.

The mining process in the DRC starts on an individual basis. While large scale operations do exist the current model for mining leverages the anonymity associated with disorganized

work, with mining companies providing crude tools and information to workers while remaining absent for accountability (Calvao, 2021, p. 3-5). Under this model, Congolese are under tremendous pressure to work, as their payment is based only on the product they can generate. Furthermore, the lack of alternative professions in many of the resource rich areas leaves residents with little to no option but to mine. The lack or organization around these artisanal mines leads to frequent workplace fatalities, with estimates citing around two thousand deaths a year (MacDonald and Pokharel 2020).

After the various ores and minerals have been collected, miners can expect to be paid around $1-3 USD for a days' worth of labor. Then, they can expect to give up around half of that to a "government official" collecting taxes, as well as to pay for food (Amnesty International, 2016, p.27). This is largely where the involvement of the Congolese ends, they have received a minimal wage for hazardous work that they have little choice but to do. The remainder of the journey of the resources they collected is where the roots of the problem lie. The locations that collect the ore are typically the first layer of middlemen in a long chain of corporate negligence. These middlemen round up the ores collected and bring them to local warehouses where they can be collected for shipment. Next, the tons of ore are loaded onto trucks, and brought to a facility in a more central location to be processed. The trucks themselves and the facilities the ores end up at are typically owned by Congo Dongfang Mining / Huayou Cobalt (Amnesty International, 2016, p.50-56). This company processes the ores before they are sold to battery component manufacturers, usually overseas. Huayou Cobalt also has strong ties to both the Chinese and DRC governments, allowing them to operate with indiscretion.

From there, the battery components become batteries and then make their way into products you might be familiar with, such as the iPhone, Mercedez-Benz vehicles, or Lenovo

laptops like the one this essay is being written on (CECC, 2023). At this point, the ore has passed through the hands of at least four intermediaries, leading to many of the final product producers claiming they are unaware of where their products originate, or outright denial that their products are sourced unethically. Much of the blame regarding the conditions has been placed on these corporations for purchasing goods originating from the DRC without verification of their production methods. While these companies are not without blame, do we not commit the same act when purchasing their product? We no longer have the luxury of willful negligence in the matter either, as much journalistic research has gone into informing the public of the ties between the electronics industry and the REI. Since we have proven our unwillingness as consumers to boycott the industry, the best path forward likely relies on rectifying the problems at the source.

Revisiting the chain of events that brings the resources to market, there are several places to seek improvement. Firstly, at the most foundational level where workers learn how to mine and acquire the tools to do so, they can be empowered through information. Providing at least written or oral guidance about the dangers associated with mining and the right techniques to use if no alternative exists will not solve the problem, but it could save lives. Advocating for livable wages and forming cooperatives between artisanal miners can help bring negotiating power back to the Congolese people just as it has for farmers worldwide (Islam et al., 2015). Incentivizing outside investment on more sustainable operations offers the companies we hold accountable to right their actions in the public eye. More than anything else though, strengthening regulations and enforcing them is the most consistent way to achieve measurable results, but doing so isn’t simple.

As discussed previously, the government of the DRC has a strong incentive to let processing facilities collect and refine ores without interference, as many government officials have financial stake in the profits of the transnational corporations that operate in the country. This relationship discourages regulatory change to occur within the country's own government, and the prospect of using outside entities to enforce regulations creates a moral dilemma. Utilitarian ethics would support the interdiction of outside entities, as doing so would provide a substantial quality of life improvement for the Congolese people (Driver, Nodelman & Zalta, 2022). However, many may argue that by intervening, we take autonomy away from the people and interjecting our own ideas of right and wrong can frequently have the opposite effects of those intended (Kurtenbach and von Soest, 2018). However, there can be a middle ground. Virtue ethics argues for a balance between action and neutrality governed by "practical wisdom" (Vallor, 2021). Applying this wisdom to the operations of the REI in the DRC and elsewhere highlights the kinds of regulation that can bring about meaningful change and empowerment to the Congolese people.

Part Three- Regulatory Suggestions and Alternative Approaches

For a regulation around resource extraction to be effective, it must work harmoniously between the actors identified in the first section. Understanding the nuanced relationships between workers, resources, corporations, governments, and regulatory bodies is critical to developing impactful and enduring guidelines. With this in mind, a few different sets of regulations stand out as having the most potential to benefit the REI. Establishing guidelines

such as those proposed by the ISREE fall nicely into this category (Litvinenko, et al., 2022, p. 4-8). Establishing globalized requirement for competent engineers to provide oversight to these operations is likely to help both the humanitarian and ecological impacts associated with these operations. However, these regulations do have limits, namely the potential for employees to become complicit and aloof in the face of corruption.

One potential solution to this is requiring companies to publicly publish revenue statements and become transparent about their income and expenses. Requiring this allows for an increased level of scrutiny by the public who are very unlikely to be persuaded or strongarmed into agreement. Pushing this onto all levels of the supply chain for resources like heavy metals extraction, crude oil production, and waste disposal keep corporations honest. Eliminating the plausible deniability many product manufacturers have used to backpedal out of accountability. Another action would be the establishment of education around safety and sustainability. Ideally funded by companies extracting or refining raw material and taught through nonprofit organizations. Historically, education of affected communities has been one of the best ways to cultivate meaningful development regardless of the conditions that currently exist (House Project, 2023). Applying this to the REI is no different, informing not only laborers but their families and other community members of the dangers and benefits of mining helps them make informed decisions and become self-advocates.

Together, these regulations represent a crucial step towards truly sustainable production. They consider the monetary interests of corporations by suggesting low or no cost actions that still allow for profit. Government institutions and regulatory bodies are given agency the ability to define engineering “best practices” and develop guiding principles. Workers and resources are empowered through education and advocacy for ethical and sustainable production. Holistically,

these regulations and actions represent a realistic middle ground capable of satisfying the concerns of the actors involved in the REI. They may provide a significant benefit at several production levels and begin the path towards truly green production. However, at its core, these regulations still satiate an industry with a long history of corruption, subjugation, and willful ignorance of the damages it causes. It is certainly a bit utopian, and perhaps naïve to think that corrupt corporations who often answer to foreign interests would be willing to commit anything towards the empowerment of the communities they pillage. As unfortunate as it may be, the only actions that many of the TNC's and product producers are likely to take must be at least somewhat self-serving, but there may still be ways to achieve that.

It has been established that at the present moment, incredibly wealthy and unethical actors have dominated the REI for years, and they are startlingly unwilling to change. Most of what has been suggested this far in this essay has been at least somewhat wishful thinking. But that does not mean that there are not other ways to help. One potential solution is to fund the establishment of more resource extraction in developing countries and in many of the same areas the industry is already prolific. In doing so, you would be in direct competition with the TNC's currently operating there, relying on the same pools of workers and the same mineral deposits. The difference would be to operate equitably, creating safer work environments with better pay to incentivize the migration of labor away from current employers and funneling it towards the sustainable extraction industry (SEI). Effectively trying to put the current corporations out of business, or at the very least forcing them to change the way they conduct it.

Ideas like this have been implemented already, model mined have been tried in several areas in Sub-Saharan Africa (Calvao, 2021, p. 4-8) but these have never reached a significant scale. This is in part because the current implementation has not seen widespread support from

many of the actors identified previously. Many government institutions in this region are very preoccupied with political discourse and fighting (Bruckner & Ciccone, 2010). While transnational corporations have no incentive to support these model mines.

It is a valid criticism of this idea to ask, “but who will pay for it?”, and ideally nobody will. Since the push towards sustainable technologies has been so strong in recent years especially as it relates to incentives for decarbonization and electrification, I argue that governments worldwide should offer tax incentives for companies who invest in these alternative resource extraction operations. Since we have been abundantly clear to producers like Samsung, Apple, and Lenovo that we do not support their raw material suppliers, it is an equitable compromise to allow them to invest in a sustainable alternative without a steep economic penalty. If the final burden for these improvements ends up resting on the consumer (i.e. you and me) so be it. But in fact, consumers are already paying this premium for nothing as discussed in the introduction.

By investing in the SEI, corporations would benefit their own public image, but could also be permitted to sell branded or otherwise stamped goods acknowledging that their goods are manufactured with materials sourced ethically that meet specifications set by regulatory bodies for whichever industry they represent. The benefits here are twofold, firstly these products could likely be sold at a higher price potentially offsetting or even increasing profits for companies who invest in SEI. It also empowers the consumers by solving the problem of “green”.

Conclusion- Holistic Solutions and Connections to Green Marketing

With development of a corporation/consumer supported SEI, problems at all levels of the supply chain can be ameliorated. At the ground level, workers can receive fair compensation,

education, and dramatically improved working conditions. Corrupt middlemen can be cut out of the industry to the benefit of the communities and the environment. Producers can purchase their raw materials with confidence not only in their quality and ecology, but that their public image, perception, and of course profits are all safe. Consumers can shop with confidence that the products they believe are sustainably sourced actually are, and that the price they pay for goods is having a real impact hundreds or thousands of miles away.

While developing such a network rapidly may seem outlandish at first, it is rapidly becoming a necessity. With the ever-increasing demand for many natural resources, the pressure put on the REI to produce an ever-growing quantity of material is unlikely to slow down soon. Likewise, the quality of life for those involved in the REI is also unlikely to improve without intervention. As the humanitarian concern around these areas grows larger, the push for action becomes stronger. Certainly, an easier solution would be for the current producers of raw materials to willingly change and work with nonprofit groups on their own to create a better environment, but they are unlikely to do so without any incentive. By creating an attractive alternative to invest in, we issue an ultimatum to the current TNC's taking advantage of systems that have been in place for centuries.

It is evident that there is no panacea for the resource extraction industry, by its very nature its existence can be viewed as problematic. However, it is necessary in some capacity to keep society running as it does now. The solution I have proposed is not a perfect one, but it is free of the moral qualms associated with interventionism, and it considers the desires of the actors involved in the current industry. By leveraging competition, regulation, and marketing, a more equitable industry from producer to consumer can be established, and we can collectively decide what it means to be green on our own terms.

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