Climate change from a Marxist perspective

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Abstract. Climate change is one of the world's most important challenges today. However, capitalist solutions to climate change dominate the conversation, and Marxist perspectives have been mostly left by the wayside by mainstream ecologists as well as fellow Marxists. This paper aims to utilize recent Marxist works on ecology to analyze various case related to climate change and showcase the flaws in current capitalist understandings of climate change and its potential solutions.

Keywords: Climate change, Marxist, capitalist

INTRODUCTION

Marxism is commonly seen as not particularly related to ecological sciences. If anything, ecologists tend to see Marxism as an anti-ecological philosophy. According to John Bellamy Foster, the common understandings around ecology in Marxism are: that ecological sections are brief and not systemic; that ecological sections exist mainly in Marx's earlier works; that Marx adopted a pro-technological and anti-ecological view; that Marxism believes ecological limits will be solved by technological and economic development; that Marx had no scientific basis for the analysis of ecological issues; and that Marx viewed humans as superior and taking precedence over other species (Chen, 2017, pp. 68-69).

These assumptions are not true, as the link between human existence and nature is consistently and repeatedly reinforced throughout Marx's work. The key ecological concepts in Marx's works however are Metabolism, Metabolic Rift, and Metabolic Shift. Metabolism describes the relations between human labor and nature, more specifically how the labor process throughout history has always required nature, as labor is "human action with a view to the production of use-values, appropriation of natural substances to human requirements; it is the necessary condition for effecting exchange of matter between man and Nature; it is the everlasting Nature-imposed condition of human existence, and therefore is independent of every social phase of that existence, or rather, is common to every such phase" (Marx & Engels, 1988, p. 208; Chen, 2017, p. 122). In simplified terms, human production and civilization is based upon the relationship and exchange between humans and nature.

The Metabolic Rift on the other hand, is the disconnection between humans and nature. Metabolic Rift materializes in three ways, namely: the disruption of cyclical processes in natural metabolism, with the example of using fertilizers to maximize crop-growth without allowing soil fertility to replenish; the spatial rift, where people and resources are accumulated more and more in urban locations, causing higher and higher resource extraction outside; and finally, the temporal rift, where the timescale of capital becomes much faster than that of nature, due to the desire to shorten turnover time and maximize profits, making it so that nature cannot "catch up" to the processes of capital (Saito, 2023, pp. 23-28).

The final aspect of Marxist ecological theory is the Metabolic Shift, which describes the attempts of Capitalism in solving the problems caused by Metabolic Rifts, not by recognizing and addressing the inherent contradictions which cause Metabolic Rifts, but instead further expands in effort to avoid the consequences. The three dimensions of Metabolic Shift are: technological shift, where new technologies are innovated to solve immediate issues but cause larger issues down the line; spatial shift, where the attempted "solutions" occur through the expansion of capital into further territories, establishing the global divide between the imperialist and wealthy Global North and the exploited and poor Global South; and lastly, temporal shift, where the consequences are shifted to a later time or generation of people, due to the prioritization of short-term profits over long-term costs (Saito, 2023, pp. 29-34).

In the current day, Marx's insights on ecology have become more important than ever. Global warming will reach 1.5°C above pre-industrial levels by 2030-2052 if continued at 2018 rates. Some potential effects of 1.5°C global warming is extreme heat, droughts, sea rise, species loss and extinction both land and sea; extreme weather events; energy, food, and water risks; and heat related health risks. Populations most at risk are those already disadvantaged and vulnerable, and some effects of climate change will be long-lasting or permanent (IPCC, 2018). In fact, current levels of climate change, around 1.1°C during 2011-2020, have already had observed impacts. These include lowered agricultural and fishery production, increased infectious diseases, malnutrition, displacement and flooding, and damages to infrastructure and economic sectors (IPCC, 2023).

1. METABOLIC RIFT

Slash-and-burn agriculture is an agricultural technique where natural environments are destroyed by cutting or burning in order to supply new fertile land for agriculture cultivation. Some effects of using this agricultural technique are soil erosion, deforestation, loss of biodiversity, and increased risk of invasive plant species. The most relevant effect to this paper, however, is the release of large amounts of greenhouse gases (GHGs), which average to 741 tera-grams yearly from America, Asia, and Africa (Tang & Yap, 2020, pp. 1-2).

Slash-and-burn agriculture causes metabolic rift not only in one dimension, but two. The first dimension is that of Temporal Rift. This occurs due to the short fallow duration, meaning the soil is not given adequate time to rest and regenerate, causing soil erosion and reduced nutrients. This then results in the second dimension of metabolic rift occurring as a result of slash-and burn, Cycle Disruption. The degradation of soil is not just harmful to agriculture, but also causes gradual deforestation in addition to the initial deforestation from slash-and-burn. This forest loss becomes permanent, as tree life progressively dies off and is replaced by shrubs and grasses. Both the degradation of soil and loss of forestry contribute to climate change through the release of captured carbon, as well as the reduction of carbon sequestration (pp. 4-6).

Another example of modern-day Metabolic Rift is the coal industry in Indonesia, specifically, coalmining and coal-based power generation. In East Kalimantan, a province of Indonesia, the coalmining industry is quite important, with the coal sector's licenses totaling ±1,162,694 ha, or 9.13% of the entire province's land. A further of 57.62% of this licensed land are registered as forests, which makes the deforestation of an average 36,000 ha/year between 2000-2015 not come as much of a surprise (Afkarina, Wardana, & Damayanti, 2019, p. 198). Besides deforestation, the mining sector in East Kalimantan causes other damage to both natural and human environments. The natural environment is damaged by air, soil, and water pollution, which reaches both natural habitats, the landscape, and groundwater. Meanwhile, humans are also affected through both radioactive and non-radioactive contaminants (p. 199).

The coal mining industry, however, cannot be separated from the power generation in Indonesia, as 62.5% of power generation in the country is coal-based. (Myllyvirta, Kelly, Uusivuori, Hasan, & Tattari, 2023, p. 8). This leaves a substantial human impact, as 91% of Indonesia's population receives air pollution levels higher than the WHO guidelines. In the Jakarta Metropolitan Area, life expectancy is lowered by 5.5 to 6.4 years. Coal-based power plants have already caused 10,500 deaths in 2022, with a total health cost of $7.4 billion (Myllyvirta, Kelly, Uusivuori, Hasan, & Tattari, 2023, pp. 7,29). Additionally, there are environmental consequences to using coal power production. There are the GHGs in the form of CO2 emissions; acid rains, which can additionally travel through rivers and water reserves, impacting plant and animal life directly, as well as indirectly, by acidifying and carrying heavy metals into the soil; fly ash and heavy metal emissions, which further contaminate land and water, which also cause damage to local life, including increased risk of cancer (Munawer, 2018). The coal sector in Indonesia represents two dimensions of Metabolic Rift: Cycle Disruption through deforestation and the damage to wildlife through emissions, and Spatial Rift as more and more resources are extracted from mines which then supply power plants that also ecologically harm the urban centers.

2. METABOLIC SHIFT

A key-change the world is making in the face of climate change is the move towards green energy. However, a key part of the current visions of the future are lithium-ion batteries, and further, a key part of these batteries is cobalt. This then becomes an example of Technological Shift, as cobalt production causes several negative effects on the environment. First of all, there are the atmospheric consequences, as the power generation needed to run cobalt production operations cause an equivalent amount of global warming as 9.52kg of CO_2, while the burning of diesel causes 3.52E-7 kg CFC 11-eq of Ozone depletion. There are also local environment impacts, such as eutrophication caused by smog and acid rain, as well as freshwater contamination (Farjana, Huda, & Mahmud, 2019, pp. 154-155).

The cobalt industry also represents Spatial Shift, as the Democratic Republic of the Congo (DRC) supplied 69% of the world's cobalt in 2020 (Gulley, 2022, p. 2; Calvao, Mcdonald, & Bolay, 2021, p. 1). Not only does the DRC face the local ecological consequences of eutrophication and ecological contamination, but the people also suffer from exposure to toxic elements such as arsenic, cadmium, manganese, and the cobalt itself, some of which are carcinogenic (Farjana, Huda, & Mahmud, 2019, p. 154). However, the benefactors of this ecological damage are mostly not the Congolese people themselves, as 70% of the DRC's mining industry is owned by Chinese investors (Kinch, 2020).

Finally, there is the dimension of Temporal Shift, which can be seen with the oil company Exxon. Exxon initially invested in climate research because thought it could financially benefit them. The first reason they believed this was that the newly formed U.S. Energy Department was handing funding for climate research. The second reason was the at-the-time uncertainty towards the responsibility of fossil fuels on climate change. If deforestation played a bigger role, or if oceans could slow climate change by absorbing carbon, then transitioning away from fossil fuels could be unnecessary or at least delayed. This of course would be to the benefit of Exxon as a primarily fossil-fuel based company (Banerjee, Cushman Jr., Hasemyer, & Song, 2015, pp. 19-20). As far back as 1977, Exxon's private research division had found evidence of future climate change caused by fossil fuels and some of its negative effects. Exxon further invested deeply into its climate research, developing a model that could predict the effects of fossil fuels and carbon dioxide. However, Exxon found that a drastic reduction of fossil fuels was needed in order to prevent climate change, and that delaying action until effects of climate change were occurring would make those effects irreversible. by the late 80s, Exxon ended its climate research, and did a complete 180 by lobbying for climate denial and the blocking of pro-climate policies (pp. 6-7, 9-10). This clearly showcases Temporal Shift, as Exxon's decision to deny and block issues related to climate change shift the consequences to the future generations which had no responsibility in creating the situation. This, however, is a perfectly rational decision under a capitalist system, where short-term profits and shareholders stand above all.

CONCLUSION

These few cases have shown how the capitalist mode of production have greatly exacerbated humanity's destruction of the environment through various Metabolic Rifts. The capitalist desire for never-ending growth and profit is not compatible with the limited resources of our planet. The capitalists have realized this for decades, as shown with Exxon, but remain content in continuing to reap the profits from the destruction, as they are not the ones who have to live with the consequences. Even after the truth of climate change become more unavoidable, the popular solution is not to search for and address the fundamental problems caused by the endless need for profits and growth, but instead to transfer the consequences away.

However, humanity is not "doomed" to ending with climate change and capitalism. Change is possible by moving away from capitalism and its inherent contradictions with the environment and instead towards a society in which the rifts between humanity in nature do not exist in the first place. A society in which the understanding of wealth is no longer in the form of commodities, as it is under capitalism, but instead one where wealth comes in the forms of a healthy and sustainable environment which supports us; free time which we can utilize in developing our skills, knowledge, and fulfilling our creative potential; and social relations, which are so fundamental to human existence.

References

Afkarina, K. I., Wardana, S., & Damayanti, P. (2019, December 31). COAL MINING SECTOR CONTRIBUTION TO ENVIRONMENTAL. *Journal of Environmental Science and Sustainable Development, 2*(2), 192-207. doi:https://doi.org/10.7454/jessd.v2i2.1025

Banerjee, N., Cushman Jr., J. H., Hasemyer, D., & Song, L. (2015). *Exxon: The Road Not Taken.* InsideClimate News. Retrieved January 6, 2024

Calvao, F., Mcdonald, C. E., & Bolay, M. (2021, December). Cobalt mining and the corporate outsourcing of responsibility in the Democratic Republic of Congo. *The Extractive Industries and Society, 8*(4). doi:https://doi.org/10.1016/j.exis.2021.02.004

Farjana, S. H., Huda, N., & Mahmud, M. P. (2019, August). Life cycle assessment of cobalt extraction process. *Journal of Sustainable Mining, 18*(3), 150-161. doi:https://doi.org/10.1016/j.jsm.2019.03.002

Gulley, A. L. (2022, October 3). One hundred years of cobalt production in the Democratic Republic of the Congo. *Resources Policy, 79*. doi:https://doi.org/10.1016/j.resourpol.2022.103007

IPCC. (2018). *Global Warming of 1.5°C.* Cambridge; New York: Cambridge University Press. doi: https://doi.org/ 10.1017/9781009157940.

IPCC. (2023). *Climate Change 2023 Synthesis Report: Summary for Policymakers*. Geneva: IPCC. doi:10.59327/IPCC/AR6-9789291691647.001

Kinch, D. (2020, December 1). Chinese dominance of DRC mining sector increases economic dependence: Mines Chamber. (J. Dart, Ed.) *S&P Global*. Retrieved December 9, 2023, from https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/metals/120120-chinese-dominance-of-drc-mining-sector-increases-economic-dependence-mines-chamber

Marx, K., & Engels, F. (1988). *Marx and Engels: Collected Works* (Vol. 23). International Publishers. Retrieved January 4, 2024, from https://www.intpubnyc.com/browse/collected-works-of-marx-and-engels-vol-23-1871-1874/

Munawer, M. E. (2018, December 29). Human health and environmental impacts of coal combustion and post-combustion wastes. *Journal of Sustainable Mining, 17*(2), 87-96. doi:https://doi.org/10.1016/j.jsm.2017.12.007

Myllyvirta, L., Kelly, J., Uusivuori, E., Hasan, K., & Tattari, V. (2023). *Health Benefits of Just Energy Transition and Coal Phase-out in Indonesia.* Centrre for Reasearch on Energy and Clean Air. Retrieved January 5, 2024, from https://energyandcleanair.org/wp/wp-content/uploads/2023/07/CREA_IESR_Health-Benefits-of-Just-Energy-Transition-and-Coal-Phase-out-in-Indonesia_EN_07.2023.pdf

Tang, K. H., & Yap, P.-S. (2020). A Systematic Review of Slash-and-Burn Agriculture as an Obstacle to Future-Proofing Climate Change. *Proceedings of the 4thInternational Conference on Climate Change, 4*(1), 1-19. doi:https://doi.org/10.17501/2513258X.2020.4101