Drowning Out The Rest: The West's Dominance of the Climate Crisis

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The issue of climate change is one that is marked by inequity in responsibility, consequences, and responses between "the West"and "the Rest" (Hall, 2019, pp. 141-146). In this paper, I will demonstrate this in three ways. First, I will discuss the sharp mismatch in greenhouse gas emissions and the burden of climate change effects observed when comparing developed ("the West") and developing countries ("the Rest"). Then, I will explain the historical and current theme of exploitation of "the Rest" by "the West" in ways such as colonialism and resource extraction that has organized the world into regions prepared to deal with environmental disasters and those that are not. Finally, I will delve into the theme of climate imperialism, enabling Western countries to utilize wealth and power, acquired through economies built on fossil fuels and the exploitation of poorer regions, to shape climate policy in their favor, and escape responsibility for their actions.

The "West" described here is not a geographical construct, but a political, economic, and historical one. As Stuart Hall defines it, it is "the type of society that is developed, industrialized, urbanized, capitalist, secular, and modern" (2019, p. 142). It can be described in many contexts - as an academic tool allowing us to categorize societies, as a "system of representation" for characteristics considered "Western", as an ideology used to evaluate other societies, and as a model of comparison to establish differences between cultures, especially those considered "non-Western" - that is, the "Rest" (Hall, 2019, pp. 142-143). However, this does not make the "Rest" simply a category complementary to the "West", but a part of the same "discourse" of "the West and the Rest", where one cannot be defined without the other. (p. 145) This discourse is implicitly flawed and destructive, as it conceals the heterogeneity within both the categories that it splits the world into. Nevertheless, though it "draws crude and simplistic distinctions and

constructs an oversimplified conception of ‘difference’” (p. 146), it is a useful tool in understanding inequity and injustice on a global scale, especially if nuances and exceptions are kept in mind when applying the discourse to a particular issue. On the subject of climate change, the partitioning into “the West and the Rest” is particularly useful because the experiences of world populations historically and presently have been sharply divided across boundaries of industrialization and urbanization. Countries that industrialized earlier in history often contributed significantly more to carbon emissions, while most developing societies are unable to successfully do the same today since such fossil fuel-based economies are being phased out. The exploitation of resources by Western cultures and their over-representation in modern climate policy design further distances such nations from those that are impoverished and do not have the political sway on the global stage to advocate for equity in climate solutions being designed. Countries typically considered part of the “West” include the major greenhouse gas emitters like the United States of America, Australia, Russia, the United Kingdom, Japan and China. These countries have been categorized by Althor, Watson and Fuller (2016) as “free riders” (p. 3). The “Rest” is often used to categorize countries most vulnerable to the effects of these emissions, the majority of which are island nations in the Pacific, Atlantic and Indian Oceans, as well as African countries. Althor, Watson, and Fuller refer to these countries as “free riders” (p. 3).

In this section, I discuss how these “free” and “forced riders” have unequal standing on the global stage, first in terms of their greenhouse gas emissions, and then in terms of how vulnerable they are to climate change effects. I also explain the failure of some landmark climate change policies to reduce this inequality and ensure that countries that are not responsible for the bulk of climate change are not victimized by it.

Even at the start of this century, scholars and policymakers recognized that some countries were overrepresented in carbon emissions while others were not. Baer and colleagues (2000) discussed "the international consensus that the industrialized countries should take the lead in mitigating climate change" (p. 2287). The carbon emissions per capita at that time averaged globally about 1 metric ton per year (tC/year), but per capita emissions exceeded 5 tC/year for the U.S and were between 2 and 5 tC/year for Japan and Western European countries, while they were 0.6 tC/year in the developing world and less than 0.3 tC/year for more than 50 developing countries (p. 2287). The emission caps established by the Kyoto Protocol (1997) were based on 1990s emission levels, which is fundamentally flawed - if future emission caps are based on past levels, big emitters get rewarded with higher caps and countries with lower levels are penalized with tighter restrictions on their subsequent greenhouse gas emissions (p. 2287). The article proposes instead the solution of "Equal per capita emissions" (p. 2287), which, which provides limits on the emissions of individuals - a more equitable approach, perhaps, as it accommodates for varying populations and strives to moderate extreme lifestyles while allowing impoverished societies to catch up.

Scholars since have delved deeper into the issue, and introduced the concept of vulnerability that is vital to understanding the true extent of inequity in carbon emissions. Fussel and Klein (2006) conceptualizes vulnerability as "an integrated measure of the expected magnitude of adverse effects to a system caused by a given level of certain external stressors" (p. 306). In the matter of climate change, this description involves both the level of awareness in a particular community about the risk to their lives and livelihoods from the effects of climate change, the knowledge and expertise available to them to design and implement suitable policy, and the success of such policy. These policies are primarily of two types - mitigation, or

"limiting global climate change through reducing the emissions of greenhouse gasses (GHGs) and enhancing their sinks", and adaptation, or "moderating the adverse effects of unavoided climate change through a wide range of actions that are targeted at the vulnerable system" (Fussel, 2006, p. 303). Adger et al. (2005) characterized a factor that reduces vulnerability as "socio-ecological resilience", or "the regenerative ability of ecosystems and their capability in the face of change to continue to deliver resources and ecosystem services that are essential for human livelihoods and societal development" (p. 1036). A difference in this resilience, either by environmental change or through human actions, can potentially turn hazards in coastal areas into disasters. For example, Hurricane Andrew in 1992 resulted in 23 deaths in Florida, while a similar tropical typhoon a year earlier in Bangladesh killed over 100,000 people and displaced millions more. The former benefited from "strong institutions, early warning systems, and a high capacity to deal with the crisis", while the latter did not (p. 1037). Therefore, the inequity between "the West and the Rest" lies not just in greenhouse gas emissions, but also in vulnerability being higher and socio-ecological resilience being lower in developing countries than developed ones.

Over the years, a number of studies have examined this inequity from different perspectives. Fussel (2010) analyzed "the asymmetries between countries' responsibility for climate change and their capability to assist on the one hand and their vulnerability to climate change on the other " using a number of indicators of each category in climate-related sectors (p. 607). Specifically in coastal zones, where climate change impacts are found to always be adverse, it was seen that "socio-economic capacity" is the more important factor in determining how these impacts are skewed towards harming impoverished populations more, rather than biophysical factors such as the nature of the coastline (pp. 607-608). The "double inequity

between responsibility/capability and outcome vulnerability to climate change" also appeared to strengthen a "moral case" for the "most responsible countries" to provide assistance in the form of finance and technology to "the most vulnerable ones" (p. 608). Wolff and colleagues (2015) focused on the impacts on coral reefs as an indicator of this larger problem, and concluded that "the greatest inequity will occur on the reefs of the world's poorer nations, particularly those in the western Indian Ocean" (p. 3988). They modeled climate change as one of the most significant stressors in a variety of coastal ecosystems, and found that, after controlling for other factors, countries with more socio-economic stress would find it harder to withstand "climate-induced losses of their reefs' ecosystem services (their natural capital) as well as greater adaptation costs of reducing other forms of ecosystem stress or seeking alternative sources of livelihood and food" (p. 3991). Althor, Watson and Fuller (2016) conducted a wider study of the inequities in climate change between their classifications of "free" and "forced" riders, quantifying equity as the difference between responsibility (through emissions) and vulnerability (p. 3). They also made projections for 2030, and their results sharply divided the world along the familiar boundaries of the 'West', with this inequity continuing to rise by 2030 (p. 3). They discuss that countries like "China and the United States of America, are in a win-win position of achieving economic growth through fossil fuel use with few consequences from the resulting climate change", while others such as "Island and African countries suffer low economic growth and severe, negative climate change impacts" (pp. 3-4), with beneficiaries of the inequity having no incentive to decrease it. They also mention that while the Paris Agreement of 2016 could be a significant change for the better by calling for funding for climate mitigation and adaptation, "there is no legally binding mechanism under which parties are responsible for providing this funding" (p. 4). This indicates that global policy has been insufficient in eroding

inequities between countries in carbon emissions and vulnerability, and has even served to enhance them, as I shall explore later.

Before I further examine the role of public policy in withholding justice for climate change, it is important to consider the historical and modern context that led to a need for this justice. In this section, I examine some phenomena that lead to"the West" being better prepared in terms of resources to deal with climate crises. These include colonialism, "othering", and the extraction of resources from developing nations in the name of clean energy production.

A major mechanism of exploitation of the Rest by the West historically has been settler colonialism. As Whyte (2018) writes, "Settler colonialism is ecological domination, committing environmental injustice against Indigenous peoples and other groups" (p. 125), describing the socio-ecological resilience of Indigenous peoples subject to U.S. domination as "collective continuance" - or a "society's capacity to self-determine how to adapt to change in ways that avoid reasonably preventable harms" (p. 132). This 'collective continuance" has been irreversibly undermined by settler colonialism, which damaged the interpersonal trust of a society, forced relocation, eroded redundancy by depleting resources, and diminished the community's ability to adapt to changes from climate change. (p. 134) It is accompanied by two sources of environmental injustice - "vicious sedimentation", or "how constant ascriptions of settler ecologies onto Indigenous ecologies fortify settler ignorance against Indigenous peoples over time", and "insidious loops", or "complex feedback from ecological systems that is particularly harmful for Indigenous peoples" (pp. 138-139) The former has resulted in the opinions of Indigenous populations being belittled and their inputs not considered in major policy decisions on climate change, while the latter has enhanced the vulnerability of these populations, as previously discussed. For example, relocation due to "US military expansion,

settler oil and gas companies pipelines, public water control infrastructure and flood control measures, and the development of industrial agriculture, among other factors" (p. 140) made the tribes vulnerable by reducing the land they had to live on, reducing their capability to adapt to changing climate conditions. Scholars have pointed to the same pattern of environmental injustice through settler colonialism occurring today in Israel-occupied Palestine (Kirk, 2022), where "Israel's occupation policy exacerbates water scarcity by siphoning off surface and groundwater, leaving inadequate amounts for basic needs" and prevents "smallholder farmers from transforming their agroecosystems to fit a changing climate" (p. 93). Israel's promises of supplying the Arab world with green technology to deal with the coming climate crisis is undermined by its occupation cutting Palestinians from such technology (pp. 93-93), thus reducing that same socio-ecological resilience that is so vital in reducing vulnerability to climate disasters.

Andreucci and Zografos (2022) directly and effectively consider the ramifications of "the West and the Rest" in climate change and find that "othering" is a "feature of fossil fuelled capitalism" (p. 2). They find that this process of "othering" has resulted in global policy calling for mitigation and adaptation strategies that are "largely associated with the extension of capitalist relations" and "predicated on racist and colonial ways of seeing and governing populations and territories" (p. 2). "Biopolitical racism", they find, is the root of this "othering" that lets institutions treat certain populations as expendable in a variety of contexts (p. 2). Examples include "carbon colonialism", where "countries in the global South and other peripheries are treated as carbon dumps, or targeted for grabbing land and resources necessary to reduce CO2 emissions generated primarily in the North" (p. 4), and the victimization and problematization of "targeted populations and territories as in need of improving, rendering

productive, and adapting to the threat of catastrophic climate change" (p. 9), framing such adaptation as a "white man's burden" (p. 5).

The historical and present exploitation of the Rest by the West makes it especially unjust to apply the goals of the Paris Climate Agreement (2016). Muttitt and colleagues (2022) write that "since coal provides 26% of power generation in high-income countries compared with 49% in low- and middle-income countries", the focus of solutions on the phase-out of coal leads to the implication that developing nations should contribute more than developed ones (p. 140). Western countries that have historically industrialized faster, aided by resources siphoned from colonization and economic exploitation of the Rest, will not face as steep a challenge in meeting climate change goals as currently outlined.

Even in moves away from fossil fuels there remains a clear theme of exploitation of developing countries by developed ones, well exemplified in the case of the 'Lithium Triangle' in Latin America, though due to geographic reasons the West and the Rest are often reskinned as the global North and the South in these discussions. A large part of carbon neutrality for Western countries, or the global North, involves "electromobility", which requires large quantities of minerals such as lithium - with a "40-fold increase in the use of lithium" expected by 2040 (Becker, 2021, NP). 55 percent of these reserves lie in the triangle of Bolivia, Chile and Argentina, with the mines now being actively developed. These lead to severe consequences for indigenous agricultural populations, with "the demand for water lowering the ground water table" and the health impacts of "wind drift of dry chemical residues" (Becker, 2021, NP). Resistance from inhabitants goes unheard as the mining is "almost entirely driven by foreign investment" - in Salinas Grandes, Argentina, "national and local authorities favored the interests of foreign mining companies over that of local indigenous groups" (Kingsbury, 2021, NP). What

has happened once again is that certain populations of the world have been rendered expendable, such “the global designs of the energy transition would sacrifice sustainable ways of existing in the Andes so that the North can extend its own fundamentally unsustainable lifestyles with minor inconvenience” (Kingsbury, 2021, NP). We have once again codified a new form of colonialism.

This brings me to the final theme I wish to explore, and that is climate imperialism - manifesting in sinister ways that undermine the seemingly altruistic goals of global climate policy. This has been exhibited through the refusal of Western countries to pay their share in compensation for their historical carbon emissions, the championing of carbon offsets, Western interference into internal policy of developing nations, and the use of power in global forums to strong-arm other nations into climate policy that is insufficient to stave off the worst effects of climate change.

Ghosh, Chakraborty and Das (2022) define imperialism as “the struggle of large, monopolistic capital over economic territory, actively aided and assisted by states” (p. 70). The issue is characterized at large by the locus of wealth and expertise in the hands of the West, and the failure of modern policy to account for that imbalance. Estimates of “adaptation costs alone (not including mitigation) range between $15 and $411 billion per year for climate change impacts to 2030”, with most estimates far in excess of the $100 billion that developed countries pledged as climate finance to developing ones at the 2009 UN Climate Change Conference in Copenhagen (p. 77). The amount actually provided has been been estimated at less that $18 billion a year through “bilateral public finance”, while at the same time the Western governments invested several trillions of dollars in dealing with the internal economic effects of the Covid-19 pandemic, and estimates by the International Monetary Fund (IMF) find that the “global fossil fuel subsidies in 2020 totalled $5.9 trillion” (pp. 78-79). Dehm (2020) finds that while

“sub-Saharan Africa will need $14–17 billion per year for 2010–50 to adapt to a 2 degree increase … nowhere near that money has been made available through public funds" (p. 242). The institutionalization of the “Warsaw International Mechanism for loss and damage associated with climate change impacts", accepted at the 2013 United Nations Climate Change Conference, “focused on questions of comprehensive risk assessment, disaster risk reduction and the promotion of privitised (*sic)*, insurance-based and financialised approaches to financing loss and damage” (p. 245). In doing so, it removed responsibility from “historical polluters” and placed the responsibility of dealing with climate disasters on individual governments, many of which in the developing world do not have the infrastructure to do so (p. 245).

The West has often instead adopted the idea of “carbon offsets”, a service provided by an industry of “offset providers" - “if someone performs an act that adds carbon to the atmosphere, then offset providers perform an activity that reduces that equivalent amount of carbon in the atmosphere” (Dhanda & Hartman, 2011, p. 120). Industries, individuals and governments often use this as a means to attain “carbon neutrality”, signifying that “there is no carbon burden upon the earth as a result of the activities performed by the company or the individual” - though that happens not by reducing emission but simply by offsetting - which results in the system morphing into an “environmental commodity market” (p. 121). Such a market is attractive for polluters as it provides a way to find an economical way to meet requirements under environmental regulations, and improve corporate image, without actually doing anything to take responsibility for the games they have historically and continue to emit.

All this had not stopped the West from further adopting climate policy that suits them, and robbing the Rest of a voice in the matter. Lal (1995) argued that the environmentalist movement building in the West at that time bore great similarity to religious fundamentalist

movements in its self-description as benign and liberal, serving to free developing countries from pre-modern practices and beliefs. The author suggests that such “eco-fundamentalists .. impose constraints upon non- Western countries' economic development in the name of environmental protection”, and in doing so they “risk causing severe disruption in international order as the countries targeted resist a new form of imperialism rooted in alien values” (p. 515). Soomin and Shirley (2009) conceptualize “eco-imperialism” as a mechanism for Western intervention in the affairs of the Rest, focusing on the role of international organizations like the World Wildlife Fund (WWF) in Brazil. The WWF has “high level government supporters in the global North, including the United States government which sponsors WWF activities via USAID – U.S. Agency for International Development” (p. 853). In response to Brazil’s attempts to use the resources of the Amazon rainforest to boost its impoverished economy, the WWF argued that “unless Brazil is forced to give up management of its own forests, the world is going to be irrevocably damaged” (p. 852). While concerns about maintaining rainforests are warranted, the alarms about internal mismanagements of resources are in sharp contrast to lack of oversight in the policies of the West in meeting their pledges in reducing carbon outputs.

Even more outrageous examples of imperialism in climate policy exist, such as the “use of aid … to manipulate vulnerable nations” (Sealey-Huggins, 2017, p. 2449). While currently a target of no more than 2°C has been agreed upon in the Paris Agreement, the emission reduction that countries have voluntarily agreed to have been predicted to lead to a warming of 2.7-3.7°C, with some predictions of even 4-7°C (p. 2447). This is far in excess of the 1.5°C warming that the Caribbean Community (CARICOM) Heads of State identified as the limit before Caribbean countries would suffer devastating consequences. Countries have been forced to agree to higher limits through threats of withholding aid, and nations like Ecuador and Bolivia had their US

development aid cut after they dissented to the Copenhagen Accord (p. 2449). These agreements also omit any legal or financial responsibility on part of historical emitters. Even though "industrialised countries have benefitted significantly from the same processes that caused climate change, and … thus owe a considerable climate debt due in the form of reparations." (p.2453), the form of imperialism that has been codified through recent climate agreements has made it impossible for this debt to be paid and only serves to enhance the various forms of inequity that I have examined in this paper.

The three dimensions of climate inequity between the developed and developing worlds that I have discussed are important to evaluate because they are self-reinforcing, since climate change itself is a major driver of global economic inequality (Diffenbaugh & Burke, 2019, pp. 9808-9813). Diffenbaugh and Burke (2019) find a "parabolic relationship between temperature and economic growth" where there is an "empirical optimum", or an ideal mean temperature that correlates to higher economic growth (p. 9809). This becomes a cause for concern because the "West" as defined at the beginning of this paper tends to be geographically located in temperate regions of the world, with developing countries having a higher density in tropical and subtropical regions. Mean temperatures in developed countries like Norway, for example, come closer to this "empirical optimum" as the world warms, leading to "cumulative economic benefits", while developing countries like India experience a shift away to more extreme temperatures resulting in "cumulative losses" (p. 9809).

The perverse implication of such a correlation is that the "West" often has less incentive to curb climate change, making it all the more important to design climate policy that includes ironclad language to prevent the further marginalization of the "Rest". Firstly, goals need to be redefined, such as limiting the temperature increase to 1.5 ^{o}C or less instead of the present

accepted limit of 2ºC (Guivarch et al., 2021, NP). “Every fraction of a degree counts” because the impacts of the rise increase non-linearly - a temperature increase of 1.5°C “would expose 245 million people to a new or aggravated water shortage”, while one of 2°C would expose 490 million people (Guivarch et al., 2021, NP). Secondly, mitigation efforts, which are often accompanied by a decrease in energy access, need to be distributed fairly “to ensure they serve the broader objectives of development, poverty and inequality reduction, improvement of air quality, health, and so forth”, with richer countries supporting such efforts financially to ensure that poorer nations are not further impoverished (Guivarch et al., 2021, NP). Thirdly, adaptation policies need to be designed while keeping in mind the specific needs of marginalized populations, to make sure that they “do not impose undue financial constraints on those who have the fewest resources”, and that they “will not be hijacked by the wealthiest or by political interests” (Guivarch et al., 2021, NP). In addition, “adaptation funds” could be set up to ensure that the technology patented in developed countries can be applied in developing ones (Guivarch et al., 2021, NP). These changes need to occur as soon as possible, because climate disasters are not a distant concern - they are reality for many around the world. Policy that does not account for equity and justice is failing the majority of the world’s population, and needs to be remedied within the next few years. If not, the global socio-economic ladder may become all too literal - with the ones at the bottom drowning first.

References

Allenby, B., & Fink, J. (2005). Toward inherently secure and resilient societies. *Science*, *309*(5737), 1034–1036. https://doi.org/10.1126/science.1111534

Althor, G., James E.M. Watson, & Fuller, R. A. (2016). Global mismatch between greenhouse gas emissions and the burden of climate change. *Scientific Reports*, *6*. https://doi.org/10.1038/srep20281

Andreucci, D., & Zografos, C. (2022). Between improvement and sacrifice: Othering and the (bio)political ecology of climate change. *Political Geography*, *92*. https://doi.org/10.1016/j.polgeo.2021.102512

Baer, P., Harte, J., Haya, B., & Herzog, A. V. (2000). Equity and greenhouse gas responsibility. In *Science* (Vol. 289).

Becker, A. (2021, November 12). *The Global South's double burden*. Www.ips-Journal.eu. https://www.ips-journal.eu/topics/economy-and-ecology/the-global-souths-double-burden-5539/

Dehm, J. (2020). Climate change, "slow violence" and the indefinite deferral of responsibility for "loss and damage." *Griffith Law Review*, 1–33. https://doi.org/10.1080/10383441.2020.1790101

Dhanda, K., & Hartman, L. P. (2011). The ethics of carbon neutrality: A critical examination of voluntary carbon offset providers. *Journal of Business Ethics*, *100*(1), 119–149. https://doi.org/10.1007/s10551-011-0766-4

Diffenbaugh, N. S., & Burke, M. (2019). Global Warming Has Increased Global Economic Inequality. *Proceedings of the National Academy of Sciences*, *116*(20), 201816020. https://doi.org/10.1073/pnas.1816020116

Ghosh, J., Chakraborty, S., & Das, D. (2022). Climate imperialism in the twenty-first century. *Monthly Review*, 70–85. https://doi.org/10.14452/mr-074-03-2022-07_4

Guivarch, C., Taconet, N., & Méjean, A. (2021, September). *Linking Climate and Inequality*. IMF. https://www.imf.org/en/Publications/fandd/issues/2021/09/climate-change-and-inequality-guivarch-mejean-taconet

Hall, S., & Morley, D. (2019). Essential Essays, Volume 2: Identity and Diaspora. Duke University Press. https://doi.org/10.1515/9781478002710

Hans Martin Füssel. (2010). How inequitable is the global distribution of responsibility, capability, and vulnerability to climate change: A comprehensive indicator-based assessment. *Global Environmental Change*, *20*(4), 597–611. https://doi.org/10.1016/j.gloenvcha.2010.07.009

Hans Martin Füssel, & Richard J.T. Klein. (2006). Climate change vulnerability assessments: An evolution of conceptual thinking. *Climatic Change*, *75*(3), 301–329. https://doi.org/10.1007/s10584-006-0329-3

Kirk, G. (2022). CONFRONTING THE TWIN CRISES OF CLIMATE CHANGE AND OCCUPATION IN PALESTINE. *Arab Studies Journal*, *30*(2), 90–95.

Lal, D. (1995). Eco-fundamentalism. *International Affairs*, *71*(3), 515–528. https://doi.org/10.2307/2624838

Lim Soomin, & Shirley, S. (2009). Eco-imperialism: The global north's weapon of mass intervention. In *Journal of Alternative Perspectives in the Social Sciences* (Vol. 1, Issue 3, pp. 846–860).

Liu, S. (2021, July 20). *"Green" Extractivism and the Limits of Energy Transitions: Lithium, Sacrifice, and Maldevelopment in the Americas*. Georgetown Journal of International Affairs. https://gjia.georgetown.edu/2021/07/20/green-extractivism-and-the-limits-of-energy-transitions-lithium-sacrifice-and-maldevelopment-in-the-americas/

Muttitt, G., Price, J., Pye, S., & Welsby, D. (2023). Socio-political feasibility of coal power phase-out and its role in mitigation pathways. *Nature Climate Change*. https://doi.org/10.1038/s41558-022-01576-2

Sealey-Huggins, L. (2017). "1.5°C to stay alive": climate change, imperialism and justice for the Caribbean. *Third World Quarterly*, *38*(11), 2444–2463. https://doi.org/10.1080/01436597.2017.1368013

Whyte, K. (2018). Settler colonialism, ecology, and environmental injustice. *Environment and Society: Advances in Research*, *9*(1), 125–144. https://doi.org/10.3167/ares.2018.090109

Wolff, N. H., Donner, S. D., Cao, L., Iglesias-Prieto, R., Sale, P. F., & Mumby, P. J. (2015). Global inequities between polluters and the polluted: Climate change impacts on coral reefs. *Global Change Biology*, *21*(11), 3982–3994. https://doi.org/10.1111/gcb.13015