TWN Climate Change Series 9

The Intersection of Trade Policy, Climate Action, Climate Technology, and the Right to Development in a Shifting Geopolitical Landscape

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1 Introduction

IN 1930, the Italian political scientist Antonio Gramsci wrote, "*Il vecchio mondo sta morendo. Quello nuovo tarda a comparire. E in questo chiaroscuro nascono i mostri.*"[1] Writing when he was in prison in Benito Mussolini's Fascist Italy, he sought to describe the socio-economic and political turmoil and power shifts that were taking place in the country following World War I and the Great Depression, particularly the "crisis of authority" that eventually led to the rise of fascism.

Although written almost a century ago, his words seem apt when applied to today's global context: a major superpower is now in the throes of domestic socio-economic and political turmoil that have global geopolitical implications as it seeks to reassert its dominance globally;[2] heretofore significant economic powers in Europe are going through national economic and political turbulence diminishing their global clout; and countries in Eurasia, Asia, the Middle East, Africa, and Latin America are increasingly becoming more confident in seeking to chart their own national courses and destinies without being geopolitical pawns and whose combined economic strength now constitutes more of the world's productive capacity compared with the Global North. The "rules" that underpinned the global economic and political order dominated by the Global North since the end of World War II and the Cold War, including those promoted by organizations such as the World Trade Organization (WTO) and the Bretton Woods institutions (BWIs) – the World Bank (WB) and the International Monetary Fund (IMF) – are now being discarded or disregarded by the very countries that had been their architects and prime promoters.

In addition, the contemporary global landscape is marked by pressing and worsening environmental challenges, including climate change, deforestation, biodiversity loss, water scarcity, and pollution. These challenges are deeply rooted in historical and systemic inequities between developed and developing countries. They are driven by unsustainable production and consumption patterns, often concentrated in developed countries, while their consequences disproportionately affect developing countries. The causes and effects of environmental degradation are not distributed evenly across the globe, and they reveal deeper systemic inequities embedded in global economic, political, and environmental systems. Understanding these inequities is essential to creating just and sustainable solutions.

For developing countries, understanding these trends, their causes, and their multifaceted impacts is essential for formulating effective response strategies to collaborate and address these issues collectively.

While the global economic, environmental, and social challenges are distinct in their domains, they are interlinked through shared underlying systemic factors such as globalization, technological advancements, and socio-economic inequalities. With less than six years left in which to fully achieve the Sustainable Development Goals (SDGs) under the 2030 Agenda for Sustainable Development, these challenges that the global community is facing remain daunting.

2 Interrelated Polycrisis of Income Inequity, Environmental Degradation, and Social Inequity

THE key economic challenge remains systemic inequity, which has manifested itself in the continued presence of a significant development gap between developed and developing countries and the rich and poor in their populations.

Having roots in historical colonialism, income inequality has become a pressing global economic issue, with wealth increasingly concentrated in the hands of a few.[3] According to the *World Inequality Report*, the top 1% of the global population owns more than half of the world's wealth, while the bottom 50% owns less than 2%.[4] This disparity is widening, with the richest 1% holding an increasing share of global wealth, and not only leads to reduced economic mobility and social tensions, but also undermines economic growth by limiting the purchasing power of large segments of the global and national populations. This disparity is evident in both developed and developing countries and has been exacerbated by factors such as globalization, technology, and policies that favour capital over labour. Furthermore, in many countries, a cost-of-living crisis has arisen, with escalating prices for essential goods and services straining households and exacerbating inequality.[5] Additionally, fragile financial systems, market volatility, and debt burdens pose risks to global economic stability.[6]

The international trade system reflects deep-seated systemic inequities between developed and developing countries. These inequities are rooted in historical power imbalances arising from colonialism, structural barriers, and institutional biases that continue to shape global trade rules and outcomes. While globalization has increased overall trade volumes and interconnectedness, the benefits of trade remain unevenly distributed, disproportionately favouring wealthier countries.

Global trade plays a dual role – acting both as a driver of economic development and as a vector of environmental harm. For example, a significant proportion of global greenhouse gas emissions is embodied in traded goods. Developed countries have often outsourced pollution-intensive (with respect to both greenhouse gases and other pollutants) production to developing countries, while importing the finished goods. This not only shifts environmental burdens to the Global South but also obscures the true carbon footprint of consumption in the North. International trade accounts for an estimated 20–30% of annual greenhouse gas emissions, highlighting its substantial role in climate change.[7]

In terms of policy approaches, systemic inequity is reflected in the greater ability of developed countries to impose unilateral measures against developing countries. Policies like the European Union (EU)'s Carbon Border Adjustment Mechanism (CBAM), while environmentally motivated, may inadvertently penalize developing countries that lack the infrastructure or financial capacity to comply. Such measures are then viewed by developing countries as potential trade barriers that could hinder their economic growth. Further, many trade agreements continue to reflect asymmetries in bargaining power.[8] Intellectual property rules, agricultural subsidies, and investor-state dispute mechanisms often work in favour of multinational corporations and developed countries, limiting the policy space of developing countries.[9]

In the environmental sphere, the past century has seen rapid environmental decline across several fronts. Climate change is accelerating due to the buildup of greenhouse gases from burning fossil fuels. Forests, particularly in the Global South, are being cleared at alarming rates for agriculture, mining, and logging (old growth forests in the Global North were depleted much earlier). Freshwater sources are drying up or becoming polluted, and marine ecosystems are under pressure from overfishing, plastic waste, and ocean acidification. Biodiversity is declining at an unprecedented rate, with species extinction in some cases occurring up to 1,000 times the natural background rate.[10]

Anthropogenic climate change is arguably the most critical environmental challenge of our time. Greenhouse gas concentrations have reached record highs, leading to significant global warming. Despite international agreements

like the Paris Agreement, global emissions continue to increase. Industrial activities, deforestation, transportation, and energy production remain the primary sources. The world is currently on track to surpass the 1.5°C warming threshold by mid-century, a scenario that would have catastrophic consequences for vulnerable populations. The consequences include more frequent and severe weather events, rising sea levels, and loss of biodiversity, thereby affecting ecosystems and human livelihoods. Unsustainable human economic exploitation of natural resources, such as water, minerals, and marine and terrestrial biodiversity, coupled with continuing reliance in many economies on fossil-fuel-based energy and products, have continued to drive anthropogenic greenhouse gas emissions. The Intergovernmental Panel on Climate Change (IPCC) warns that without significant reductions in greenhouse gas emissions, the impacts of climate change will become increasingly severe, affecting ecosystems, human health, and economies worldwide.[11]

Forests are disappearing at an alarming rate, particularly in Latin America, sub-Saharan Africa, and Southeast Asia.[12] Deforestation is often driven by international demand for commodities like soy, palm oil, beef, and timber – consumed predominantly in wealthier countries.[13] Rapid deforestation is causing substantial biodiversity loss and contributing to carbon emissions.

Many developing countries are facing acute water shortages and widespread pollution.[14] Industrial runoff, agricultural chemicals, and urban waste have degraded water quality, with serious public health implications.[15] Air and water pollution, along with the overexploitation of natural resources, are escalating, leading to health issues and diminishing the quality of life, particularly in vulnerable communities.[16]

Human activities have altered three-quarters of the Earth's land and two-thirds of the marine environment. The loss of species and ecosystems undermines food security, climate resilience, and cultural heritage, particularly for Indigenous communities. These rapid, large-scale changes in global ecosystems threaten the health of the planet and the well-being of billions of people.[17]

At the root of these trends are patterns of resource extraction, industrialization, and overconsumption, primarily driven by developed countries. These countries, through centuries of industrial growth, have built economies based on the exploitation of natural resources, often sourced from the Global South. The legacy of colonialism, which structured global economies around raw material extraction for the benefit of European powers, still shapes trade, environmental degradation, and development patterns today.[18]

These large-scale ecosystem crises have causes, impacts, and responses that are deeply unequal. At the heart of this inequality lies a systemic imbalance between developed and developing countries. While developed countries are historically responsible for the bulk of greenhouse gas emissions, global deforestation, and air and water pollution, developing countries bear the brunt of their impacts economically, socially, and environmentally. This disparity is not accidental but the result of longstanding global power imbalances, unequal access to resources and technology, and a global governance system, especially in the economic and environmental fields, that often fails to reflect the voices and needs of the Global South. Understanding these trends through the lens of systemic inequity is crucial for crafting just and effective solutions.

Additionally, social inequity, encompassing issues such as gender inequality, racial discrimination, and lack of access to education and healthcare, remains a significant challenge that many countries face globally. These disparities can lead to social unrest, hinder economic growth, and perpetuate cycles of poverty. For example, the world is failing to achieve gender equality, with more than 340 million women and girls projected to live in extreme poverty by 2030 and the gender gap in power and leadership positions remaining entrenched.[19] Furthermore, increasing political polarization and social divisions are eroding democratic institutions and social cohesion in many countries, often driven by factors such as economic disparity, misinformation, and identity politics; many countries are experiencing growing divides over cultural, economic, and political issues, often contributed to by misinformation and digital media, which in turn weaken collective action needed to address global challenges like climate change, global economic inequalities, and rising geopolitical tensions and rivalries.[20] Changing demographics in many countries, such as aging populations, inward migration, and urbanization, impact labour markets, access to and provision of healthcare, and the delivery of public social services.[21]

There is hence a polycrisis whose causes and effects are interconnected: the triple planetary crisis (climate change, nature protection and conservation, pollution in the air, oceans and land), the triple economic crisis (poverty, unemployment, shrinking fiscal space), and the triple social crisis (inequality, social marginalization, socio-political instability), all of which are driving more complex geopolitical and geoeconomic inter-state and intra-state tensions and stresses and are putting the world off-track from achieving the SDGs.[22]

These challenges are interconnected and reflective of underlying systemic inequity. For instance, economic disparity such as a widening income gap fuels social tensions and political polarization. Populations facing economic hardship may become more susceptible to populist rhetoric and divisive politics, leading to further social fragmentation and instability. Climate change disproportionately affects poorer communities, exacerbating existing social and economic inequalities. Similarly, marginalized groups often have less access to resources and opportunities to adapt to environmental changes, perpetuating cycles of poverty and exclusion, and exacerbating existing economic inequalities. For example, lower-income populations are more vulnerable to extreme weather events and have fewer resources to adapt to environmental changes.

Climate-related disruptions (e.g., extreme weather or slow-onset events) can exacerbate conflicts and displacement due to resource scarcity, migration, and competition, heightening social tensions and divisions. For instance, climate-induced displacement can increase pressures on urban areas and social services, leading to conflict and exclusionary politics. Environmental degradation can often drive migration patterns, affecting social cohesion and economic systems. Globalization and technological advancements further intertwine these challenges, as they can both mitigate and exacerbate inequalities and environmental impacts.

Furthermore, rising geopolitical tensions are shaping national and international responses to this polycrisis. The strategic competition between the United States and China has intensified concerns about global supply chain fragmentation. Both countries are investing heavily in clean energy technologies, yet trade barriers and export restrictions risk undermining global cooperation on climate and other environmental goals.

In an era defined by interconnected global challenges, the intersections between international trade policy, climate action, clean technology production, and the right to development have become increasingly salient. These policy domains are deeply intertwined, with each influencing the others in complex ways. Current geopolitical and geoeconomic trends add layers of complexity to these policy linkages. The rise of economic nationalism and protectionism, exemplified by the heightening US trade war on China and other countries and the increasing use of unilateral economic coercive measures (particularly by the Global North), is disrupting global supply chains and creating uncertainties for clean technology trade. At the same time, the growing emphasis on strategic industrial and technological autonomy has led countries to prioritize domestic production of critical technologies, including clean energy solutions.

A cross-cutting issue underlying all these challenges is the role of the international financial architecture in both giving rise to them and contributing to effectively addressing them. The existing architecture has fallen short in mobilizing the needed sustainable public financing to combat the climate crisis, deliver on human rights and achieve the SDGs – the United Nations has estimated that the SDG financing gap is at $3.9 trillion a year. As the UN Secretary-General stated in his address to the UN General Assembly in September 2023 at the opening of the GA's High-Level Dialogue on Financing for Development, "That architecture was created at a time when many of today's developing countries were still under colonial rule. It is deeply skewed in favour of the developed world."[23]

The international tax architecture has not limited global tax evasion and avoidance and illicit financial flows that restrict the ability of national governments to raise and use national tax revenues for development purposes. Rising inflation and historically high interest rates together with the economic impacts of the COVID-19 pandemic and climate change have exacerbated a debt crisis in developing countries, limiting their ability to finance essential public policies, with an estimated 52 developing countries facing serious debt-related difficulties in 2023.[24] Borrowing costs are eight times higher for developing countries compared with developed countries on the global financial markets, while developing countries' ability to access liquidity in times of crisis varies considerably. Persistent unfair terms of trade and unbalanced intellectual property regimes continue to contribute to net South-North financial flows.[25] Climate change actions

under the UN Framework Convention on Climate Change (UNFCCC) and the Paris Agreement are largely insufficient due to unfulfilled climate finance obligations that, in any event, also fall short of climate finance needs.[26] Even the new collective quantified goal on climate finance (NCQG) adopted at the 29th UN climate conference in Baku in December 2024 is not commensurate to what is needed by developing countries.

Macroeconomic policies, including fiscal and monetary policies, also play a critical role in shaping the economic environment within which climate action occurs. At their core, these policies influence and reflect the underlying allocation of resources, investment patterns, and economic and political power and inequity, all of which have profound implications for global climate goals.

Public spending and taxation policies directly impact climate change mitigation and adaptation efforts. Green fiscal policies, such as subsidies for renewable energy, carbon pricing, and investments in sustainable infrastructure, align economic incentives with climate objectives. For example, carbon taxes provide disincentives for high-emission activities while generating revenue that can be reinvested in green initiatives. Conversely, fossil fuel subsidies, amounting to hundreds of billions of dollars annually, perpetuate greenhouse gas emissions and delay the transition to low-carbon economies. Phasing out these subsidies is a critical step towards aligning fiscal policies with climate objectives.[27]

Central banks increasingly recognize the systemic risks posed by climate change to financial stability.[28] Integrating climate considerations into monetary policy – such as through green quantitative easing, incorporating climate risks into financial supervision, or incentivizing green lending – can steer capital flows towards sustainable investments. However, traditional monetary policy frameworks that prioritize short-term inflation and employment targets may conflict with the long-term horizons required for climate action.[29]

In this context, the nexus between international trade policy, climate action, clean technology production, and the achievement by developing countries of their right to development is increasingly significant in today's complex geopolitical and geoeconomic environment. The urgent need to address climate change and other global environmental challenges has brought global climate and environmental policymaking to the forefront of international

policy discourse in recent years. Simultaneously, macroeconomic and trade agendas continue to shape the global economy, determining patterns of production, consumption, and resource allocation. These agendas and climate action are intricately interconnected. Understanding these systemic interlinkages is crucial to ensuring that global economic systems support, rather than hinder, the transition to a sustainable and resilient future.

3 Historical and Present-Day Causes of Systemic Inequity in International Trade and Climate Policy Regimes

THE roots of global environmental and trade inequities lie in centuries of unequal power dynamics. Colonial powers from Europe and their offshoots in North America and Oceania systematically extracted raw materials, labour, and wealth from colonized regions, disrupting local political structures, economies, and ecosystems. Colonial exploitation established economic structures that prioritized resource extraction from the colonized regions for the benefit of colonial powers, leading to long-term economic dependencies. Colonial infrastructure and institutions were designed to serve colonial export markets rather than support the development of the colonized regions. These colonial structural patterns continue to be reflected in many ways, including in the commodity dependence of the economies of many of today's developing countries, the patterns of trade with their former colonial masters, and the political, legal and economic structures that they have adopted.[30]

Colonialism supported asymmetrical industrialization and development. Today's developed countries by and large industrialized early using coal, oil, and gas, sourced at first domestically but increasingly from their colonial possessions – these are inexpensive fossil-based energy resources that fuelled economic growth but also caused environmental damage in their extraction and production and greenhouse gas emissions in their use, leading to global warming. This leading role in fossil-fuelled industrialization, coupled with the creation of international structures and patterns of trade that maintained colonial patterns of dependency, enabled today's developed countries to accumulate wealth and establish economic and political dominance on a global scale over the course of the past 500 years, particularly more so from the late 19th to the early 21st centuries.[31]

For example, one of the clearest indicators of systemic inequity in climate change is the historical emissions gap. Since the Industrial Revolution, developed countries have been the primary emitters of carbon dioxide and other greenhouse gases, building their wealth through fossil-fuel-driven industrialization. The United States, European countries, and other industrialized countries collectively account for most of the cumulative anthropogenic greenhouse gas emissions that give rise to global warming since the start of the Industrial Revolution. In contrast, many developing countries, including those with large populations like India and much of sub-Saharan Africa, have contributed relatively little to the climate crisis yet are now expected to limit their emissions growth while still struggling with poverty and underdevelopment.[32]

This historical responsibility for colonialism and global warming is rarely matched by accountability. While developed countries have, for example, pledged climate finance and technology transfers to support developing countries' transitions to low-carbon economies (not least as actual treaty commitments under the UNFCCC and Paris Agreement), the actual delivery of these commitments has been inconsistent and often insufficient.[33] The global climate discourse tends to focus on current emissions, which obscures the historical role of developed countries and shifts blame to emerging economies.

Systemic inequity becomes starkly visible when comparing who causes environmental harm and who suffers its effects. As pointed out above, developed countries with their high levels of industrialization account for most cumulative carbon emissions, consume a disproportionate share of global resources, and generate the most waste per capita. Their economic models rely on a global supply chain that often outsources the most environmentally harmful activities – such as mining, manufacturing, and waste disposal – to developing countries.

The impacts of environmental degradation and climate change are felt unevenly, reinforcing global inequalities. Developing countries face the harshest consequences. Coastal countries are vulnerable to sea-level rise, while arid and tropical regions experience desertification, extreme weather, and loss of agricultural productivity. Communities in these countries

frequently lack the infrastructure, financial resources, or political influence to effectively adapt to environmental threats or address the losses and damages that arise from extreme weather and slow-onset events. Developing countries face heightened risks from climate change due to geographic, economic, and infrastructural vulnerabilities. For instance, the Sahel region faces worsening droughts, while small island developing states confront existential threats from sea-level rise. This vulnerability is compounded by poverty, weak governance, and limited access to technology and capital.[34]

Climate change is reversing decades of development gains. Agricultural productivity is declining, infrastructure is being destroyed by extreme weather, and health crises are worsening – all of which strain public budgets and reduce growth potential. Climate change has increased economic inequality between developed and developing countries by 25% since 1960, as it hampers economic growth in poorer countries while sometimes benefiting cooler, developed regions.[35]

Many developing countries also face the virtually impossible task of financing climate adaptation and disaster recovery while also servicing external debts.[36] Many are forced to take on more debt after climate disasters, further entrenching cycles of dependency and economic precarity.[37] Despite international commitments, developing countries face an annual shortfall of about $2.2 trillion in climate finance necessary to transition to renewable energy and meet 2030 climate targets,[38] and up to nearly $6 trillion to implement their national climate action plans by 2030. While international agreements like the Paris Agreement recognize the principle of "common but differentiated responsibilities," climate finance has fallen short of what is needed. Developed countries pledged $100 billion annually by 2020 to support climate action in developing countries, yet this target might not have been met. Moreover, much of the finance provided comes in the form of loans rather than grants, increasing the debt burdens of already-struggling economies.

The term "environmental injustice" describes how marginalized populations bear disproportionate environmental burdens. In the international context, this becomes a "green divide" between rich and poor countries.[39] Developed countries have the capacity to invest in clean energy, climate-resilient

infrastructure, and pollution control. Developing countries, on the other hand, often lack the financial resources or political stability to make these investments without external support. Access to green technologies – such as renewable energy infrastructure, early warning systems, and climate-resilient agriculture – is also highly unequal. Patents, costs, and restrictive intellectual property rights often place these technologies out of reach for poorer countries.[40] This limits their ability to decarbonize and adapt at the pace required to meet global climate goals.

This divide extends to undertaking economic diversification and transition efforts to shift economies onto sustainable development pathways. While the transition to renewable energy and sustainable technologies is crucial, the materials needed for solar panels, batteries, and other green infrastructure – such as lithium, cobalt, and rare earth metals – are often extracted from ecologically fragile and politically unstable regions in the Global South. The benefits of any sustainable development-focused transition risk being captured by wealthy countries, while the environmental and social costs remain in poorer countries.

A. Systemic Inequity in Global Climate Governance

Global environmental governance, for example through agreements like the UNFCCC, the Convention on Biological Diversity (CBD), and international environmental funding mechanisms, has seen significant progress in developing shared international norms and mechanisms for cooperation on global environmental problems. However, these frameworks often fall short in addressing the core inequities between developed and developing countries.

Developing countries are frequently underrepresented in decision-making spaces and face pressures to adopt environmental standards set by the Global North, which may not align with their development needs. Global climate governance continues to be heavily influenced by the interests and agendas of developed countries. Developing countries frequently find themselves sidelined in key negotiations or pressured into agreements that do not reflect their priorities. The lack of equitable representation and imbalanced power dynamics within climate institutions mirror broader systemic inequities in global governance.[41]

Addressing the systemic inequities that underpin the climate crisis requires a shift towards climate justice. This means recognizing historical emissions responsibility, ensuring fair access to climate finance and technology, and amplifying the voices of developing countries in global climate forums. Solutions must be grounded in equity – supporting sustainable development, protecting human rights, and prioritizing the needs of the most vulnerable.

Equity and justice are fundamental to effective climate governance. This is clearly exemplified in, for example, Article 3.1 of the UNFCCC – which states: "The Parties [to the UNFCCC] should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof" – and Article 2.2 of the Paris Agreement which states: "This Agreement will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances." These principles are central to international climate agreements, underscoring that while all countries are responsible for addressing climate change, developed and developing countries have differentiated responsibilities and capabilities for doing so. Developed countries, having historically contributed more to greenhouse gas emissions, are expected to lead mitigation efforts and support developing countries through financial and technological means. Reaffirming commitments to principles like common but differentiated responsibilities and enhancing support for vulnerable countries are essential steps towards rectifying these disparities and fostering a more just and effective global response to climate change.

However, President Donald Trump's decision in January 2025 to again withdraw the United States from the Paris Agreement[42] and cease US federal government participation in virtually all climate-change-related actions and activities both domestically and internationally serves as a stark reflection of the systemic inequities that pervade global climate change discourse, particularly the ability of developed countries generally to act as they wish with relative impunity and without sanction, even if doing so violates international law or vitiates international cooperation. It underscores the

challenges of achieving equitable international cooperation in addressing a crisis that, while global in nature, imposes common but differentiated responsibilities.

The US' unilateral (re)withdrawal highlights the fragility of international commitments to equitable climate action. By stepping back from its commitments, the US set a precedent that could encourage other developed countries to evade their responsibilities, potentially leading to a domino effect that undermines collective climate action. This retreat from leadership exacerbates the challenges faced by developing countries, deepening the chasm between countries in terms of both culpability for and capacity to address climate change. The US withdrawal not only reduces the financial and technological support that can be made available from developed to developing countries but also undermines the collaborative spirit necessary for global climate resilience.

Furthermore, it is not only the US that has stepped back from or not fulfilled its international climate obligations under the UNFCCC and the Paris Agreement. Other developed countries have also fallen short, including in the areas of mitigation, provision of adaptation finance and climate finance, and technology transfer.[43]

B. Systemic Inequity in the International Trade System

One of the fundamental sources of inequality in the global trade system lies in the colonial legacy and the historical structuring of the global economy. Colonialism created economic patterns where developing countries, especially those that were occupied and became colonies, were integrated into the world economy as primarily providers of labour (in many cases, slaves and other forced labour) and raw materials and as consumers of manufactured goods exported from the colonizing country. Even after decolonization, many developing countries remained reliant on the export of primary commodities with limited value addition, while developed countries continued to dominate the production and export of high-value manufactured goods and services. This historical dependence has had lasting consequences, constraining the economic diversification of many developing countries and locking them into disadvantageous positions within global value chains.[44]

Trade agreements and institutions such as the World Trade Organization are often structured in ways that reflect the interests of powerful economies, especially the developed countries such as the US and the EU. While these institutions promote liberalization and "level playing fields," the reality is that trade rules are not equally beneficial to all. Since the establishment of the General Agreement on Tariffs and Trade (GATT) in 1947 and later the WTO in 1995, the global trading system has ostensibly operated on principles of fairness, predictability, and multilateral cooperation. However, notwithstanding the inclusion of provisions in these agreements that provide for special and differential treatment – e.g., preferential treatment – for developing countries, these institutions often reflect the interests of developed countries rather than genuine equity among countries. The rules of global trade disproportionately benefit developed countries, allowing them to maintain protective measures such as agricultural subsidies while demanding liberalization from developing countries, creating unfair competition for farmers in developing countries. In the manufacturing sector, developing countries are often pressured to lower tariffs and open their markets prematurely, exposing their fledgling industries to international competition without sufficient support.[45] Moreover, trade-related intellectual property rules, such as those enforced under the WTO's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), often benefit corporations in developed countries while restricting access to essential climate technologies and medicines in the Global South.[46] This institutional asymmetry reinforces existing inequalities and limits the policy space of developing countries to pursue developmental objectives.

Participation in global trade arrangements therefore does not automatically translate into economic empowerment for developing countries. Many of these countries find themselves trapped at the bottom of global value chains, performing low-wage, labour-intensive tasks with minimal opportunities for technological upgrading or value addition. The dominance of multinational corporations, often headquartered in developed countries, further exacerbates this situation, as they capture a disproportionate share of profits while limiting the bargaining power and developmental benefits available to local firms and workers.

Another major source of inequity is the imbalance of power in international trade negotiations. Developed countries typically have more resources,

technical expertise, and ability to coordinate and work together, which then increase their influence to shape the rules of trade to their advantage. In contrast, many developing countries lack institutional capacity and negotiating power to fully defend their interests, in addition to all too often lacking the political will to coordinate and cooperate with each other to defend and promote their common interests. As a result, trade deals often reflect the preferences of developed countries, with limited representation or meaningful participation from the Global South. This dynamic is evident not only in multilateral institutions like the WTO but also in regional and bilateral trade agreements, where the disparity in negotiating power is even more pronounced.[47]

Nowhere is such an imbalance of power and influence more clearly seen than in the relative ability of developed countries to undertake unilateral trade actions. Where developing countries often lack the ability and market clout to unilaterally impose trade sanctions on others, developed countries, particularly the bigger ones among them such as the US and the EU, often can do so with relative impunity.

For example, the unilateral tariff actions pursued by US President Trump, whether during his first term or during his second term, reflect the broader systemic inequities embedded in global economic power relationships. These actions have bypassed and violated US treaty obligations under the WTO. In doing so, they highlight a foundational flaw in global trade governance: powerful countries can choose to ignore the rules when those rules are inconvenient to them, revealing the WTO's limited capacity to enforce compliance against its most influential members. Even now, as of this writing, US unilateral trade actions that violate its WTO obligations have triggered unilateral trade actions in response by other countries that are also inconsistent with such WTO obligations, thereby creating a systemic institutional crisis in the multilateral trade regime.

These should be seen as not isolated instances but rather as symptomatic of a global order marked by asymmetrical power, selective rule enforcement, and declining multilateralism. Trump's tariff actions represent not merely an aggressive negotiation tactic, but a manifestation of the deeply unequal structure of global trade governance and power distribution. By seeking to unilaterally enforce its economic will, the US exemplifies the capacity of

powerful countries to operate outside multilateral frameworks, thereby weakening or collapsing these frameworks in the process, to respond to domestic political and nationalist concerns. Nevertheless, the global implications of such actions go far beyond domestic concerns. They serve as a form of economic coercion aimed at reshaping global supply chains in favour of, for example, US strategic economic and geopolitical interests, serving as instruments for reasserting US hegemonic control over international trade norms and relationships outside of multilateral consensus-based decision-making.

The effects of Trump's tariffs are now rippling through the global economy, with the impacts to be potentially proportionally more adverse in developing countries. Many developing countries are integrated into global supply chains and disruptions in trade flows can have severe economic consequences. Moreover, the trade policy liberalization demanded of developing countries under the WTO and previous rounds of regional and bilateral free trade agreements has often left them vulnerable to external economic shocks caused by the actions of their developed country partners. This erosion of multilateralism is particularly dangerous for smaller developing countries as they are left more vulnerable to coercive tactics by developed countries.

In exposing the fragility and inequity of the existing order, Trump's trade policy ultimately serves as a case study in how global economic power continues to be exercised through hegemonic rather than democratic means. For a truly equitable international system to emerge, there must be not only reform of global institutions, but also a recognition of the systemic power imbalances that allow for such unilateral actions in the first place.

C. Systemic Inequity in Climate Technologies

The production of and trade in climate technologies, such as solar panels, wind turbines, and electric vehicles (EVs), are central to the global transition to a low-carbon economy. However, the global supply chains for these technologies are often concentrated in a few countries, raising concerns about supply security and geopolitical tensions. This concentration creates vulnerabilities for other countries and underscores the need for diversification and resilience in clean technology supply chains.

Climate technologies are disproportionately developed and controlled by countries and firms in the Global North. Intellectual property regimes often make access to these technologies expensive for developing countries, inhibiting their ability in various ways to pursue just transitions and economic diversification strategies.[48] The accumulation of wealth in developed countries, historically through colonialism and more recently through globalization, has enabled substantial investments in climate technologies and infrastructure, whereas developing countries often lack the financial resources to make similar transitions.

Several countries lead in the research, development and production of clean climate technologies, driven by investments in renewable energy, energy efficiency, and carbon reduction technologies. Aside from China, these leading countries are all developed countries. For example, the US leads in innovating on carbon capture, hydrogen energy and nuclear fusion research and development (R&D), driven in part by massive infusions in recent years of public subsidies for clean energy under the Biden-era Inflation Reduction Act. In the EU, Germany and Denmark are leaders in the development and production of wind energy technologies (including offshore wind), Germany and France in hydrogen energy technology, and Germany in energy efficiency technologies such as heat pumps and battery storage. Australia, Japan, and Canada have also been at the forefront of R&D in hydrogen energy, while Japan has also led in energy efficiency innovations such as heat pumps, battery storage and EVs. Among developing countries, only China and to some extent India have managed to develop leadership in some types of climate technologies, including solar panels, wind turbines, and battery storage; China has developed a strong lead in the development and production of EVs.[49]

The patenting of climate technologies is a key indicator of where control of these technologies is concentrated. In the area of renewable energy technologies, for example, historically, developed countries have dominated patent filings. As of 2010, five patent offices – the US, Japan, China, South Korea, and the European Patent Office – accounted for almost 85% of all patent applications in clean energy technologies. Historically, Japan has been a leader in renewable energy patents. Between 2010 and 2019, Japanese entities accounted for 25% of international patents in low-carbon energy inventions. The US has also maintained a strong position in clean energy patents, contributing 20% of international patents in the same period. Germany

also has been a significant contributor to clean energy innovations, with German firms accounting for a notable share of patents. Among developing countries, China's patent filings in renewable energy technologies have increased notably, especially in areas like solar photovoltaics, far outpacing the rest of developing countries combined. Less than 1% of all patent applications related to clean energy technologies have been filed in Africa, highlighting the continent's limited participation in clean energy innovation. Developing countries have had a relatively small share in global patenting activities in this sector.[50]

This skewed pattern of climate technology production and patenting stems from, and is also a reflection of, the systemic inequity present in capital investment patterns with respect to these technologies. Investment in climate technology is heavily dominated by companies based in developed countries, again with the exception primarily of China and its companies.

Major technology firms and energy companies primarily from developed countries, including Tesla (US), BYD (China), Siemens (Germany), and Shell (UK), are at the forefront of driving clean energy adoption and electrification. Corporate power purchase agreements (PPAs) have emerged as pivotal drivers of solar and wind energy expansion. Leading technology firms such as Amazon (US), Google (US), and Microsoft (US) have spearheaded this movement, with Amazon investing in over 100 new solar and wind projects in 2023, thereby becoming the world's largest corporate purchaser of renewable energy.[51]

Among developed countries, the United Kingdom, for instance, had seven offshore wind projects under construction as of June 2024 as it seeks to expand its renewable energy infrastructure, followed by France and Germany.[52] The EU has enacted legislation mandating that all new cars sold from 2035 onwards must be zero-emission vehicles, aiming to achieve carbon neutrality in the transport sector by 2050.[53] Heavy-duty transportation is also transitioning towards electrification. Major developed country truck manufacturers such as Daimler and Volvo anticipate that 25% to 35% of their new truck sales will be electric by 2030, reflecting a significant shift in the industry.[54]

Hydrogen is gaining global attention as a versatile clean fuel. Japan has launched a ¥5.7 billion subsidy tender to support the development of hydrogen hubs, aiming to enhance efficient production, transportation, and storage of hydrogen.[55] Similarly, Saudi Arabia is investing $5 billion in the Helios project to produce green hydrogen for export, aiming to diversify its energy portfolio.[56]

The US is promoting carbon capture, utilization, and storage (CCUS) through tax credits, offering up to $85 per metric ton of sequestered carbon dioxide to incentivize the reduction of greenhouse gas emissions. Major oil and gas companies are investing in CCUS technologies to decarbonize their operations and align with global climate goals.[57] Investments in grid resilience are also increasing, with the US and EU focusing on artificial intelligence (AI)–powered smart grids to enhance efficiency and reliability.[58] Additionally, the electrification of heating systems, particularly through heat pumps, is experiencing significant growth as a sustainable alternative to traditional heating methods.[59]

The global battery manufacturing sector is experiencing robust growth, with investments projected to reach approximately $300 billion by 2030; this surge is driven by the escalating demand for lithium-ion batteries, essential for EVs and energy storage solutions.[60] Innovations in battery chemistry are also advancing. Contemporary Amperex Technology Co., Limited (CATL) (China) has announced plans to commence production of its second-generation sodium-ion batteries in 2025, aiming for an energy density exceeding 200 Wh/kg. Concurrently, companies like QuantumScape (US) are developing solid-state batteries that promise enhanced performance and safety for EVs.[61] In the US, the Inflation Reduction Act is stimulating domestic battery production through substantial incentives, aiming to reduce reliance on foreign supply chains and bolster the national clean energy economy.[62]

Even in the area of agriculture, venture capital from developed countries is increasingly supporting plant-based and lab-grown meat companies, driven by environmental and ethical considerations.[63] AI-driven agriculture technologies, such as precision soil monitoring, are gaining traction, enhancing productivity and sustainability.[64] Furthermore, carbon farming initiatives are expanding, offering incentives for practices that sequester carbon in soil, thereby contributing to climate change mitigation, albeit not without some controversy.[65]

Developing countries' contributions to global patenting, production, and export of clean climate technologies vary significantly, with notable disparities between regions and individual countries. Almost solely among developing countries, China has managed to develop a leading role in these technologies. China has become a global leader in manufacturing and exporting clean energy technologies, including solar panels, wind turbines, and batteries; for instance, in 2022, about 99% of solar panels imported into Latin America were made in China, and approximately 70% of EVs imported into the region were also Chinese-made, and as of 2021, China produced approximately 70% of the world's solar photovoltaic modules.[66] China has solidified its position as the preeminent investor in renewable energy, directing significant capital towards low-emission power sources; in 2024, China allocated approximately $940 billion to clean energy investments.[67] China continues to lead globally in EV sales and production. In 2024, the country marked its 10th consecutive year as the top producer and seller of EVs, with sales increasing by approximately 40% compared with the previous year.[68] China's significant production capacity has positioned it as a leading exporter of clean energy technologies, supplying affordable renewable energy equipment globally.

Other developing countries are also seeking to establish themselves in climate technologies. India has made substantial investments in renewable energy, particularly in solar and wind power, aiming to increase its renewable energy capacity significantly; other countries like Chile are positioning themselves as leaders in clean hydrogen production, leveraging abundant renewable energy resources to produce and potentially export clean hydrogen. Some developing countries are adopting microgrid solutions to provide off-grid electricity, improving energy access in remote areas.[69]

Despite these advancements, many developing countries still face challenges in scaling up production and export of clean energy technologies due to factors such as limited access to financing, technological know-how, and infrastructure. Overall, while developing countries have made strides in producing and exporting certain clean energy technologies, their share in global patenting remains low. Continued efforts to enhance innovation capabilities, infrastructure, and investment in these countries are crucial to increasing their participation in the global clean energy sector.

D. Systemic Inequity in Capital Ownership and Its Impact on Investment, Trade, and Patent Ownership in Climate Technologies

The reason for the systemic inequity in terms of the patenting, production, and export of climate technologies lies in the relationship between capital ownership and investment, trade and patent ownership of such technologies. The global transition to a low-carbon economy hinges on the rapid development and deployment of climate technologies. However, the direction and pace of this transformation are not solely determined by innovation or environmental need; they are profoundly shaped by the structures of capital ownership. Capital ownership plays a crucial role in shaping investment patterns, trade flows, and patent ownership in climate technologies.[70]

Whether through direct investment, control over trade, or dominance in intellectual property rights, the ownership and distribution of capital play a central role in determining who benefits – and who is left behind – in the emerging climate technology economy. This relationship significantly impacts the development and technological gap between developed and developing countries. The concentration of financial and technological resources in specific regions and industries influences which countries and corporations lead in developing, producing, and exporting clean energy technologies.

As the world transitions towards clean and sustainable energy systems, a stark reality persists: the benefits of climate technology are not shared equally. At the core of this imbalance is capital ownership, which determines who innovates, who produces, who trades, and ultimately who leads in the global clean tech economy. Capital ownership widens the technological gap between developed and developing countries by influencing patent control, trade dominance, investment flows, and policy sovereignty. Wealth and innovation are increasingly concentrated in a few corporate hands mostly from developed countries because of systemic inequities – leaving much of the Global South struggling to catch up.[71]

i. Corporate Control of Capital

Capital ownership fundamentally shapes who can invest in climate technologies and what types of innovations are prioritized. Capital investment is an area where ownership dynamics play a critical role. Developed countries,

for example, dominate global clean energy finance: the US, the EU, and China are the top investors in renewable energy infrastructure and R&D. About 80% of all private capital in clean tech is directed to these countries.[72]

Large multinational corporations (MNCs) mostly from developed countries, state-owned enterprises (SOEs), and financial investors like private equity and venture capital (VC) firms dominate the climate tech investment landscape (even as global climate technology equity financing fell in 2024). In developed economies, especially the US, the EU, Japan, and South Korea, private-sector R&D spending plays a central role. Corporations such as Tesla, Siemens, and Toyota are at the forefront, channelling billions into batteries, hydrogen technologies, and carbon capture solutions.[73]

Meanwhile, state-backed capital – particularly in China and the Middle East – has emerged as a powerful force in scaling up production capacity. Chinese SOEs like CATL and the State Grid Corporation benefit from massive state funding, enabling them to dominate global solar, EV, and battery markets.[74] Similarly, sovereign wealth funds from Saudi Arabia and the UAE are investing heavily in hydrogen and carbon capture technologies, often with a long-term strategic focus.[75]

Venture capital and private equity, especially prevalent in the US and parts of Europe, support the riskier end of the innovation spectrum. Startups like QuantumScape (solid-state batteries) and Climeworks (carbon capture) receive high-risk, high-reward funding, pushing the technological frontier but often lacking the capacity for large-scale deployment.[76]

The implications of these dynamics are clear: access to capital not only accelerates innovation but also shapes its direction. State-led investments tend to emphasize industrial scaling and national competitiveness, while private capital focuses on breakthrough innovations with commercial promise. In many cases, however, developing countries would often face multiple barriers to attracting similar investment due to limited access to capital markets and investment risk; high perceived risks – such as political instability, weak regulatory frameworks, or inadequate infrastructure – deter investors, and the cost of capital is significantly higher in these regions, making clean energy projects more expensive to launch and sustain.[77] As a result, their ability to develop, deploy, or scale climate technologies remains constrained.

Many developing countries struggle to scale renewable energy fast enough to meet their climate and development goals. Without adequate capital, they remain reliant on international aid, loans from the IMF or World Bank, or foreign investments.

ii. Capital Ownership and Trade in Climate Technologies

Trade outcomes in climate technologies are equally shaped by capital ownership, particularly in terms of production assets. China's dominance in global clean energy trade is closely tied to its ownership of vast production infrastructure, largely funded and operated by SOEs. The country controls approximately 80% of global solar panel production and a significant share of EV battery manufacturing, securing its position as the world's leading clean tech exporter.

In contrast, high-tech components and systems – such as semiconductors and hydrogen technologies – are largely dominated by firms based in the US and Japan. Ownership of the raw materials essential for many climate technologies is similarly concentrated. Countries like Chile (lithium) and the Democratic Republic of Congo (cobalt) possess the resources, but foreign firms – often backed by foreign governments or private capital – control extraction and export rights.

Trade policies are increasingly shaped by this capital concentration. Developed countries, concerned with protecting domestic industries and addressing supply chain vulnerabilities, have imposed tariffs and carbon border adjustment mechanisms. The US, for example, levies tariffs on Chinese solar panels, while the EU is implementing measures to reduce the carbon footprint of imports. These policies often disadvantage developing countries, which, due to their capital limitations, remain locked in roles as raw material exporters rather than value-added producers.

This uneven trade landscape reinforces existing inequalities. Countries with the capital to build clean tech production facilities dominate global markets, while others are relegated to the lower end of the supply chain.[78] Trade tensions – such as the ongoing disputes between the US and China over solar and EV technologies – are a direct reflection of these imbalances in capital ownership.

Global trade in climate technologies mirrors patterns of capital ownership. China, the US, and the EU dominate exports of clean tech products. China alone manufactures over 80% of the world's solar panels, 60% of wind turbines, and 70% of EV batteries – thanks to its strategic investments and ownership of key production facilities; meanwhile, the US and EU excel in exporting high-tech components like semiconductors, hydrogen systems, and AI-based energy technologies.[79]

In contrast, developing countries are locked into low-value roles within the clean tech supply chain. Chile exports lithium, but it lacks domestic battery production. The Democratic Republic of Congo supplies 70% of global cobalt but has no significant domestically owned refining capacity. Similarly, Africa exports materials critical to solar panels yet produces almost none of the final products.[80]

This production imbalance results in a familiar pattern: developing countries export raw materials, while developed countries capture the value-added benefits through manufacturing and intellectual property. These dynamics limit opportunities for industrial growth in the Global South and make their economies vulnerable to price swings and supply chain disruptions.

Further, unequal trade policies – such as tariffs on clean tech exports from developing nations and carbon border adjustment taxes – make it even harder for these countries to compete in the global market. These barriers compound existing disadvantages, reinforcing the cycle of underdevelopment.

iii. Capital Ownership and Patent Ownership in Climate Technologies

The control of intellectual property (IP) – particularly patents – is another critical dimension through which capital ownership exerts influence over the climate technology landscape. Patent ownership not only reflects past investments but also confers long-term market power, as it dictates who can license, use, and profit from technological advancements.

As noted above, ownership of patents with respect to climate technologies is heavily skewed towards developed countries. This disparity stems largely from unequal access to capital. Clean technology R&D is capital-intensive

and typically backed by robust public and private investment. Countries like the US fund research through agencies like the Department of Energy (DOE), while China leverages its state-owned enterprises to drive innovation.[81] Meanwhile, most developing countries lack the public funding, venture capital networks, and institutional infrastructure necessary to support sustained innovation. China's investment in state-led R&D has yielded a rapid increase in domestic patent filings, challenging the longstanding dominance of Western nations. However, the innovation gap between developed and developing countries remains stark, as developed countries (aside from China) largely dominate the field.[82] This imbalance in patent ownership limits the accessibility of climate technologies for developing countries, as the cost of licensing patented technologies can be prohibitively high, slowing adoption and localization.[83]

Compounding the problem is the migration of talent. Highly skilled researchers from the Global South often relocate to wealthier nations in search of better funding, facilities, and opportunities.[84] Even when innovation does occur locally, foreign ownership of local R&D centres often results in patents being registered under foreign corporations, depriving local innovators of full benefits.[85]

The relative lack of locally owned patents and technologies has cascading effects. Developing countries face higher costs when deploying renewable energy solutions, as they must import equipment and pay royalties. This slows their energy transitions, undermines domestic industrialization efforts, and results in fewer economic benefits staying within their borders. This pattern entrenches technological dependence and leaves developing countries as consumers – not creators – of clean technology.

iv. Capital Ownership Shapes the Future of Climate Technologies

The structure of capital ownership over climate technologies is a powerful determinant of who leads, who lags, and who benefits from the global climate transition. Countries and corporations with deep financial resources and ownership of critical assets and intellectual property dictate the pace, scale, and direction of clean tech development. Capital ownership is not just an economic statistic – it is a systemic force that shapes who holds power with respect to the technologies needed for effective climate action and the clean

energy transition. Today, the dominance of developed countries and large corporations in patents, trade, and investment has created an entrenched technological hierarchy. Developing countries face persistent obstacles: limited innovation capacity, unequal trade terms, high financing costs, and weakened policy autonomy.

Investment power drives innovation, with state-led efforts (China, Middle East) focused on scaling production and private capital (US, EU) emphasizing early-stage, high-impact innovation. Ownership of production assets determines trade dominance, allowing countries like China to export finished technologies at scale, while other developing countries remain tethered to raw material exports. Meanwhile, patent ownership reinforces market power, enabling wealthy nations and corporations to control the pricing, access, and diffusion of clean tech innovations.

To foster a more equitable clean energy future, several strategies must be pursued. Public-private partnerships can help mobilize capital for clean energy development in the Global South. Technology transfer policy initiatives, such as those proposed by developing countries in the WTO and the UNFCCC, should be pursued to reduce IP-related barriers. Finally, local production incentives – like India's "Make in India" initiative – can help shift countries from resource exporters to clean tech producers, ensuring more inclusive participation in the global climate economy.

Ultimately, addressing the inequalities embedded in capital ownership will be critical to ensuring that the clean energy transition is not only rapid and effective but also just and inclusive. Addressing these challenges requires more than aid – it calls for structural reform.

4 Geopolitics, Trade, Climate Policy, and Sustainable Development: Intersections in a Multipolar World

THE intersection of international trade rules, climate change policies, and sustainable development is increasingly shaped by geopolitical dynamics and great power rivalries. As the urgency of climate action intensifies, these domains – once governed in relatively separate silos – are now deeply entangled. This convergence is especially consequential for the Global South, which sits at the crossroads of economic vulnerability and environmental risk. Climate and trade frameworks have become new arenas for geopolitical competition and the Global South is both a battleground and a potential shaper of systemic global interlinkages.[86]

While climate change mitigation is a global imperative, it is also emerging as a tool of strategic competition among great powers. The US, the EU, and China have positioned themselves as leaders in the green transition, but their climate actions are increasingly shaped by broader geopolitical agendas. The EU's Carbon Border Adjustment Mechanism exemplifies this dynamic. Although designed to prevent "carbon leakage" by taxing carbon-intensive imports, CBAM also serves as a mechanism to export EU environmental standards. For countries like China and India – major exporters of steel, cement, and other emissions-intensive goods – CBAM is seen as a form of green protectionism that undermines their industrial competitiveness. The result is diplomatic tension and accusations of disguised trade barriers. The US' Inflation Reduction Act escalated tensions further by prioritizing domestic green energy production through subsidies that exclude many foreign firms. Although it represents the largest-ever American investment in clean energy, allies such as the EU and Japan have criticized it for violating global trade norms and sidelining international cooperation in favour of industrial nationalism.

Control of green technologies and critical raw materials is also at the heart of this rivalry. China's dominance in the production of solar panels and electric vehicle batteries together with its control over rare earth mineral supply chains has caused concern in developed countries.[87] As countries race to secure energy independence, these supply chain dependencies are no longer considered to be just economic concerns but increasingly seen to be national security issues.

Geopolitical rivalries have also eroded trust in multilateral trade frameworks, making it harder to coordinate climate and development policies equitably. The WTO, once a central forum for resolving disputes and promoting trade, has been increasingly paralyzed as unilateral trade measures imposed by countries against each other proliferate. One other contentious area is intellectual property. The WTO's TRIPS Agreement has become a sticking point in global climate negotiations. Developing countries such as India and South Africa argue that IP protections on green technologies hinder their ability to decarbonize affordably. Their calls for TRIPS waivers to promote technology transfer have been met with resistance from developed countries, perpetuating a technological divide. Meanwhile, the US-China trade war has disrupted global supply chains, affecting third-party economies in the Global South. Countries like Vietnam and Bangladesh, which rely on exports to both countries, now face rising uncertainty due to the unpredictability of geopolitical manoeuvring.

Nowhere are the systemic linkages, and the systemic inequity, between climate, trade, and development more consequential than in the Global South. The energy transition has fuelled new resource conflicts, especially around critical minerals. Climate-induced disruptions – such as floods in Pakistan or cyclones in Mozambique – continue to ravage economies that are already heavily dependent on trade. For some developing countries, access to climate finance is blocked by developed countries due to geopolitical considerations.

5 International Cooperation as the Vehicle for Addressing Systemic Inequity

ADDRESSING the systemic inequities embedded in global environmental trends requires structural changes as developing countries face the dual challenge of addressing poverty and inequality while transitioning to sustainable economies. Protecting the environment cannot come at the expense of poverty reduction and human development. A just environmental transition must support countries in pursuing low-carbon, resilient pathways that align with their own development priorities, while ensuring ecological sustainability, social equity, and local community empowerment.

The right to development, enshrined in the United Nations Declaration on the Right to Development (1986),[88] emphasizes that all individuals and peoples are entitled to participate in, contribute to, and benefit from economic, social, cultural, and political development. This right is particularly relevant in the context of climate action and climate technology trade. Trade and climate policies must be designed to support the right to development by ensuring that developing countries have the resources, technology, and capacity to pursue low-carbon development pathways. Balancing trade, climate action, and climate technology adoption with the right to development presents unique challenges. For developing countries, green industrialization strategies can facilitate climate resilience while driving economic growth. Investment in renewable energy infrastructure, skill development for green jobs, and sustainable agriculture initiatives are critical.

This requires financial and technical assistance from developed countries, as well as equitable access to global markets for climate technologies. For instance, preferential trade agreements and capacity-building initiatives can help developing countries integrate into global clean technology value chains.

At the same time, climate policies must avoid imposing undue burdens on developing countries, such as through overly stringent carbon tariffs that could hinder their economic growth.

The complexity of the systemic inequity challenge, with its multiple interlinkages to global policy issues in the trade and climate arenas, implies that no single country can address this challenge by itself. International cooperation is required.

International cooperation frameworks, such as the UNFCCC and its Paris Agreement, provide the foundation for global climate action. These frameworks establish common goals, such as limiting global warming to 1.5°C, and mechanisms for collaboration, including Nationally Determined Contributions (NDCs) and climate finance commitments. However, their effectiveness depends on alignment with other policy areas, particularly trade and technology transfer. Developing countries can take proactive steps to shape and influence such international cooperation frameworks and ensure their interests are represented.

International cooperation in the current context, however, faces several barriers. Geopolitical rivalries, particularly between major powers like the US and China, often obstruct collaborative progress. Inequitable power structures within multilateral institutions reduce the influence of developing countries, undermining trust in global governance. Resource limitations and inconsistent donor commitments hamper the implementation of multilateral programmes, especially in climate finance. Overcoming these challenges requires intentional reform, sustained political will, and inclusive leadership.

To ensure that international cooperation would be viable and effective, there is a need to enhance inclusivity in governance so that developing countries have greater representation in decision-making bodies and governance structures; promote policy coherence among institutions working on trade, climate, and development to avoid contradictory outcomes; and support the strengthening of international and regional bodies to work together and serve as institutional vectors between global frameworks and national implementation.

6 The Need for Collective Action Among Developing Countries to Address Systemic Inequity

GIVEN the scale and systemic nature of these challenges, no country can address them alone. Developing countries must act collectively to reshape the global environmental and trade systems in a way that prioritizes justice, equity, and sustainable development. This would require:

- **Strengthening the equity and climate justice narrative:** Developing countries should call for a restructured global economy that centres equity, including significant investments in clean energy infrastructure, debt cancellation tied to climate action, and new models of trade that reward sustainability. Developing countries should continue pushing for and highlighting equity and climate and developmental justice considerations in the international trade and climate regimes. They should pursue trade agreements that protect their policy space for industrialization, allow green industrial policies, and promote fairer access to global markets. Environmental standards should be harmonized in ways that do not penalize developing countries based on capacity gaps.
- **Enhancing the role of the state to focus on green industrialization and resilience:** Rather than replicating the carbon-intensive paths of the past, countries in the Global South should invest in renewable energy, agroecology, and green industrialization pathways that can create jobs, reduce emissions, and build resilience.[89]
- **Enhanced South-South cooperation and coordination:** Organizations like the Group of 77 and other developing country groups and coalitions should focus on their common interests to push for stronger, more unified demands in international negotiations. Unity increases bargaining power and helps shift the narrative from charity to rights and justice. Sharing

knowledge, technologies, and best practices among developing countries – especially around adaptation practices, technology development, and environmental governance – can build collective resilience and reduce dependency on developed countries. Regional climate funds, joint research initiatives, and technology transfer agreements can reduce dependence on the Global North. By consolidating their positions in international forums, developing countries can advocate more effectively for equitable climate policies and financial support.[90]

In this context, the adoption and implementation by developing countries of strategic policy choices nationally and through enhanced international cooperation is essential, particularly in the following areas:

- **Low-carbon industrialization through economic diversification and the building of domestic manufacturing capacity:** Developing countries can pursue low-carbon industrialization by investing in renewable energy, energy efficiency, and sustainable infrastructure, and diversifying clean technology supply chains can enhance resilience and reduce dependence on a single country or region. Developing countries can leverage their natural resources and labour advantages to participate in global value chains, such as by processing critical minerals for battery production. Policies that shift focus from raw material exports to value-added production can help build domestic clean tech industries. Incentives for local manufacturing of batteries, solar panels, and wind turbines are key.[91]
- **Regional value chains:** Developing countries could develop regional clean technology value chains that make the most of their natural and human resources in complementary ways. For instance, countries in Africa with abundant reserves of cobalt and lithium, essential for battery production, can partner with multinational corporations to establish local processing and manufacturing facilities.
- **Green jobs and skills development:** Transitioning to a green economy requires a skilled workforce. Developing countries can invest in education and vocational training programmes to equip workers with the skills needed for clean technology sectors. International partnerships, such as the International Labour Organization (ILO)'s Green Jobs Programme, can support these efforts.

- **Social protection measures:** The transition to a low-carbon economy must be inclusive and just. Developing countries should implement social protection measures, such as unemployment benefits and reskilling programmes, to support workers and communities affected by the shift away from fossil fuels.
- **Access to climate finance:** Developing countries require significant financial resources to implement climate action and clean technology projects. Multilateral development banks (MDBs) and climate funds, such as the Green Climate Fund (GCF), must scale up funding and simplify access procedures. Innovative financing mechanisms, such as green bonds and debt-for-climate swaps, can also mobilize resources.[92]
- **Equitable transfer of and access to climate technologies:** Developing countries must have equitable access to climate technologies to achieve their development and climate goals. International cooperation frameworks and trade policies should prioritize technology transfer and capacity building. Developing countries can negotiate technology transfer agreements as part of international climate and trade agreements. For instance, the UNFCCC's Technology Mechanism facilitates the transfer of climate technologies to developing countries, supported by funding from developed countries.[93]
- **Reforming intellectual property rights (IPR) regimes:** IPR regimes must strike a balance between incentivizing innovation and ensuring affordable access to climate technologies. At the international level, developing countries should advocate for fairer trade rules and challenge restrictive IPR regimes at forums like the WTO. Expanding South-South trade agreements can also help bypass Global North–imposed constraints. Developing countries can advocate for flexible IPR provisions in international agreements, such as compulsory licensing for essential climate technologies.[94]
- **Investment in domestic R&D:** Governments must prioritize funding and other subsidies for local research institutions and forge South-South collaborations. Open-source patent pools and cooperative technology-sharing agreements can reduce the barriers created by intellectual property monopolies. By investing in domestic R&D, fostering local production, rethinking global trade rules, and democratizing access to finance, developing countries can begin to chart their own path towards clean, equitable, and sustainable development.[95]

- **Capacity building:** Developing countries need support to build technical and institutional capacity for clean technology production. International organizations, such as the United Nations Industrial Development Organization (UNIDO), can provide training and resources to help countries integrate into global clean technology supply chains.
- **South-South cooperation:** Developing countries can strengthen collaboration through South-South cooperation initiatives, sharing knowledge, technology, and best practices, as well as coordination of their positions in multilateral climate and trade forums. In the trade area, developing countries could explore reviving and strengthening the Global System of Trade Preferences (GSTP); in the climate area, South-South cooperation initiatives on climate technology transfer, finance, and capacity building for climate action should be explored.[96]
- **Special and differential treatment (SDT):** Developing countries must retain access to SDT provisions in trade agreements, which allow them flexibility to implement policies that support their development and climate goals. Such flexibility includes longer timelines for compliance with environmental standards, and access to financial and technical assistance.[97]
- **Prohibition of trade protectionism on environmental grounds:** From the perspective of developing countries, trade measures are not necessarily the best nor the most appropriate means for addressing environmental concerns. Developing countries should push to explicitly prohibit unilateral trade measures taken on environmental grounds that would have an adverse impact on, or discriminate against, the trade of developing countries.[98]

7 Conclusion

THE world faces a convergence of environmental, climate, and trade crises that expose and deepen longstanding global inequities. The intertwined challenges of environmental degradation, climate change, and trade dynamics underscore deep-seated inequities between developed and developing countries. These challenges are not merely technical – they are political and deeply rooted in historical injustice.

The global environmental crisis is not just ecological – it is deeply political and profoundly unequal. The trends, causes, and effects of environmental degradation expose systemic inequities between developed and developing countries shaped by centuries of exploitation and imbalance. If the international community is serious about sustainability, it must also be serious about justice. Without addressing these inequities, any action taken risks reproducing the very injustices it seeks to resolve. A fair and inclusive global response is not only a moral imperative – it is a practical necessity for the survival of both people and the planet, and it must confront historical responsibility, empower marginalized communities, and prioritize equity at every level of governance.

While developed countries must take the lead in cutting emissions and delivering on climate finance, developing countries cannot afford to wait. Through solidarity, cooperation, and bold leadership, the Global South can forge a new development path – one that prioritizes justice, sustainability, and sovereignty.

Developing countries have been consistent and clear in articulating the primacy and necessity of addressing and promoting their development options in both the trade and climate regimes. In trade, they have pushed for a

development-oriented multilateral trade regime. In the climate regime, developing countries have stressed that meeting development objectives would require, among others, a reflection of the principle of common but differentiated responsibilities with respect to reductions in greenhouse gas emissions (including for developed countries to fully implement their commitments in this area) and the implementation of existing commitments on technology transfer to developing countries. Developing countries have also continually stressed the need for development policy space, choices, and flexibilities, so as to ensure that international commitments and domestic policies are able to address in a flexible manner the unique set of development and environmental circumstances of each individual developing country. They have also stressed the need to improve supply-side productive capacity through financing support for the acquisition of technologies and the modernization of production in developing countries. In addition, they have called for technical assistance and capacity building, especially in terms of R&D, design and production, and infrastructure development to support a shift to cleaner, less carbon-intensive, and more equitable and sustainable production and consumption patterns in developing countries.[99]

The international trade system is not a neutral arena of exchange but a reflection of global power structures that continue to privilege developed countries at the expense of developing ones. The persistence of structural inequalities – rooted in history, entrenched in institutions, and reinforced through unequal rules – demands urgent reform. Only through more inclusive, equitable, and development-centred trade policies can the international trade system fulfil its potential as a driver of shared prosperity.

Powerful industries and stakeholders vested in the status quo, such as the big corporate interests in the global fossil fuel and derivatives industry, are likely to resist the policy changes and economic changes that may be necessary for effective trade and climate action that supports sustainable development. Overcoming this resistance will require political will, public awareness, and policies that incentivize community-oriented innovation and adaptation.

Developing countries face disproportionate vulnerabilities to climate change and lack the resources to implement ambitious climate-aligned economic reforms. Addressing these disparities requires enhanced international support

through finance, technology transfer, and capacity building. The mechanisms that have been set up under the UNFCCC and the Paris Agreement for the provision of climate finance, adaptation finance, loss and damage finance and technical assistance, technology development and transfer, capacity building, and to address just transition issues and the impacts of response measures need to be adequately resourced and supported.

The systemic linkages between international cooperation frameworks, trade policies, clean technology production and trade, financing mechanisms, and the right to development are critical to achieving a sustainable and equitable global future. Developing countries play a central role in shaping these dynamics, advocating for policies that support their development aspirations while contributing to global climate goals. By fostering international cooperation, aligning trade and climate policies, and mobilizing financing, the global community can ensure that the transition to a low-carbon economy is inclusive, just, and sustainable.

Linking international trade and climate policies requires that the systemic inequities that underlie these policy regimes be addressed, so that such linkages do not perpetuate inequity. To do so, the focus should be on creating systemic coherence between these policy regimes so that they become mutually supportive in promoting a systemic approach to reflecting equity and fostering the right to development of developing countries operating under these regimes.

The institutional separation between economic and environmental governance structures limits coordinated action. To address this, there must be a greater level of synergy and coherence between economic and climate agencies, at both the national and international levels, in terms of policy approaches and implementation. This is based on the recognition that economic policy impacts climate change responses and vice versa, such that ultimately economic and climate policies should be seen as separate sides of the same coin.

At the international level, greater coherence and synergy in terms of policy approach should be sought by developing countries through ensuring that their negotiating teams and policy positions in the trade and climate regimes are aligned; developing countries should also seek to develop greater levels

of coordination and cooperation with each other in order to push for their common positions.

Addressing these issues requires a concerted effort from developing countries to collaborate, advocate for fair policies, and implement sustainable development strategies. It requires a fundamental rethinking of how trade and climate policies and rules are designed and implemented. This includes developing countries gaining a greater voice in global decision-making (through, for example, coordinated and cooperative action), reforming subsidy and intellectual property regimes, ensuring that trade policies support rather than undermine national development strategies, supporting technology transfer to developing countries, and promoting economic diversification and just transitions. Additionally, more attention must be given to the social and environmental dimensions of trade and climate policy, ensuring equitable and sustainable development in developing countries is supported.

Endnotes

1 The literal translation is "The old world is dying. The new one is slow to appear. And in this chiaroscuro monsters are born." The most oft-repeated translation is "The old is dying and the new cannot be born; in this interregnum a great variety of morbid symptoms appear." See A Gramsci, "Wave of Materialism" and "Crisis of Authority", in Q Hoare and G Nowell Smith (eds.), *Selections from the Prison Notebooks of Antonio Gramsci* (1971), p. 556, at https://uberty.org/wp-content/uploads/2015/10/gramsci-prison-notebooks.pdf

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THE INTERSECTION OF TRADE POLICY, CLIMATE ACTION, CLIMATE TECHNOLOGY, AND THE RIGHT TO DEVELOPMENT IN A SHIFTING GEOPOLITICAL LANDSCAPE

The global community stands at a critical crossroads marked by escalating environmental degradation, intensifying climate change, and increasingly complex trade dynamics. These phenomena do not occur in isolation; rather, they are deeply interlinked and underpinned by historical patterns of exploitation, uneven development, and entrenched global inequalities. While developed countries have reaped the benefits of industrialization and resource exploitation, often largely as a result of historical colonialism and modern-day neocolonialism, developing countries often find themselves disproportionately bearing the costs of environmental and economic crises.

This paper explores the current environmental, climate change, and trade trends; analyzes their historical and contemporary causes and effects; demonstrates how they reflect longstanding systemic inequities between the Global North and the Global South in global climate governance, the international trade system, climate technologies, and capital ownership; and outlines key considerations for international cooperation and collective action among developing countries.

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