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Review

Global South & Sustainable Development Discourse

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Abstract: Historical events leading to establishment of the Global South—Global North polarity in world affairs, took place during the Colonial Era. After almost three decades of accelerated globalization, in recent years, we witnessed its substantial slowing down. Hyperconnected, globally integrated economic systems established since the early 1990s, are giving place to a far more fragmented world of the late 2020s. The sustainable development concept has become increasingly prominent in the world's development discourse over the last half-century. The ultimate challenge of sacrifice of modern-day nations to respect sustainable development related self-imposed limitations, relates to the need to transform the entire economic model primarily for the sake of the future generations. The purpose is to create long-term growth balancing natural resource consumption to ensure a viable planet for our descendants to come. Although underlying theoretical concepts originated in the North, the Global South has unique circumstances ranging from quite large populations to persistent epidemiological burden of infectious diseases, rapidly growing but insufficient transportation networks, brain drain on a scale unseen in the North and so on. We witness substantially different landscape and governance issues having a profound and long-lasting impact on the sustainable development challenge as well. This article examines the evolving challenges and opportunities of the Global South, aiming to rethink sustainability in a global context and to identify pathways for research, policy, and practice that foster equitable and sustainable futures. A strong unmet need is integration of social justice systems into environmental sustainability. Urban sustainability remains of utmost importance since 90% of forecasted population growth between 2018 and 2050 will happen in cities of the Global South. Despite Global North economies being responsible for the majority of cumulative carbon emissions since 1850, low-and-middle-income countries struggle with consequences of climate change such as intense heatwaves, droughts, floods, and wildfires substantially affecting agriculture and crops harvest. Regardless of difficulties, there are exceptional success stories in renewable energy with some of the GS countries becoming global leaders in wind turbines and solar panels manufacturing and export. There is a growing need across these countries to mobilise domestic financial resources through the capacities of the local banking systems and capital markets and channel

them into sustainability related domestic investments. Ability to lead Emerging BRICS+ economies to meet UN's Sustainable Development Goals, Kyoto Protocol and Paris Climate Accords, will likely remain well ahead of most Global South nations.

Keywords: global south; sustainability; development; economic growth; science diplomacy; global north; emerging markets; BRICS+; belt and road; green agenda; UN

1. The Global South—History and Presence

Historical and contemporary chain of events leading to the establishment of the Global South—Global North polarity in world affairs, dates back to the origins of the Colonial Era [1]. Prevailing economic history evidence thought us that cradles of the wealthiest civilizations of Antiquity and Middle Ages were situated in the Global South [2]. For the most of these ages, entire world's economic output remained heavily dominated by the predecessor statehoods of modern China and India, such as Song and Tang Chinese dynasties [3] and Kingdom of Ashoka (The Mauryan Empire) in India [4]. Centuries of the Colonial history began with great European naval discoveries, later to be accelerated by industrial revolutions. It triggered gradual but huge transition of wealth, knowledge and technology from the East to the West [5] and from the South to the North [6]. After the Second World War, North-South political geography was largely influenced by the Cold War rivalry of USA and USSR [7] and dissolution of Western European colonial empires [8]. This is how the "Third World" was born to describe nations not aligned with either the U.S.-led capitalist "First World" or the Soviet-led communist "Second World". The Third World concept largely overlapped with the Global South's silent majority of nations and remained a dominant mainstream theory in development economics and diplomacy of that time [9].

The concept of the Global South refers to a diverse group of nations primarily in Africa, Latin America, the Caribbean, and parts of Asia, whose historical past was shaped by systemic marginalization within global political and economic structures [10]. The Global South encompasses varied sociocultural and economic contexts, including both low-income states and emerging economies such as India and Brazil, showcasing the fluidity of its boundaries [11]. Definitions of the Global South remain entangled with colonial and neocolonial legacies that inform patterns of resource distribution, development pathways, and geopolitical power relations [12]. While characterizations emphasizing poverty, health disparities, and climate vulnerability [13] reflect actual realities, scholars caution that framing the Global South primarily through these problems risk obscuring the region's diversity and diminishing local agency [14]. Thus, the Global South functions both as a lens for analyzing inequalities and as a framework for building coalitions, movements, and scholarship that confront historical injustices. These roles call for critical reflexivity about whose voices and lived experiences are brought to the forefront.

This article aims to map key challenges and emerging opportunities facing the Global South across interconnected domains: the implications of the 'mineral resource blessing' hypothesis; urban sustainability and resilience; the enduring legacy of the Global North in shaping climate trajectories; public health, climate vulnerability, and the political economy of sustainability; and sustainable finance and investment. By framing these areas together, the article seeks to illuminate pathways for research, policy, and practice that advance equitable and sustainable futures—and, in doing so, to reconsider what we mean by sustainability in a truly global context. Leveraging the multidisciplinary expertise of the authorial team, this study adopts a narrative literature review methodology. Unlike a systematic review that targets a narrow technical question, a narrative approach enables a synthesis of the multifaceted crises facing the Global South. By aggregating diverse themes from extractivism to the political economy of public health, this method identifies the structural dependency that defines the Global South realities. This breadth is a deliberate analytical choice, essential for proposing a holistic alternative path that transcends sectoral silos and addresses the overarching coloniality of power. Furthermore, we provide targeted examples within each thematic section, illustrating how these global challenges manifest in specific local contexts.

Climate change appears throughout various sections of this review. This intentional choice reflects the systemic nature of the climate crisis in the Global South [15]. Given that environmental degradation acts as a threat multiplier for Global South economies, it is treated here as an intrinsic variable across all spheres of human life from economic sovereignty to public health, rather than an isolated environmental issue

After almost three decades of accelerated globalization, in recent years we witnessed its substantial slowing down. Hyperconnected, globally integrated economic systems established since the early 1990s, are giving place to a far more fragmented world in the late 2020s. Policies of national governments, regardless of country size and influence, are marked by rising trade restrictions, a focus on domestic manufacturing and consumption, and a

decline in overall trade growth which began at the dawn of the 2008 financial crisis. Policymaker's agendas are topped with emphasis on regionalization, digital services, and national industrial policies.

Western civilization played a substantial role in shaping modern global interconnectedness and trade at scales unwitnessed in prior recorded history. At the same time, this process was deeply intertwined with colonialism, exploitation, and the erasure of pre-existing trade systems. However, due to ongoing geopolitical uncertainties and trade wars, in addition to Bretton Woods institutions [16], increasing geo-economic attractiveness in the Global South is gained by alliances of nations such as the BRICS+ [17], Belt and Road Initiative (BRI) [18], Shanghai Cooperation Organization (SCO), ASEAN, Eurasian Economic Union (EAEU), Organization of Islamic Conference (OIC), Arab League, African Union, Community of Latin American and Caribbean States (CELAC) etc.

A wide variety of social and economic shifts and challenges in Low-and-Middle-Income countries (LMICs) [19], restrict their ability to grow their economies. These are global challenges as Silver Tsunami and demographic transition, migrations, extinction of traditional family, penetration of artificial intelligence and robotics in all spheres of life, and much more. Apart from global shifts, these countries are facing political unrest, military conflicts, mega scale urban development, industrial capacity expansion, environmental pollution, extinction of wildlife habitats such as tropical rainforests, advanced agriculture and food hyperproduction, sexual revolution and female emancipation, and challenges for housing for the poor and rural inhabitants [20].

This complex socioeconomic evolution is driven with rapidly rising living standards across the Global South and technology dissemination [21]. Emerging BRICS+ markets middle class's purchasing power is rapidly expanding [22] simultaneously with stagnation or decline in the purchasing power of the middle class in leading Western nations [23]. Ultimately, there might be certain converging development pathways towards the Global North patterns and inevitable rise of the Global South influence in world affairs [24].

The analytical logic of this review is structured around the pivotal dimensions of Global South transformation. It first examines the shift from extractive to inclusive and participatory institutions, followed by the transition from basic poverty reduction toward sustainable prosperity. It then explores the global connectivity as a means to avoid center-periphery dependency. Finally, the study addresses the advancement of global public cooperation in fields such as health and climate. By synthesizing these themes through a multidisciplinary lens, the paper identifies how post-growth and localized models serve as necessary structural responses to the systemic challenges of the contemporary era.

2. Sustainability Concept and Its Consequences for Global South

The sustainable development concept has become increasingly prominent in the world's development discourse over the last half-century. It is largely driven by the United Nations 2030 Agenda for Sustainable Development and the New Urban Agenda [25]. The latest UN-Habitat World Cities Report further expands it in "World Cities Report 2024: Cities and Climate Action", officially released at the World Urban Forum in Cairo, Egypt [26].

In the continuing and rapid acceleration of urban development in the Global South, implementation of sustainable development postulates remains risky and unpredictable. A striking example in this regard is the fact that in 2030, the world should have 43 megacities with majority of them being situated in the Global South [27]. Although most of LMICs governments are quite eager to implement SDGs principles, in loco-regional contexts, these goals are often at odds with the economic needs of local and indigenous communities [28].

Legal issues present another complex obstacle to achieving SDGs in terms of inter-dependence of different branches of international law, ensuring environmental justice, guaranteeing social protection, and safeguarding the rule of law for sustainable communities [29].

This disconnect between urban sustainability and local reality is not an isolated planning failure, but rather a consequence of the broader global economic architecture. The pursuit of profit and deregulation under neoliberal capitalism has led to massive environmental damage and increased social inequality worldwide [30]. Such economic system drives multinational companies to exploit world's natural resources and human labour [31]. This profit-driven model encourages corporations to relocate to countries with weaker regulations, further contributing to deforestation, pollution and climate change [32]. Ultimately such unequal distribution of environmental burden substantially affect communities of indigenous peoples and the poor citizens residing in rural countryside far away from coastal and industrial hubs more heavily [33].

The ultimate challenge of sacrifice of modern-day nations to respect sustainable development related self-imposed limitations, relates to the need to transform the entire economic model primarily for the sake of the future generations [34]. The purpose is to create long-term growth balancing natural resource consumption to ensure a viable planet for our descendants to come. Probably the most iconic definitions of sustainability remain the one

cited in the Brundtland 1987 Report, stating that it is *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"* [35].

New York City hosted the latest High-Level Political Forum on Sustainable Development (HLPF) in July 2025, continuing the series of forums convened by the UN Economic and Social Council. This event was prominent not only for its diplomatic outreach but also because of several dozens of countries presented voluntary national reviews (VNRs) of their 2030 Agenda implementation at the national level in terms of SDGs achievement [36].

Convenient example of inner peculiarities comes from Sub-Saharan Africa where huge share of poor domestic population lives in informal slum settlements under precarious and unhealthy living conditions [37]. Furthermore, such slum dwellers lack formal land tenure rights and remain vulnerable to government-supported evictions [38]. Rare empirical studies provide seminal literature with local insights on such core legal hurdles. Furthermore, it imposes the serious question whether some of the sustainable development goals are feasible to achieve in many underdeveloped regions worldwide [39].

This institutional fragility in urban centers is mirrored and often magnified in the rural peripheries, where the geographic distance from industrial hubs creates a different challenge. High levels of social inequality and poverty still constitute significant challenges for rural countryside regions across the Global South [40]. Their inhabitants residing far away from the rich coastal or industrial centres and their megacities frequently lack access to pure water, sanitation, decent housing and guaranteed complete meals per day [41]. In the economic mainstream theory, there are well known hurdles of economic development to avoid the so-called poverty loop [42]. The underprivileged citizens find it hard to escape poverty without dooming future generations to an even more degraded environment compared to contemporary one [43]. This is the case because their revenue basis is frequently tied for fossil fuel driven industries, or intensive agriculture leading to rapid deforestation and destruction of wildlife habitats. Rarely, some pieces of successfully applied technological innovation might pave the road of transformation to a more sustainable world. Examples of just a few such solutions might be genetically engineered bacteria capable of digesting the oil in the ocean [44], waste management [45] through recycling and bioplastics [46], smart agriculture using modern irrigation and drainage networks drastically reduces water consumption alongside satisfactory crop harvests and all sorts of clean energy acquisition.

To a significant extent, rural and urban planning for a sustainable future in LMICs must take into account erosion, geographic restructuring, adaptive urbanism, social justice issues (land ownership and water accessibility first and foremost) and last but not least—disaster mitigation and management. The recent catastrophic episodes with huge scale floods in Pakistan [47] or Bangladesh, mudslides destroying entire villages, frequent earthquakes in Iran and Turkey [48], severe droughts and water shortages throughout the Middle East and Sub-Saharan Africa, or tsunami impacts in Indonesia and Sri Lanka [49]—all have exposed substantial vulnerabilities of Global South societies to large-scale natural disasters. Unlike that, Fukushima Daiichi nuclear accident following The Great East Japan Earthquake, or Tōhoku earthquake, much more to the North, is an example how high-income OECD countries expose substantially stronger resilience and less casualties in similar circumstances [50]. There is a world record density of inhabitants in South Asia and ASEAN coastal urban areas associated with struggling infrastructural capacities to satisfy the unmet needs associated with overpopulation. Such capacities become acutely insufficient when overstretched in exceptional circumstances like mass-scale public health emergencies. For the same reason, bottleneck of capacities is particularly visible in hospital beds and poor medical and nursing staff density reaching its peaks in intensive care unit insufficiencies, substantially raising mortality in acute crisis events [51].

Important and fairly neglected aspect of sustainability science relates to the fact that most of its theoretical concepts were born in post-industrial Global North [52]. For decades these concepts used to be primarily focused to the environmental pollution caused by heavy industry and traffic. This was among the major undergoing reasons for the so-called outsourcing of manufacturing technologies since the late 1970s from the USA and Western Europe towards Asia, first to China and ASEAN, and later to India [53]. Yet nowadays, in mid-2020s, the Global South has its own contextual realities and perspectives of the Global South within techno-scientific framings of sustainability [54]. Research on waste colonialism reveals that the Global North systematically exports its environmental burden by shipping vast quantities of plastic and electronic waste to the Global South, exploiting weaker regulations in developing nations to manage domestic consumption [55].

Many unique circumstances ranging from hard to manage population density to issues of governance in the countries with millenniums old legacy of monarchies, persistent epidemiological burden of infectious diseases, rapidly growing but insufficient transportation networks, brain drain on a scale unseen in the North and so on [56]. Given the almost universal global phenomenon of population aging, it is worthy to mention that Sub-Saharan Africa remains a notable demographic outlier. Given its current average total fertility rate (TFR) of 4.28 children per woman in 2025, we anticipate almost ~79% population increase by 2054 [57]. At the same time SSA region is forecasted to contribute ~67% of global adolescent births by 2035 [58]. The honest observer would therefore

witness a substantially different landscape and governance issues compared to the Global North. These facts will have a profound and long-lasting impact to the sustainable development challenge as well.

From the legal point of view, there is a strong unmet need of the Global South countries to integrate their social justice systems into environmental sustainability [59]. Surprisingly, a variety of environmental burdens substantially affecting poor households remain excluded from mainstream government planning and development in LMICs. At the same time, the entire success of Agenda 2030 and SDGs goal achievement remains deeply rooted in the local, municipal level of social responsibility. Globalized economy creates patterns such as demand for palm oil or pineapple from Madagascar and Indonesia [60]. This leads to the financial incentive to provide supply, primarily to the Global North markets. This inevitably leads to rapid deforestation and plantation creation which affects entire ecosystem stability. destroys natural habitats, reduces biodiversity, and impacts climate change. From a historical perspective, the same was happening in earlier decades in Amazonia with Brazilian, Colombian and other coffee breeding and cultivation regions [61].

Evolving economic transformation in an array of very different low-and-middle-income countries, largely consists of harmful anthropogenic activities. Exceptional vulnerability to man-made activities such as draughts, shifting river streams, and ecosystem disturbances was documented to adversely affect Indigenous populations, such as the Aboriginal population of Australia [62], Bushman tribes of Kalahari desert [63], the Inuit people [64] and Nigeria's Ogoni people [65]. Environmental degradation has forced many of these indigenous communities to seek environmental justice. Court tribunals at various levels of hierarchy affirmed that failing to safeguard the environment violates human rights of Indigenous people who need a balanced ecosystem, wildlife and water for their survival [66].

3. "Mineral Resource Blessing" Hypothesis

The *"Mineral Resource Blessing"* hypothesis highlights how resource abundance can generate unexpected economic distortions, including currency pressures and the gradual weakening of other productive sectors. However, the outcomes of such abundance are far from uniform. While some GS economies experience institutional capture, rent-seeking, others channel resource revenues into strategic investments that broaden their industrial base. In this sense, the "blessing" is not inherent to the resources themselves but emerges through the quality of institutional governance and the state's broader developmental orientation.

The mineral resource blessing hypothesis pays attention to the fact that indeed, an abundance of world's natural resources, including ores, resides in the LMICs territories. Some of the most prominent cases of mineral-endowed countries of the Global South consists of: Democratic Republic of Congo (DRC)—Cobalt (70%+ of world supply), Copper, Diamonds, Tantalum, Gold; Brazil—Iron ore (top exporter), Gold, Bauxite (aluminum), Manganese, Niobium, Rare Earths; South Africa—Platinum (world's largest), Gold, Chromium, Manganese, Diamonds, Coal; Chile—Copper (world's largest producer), Lithium, Molybdenum; Peru—Copper, Silver, Zinc, Gold, Lead; Indonesia—Nickel (top global producer), Tin, Bauxite, Gold, Coal; Venezuela—Oil (world's largest proven reserves), Gold, Bauxite, Iron ore; Zambia—Copper (second in Africa), Cobalt; Bolivia—Lithium (in the "Lithium Triangle"), Tin, Silver, Zinc.

If we observe Russian Siberia and Arctic coastal zone and continental shelf beyond this equation, this is even particularly the case with the least developed countries and jurisdictions such as diamonds of Congo basin, lithium sites in Bolivia, and many others [67]. This abundance of mineral capital fosters hope for economic prosperity in terms of strong global demand for such resources, particularly those coming from wealthy Western and Asian Global North nations. Yet at the same time it turned out to be the curse for many countries, given their rather weak legislation and inability to impose the respect of rule of law when faced with pressures from multinational companies [68].

Imported technologies for ore excavation in the mines aids short-term but in some scenarios was proven to harm long-term Global South development. Economic mainstream theory is clear that local processing is manifesting in domestic value addition, instead of export of raw materials and helps boost sustainability in LMICs economies in both short and long terms. A striking example is export of locally manufactured wooden furniture instead of a jungle cut of tropical timber (selective logging) [69]. Aluminum, copper and rare metals exports in a semi-finished state, rather than as its ore of bauxite, offers countries a higher value-added product, increases export revenue and fosters domestic manufacturing industries [70]. Here there is an impressive story of People's Republic of China who officially considers itself as the Global South country, and at the same time hosts an impressive global dominance over most of the world's rare earth refining capacity [71]. These materials remain necessary for electronics, aerospace industry and variety of other technologies including medical devices and robotics [72]. From the perspective of the Global South, supply chain efficiency decreases in the short term and increases in the long

term. So, there is a clear return on investment in matters like semi-processed metals and underground mining excavating minerals deposits. On the other side many mineral-rich countries face difficulties to charge sufficiently high mining rents from the foreign multinational companies, impose government regulated quality, adoption of knowledge and local capacity building [73]. There are also hurdles against local downstream processing and supply chain efficiency so that revenue sources generated this way can be truly used for the sustainable development of their own societies. However, this transition must be managed carefully, as domestic mining and processing itself introduces new environmental burdens, such as increased energy consumption and chemical runoff [74]. Therefore, the sustainability of mining and local processing depends on whether a nation can implement green industrialization, upgrading its technical capacity to mitigate the pollution generated during the manufacturing stage.

4. Urban Sustainability and Resilience in the Global South

Sustainable development of cities is particularly striking topic in the growing seminal literature on urban sustainability. Namely, approximately 90% of forecasted population growth between 2018 and 2050 is supposed to happen in cities of the Global South [75]. Most of such conurbations have vast peripheries without reliable public traffic connectivity, unresolved decent housing, drainage water and sanitation issues and so forth. These urban centers experience compounded pressures from rapid urbanization coupled with inadequate infrastructure. Wild nature mimicking solutions, such as green architecture with rooftop gardens use principles of biophilia and biomimicry to integrate living elements into buildings to improve human well-being [76]. Coupled with capillary water management these breakthrough changes in the mainstream architecture, are able to enhance overall urban resilience. Good cases for exploration are success stories related to advanced waste management technologies and solar or wind energy exploitation. It literary means easier access to services, electricity, warm water and reduced ecological footprints [77]. To a limited extent such organizational innovation may as well empower socially excluded groups, in spite of pressures of poverty and limited institutional capacity. In this sense, collaborative governance frameworks might play a crucial role enabling cities to align their local growth with the national climate goals [78]. Architectural planning strategies should inevitably prioritize marginalized citizens living below poverty line, such as indigenous communities, to ensure inclusivity and long-term resilience.

Urban sustainability concept is targeted to build up socioeconomic and environmental security in these cities with as little burden to the future generation as it may be feasible. Despite this noble cause, everyday reality across a broad spectrum of Asia, African and Latin American LMICs economies, means that relicts of modern economy with its vast exploitation of fossil fuels and destruction of natural habitats across climate zones, will be strongly felt at least until the end of 21st century [79]. Furthermore, most of unmet needs takes place in the Global South while the seminal literature including current research is heavily biased towards the cities of the wealthy post-industrial Global North and its own needs [80].

5. Climate Change and the Legacy of the Global North

From a historical perspective, the majority of existing sustainability concepts and even development goals [81] were born in academia and policy makers' agendas of wealthy, industrialised countries. To the significant extent, these same concepts and goals do not cover the unmet needs of cities in developing countries. Typically, high-income nations sustainability emphasis remains with environmental pollution and its attributable global warming [82]. On the contrary, LMICs governments are still overwhelmed with widespread poverty, inequalities, social injustice and female discrimination. For example, in many federal states of India (Haryana, Punjab, Rajasthan, Uttar Pradesh and Madhya Pradesh) authorities have to place substantial effort to prevent gynaecologists from telling pregnant patient families the gender of the baby due to widespread female foeticide, which has deep cultural and societal roots [83]. On the other side, early adolescent pregnancies and childhood marriages are widespread throughout Sub-Saharan Africa. In countries such as Niger, Chad, Central African Republic, and Mali this count exceeds 50% of all marriages and is likely to remain so deeply into the 21st century [84].

Furthermore, Global North with its cumulative legacy of several consecutive industrial revolutions is responsible for a lion share of climate change worldwide. During the mega scale industrial development of Western Europe since 1740s and to even larger extent in Russia since 1860s, and USA since 1790s, these Global North nations heavily relayed on fossil fuels, primarily coal and oil and vastly deforested their own lands [85]. This growth was paid with huge cost of air, rivers and ocean pollution, suffering of natural habitats and extinctions of hundreds of wildlife species in these lands [86]. Firmly grounded evidence points out to the Global North economies being responsible for the majority of cumulative carbon emissions since 1850, such as the case of USA alone contributing ~25% of historical CO_2 emissions [87]. Yet at the same time, in this regard innocent low-and-middle-income countries, particularly the least developed ones with their huge populations, have to struggle with

consequences of climate change such as intense heatwaves, droughts, floods, and wildfires substantially affecting agriculture and crops harvest [88]. Furthermore, Kyoto protocol and Paris Climate Accords demand from the giant nations of the Global South such as India, China, Brazil, Nigeria, Indonesia, Pakistan, Mexico to sacrifice the pace of their economic development by decreasing the role of fossil fuels and fostering green agenda [89]. These two hailed diplomatic victories in favour of combat against climate change, and remain the leading international consensus agendas to tackle climate change under the United Nations Framework Convention on Climate Change (UNFCCC). Yet, at the same time the Global North nations, imposing these duties to the world governments, are directly responsible for current state of affairs in environmental pollution and current global warming phenomenon [90]. Here a variety of legal issues are being open, with evolving jurisprudence to various objections to human rights-based approaches to environmental protection. Among others such critics refer to the human rights-based framework's anthropocentrism and difficulties to address transboundary harm [91]. Typically, this is the case where large-scale mining and ore exploration causes harmful consequences in neighbouring states. In case of Danube, pollution reflects to the ecosystems of twelve European countries alongside its river basin [92]. Constant failure to challenge the economic law instruments highlights the lack of opposition to policies and market structures that incentivize activities causing pollution, resource depletion and environmental damage [93].

After the adoption of The Paris Climate Accords at the UN Climate Change Conference (COP21) in Paris, in December 2015, transnational climate litigation has become a widespread phenomenon, casting courts as crucial players in multilevel climate governance [94]. Typically, these processes consist of civil lawsuits taken by the communities or organizations based in one country bringing legal cases against corporations or governments of another country, holding them accountable for contributing to the regional climate or environmental harm [95]. Yet the vast majority of climate litigation cases focuses on jurisdictions across the Global North [96]. The rising Global South's contribution to transnational climate jurisprudence continues to contribute meaningfully to global climate governance. Furthermore, it will ensure just outcomes for the most climate-vulnerable nations and marginalized indigenous communities worldwide.

6. Public Health, Climate Vulnerability, and the Political Economy of Sustainability in the Global South

Against this broader backdrop, the public health landscape of the Global South reveals how deeply the region's developmental constraints are anchored in structural inequalities that extend well beyond the health sector. Public health outcomes do not arise in isolation. They are embedded in the same historical configurations of postcolonial governance, resource extraction, and asymmetric integration into global markets that have shaped environmental vulnerability and institutional fragility [97]. As with other domains of sustainability, the distribution of health risks mirrors long-standing hierarchies of power, exposure, and decision-making authority at both national and international levels. Thus, the health profile of the Global South must be approached not simply as a catalogue of epidemiological trends but as a window into the deeper political-economic architecture that governs the region's developmental possibilities [98].

This becomes evident in the enduring coexistence of infectious diseases with rapidly rising non-communicable conditions. Regions such as Sub-Saharan Africa and South Asia continue to confront heavy burdens of malaria, tuberculosis, undernutrition, and waterborne illnesses, even as they undergo a swift epidemiological transition driven by urban expansion, precarious labour regimes [99,100]. These dual burdens are the cumulative product of a development model that expanded markets and production without building social infrastructures capable of safeguarding basic wellbeing as seen in rising urban slums, healthcare workforce shortages, and insufficient public investment [101,102]. Demographic pressures, high fertility rates, and uneven gains in gender empowerment further compress already limited fiscal and administrative capacity, reinforcing the constraints that hinder progress toward the SDGs [103]. The challenges faced by health systems thus mirror the broader structural tensions that define state capacity across much of the Global South.

Climate change intensifies these dynamics by amplifying pre-existing vulnerabilities. Countries across the Sahel, South Asia, the Caribbean, and Central America encounter disproportionate exposure to extreme heat, vector borne diseases, water scarcity, and climate-induced migration, despite bearing little historical responsibility for global emissions [104]. These impacts unfold within contexts already marked by debt dependence,externally-imposed fiscal austerity, and limited adaptive resources. Air pollution and ecological degradation, often driven by unregulated industrial activity and fossil fuel dependence, further illustrate how the burdens of environmental harm fall most heavily on poorer and politically marginalized populations [105,106]. The geography of climate risk therefore closely tracks the geography of historical and economic disadvantage.

Health system governance itself reflects these structural inequities. Chronic underinvestment, often falling below 3% of GDP, is closely tied to decades of externally imposed policy regimes that constrained the expansion

of essential public services [102,107]. The COVID-19 pandemic revealed the brittleness of these systems, from inadequate supply chains to uneven access to diagnostics and therapeutics, while simultaneously spotlighting the resilience of community networks, social solidarity initiatives, and local adaptation [108,109]. These experiences underscore the extent to which health system fragility is bound to larger political-economic structures that shape state autonomy and developmental agency.

Social determinants of health reveal persistent inequalities rooted in the political economy of daily life. Gender-based disparities, insecure housing, informal labour markets, and limited social protection reinforce patterns of exclusion and expose millions to heightened vulnerability [110]. Rapid urbanization, often unfolding within neoliberal development regimes, has produced extensive informal settlements where inadequate water, sanitation, and healthcare infrastructure create enduring areas of epidemiological risk [101]. These spatial patterns of marginalization echo the broader territorial inequalities that characterize development across the region and hinder realization of SDG 3 3 ("Good Health & Wellbeing").

Ecological degradation adds another layer to this political-economy of vulnerability. Deforestation, mining, large-scale agriculture, and wildlife exploitation, often propelled by global commodity chains and multinational investment have generated environmental conditions conducive to the emergence of zoonotic disease [111–113]. Zoonotic outbreaks from Nipah to COVID 19 illustrate how globalized economic activity reverberates through ecosystems to produce human health threats. Thus, the integration of 'One Health' and 'Planetary Health' frameworks is not only advisable but essential. These approaches offer analytical tools for understanding the deep interconnections between public health, ecological stability, and economic governance [107].

Integrating public health into the broader sustainability discourse is therefore essential for revealing the deep structural drivers of vulnerability. Health inequities in the Global South are not anomalies but the predictable outcomes of a global order that distributes risks and benefits unevenly. Without transforming these underlying political-economic foundations and prioritizing South-South cooperation, inclusive governance, and local knowledge systems, efforts toward sustainability may simply perpetuate the inequalities they seek to redress [97,114].

7. Sustainable Finance and Investment in the Global South

Due to prevailing public discourse, there is rapidly growing awareness about the global warming phenomenon among the ruling elites and the popular masses alike. This creates the need to derive politically legitimate and economically feasible solutions to tackle climate change. For emerging markets such as the BRICS+ and even more so for the other less advanced developing economies, such task may be exceptionally difficult. This is the fact due to a lack of financing, increasing debt accumulation and parallel need to cope with wide spectrum of unresolved domestic socio-economic concerns [115].

National monetary and financial authorities across the governing authorities of the developing countries should have the central role in addressing sustainability risks and scaling up sustainable lending and investment [116]. Furthermore, there is a growing need across the LMICs to mobilise domestic financial resources through the capacities of the local banking systems and capital markets and channel them into domestic investments [117]. To a certain extent, foreign direct investment may be attracted in some economy sectors. Revolution in digital technologies, including artificial intelligence drive software applications may as well be used to develop new, creative fundraising approaches [118]. Success of such AI driven individual approach to potential investors, was already proven in the success of Global South tourism hotspots direct advertising worldwide [119]. Alongside with rich cultural and ethno-geographic heritage they have to offer, many of these countries became top tourist destinations exceeding many high-income economies of the North. The most famous examples are Mexico, Brazil, Kenya, South Africa, Thailand, United Arab Emirates, Malaysia, Egypt, Morocco and so on.

Large body of seminal literature indicates existence of a substantial financing gap in the emerging markets and wider developing countries [120]. This inherent weakness, largely inherited from the colonial era, is unlikely to be overcome in a matter of a few decades. Yet the most successful and largest among these economies, are likely to get it much milder as we approach 2050. Ability of BRICS+ countries (Brazil, Russia, India, China, South Africa, Egypt, Ethiopia, Iran, Indonesia, Saudi Arabia, and the United Arab Emirates) to meet the Sustainable Development Goals and Paris climate goals to a significant extent, will likely remain well ahead of the average low- and middle-income economies [121].

8. Renewable Energy and Its Contribution towards GS Resilience

A convenient area of the Green Economy investment is renewable energy being widely considered one of the pillars of sustainable development. This is the industry which is well known for its support by the global banking sector [122]. Also, it is of the fastest growing industries in many regions of the world, South and North

alike [123]. Renewable energy is considered as a critical sector for building resilience of the LMICs national economies. This is even more the case with rural and remote populations inhabited far away from their wealthy coastal and industrial regions [124]. Investment in off-grid solar and wind technologies being distributed energy systems provide reliable power supply to rural areas [125]. At the same time, they substantially reduce greenhouse gas emissions. Across the Mediterranean and most of Middle East region, roof top solar panels heated water used for cooking and household needs, has become a dominant form of energy supply [126]. These regions are located in or near the subtropical high-pressure zone, which leads to clear skies and minimal cloud cover and therefore experience an abundance of sun light year-round [127].

There are a few examples of exceptional success stories in this regard, where wind turbines and solar panels have been widely used in a vast array of regions with sufficient insolation hours annually. Morocco's Noor Ouarzazate Solar Complex is one of the world's largest solar power stations. It includes Concentrated Solar Power (CSP) plants, photovoltaic capacity (PV) and uses molten salt storage, which allows the plant to generate electricity even after sunset, helping with grid stability [128]. Morocco's national goal is to provide more than 50% of its electricity coming from renewables until 2030. Chile's Cerro Dominador as a flagship project in Latin America for solar thermal energy, is a hybrid plant combining CSP and PV in the Atacama desert [129]. This complex also adds thermal storage capacity so electricity can be supplied more reliably beyond daylight hours. Brazilian national projects such as Osório Wind Farm in Rio Grande do Sul with its capacity of ~318 MW shows large-scale wind deployment. However, most of Brazil's explosive growth in distributed solar systems refer to "mini" or "micro" generation up to ~5 MW in homes and businesses contributing in total with ~41 GW total PV capacity by early 2024 and more than 2.6 million PV systems connected [130]. At the other end of the spectrum, undisputed champions of clean energy growth in the Global South remain China [131] and India with their coupled wind and solar capacities estimated at ≈ 1,408 GW and ≈ 162.6 GW respectively [132]. Unsurprisingly, China dominates nearly every stage of the solar PV global supply chain, holding production shares of ~92% of polysilicon, ~99% of wafers, ~89–92% of solar cells, and a large share of modules [133]. Chinese solar module exports consisted of about 220,000 MW (220 GW) of solar modules, and its module exports make up roughly 80% of global solar exports [134]. ASEAN countries of South-East Asia, dominated by Vietnam, Malaysia and Thailand cover almost the entire remaining of global export-oriented solar panel industrial output, with almost negligible manufacturing capacities and Eastern Europe and Western countries [135]. To sum up, climate commitments offer opportunities to create jobs, bolster energy security, and foster equitable economic growth. Despite these promises, challenges in terms of renewable energy sector development, related to the funding access and the dominance of fossil fuel driven economy, remain widespread across the LMICs of the Global South [79].

9. Perception of Globalization as Neocolonialism and the Role of Multinational Corporations

Across many regions of the Global South there is almost widespread perception of Globalization as we witnessed it since the end of Cold War era, as a form of neocolonialism [136]. It is hard to resist this impression because large diversity of multinational companies had exceptionally high success rates throughout the previously nicknamed Third World countries [137]. This was the documented case in heterogeneous economy branches ranging from textile and fashion industry to tourism, and from pharmaceuticals and medical care to electronics technology and car manufacturing [138]. The economic principle standing behind this success was a huge capital and technological supremacy of the Global North coupled with affordable, decently educated labour force. Furthermore, there is long-standing issue of economic sovereignty, global inequality, and the power imbalance between Global South countries and multinational corporations (MNCs) [139]. Namely, the vast majority of LMI Countries in the South face structural, political, and economic constraints that limit their ability to impose strong protective legislation and financial barriers against exploitation by the large and powerful foreign businesses. There are several underlying reasons for this inherent vulnerability [140]. First of them are economic dependence, debt pressure and heavy reliance on foreign direct investment (FDI), loans from the International Monetary Fund or World Bank coupled with their export-oriented economies. Such an economic system feeds policy makers' reluctance to implement tough regulations which could possibly trigger capital flight [141]. Frequently the rules of debt servicing obligations often assume conditionalities such as privatization and market deregulation. Second issue are Investor-State Dispute Settlement (ISDS) Mechanisms which means that some bilateral investment treaties (BITs) or free trade agreements, allow multinational corporations to sue states in international arbitration if newly adopted laws harm their own profits in a target country [142]. Therefore, many governments fear litigation and serious financial penalties for enacting environmental or tax laws. The third factor is mostly exceptionally weak bargaining power of a single Third World country against exceptionally wealthy MNCs whose Enterprise Value (EV) or Market Capitalization can range within billions of USD [143]. MNCs capacity to threaten to relocate

workplaces, their factories or hotels, outsource, or lobby for exemptions is usually hard to compare with the host country hosting their services [144]. Convenient examples are Apple® Inc. whose Enterprise Value (as of 2025): ~$3.7 trillion (approx., includes debt—cash) exceeds entire annual GDP (Gross Domestic Product) of UK (as of 2024) valued at ~$3.5 trillion while Amazon®'s Market Capitalization of ~$2.3 trillion+ is roughly equal to annual GDP of Canada (2.3 trillion) while exceeding Italy (2.2 trillion) being G7 members. To make it even more impressive Nvidia® as a leading global manufacturer of semiconductors and Artificial Intelligence (AI) related hardware has approximate market capitalization of ~$4.5 trillion in October 2025 which is roughly equal to that of Germany as second ranked Western economy by size (~$4.5 trillion in 2024 nominal terms).

Fourth condition shaping these relationships among the national states across the South and global MNCs are their own political elites. Namely, local leadership frequently experiences benefits from MNC investments, creating conflicts of interest. Due to implicit or explicit corruption taking place, enforcement of protective laws becomes problematic, even when they really do exist in a local context [145].

Last but not least, fifth cause is related directly to the World Trade Organisation practices and various free trade agreements which often limit protectionist measures, tariffs, and subsidies [146]. Official adoption of such free trade agreements (such as NAFTA in case of Mexico or EU Accession market regulation conditions in case of non-EU candidate countries) restrict the tools which LMIC countries may use to protect their infant industries or regulate imports [147].

There are examples of rather successful and unsuccessful combat of national states of the Global South against MNC interests on both sides of the spectrum. Some cases of countries that undergo substantial exploitation despite regulation are: Congo (DRC) being rich in cobalt and minerals, but exploited by MNCs with low wages, environmental damage, and tax avoidance. India, Pakistan and Bangladesh have strong garment industries which generate significant export income but rely on low-paid labour, weak labour laws, and unsafe working conditions [148]. Several prominent states in Latin America conduct their lucrative agribusinesses of soy breeding, palm oil extraction and mining which often displace Indigenous communities despite environmental protection laws [149]. On the other end of spectrum there are cases of clearly successful resistance in terms of defending national sovereignty by bold moves: Bolivia and Ecuador during the 2000s renationalized their energy sectors and defied IMF policies despite political pressures [150]. India acting as a global hub for software and generic pharmaceuticals manufacturing has imposed digital sovereignty banning foreign applications [151] and strong domestic pharmaceutical regulation. At the same time South Africa succeeded to achieve The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) waivers with the World Trade Organization (WTO) during COVID-19 pandemics to access vaccine patents [147]. In ASEAN countries South-East Asia, Indonesia as the largest nation in the group, banned raw mineral exports to force domestic processing, The country succeeded to stood firm despite being successfully challenged by both the European Union at the WTO [152].

10. Globalization Caused Environmental Degradation and Disrupted Climate

There is almost consensus opinion in the seminal literature that the processes that accompanied globalization have had tremendous impacts on the environment worldwide [153]. Gradual and mostly irreversible changes to natural habitats, coupled with environmental degradation have raised awareness of the negative impact of disrupted climate [154]. It took a few human generations to clearly understand, that efforts towards conservation and restoration of the environment, and the protection of biodiversity are essential for human communities and their economic productivity. The leading UN legislation in this area was provided by the Convention on Biological Diversity (CBD) signed at the 1992 Rio de Janeiro Earth Summit [155]. The most recent legal framework is presented by the "High Seas Treaty" a new, legally binding international agreement under the United Nations Convention on the Law of the Sea (UNCLOS) on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction, or BBNJ Agreement, signed in New York in 2023 [156].

We may observe at least a few prominent cases of globalization attributable negative environmental impact of disrupted climate in the Global South's LMICs.

Amazonia's Trade-Driven Deforestation is probably the most widely renown example [157]. It may be hard to believe that from 2000 to 2018, Amazonia lost about 513,000 km² of native forest in total, within the jurisdictions of Brazil, Peru, Colombia, Venezuela, Ecuador, Bolivia, Guyana, Suriname, and French Guiana [158]. During the first decade of 21s century (2000–2010) Argentina's own subtropical and biodiverse Misiones jungle, lost ~15.9 million hectares (i.e., ~159,000 km²) to deforestation [159]. Although not all of Amazon deforestation is driven by global export trade, a large fraction is tied to commodity production such as soy, cattle, timber supplying both domestic Latin American and international overseas markets. Cattle ranching remains the largest single direct driver with

about ~78% of commodity-driven deforestation in many parts of Amazon between 2017–2022 [160]. Cropland expansion and cultivation is the second ranked cause and also of utmost importance [161].

Rising global demand for agricultural commodities such as Argentinian beef, soy, palm, rare species of tropical timber used in architecture and furniture manufacturing, has led to large scales of forest conversion [162]. Jungles and subtropical forests are cleared for pasture or cropland to supply international supply chains mostly established by the globalization trade routes [163]. Consequences include loss of wildlife [164] and its biodiversity, increased carbon emissions, disruption of local rainfall patterns, soil degradation and ultimately increased CO_2 release into the atmosphere [165]. Besides direct there are indirect, downstream impacts such as increased air pollution by smoke, particulate matter originating from factories and traffic [166]. These small inhalable particles travel by wind over vast distances, harming human health in terms of respiratory, cardiovascular and oncology diseases [167].

Indonesia, with its huge population size continues to have one of the highest deforestation rates in the world [168]. In her case ecosystem losses are clearly driven by global demand for palm oil, pulp & paper, and few other commodities [169]. Forests replaced by palm tree, natural rubber, coconut, coffee, tea and sugarcane plantations [170]. All of this intensive agriculture is directly tied to export-oriented trade [171]. The consequences are huge loss of wildlife species; local climate changes in terms of rainfall, humidity, peatland fires that release massive amounts of CO_2, social and health impacts on indigenous communities and increased greenhouse gas emissions [172]. Last but not least, Indonesia is prominent as the world's largest illegal markets for smuggling of wildlife species both as a source country and a transit route for trafficked species [173].

Emerging economies and LMICs macroeconomic dynamics are largely driven by investment climate, trade and technological advances. In this sense the "green-growth" economic development policies, largely preferred by the globalizing forces, regard Green Agenda as most suitable way to cope with climate disruption [174]. Certainly, the experience of a vast social experiment since the end of Cold War era in 1991, has proved that the globalization of economics brought about certain aspects of the globalization of law. The currently evolving process across the Global South nations is globalization of environmental law. It is supposed to address the integration of the ecological and economic processes by analyzing the contribution of emerging and developing economies [175].

11. Radical Sustainability and Alternative Pathways for the Future

Widely present misconception amongst academia and policy makers alike, is the one that historical growth in the South should converge to the idealised Global North "model" [176]. This is deeply wrong given the fact that the entire legacy of LMICs in the South is substantially different alongside with complexities in geography and their societal hierarchies [177]. Therefore, specific solutions have to be found to meet their unique sustainability issues and concerns.

Sustainable development of thriving Global South cities is supposed to be crucial for creating resilient and equitable urban environments [178]. Observing the worldwide landscape, such a perspective is visible from Kario, Egypt in the west to Manila, Philippines in the east and from Lahore, Pakistan in the north to Buenos Aires, Argentina in the south.

Innovations and technologies such as clean energy, are set to play a key role in sustainability transformations across the LMICs. Popular wisdom means that radical transformation to a more socially and ecologically sustainable society will be necessary to impose an endurable and lasting change. Yet, perspectives on sustainability transformations and how to reach them vary greatly. Leading Global North circles put green growth and technological innovations for decarbonisation and biodiversity conservation on top of their agendas [179]. Yet, alternative understandings of innovation and technology are gaining ground [180]. This is particularly the case in response to the question of whether economic growth can be decoupled from CO2 emissions and material consumption [181]. At its core, decoupling means that an economy is growing without increasing its environmental footprint. This typically happens in two stages: first, through efficiency gains, where the economy grows much faster than its pollution; and ultimately, through total reduction, where the economy expands while overall emissions actually fall. Current literature evidence claims that such decoupling might indeed be possible as it appears to have been done to a large extent by certain national economies [182].

A growing body of evidence indicates alternative perspective on sustainable innovations emerging from post-development and post-growth movements in the Global South [183]. These perspectives might be in the opposition with the prevailing Western perception of sustainable development being heavily reliant on technological optimism and innovations for profit [184]. Such movements challenge the idea that economic growth as measured by GDP and industrialization is the universal path to progress, and instead advocate for alternative ways of living, rooted in local knowledge, ecological sustainability, social justice, and cultural diversity [185]. Core hypothesis

behind post-development theory is that "Development" itself, is a Western construct, used to control and shape the Global South [186]. Its protagonists such as Gustavo Esteva (1987), Wolfgang Sachs (1992), Arturo Escobar (1995) and others, firmly believed that development or "the myth of progress" [187] devalues local cultures, economies, and indigenous knowledge systems, replacing them with Eurocentric, capitalist, and technocratic models. Essentially, this concept challenges the idea that all societies should follow a linear pathway from "tradition" to "modernity" through economic growth, industrialization, and globalization [188]. This alternative understanding is based on principles of conviviality, pluriverse and grassroots to create a more sustainable and inclusive society [189]. Some of the prominent examples are Gandhian village economy movements of India with its emphasis on local self-reliance and non-industrialization; Indigenous Andean concept of "living well" in harmony with nature occurring in Bolivia and Ecuador and Zapatista movement of Mexico which clearly rejected neoliberal development, promoted autonomy and indigenous governance [190]. This social theory is firmly coupled with a variety of so-called Post-Growth or Degrowth Movements in the Global South. Typical representatives are India's Ecological Swaraj or grassroots democracy with its local control of resources and degrowth activism; Senegal's Eco-villages movement with its sustainable living, traditional knowledge and local governance [191]; Brazilian Landless Workers Movement (MST) conveying agrarian reform, food sovereignty and rejection of agribusiness-led growth [192] and ultimately Indonesia & Philippines born anti-extractivist coalitions with their firm opposition to mining and mega-projects destroying local livelihoods [193].

All of these historical and contemporary social phenomena clearly indicate that despite the prevailing economic growth model, there are alternative visions of future for the Global South [194]. There is growing support for moving away from traditional top-down aid models toward approaches that respect local knowledge, reject colonial mindsets, and build partnerships among Global South nations [195]. Given its huge diversity of cultural fcontinents, reconciliation with the past and successful development pathway is needed for all together. As historical experience has taught us, all attempts to impose foreign models of development, throughout either imperial or globalization led projects have caused a variety of local resistance movements. Therefore, Global South countries should exchange knowledge and complement their capacities through strengthening of South-South trade and exchange, alongside traditional South-North connections. Each single one of these societies contributes with a beautiful and unique cultural legacy to the world's heritage. We should put every possible effort to preserve this diversity and convey it to our descendants, as our ancestors were doing for us for so many centuries.

The transition toward localized and post-growth models is articulated as a strategic countermeasure necessitated by the current anti-globalization era. As traditional Northern-led trade paradigms undergo significant fragmentation, the strengthening of South-South cooperation serves as a mechanism for institutional decoupling. This structural evolution allows the Global South to mitigate inherent center-periphery vulnerabilities and establish a resilient framework for public cooperation grounded in endogenous conditions rather than externalized Northern models. By transcending a narrow sectoral perspective, this paper offers solutions for systemic transformations required to secure Global South coutnries' economic sovereignty within a shifting global order. Sustainability in the Global South requires moving away from extractive global models and advancing development pathways that prioritize ecological resilience, social equity, and long-term economic autonomy. Examples such as smart agriculture and waste remediation technologies show that meaningful progress depends on strengthening locally driven innovation rather than relying on the passive adoption of Northern models. When GS countries invest in their own innovation systems instead, they challenge the external pressures that shape what sustainable development is supposed to look like and open space that serve their own social and ecological priorities. Furthermore, future research should adopt decolonial methodologies that move beyond Western GDP and sustainability metrics to embrace localized indicators of well-being and Indigenous Knowledge.

Author Contributions

M.J. has created research questions, proposed a study design and wrote an early manuscript draft. However X.Z., A.M., M.K. and A.C.U. have all contributed to multiple manuscript revisions for important intellectual content fulfilling ICMJE conditions for full authorship. All authors accept and share responsibility for the manuscript's final appearance. All authors have read and agreed to the published version of the manuscript.

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Use of AI and AI-Assisted Technologies

No AI tools were utilized for this paper.

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