Horizon Scanning: Mitigating Climate and Resource Risks Through Strategic SDG Planning

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Introduction to Climate Risks and SDG Planning

To date, global greenhouse gas emissions have risen to an unprecedented level, according to the United Nations Environment Programme, which records 57.1gTEq of CO_2 equivalent on 2023 own-road operations, a 1.3 cent increase over 2022. The worrisome trend calls for immediate measures such as the transformation of energy systems, industrial processes, and frameworks for the management and use of resources. The Sustainable Development Goals (SDGs) offer a roadmap informed by a common view of the world that needs to be guided by better core principles of climate action, SDG 13, and affordable clean energy, SDG 7, to ensure that such navigation and leadership achieve greater equity and development. This paper discusses the use of horizon scanning as a method of systematic anticipation of new climate and resource challenges and how this can contribute to strategic SDG planning at national and regional levels. We highlight through real-country data of key emitters like India, Brazil, Nigeria, and Indonesia how emissions reduction and sustainable development can be done simultaneously [4].

Horizon Scanning as a Strategic Climate Tool

Climate crisis and limited resources pose a new challenge never before encountered by development planners. The global warming is currently around 1.55 °C above the pre-industrial level, and the year of 2024 has been the hottest year on record. Acting sustainably by 2030 means cutting global emissions down by 43 percent – 1.5°C comes about in just seven years, by 2050. Yet, horizon scanning shows that there are structural barriers: 26 percent comes from the power sector, 15 percent from transport and 11 percent from agriculture and industry. Such interlinkages across sectors require an integrated approach to planning, in which reducing emissions and managing resources are treated as one system instead of separate interventions.

Access to energy is still at the heart of sustainable development. 97 percent of the world's population now have access to electricity, but this has stalled in certain parts of the world, and 2.1 billion people still do not have access to clean cooking technologies. A major challenge for the major emerging economies is to combine these two goals; increased access with de-coupled growth. The power sector example of India, for instance, has reached 42% capacity of renewable energy and biomass in the power sector but with developmental pressures, coal dependency still continues. The dynamics of energy transition in Brazil are also of the same kind; deforestation pressures are found in the Amazon, while renewable federal expansion is happening.

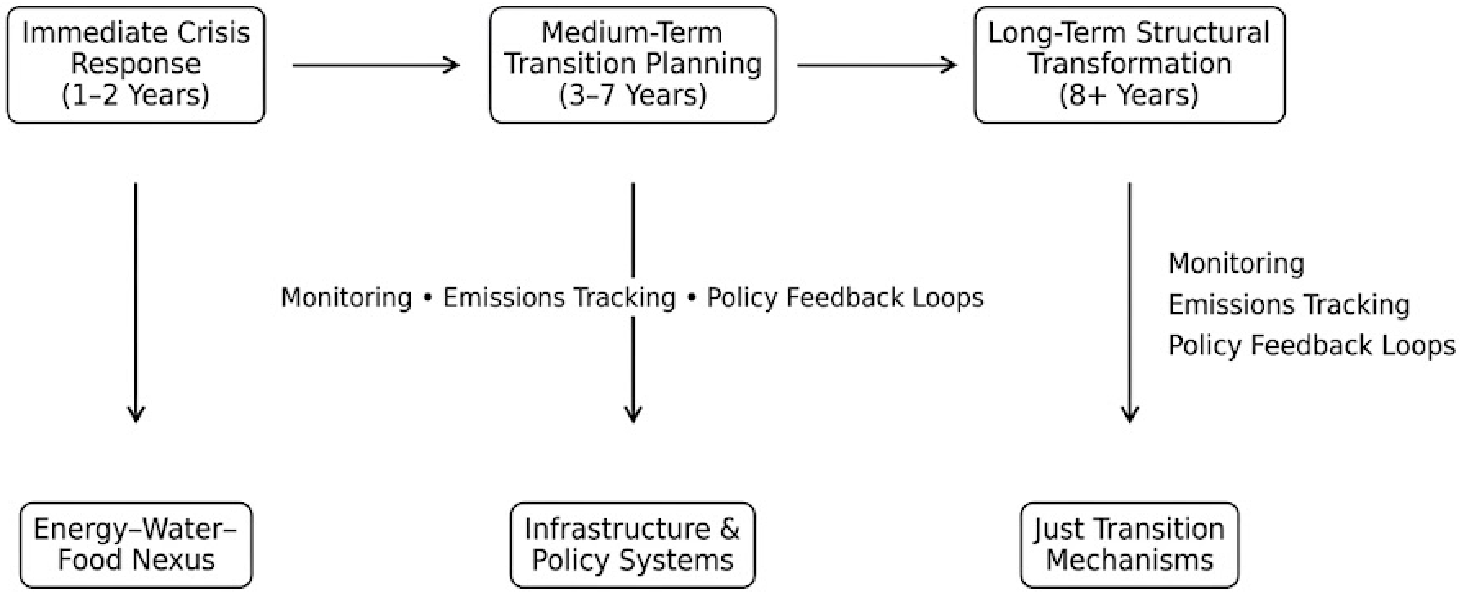

Figure 1: Strategic SDG climate planning framework

This is reflected on the interwoven architecture of connecting horizon scanning to SDG implementation (Figure 1). Three-time horizons are captured by the framework: immediate crisis response (1-2 years), medium-term transition planning (3-7 years) and long-term, structural transformation (8+ years). Feedback loops/interactions incorporate monitoring emissions, depletion of resources, and adaptation in policies [3]. There are key nexus areas, such as energy-water-food systems, infrastructures and just transition mechanisms geared toward benefitting the vulnerable (Table 1).

Table 1: Emissions, renewable energy capacity, and clean energy investment in major emerging economies (2023-2024)

Country	GHG Emissions ($Gt\ CO_2eq$)	Renewable % of Generation	Clean Cooking Access (%)	Clean Energy Investment ($B/yr)
India	3.8	42%	68%	~10.0
Brazil	0.62	65%	92%	~7.5
Nigeria	0.52	10%	19%	~1.8
Indonesia	0.68	12%	56%	~3.2

Note: Data compiled from EDGAR 2025 Emissions Database, IEA Electricity Statistics 2024, and World Bank Global Electrification Database. Clean cooking access reflects SDG 7.1.2 progress metrics; renewable capacity percentages indicate share in total electricity generation mix.

Heads up in favour of the future: strategic SDG planning should build in horizon scanning to contingencies of resource scarcity or climate changes, so that they do not jeopardise development achievements [1]. In emerging markets, the vulnerability clusters around three areas: water stress (mainly in Sub-Saharan Africa, South Asia), agricultural productivity in the face of climate variability, as well as coastal exposure (mainly in China and the Middle East). Current energy and climate policies are projected to see renewables account for only 21-23 per cent of total final energy consumption by 2030, which is further short of 1.5°C alignment but represents a big step up from the current 18.7 per cent. This path will need concerted efforts to ramp up renewable power generation in tandem with energy demand-side efficiency measures, but energy efficiency did not make the required strides, holding steady at just 0.8 percent annual contribution growth in 2021.

Emerging Economies and Climate Transition Challenges

Nigeria is one of these nexus challenges. Having electrification demand growing by 223 million people, Nigeria will need to keep expanding the network while deploying renewable energy. Clean cooking access is at 19 percent which is one of the lowest in the world. Nigeria's horizon scanning should include concerns around renewable investment (currently about $2 billion per year, which is not enough to achieve climate and development goals); (4) grid resiliency in the face of extreme events; and (5) just transition pathways for fossil fuel reliant communities. These must not be considered in isolation as policy sectors but must be integrated thematically into a broader resource planning model that seeks to model ecological carrying capacity, economic multipliers and distributional equity.

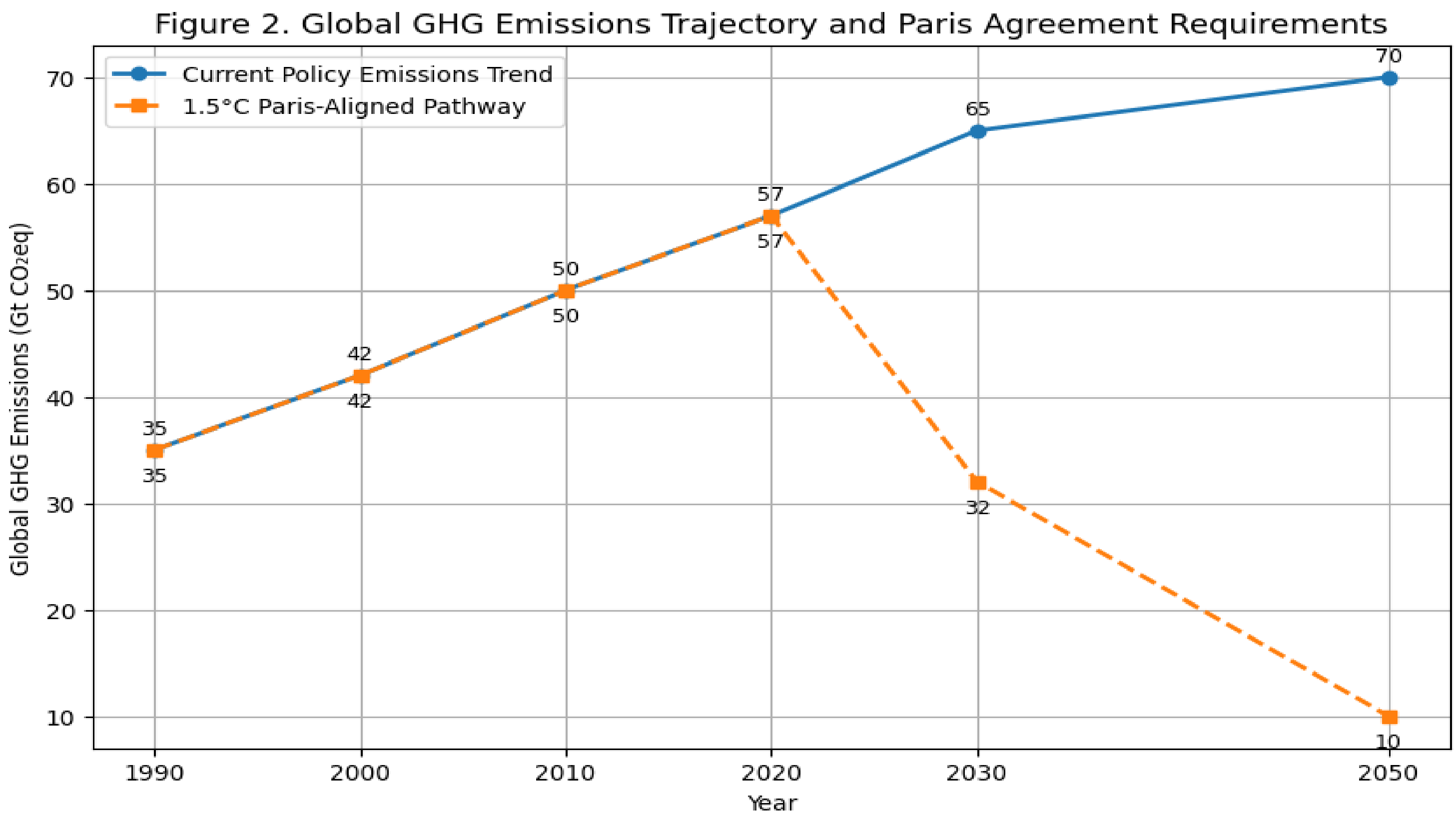

Figure 2: Global GHG emissions trajectory and Paris agreement requirements (1990-2050)

Figure 2 compares the current trends in emissions pathways (projected 14% increase in emissions by 2030 with no policy changes) and 1.5°C aligned requirements (43% cut in emissions by 2030). The only two years when emissions were not growing were 2009, due to the financial crisis (5.2% fall) and 2020, during the COVID-19 pandemic (temporary 5.2% fall) but they recovered as fast as the restrictions ended. The chart highlights that the global community of voluntary climate pledges – expected to cap warming at around 2.7°C – needs to be significantly stepped up. Most importantly, it presents the sectoral reductions that are necessary to make: the power sector needs to decarbonize by 70-80% by 2050, transport by 55% and industry by 65%.

Integrated Climate and Resource Planning Framework

The current climate finance is still highly misaligned with the needs of developing countries. So far, developed countries have pledged $100 billion every year by 2025 for climate action in developing countries, but have fallen short. A recent analysis shows that global climate finance flows have seen strong growth in recent years, totaling $1.3 trillion a year on average in 2021-22, up 63 percent from 2019-20, but much of this comes in the form of private climate finance which focuses on renewable energy and e-mobility in middle-income countries. Adaptation finance is of vital importance to mitigate the impacts of climate change on vulnerable populations and only equates to $63 billion per year, below 5 per cent of total climate finance flows. SSA and least developed countries continue to be poorly funded, reinforcing the paradox that those who are responsible least for the emissions are the ones who are impacted most.

Through horizon scanning it is recognised that this inequity will be exacerbated by resource constraints without targeted policy action. In business-as-usual climate scenarios, 5.7 billion people will be affected by water stress by 2050, mostly in Asia and Africa where farming jobs still make up a large proportion of all jobs. Climate variability poses a risk to the improvements in the area of food security (SDG 2 Zero Hunger) and to poverty reduction (SDG 1 No Poverty). Competition for land use between food production and energy crop cultivation (for biofuels), as well as carbon sequestration forests and urban expansion will increase, especially in the Congo Basin, Brazil and Indonesia. If a strategic SDG planning process is developed there needs to be explicit trade-off scenarios between ecological sustainability and immediate livelihood needs, and social protection measures need to be built into the planning to guard against incorporation of adjustment costs by communities.

Figure 3 shows the difference between renewable energy capacity additions (in GW and fraction of electricity generation) and clean energy investment flows for India, Brazil, Nigeria and Indonesia. The graph displays major differences: India has 42 percent renewables (mainly solar and wind power) with ~$10 billion in clean energy investment per year, Brazil has 65+ percent renewables, with the majority coming from hydro and an increasingly significant role played by wind and solar, Nigeria has <$2 billion in annual clean energy investment and 10 percent renewables, despite being blessed with enormous potential, while Indonesia has the world's third largest solar resource and 12 percent renewables. These dissimilarities signify as well policy commitment differences as capital availability differences. The graph highlights the importance of three key factors that need to work together for the velocity of the clean energy transition: investment volume, policy certainty and institutional capacity to implement.

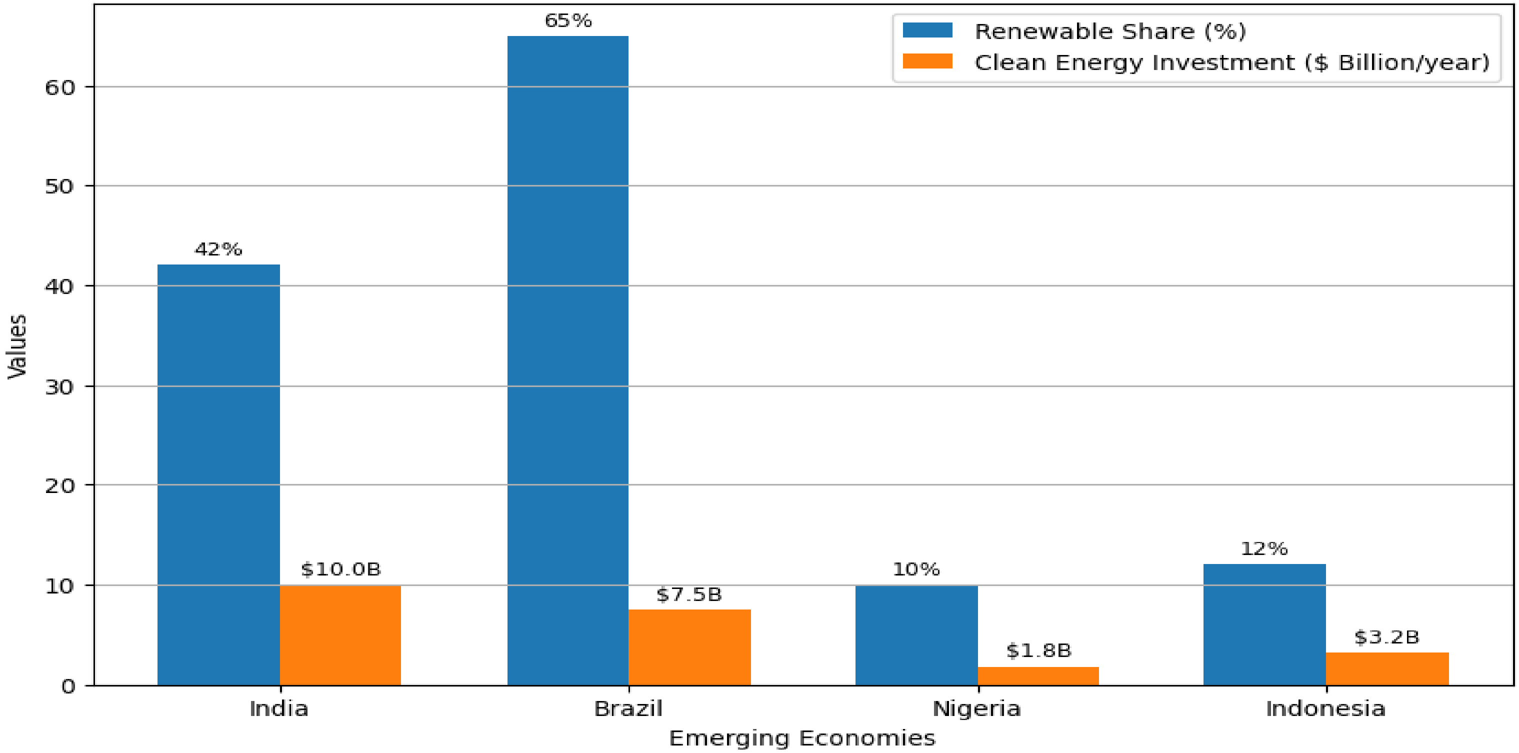

Figure 3: Renewable energy capacity and clean energy investment allocation (Top Emerging Markets)

Climate Finance Gaps and Equity Challenges

There is a need for institutional mechanisms to integrate social equity, the economy, and climate science in effective horizon scanning. Climate champions like Denmark, Sweden and Norway have their own climate bodies that connect scientific facts to the mandatory sectoral reduction targets, which are reviewed on an annual basis. These mechanisms incorporate adaptive management - if progress is not made, the policy tools are automatically activated without waiting for political consensus. At a wider scale, successful SDG-aligned planning for adaptation planning has four components – (1) participatory foresight processes that involve those most affected in identifying adaptation priorities; (2) nexus analysis that ensures the adaptation of both water, energy and food systems, without creating further unintended consequences; (3) transition financial mechanisms, which provide workers and people whose livelihoods rely on fossil fuel sectors with similar financial support; and (4) dynamic monitoring systems that update what should get done as new climate science emerges.

In countries where integrated planning is in practice, progress has been demonstrated to move faster. The 42 per cent target for renewable energy capacity by 2030 in India is no mere coincidence, but the result of thoughtful policy stacking, with renewable energy auctions driving down investment costs, grid codes enforcing renewable integration and green hydrogen projects putting in place future ready infrastructure. The renewable share was brought to the fore by the constant promotion of the use of hydroelectric power and biofuels and, recently, the expansion of wind and solar energy sources. Such transition pathways can be found even in resource-poor settings, as evidenced by Indonesia's growing electrification coupled with decentralised renewable energy deployments, such as the 15MW solar battery project in using the energy from the sun to power electricity in Indonesia, specifically in East Sumba. In contrast, Nigeria's renewable transition delays, in spite of its huge solar capacity resources (5.25 kWH/m2/day), are associated with the multiple challenges of limited financing, institutional fragmentation and competing fiscal priorities, which can only be addressed with support from the international community, in combination with strengthening domestic governance.

Strategic Imperatives for NDCs 3.0 and SDG Acceleration

These three strategic imperatives arise from horizon scanning analysis in looking to 2030 and beyond From an NDCs 3.0-country climate plan perspective, this means that the next round of commitments, to be submitted to the UN Framework Convention on Climate Change by 2025, needs to set out a path for the sectors, setting more demanding targets, and embedding annual review processes as well as clear financing plans. Current NDCs predict 2.7°C of global warming, which still reflects a lack of ambition and horizon scanning shows that 0.1°C global warming induces cascading vulnerabilities, including a worsening of extreme weather, glacier melting and subsequent loss in water security (impacting 2 billion people) and coral bleaching (impacting 1 billion people dependent on seafood). Second, global clean energy investment needs to triple to achieve SDGs 7 targets and Paris Agreement commitments and financing arrangements should specifically focus on least developed countries, where they receive only 5-7 percent of climate finance flows. For the $100 billion a year that has been pledged for developing countries, it has not been fully realised and new finance streams—like international climate finance facilities, carbon pricing revenues and Nature-based solutions financing—must be made to work and made to work quickly [2]. Third, forward-thinking climate planning must include just transition from the beginning, as certain regions of the world, including in India, Indonesia and South Africa, are reliant on coal jobs and need 15–20-year transition periods with equivalent income opportunities before fossil fuel phase-outs.

Horizon Scanning for Sustainable Development

The science is clear: horizon scanning is proof that lower action costs will increase as delay to climate action continues and adaptation opportunities will contract. For every year of deferring emissions reduction, the amount of subsequent emissions reduction and the resulting economic disruption of increases. Strategic SDG planning puts this knowledge into action, where climate action is not seen as a limitation of development but as its basis. Efficiency dividends that are lost in the current expansion of energy access, agricultural intensification, and growth of resilience-enabling infrastructure will be harvested if countries link those three actions. This 2030 Agenda offers the pathway; horizon scanning offers the sense of urgency. The only way to speed up the implementation at the required rate outlined by science and equity is if the governance system can do it.

Data sources: All figures and tables integrate datasets from the EDGAR Emissions Database (EC-JRC), IEA/IRENA energy statistics, World Bank electrification metrics, and UN SDG Indicators databases, accessible at unstats.un.org, iea.org, and irena.org. Country-level analyses draw from national climate action plans, energy ministry reports, and World Economic Forum Energy Transition Index assessments.

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