Monitor Deloitte.

MUMBAI CLIMATE WEEK

Climate in the Global South:
Advancing innovation and collective action

February 2026

Future Confident

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Foreword by the Hon'ble Chief Minister's Office, Government of Maharashtra

Climate change is one of the most pressing challenges of our time, demanding urgent action from governments, businesses and civil society alike. The Government of Maharashtra recognises that climate change is not a distant threat but a present reality with profound implications for economic stability, livelihoods and the well-being of our people. Hence, it is time for decisive action to tackle climate change and enable our society to become more climate resilient.

As the host of Mumbai Climate Week, the Government of Maharashtra, along with MMRDA, BMC, and Majhi Vasundhara, has played a pivotal role in conceptualising the inaugural edition. The Climate Week is designed to serve as a key platform to amplify the challenges and priorities of the Global South, showcase innovative, scalable solutions that promote equitable and inclusive growth, and elevate the diverse voices shaping the climate agenda. Mumbai Climate Week, 2026, which centres on food systems, the energy transition, and urban resilience, is taking place at a crucial juncture in the global climate agenda. India, as the world's fastest-growing major economy and the engine of global economic development, must play a central role in demonstrating how climate action and economic progress can advance together.

As the state with the highest GSDP in India and home to a dynamic and diverse economic ecosystem, Maharashtra recognises that sustainable food systems, equitable access to clean energy, and climate-resilient cities are not merely environmental priorities – they are central pillars of long-term economic stability and social well-being. Climate resilience in Maharashtra is therefore intrinsically linked to our development agenda, influencing how we produce and distribute food, power our industries and communities, and plan to make cities more liveable.

The Government of Maharashtra has undertaken several impactful initiatives to strengthen these pillars in recent years, guided by a holistic approach that integrates mitigation and adaptation.

This includes support for the adoption of clean, renewable energy; the advancement of sustainable agricultural practices that protect livelihoods and natural resources; and forward-looking urban planning frameworks designed to withstand heat stress, flooding, and other climate-related risks. These interventions are rooted in the belief that economic growth and environmental stewardship can reinforce one another to improve quality of life, enhance productivity, and expand opportunity. Home to a vibrant startup ecosystem, the Government of Maharashtra is also committed to nurturing innovative technologies and business models centred around climate change and sustainability, thus enabling them to scale up and amplify their impact.

While government action is indispensable, addressing climate change requires collaboration among all stakeholders. Collaboration not only unlocks new technologies and financing models, but also ensures that climate strategies are socially inclusive, contextually relevant and responsive to on-the-ground realities. Only through such collective effort can we accelerate climate solutions and mobilise capital to build resilience where vulnerabilities are most significant.

This Monitor Deloitte thought leadership highlights the urgent need for climate action in the Global South and showcases innovative climate solutions across the themes of food systems, urban resilience, and the energy transition. It highlights the critical role of private capital, scientific innovation, and multi-stakeholder collaboration in addressing climate challenges, particularly in the Global South. We recognise the contributions of Monitor Deloitte, Project Mumbai and the stakeholders who helped shape this report. We hope that this report will deepen awareness of the climate challenges facing the Global South and inspire stakeholders to work together to build a more sustainable, equitable and resilient world for present and future generations.

Shri Devendra Fadnavis
Hon'ble Chief Minister,
Maharashtra State

Host agencies:

Foreword by Monitor Deloitte

Climate change is no longer a distant or abstract risk. It is now a defining challenge shaping the global economy. Its impacts are already disrupting economic systems, undermining livelihoods, and placing sustained pressure on societies worldwide. The risks associated with climate change are particularly severe for developing and emerging economies, collectively referred to as the Global South. Home to most of the world's population, these countries are expected to drive global economic growth in the decades ahead. Yet this growth is unfolding alongside persistent structural challenges, including gaps in infrastructure, income, health and social protection. At the same time, the Global South is disproportionately exposed to climate-related hazards, including heat stress and water scarcity, as well as floods and extreme weather events that are increasing in both frequency and severity. These overlapping pressures heighten vulnerability and limit communities' and economies' ability to absorb and recover from climate shocks. Strengthening climate resilience across the Global South is therefore not only a social and environmental necessity, but also a fundamental economic and development imperative.

Addressing climate change requires interventions in both mitigation and adaptation. Mitigation aims at avoiding further damage, while adaptation focuses on coping with existing damage. Most climate action efforts focus on mitigation, particularly in the Global North. Yet the Global South, which bears the brunt of climate impacts, also requires adaptation in equal measure. The Global South, therefore, requires responses to climate change tailored to its contexts.

This report examines climate risks and opportunities through three themes central to the agenda of Mumbai Climate Week 2026: food systems, urban resilience and energy transition. Under food systems, the report examines challenges across the value chain of food production and distribution, including green financing as an enabler. Under urban resilience, it analyses climate-driven extreme heat and associated productivity losses. The energy transition underscores the importance of renewable energy and expanding access to electricity. Overall, the report highlights the materiality of climate change for the Global South, outlines key challenges across these themes and identifies innovative solutions with the potential to deliver long-term, scalable impact.

Our search for solutions is guided by their ability to be deployed at scale, replicated in local contexts and to meaningfully improve the lives of the most vulnerable. We also assess how well these solutions can financially sustain themselves and achieve scale through partnerships. We have found that innovation can emerge through multiple lenses. These include technology, implementation, delivery mechanisms, governance and financial models. Importantly, these solutions demonstrate the economic case for climate actions.

Deloitte is committed to supporting the Global South on its journey towards sustainability and resilience. We are proud to serve as the strategic knowledge partner for Mumbai Climate Week 2026. We believe this platform offers an opportunity to spotlight the urgency of climate resilience, share practical insights and promote cross-sector collaboration. Through our expertise, industry experience and understanding of climate-resilient business models, we aim to guide stakeholders in enabling enterprises and communities to grow economically while strengthening their capacity to withstand climate impacts.

We sincerely thank Project Mumbai, the Thematic Partners and contributing stakeholders from across the globe who are at the forefront of climate action. Their insights, expertise and on-the-ground perspectives have played a key role in shaping this report. We hope it deepens the understanding of the Global South's growing importance to the world economy and the urgency of empowering it to navigate a changing climate. Addressing climate change is complex, particularly for regions facing developmental and resource constraints. Yet with a shared vision, coordinated policy action and sustained collaboration among public, private and community stakeholders, progress at scale is possible. We hope that Mumbai Climate Week demonstrates what is possible and spurs further innovation in climate action.

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Executive summary

Climate change is among the most pressing challenges facing the world today, posing systemic risks to communities, ecosystems and economic growth. Current emissions trajectories place the world on track for 2.3–2.8°C of warming by 2100. Despite more than a decade of climate commitments, net-zero pledges and increased adoption of clean technologies, global CO_2 emissions have increased by 13 percent since 2010. Climate-driven physical risks, which undermine health, productivity, infrastructure and supply chains, are intensifying over time through self-reinforcing feedback loops. The economic consequences are profound: climate change could result in US$178 trillion in global economic losses between 2021 and 2070, according to *Deloitte's Turning Point report*.

Climate risks as well as opportunities are concentrated in the Global South, which, excluding China, is home to 63 percent of the world's working population and contributes 20 percent of the world's GDP. By 2050, the Global South is projected to account for over 35 percent of the global GDP. While most of the world's economic and demographic growth will come from the Global South in the coming few decades, climate change poses significant risks. More than 80 of the world's most climate-vulnerable countries lie in the Global South. Historically, countries in the Global South have contributed the least to global emissions. However, their share has increased steadily over the past century, approaching ~40 percent in 2024. With economic growth in the Global South, the demand for food, urbanisation and energy also increases.

The Global South's path to prosperity differs fundamentally from that of the Global North, and so must its climate response. The Global South cannot afford to rely solely on mitigation and must simultaneously adapt existing and new infrastructure to withstand escalating climate risks. Encouragingly, multifunctional, context-specific solutions are already demonstrating impact across three interconnected themes – food systems, urban resilience and energy transition – where building resilience is paramount. These themes anchor the inaugural Mumbai Climate Week, and this paper highlights innovative solutions under each.

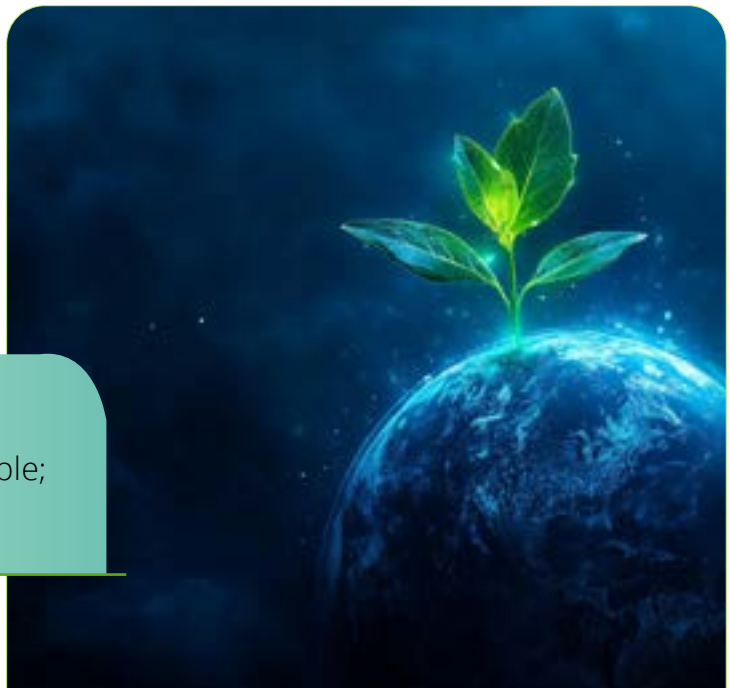
Resilience in food systems can help feed the world sustainably. The Global South has twice the share of freshwater withdrawals for agriculture as the Global North, while cereal yields are half those of the Global North, reflecting a combination of high resource intensity and low technological productivity. To address the challenge of resource intensity, solutions have taken the shape of protected cultivation in India, led by communities and catalysed by the government to enable farming in arid regions. Another challenge is mounting post-harvest loss due to market inaccessibility, which has been addressed through on-farm solar dehydration processing units paired with market linkages in India.

Achieving urban resilience is critical – nearly 70 percent of the world is set to live in cities by 2050. Ensuring livability in cities necessitates combating the urban heat island effect, which has health and productivity consequences. In the Global South, extreme heat leads to productivity losses, with more than five times as many work hours lost due to heat as in the Global North. Communities have adapted to extreme heat through cool-roof initiatives led by the Indian government as part of a wider Heat Action Plan roadmap, supported by NGOs and corporates. In contrast, commercial buildings in Zimbabwe have adopted biomimetic passive-cooling architecture, with the added benefit of reduced cooling energy demand.

The energy transition is non-negotiable; development brings rising energy demand, which renewables must increasingly meet. Energy use per capita in the Global South remains markedly lower than in the Global North, with many Least Developed Countries still facing significant energy access gaps. At the same time, conventional sources still fuel the energy mix. The case of community-led decentralised energy systems in Africa demonstrates how electricity access can be expanded to millions through mini-grids. In Thailand, a public–private–people partnership to decarbonise a hard-to-abate industrial cluster demonstrates how an industrial hub can function as a "living laboratory" for ambitious energy-transition efforts, where the government sets the vision, industries lead initiatives, multilateral institutions support financing and citizens contribute to on-ground implementation.

The cases in the paper present a subset of possible solutions, demonstrating how justice and equity are embedded in innovative, scalable and replicable models. These solutions have generated economic returns, making a strong business case for climate action. Effective climate action mobilises multiple stakeholders, including governments, businesses, communities, the scientific community, multilateral institutions and private capital. When aligned, these stakeholders, they can scale solutions through ecosystems and partnerships, institutional enablement, innovative financing mechanisms and solution design. Governments must take the lead in institutional enablement by setting clear national visions, maintaining long-term policy commitment and creating predictable, business-friendly regulatory environments. The Indian government's ethanol blending roadmap presents a compelling case. Unlocking scale also necessitates financing, particularly in climate adaptation. There is currently a financing gap of ~US$4 trillion annually across Global South countries in achieving the SDGs and Paris Agreement objectives. Businesses, supported by multilaterals, must invest in innovative technologies and scalable business models centred around climate to bridge this gap.

Scaling climate impact now demands a decisive shift: From fragmented, incremental efforts to coordinated action.



As the Global South becomes world's next growth engine, embedding climate actions into economic growth becomes indispensable; it demands scaling up locally led and transformative innovations.

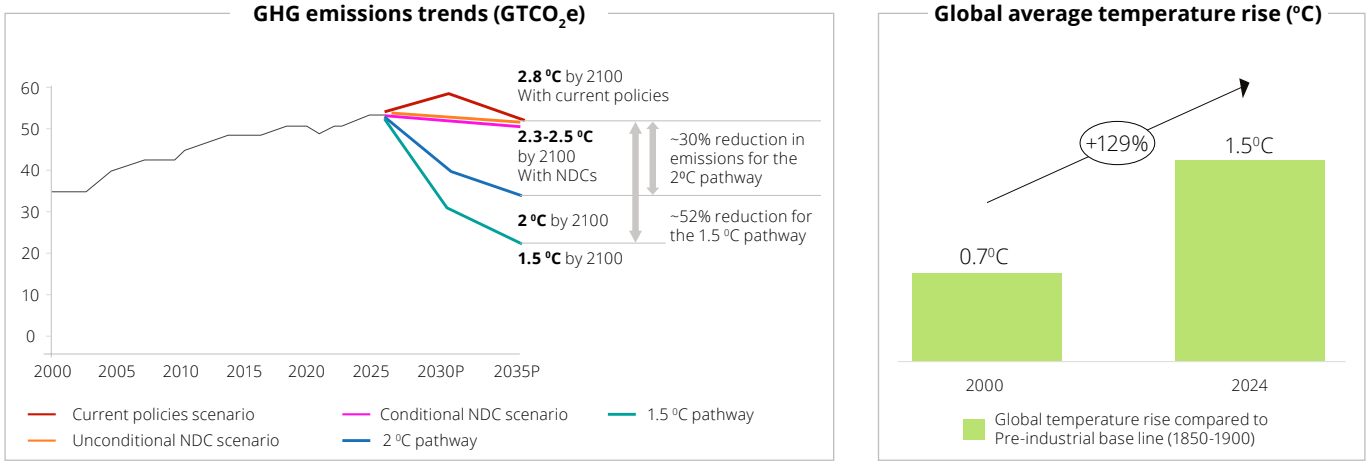
Climate – The most critical issue facing the world today

1.1 The climate reality: A rapidly escalating global crisis

Climate change is a global, systemic challenge affecting businesses, communities and the broader ecosystem worldwide. The increasing frequency and intensity of heat waves, floods and storms are already imposing economic, social and ecological costs across regions and income groups. Global Greenhouse Gas (GHG) emissions reached a record **~57 $GtCO_2e$ in 2024, the highest level on record, representing ~13 percent increase from 2010.** Despite more than a decade of climate commitments, technological cost declines, and net-zero pledges, CO_2 emissions are still on the rise.[1] This reflects a persistent absolute rise in emissions rather than the sustained declines required for climate stabilisation.

EXHIBIT 1

Current emissions put the world on track for ~2.8 ºC of warming by 2100; Current temperature of 1.5 ºC above pre-industrial levels has culminated in extreme rainfall and floods as well as prolonged droughts and heatwaves



Observed changes and impacts

Atmosphere

Heavy rainfall

30%

more intense heavy precipitation events globally compared with the pre-industrial climate

Air pollution

3x

higher global atmospheric black carbon burden than pre-industrial times, thus degrading air quality

Extreme heatwaves

2.8x

more frequent extreme temperature events ccompared with pre-industrial climate

Hydrosphere

Ocean heatwaves

2x

more frequent and longer lasting global marine heatwaves compared with early 20th century

Sea levels

3x

faster rate of rise (3.7mm/year) through 2006-18 compared with the 20th century

Ocean Acidification

30%

Higher acidification in ocean levels since the pre-industrial era

Lithosphere

Wetlands

50%

of coastal wetlands have been lost over the last 100 years

Agricultural productivity

21%

loss in productivity growth globally

Forests and biodiversity

27%

loss in forest cover globally since the pre-industrial age

Source: UNEP Emission Gap Report 2025, IPCC AR6 Synthesis Report- 2023, IPCC Draft report- 2021, European Environment Agency, Earth Science Reviews, International Journal of Climatology (V.45), Our World in Data (Hannah Ritchie – 'The world has lost one-third of its forests, but an end to deforestation is possible'), Deloitte analysis

These emissions trends have translated directly into rising global temperatures. The global mean surface temperature was approximately 1.1 °C higher over the 2011–2020 period than the 1850–1900 pre-industrial baseline.[2] In 2024, the global average temperature peaked at ~1.5 °C above pre-industrial levels, making it the hottest year on record and underscoring how emissions are driving global temperatures higher.[3]

Governments around the world adopted the Paris Agreement to collectively restrict the rise in global average temperature to well below 2°C and pursue efforts to limit it to 1.5°C above pre-industrial levels.[4] However, current commitments and Nationally Determined Contributions (NDC) fall short of this goal. Under existing pledges, global average temperatures are projected to increase by 2.3–2.8 °C over pre-industrial levels by 2100. Therefore, urgent action is required to address this challenge.[5]

The steady rise in temperatures has already triggered a wide range of physical impacts worldwide related to climate change. Regions are increasingly exposed to extreme heatwaves that strain agricultural systems, while intense rainfall and flooding are damaging infrastructure and disrupting communities. Glaciers are retreating at unprecedented rates, water tables are declining, and forests are burning more frequently.[6] These impacts are no longer theoretical; they are quantified, widespread and occurring across every region, with the vulnerable populations disproportionately affected. As these impacts intensify, they increasingly translate into more frequent and severe natural disasters, including floods, storms and earthquakes.[7]

Climate impacts are no longer theoretical; the burning platform is quite measurable, material and already affecting economies and livelihoods.

According to the 2024 Annual Report of the Emergency Events Database (EM-DAT), 393 natural hazard-related disasters occurred globally, resulting in economic losses of US$242 billion in insurance and reconstruction costs, 16,753 lives lost and 167.2 million people affected.[8] These disasters were particularly pronounced across Asia, Africa, and the US. What were once episodic shocks are now recurring disruptions, steadily eroding economic resilience and placing sustained pressure on public finances, businesses, and communities. Economic costs of climate change extend far beyond reconstruction and insurance expenses, manifesting in declining labour productivity due to heat stress, reduced agricultural output and food system disruptions, damage to capital stock and infrastructure from extreme weather events, higher health expenditures and persistent supply-chain disruptions.

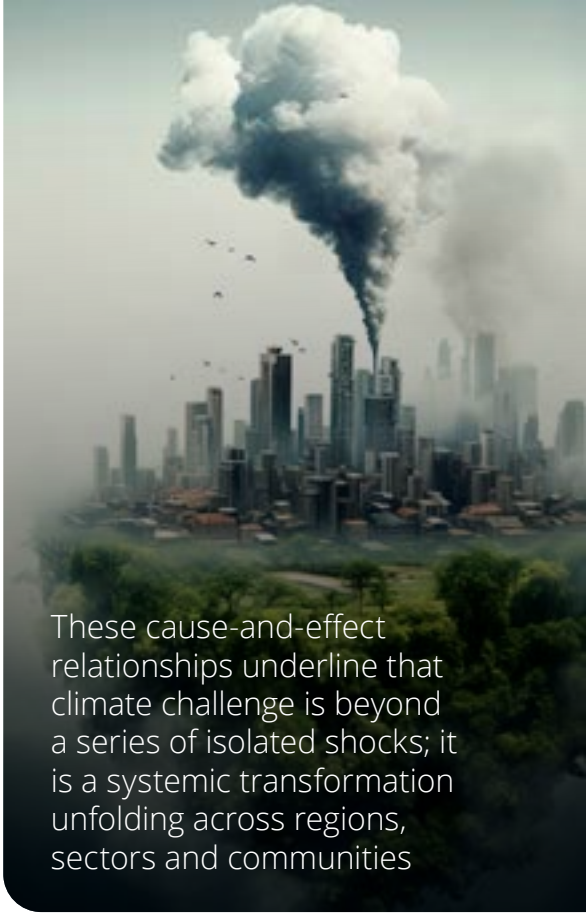
According to Deloitte's The Turning Point Report, unchecked climate change could result in approximately US$178 trillion in global economic losses (in net present value terms) compared with a baseline scenario that excludes climate change. Although timely transition efforts can substantially reduce long-term GDP impacts, near-term economic costs are likely to be higher than previously estimated, even under a net-zero pathway.[9]

1.2 A wicked, systemic challenge with uneven economic trade-offs

While the scale of climate-related physical and economic costs is increasingly recognised, stakeholders, including governments and businesses, often remain focused on the near-term impacts. Understanding the true scale of economic disruption requires moving beyond isolated events to understand the **interconnected drivers, risks and feedback loops** through which climate impacts compound over time.

As climate change intensifies, economic and social impacts increasingly arise not as isolated outcomes but through a **complex web of interconnected interactions** across environmental, economic and social systems. A limited set of underlying drivers, such as continued reliance on fossil fuels, rapid urbanisation and deforestation, gives rise to first-order physical risk impacts, including rising temperatures, extreme weather events and ecosystem degradation. These physical disruptions then cascade into second-order economic and business effects, including reduced agricultural productivity, infrastructure damage, health impacts, labour productivity losses and supply-chain disruptions. Over time, these effects reinforce the original drivers, creating **self-amplifying feedback loops** through which climate risks and economic losses compound. These interconnected pathways link human activities, climate change, business risks and societal well-being, underscoring why climate impacts must be understood as a systemic challenge rather than a series of discrete events.

Unsustainable agricultural practices, for instance, degrade soil health and reduce crop productivity, triggering a self-reinforcing cycle where declining yields push farmers towards even more extractive methods, further accelerating land and ecosystem degradation.

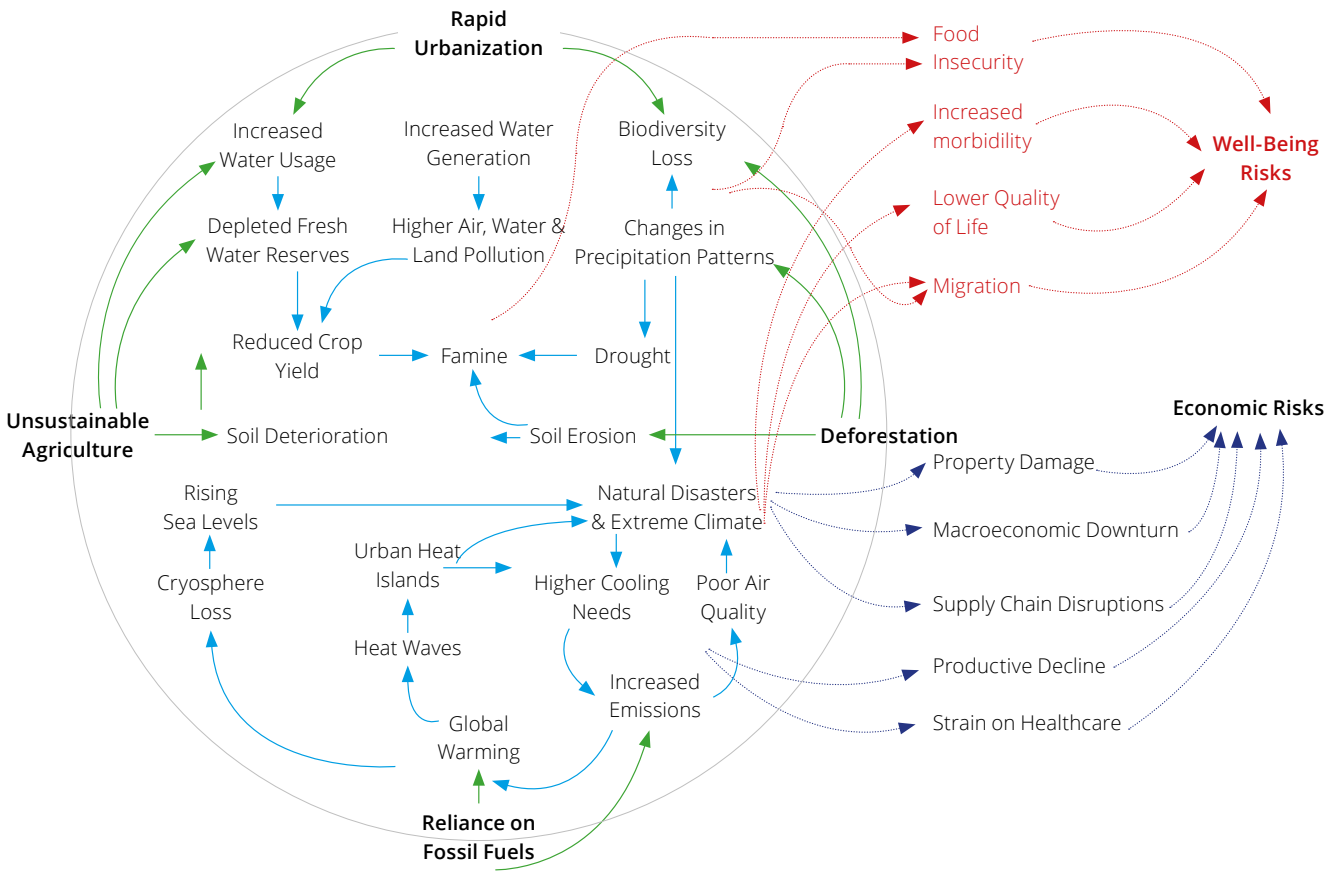


These cause-and-effect relationships underline that climate challenge is beyond a series of isolated shocks; it is a systemic transformation unfolding across regions, sectors and communities

EXHIBIT 2

As climate changes, a complex web of systematic interactions and impacts emerge

Systems Thinking Causal Loop Diagram



Source: The state of climate response in India- Report by Deloitte and Rainmatter Foundation, Deloitte analysis

Given the materiality of climate impacts, it is imperative to focus the study on areas that could move the needle the most. **Energy transition, sustainable food systems and urban resilience** represent the areas where development priorities overlap most significantly with climate action needs. With increased economic activity and growth, the pressure on food systems, urban systems and the energy transition is set to intensify. Hence, the links established under the systemic loop of effects must be addressed together for these themes, so that interventions reduce risk across the whole system rather than shifting it from one part to another.

EXHIBIT 3

While multiple levers exist to address climate risks, the most critical ones emerge around energy, food and urban systems.

Energy transition

Materiality of the theme

~50%
increase in **global primary energy demand** by 2050

~150%
increase in **global electricity demand** estimated by 2050

>60%
contribution of renewable sources targeted by 2050 for Net Zero targets by IEA

~20%
limited **current share of renewable sources** to primary energy requirement

Critical issues in energy transition today...

Unreliable energy supply
An estimated **1.5–2.75 billion** people globally have unreliable access to electricity; these populations are mostly concentrated in the Global South

Investment gaps
US$14 trillion shortfall in investments in global grid infrastructure is expected by 2050

Lack of infrastructure
IEA's net-zero roadmap indicates ~2 million km of grid expansion each year to 2030 is needed to meet NZE Scenario

Energy access & equity
Under current policies, **~645 million people** will still be without electricity by 2030 and 1.8 billion will still rely on polluting fuels and technologies for cooking

Food systems

Materiality of the theme

~25%
GDP Contribution by agriculture in low-income economies

~86%
contribution share towards **biodiversity loss** and deforestation

>60%
increase In food production needed to feed more than 9 billion people by 2050

~70%
the **world's freshwater reserve** is utilised for agriculture

Critical issues in food system today...

Crop yield variability
Climate change has reduced global agricultural productivity growth **by ~21%** since 1961, equivalent to losing 7 years of productivity gains

Water dependency
By 2050, **up to 50% of cropland** could be exposed to very high water-stress, especially in South Asia, the Middle East, and Africa

Food wastage
Roughly **1/3 of all food produced** globally is lost or wasted, accounting for 8-10% of global GHG emissions

Inefficient food distribution
In 2023. **over 733 million** people faced hunger globally, driven largely by distribution failures & climate shocks.

Source: IEA, University of Cambridge, Stanford Energy, World Energy Council, Deloitte Report 2024 "Expanding and modernizing the power grid for a clear energy transition. The Joint Research Centre: ELU Science Hub, WHO, UNEP Food Waste Index Report (2023), IPCAR6, CPI 2025, FAO 2024. UNEP Food Waste Index Report (2023), IPCCAR6. World Bank Ortiz - Bobea Nature climate change report, Deloitte analysis

Urban resilience

Materiality of the theme

~70%
projected **urban population by 2050,** compared to 56% in 2024

~80%
contribution to **global GDP** comes from cities

~15%
of urban population by 2050 projected to be **at risk of coastal flooding** and cyclones

~30%
of global population will be **dwelling in slums** or slum-like conditions in cities by 2050

Critical issues in urban infrastructure today...

Urban heat islands

Cities can be **4-6 ºC hotter** on average than surrounding rural or suburban areas due to UHI effects, with peak differences up to ~10 ºC in some cases

Vulnerability to disasters

Close to **3 in 5 cities worldwide** with >500,000 people are at high risk of one or more natural disasters such as floods, storms, earthquakes, or droughts

Inadequate urban transportation

Globally, **less than half** the world's urban population has convenient access to frequent public transport constraining sustainable mobility options

Inadequate clean water access

Around **1 in 4 people globally (~2.1 billion)** still lack access to safely managed drinking water services, that is, water that is on-site, available when needed, and free of contamination

Energy is a fundamental enabler of economic growth and human development, with a well-established correlation between per capita energy and economic development indicators. Higher-income countries and countries with higher Human Development Index scores typically have higher energy consumption per capita.

Per estimates, total global energy consumption could increase by ~50 percent by 2050 due to economic and population growth, particularly in Asia.[10] Yet today, around 80 percent of global primary energy supply still comes from fossil fuels, and only 20 percent comes from renewable sources, including nuclear energy. According to projections, renewables should account for around 60–70 percent of total energy supply by 2050, to keep warming below 1.5-2 °C.[11] Although renewables and other non-fossil energy sources are scaling rapidly, their growth remains insufficient to keep pace with projected economic expansion while meeting net-zero commitments. Additionally, global grid infrastructure should expand by 2.5x by 2050 to support this energy transition. Globally, energy infrastructure gaps are projected to increase the risk of unreliable power supply and blackouts .

Food systems, encompassing activities across production, processing, distribution, preparation and consumption, are foundational to livelihoods and economic stability, supporting the livelihoods of around 1.2 billion people globally.[12] Yet, they lie at the heart of escalating environmental pressures. Unsustainable practices, including excessive water, chemical use, and cropping can lead to freshwater depletion and soil degradation. Simultaneously, food systems contribute to biodiversity loss as consumers favour a limited set of varieties, thereby narrowing genetic diversity over time. According to the Food Systems Economics Commission's 2024 Report, "The Economics of Food System Transformation," the economic value of human suffering and planetary harm by current food systems is ~US$15 trillion a year.[13] This includes the economic costs of ill health, such as diabetes, hypertension and obesity driven by unsustainable food systems, as well as the environmental impacts, including ~30 percent contribution to global GHG emissions. It also encompasses persistent structural poverty caused by rising food prices and low incomes among food system workers, particularly in developing countries.[14]

Urban resilience is a critical priority for the climate transition, as cities are rapidly becoming the dominant centres of population, economic activity and resource consumption. By 2050, nearly 70 percent of the world's population is expected to live in urban areas, up from about 56 percent today, significantly increasing the concentration of people and assets exposed to climate risks. This concentration of people, economic activity and resource use makes current urban development unsustainable and underscores the need for a fundamental shift in urban planning to create livable cities.

According to the Global Assessment Report on Disaster Risk Reduction (GAR), the direct economic burden of disasters is ~US$180–200 billion annually, but the indirect ecosystem and productivity losses exceed US$2.3 trillion annually and have been growing steeply. **The report also highlights that every US$1 invested in urban resilience can save up to US$15 in future disaster losses, pointing to massive forgone savings when resilience is ignored.**[15] In addition to climate-induced disasters, urban areas are increasingly confronted with challenges, including urban heat islands, deteriorating air quality, insufficient access to healthcare, inadequate transportation networks and limited availability of clean water in some communities, especially for the marginalised. These vulnerabilities drive higher health burdens, productivity losses, and growing inequities in the quality of life for lower-income groups.

Climate in the Global South – Why is this even more important?

2.1 The Global South as a central engine of global growth

As developing and emerging economies across Africa, Asia, Latin America and Oceania began to grow economically, they also faced shared socioeconomic challenges related to development, trade, finance and institutional capacity. Hence, these countries sought a collective voice in global forums to advance common economic interests and cooperation, leading to the broader concept of the Global South as a distinct bloc in global economic and policy discourse.

While the Global South has no single, formal definition in multilateral frameworks, it is used broadly to refer to a diverse group of countries, primarily in Africa, Asia, Latin America and Oceania, that share similar economic characteristics. World Bank refers to the Global South as low- and middle-income countries. The UN Finance Centre for South-South Cooperation (UNFCSSC) formed a coalition of developing countries, known as the "Group of 77" (G77), to promote collective economic interests and South-South cooperation. The coalition currently comprises 134 member states. While China is formally part of the G77, it is often referenced separately as "G77 + China" in UN processes, reflecting China's distinct economic scale within the Global South.[17] The Global North largely comprises high-income economies across North America, Europe, Japan, South Korea, Australia and New Zealand, which broadly share mature economic structures, stronger institutional capacity and more convergent development outcomes.

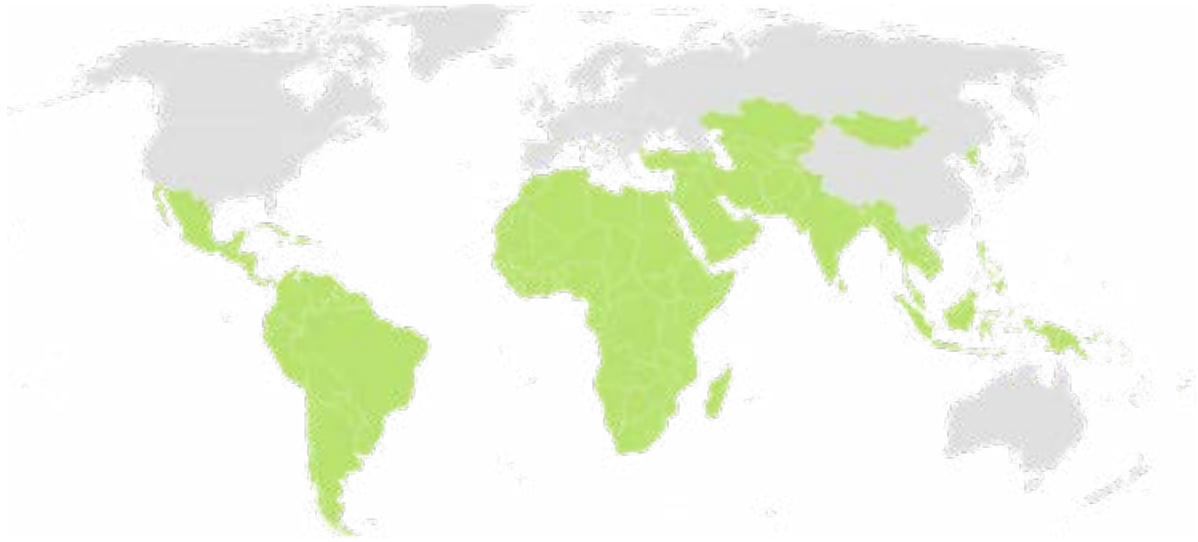
The Global South has become the primary driver of global economic momentum and will play a decisive role in shaping the world's development and climate trajectory over the coming decades. Global South (ex-China) currently accounts for ~20 percent of global GDP.[18] Over successive 10-year periods, the Global South's nominal GDP growth rates have consistently exceeded both the global average and those of the Global North.[19]

Global South economies are expected to maintain a strong long-term growth trajectory, progressively reshaping the global distribution of economic output. According to OECD's long-run economic scenarios (BAU1 case), the share of East Asia and the Pacific in global output is projected to continue rising until the early 2030s, before gradually declining thereafter, after which growth will be driven by South Asia and Sub-Saharan Africa.[20]

Beyond economic output, the Global South accounts for a substantial share of the world's working population, energy resources and industrial activity, underscoring its central role in determining future global growth and transition pathways.

EXHIBIT 4

Defining the Global South



Global South

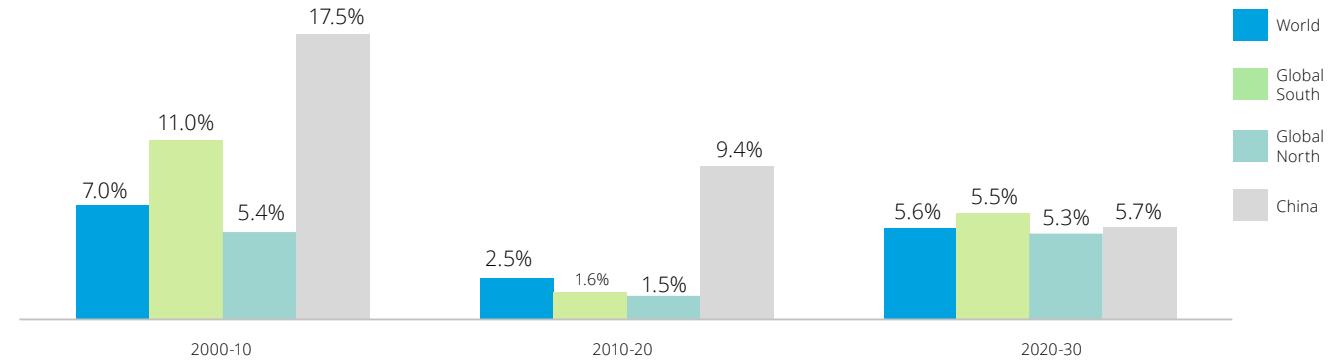
The Global South is poised to drive a significant share of global GDP growth in the coming decades, increasing its contribution from 20 percent to over **35 percent** by 2050.

EXHIBIT 5

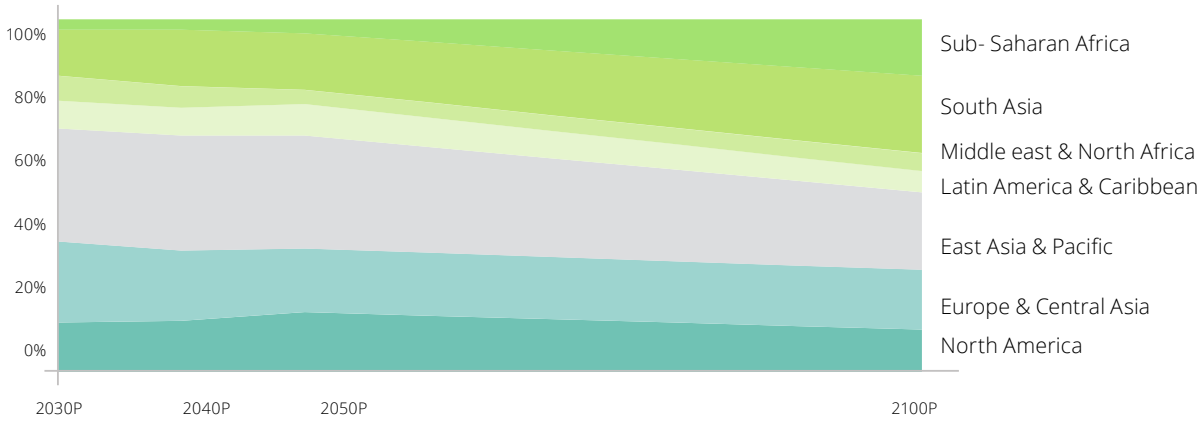
Shifting growth dynamics: The Global South's expanding role in the world economy

Global South is outpacing global growth rates; projected to account for a substantial share of global economic output by the next decade

Historic and projected growth profiles of Global North vs Global South economies (Nominal GDP, CAGR, %)

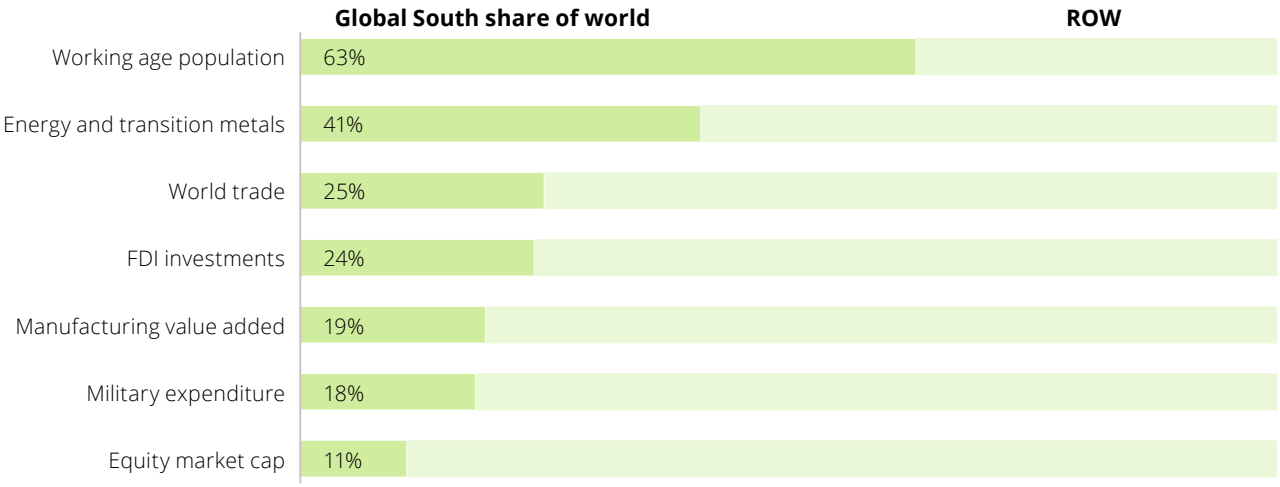


Composition of global output (%)[2]



Global South significance extends across key demographic, resource and economic dimensions, beyond GDP alone

Contribution to global metrics (%)



Note: 1. Impact of COVID19 in the growth rates 2. OECD Real GDP Projections in BAU1 case considered
Source: IMF World Economic Outlook October 2025, United Nations FCFSSC, DB Research, OECD global long run economic scenarios, Deloitte Analysis.

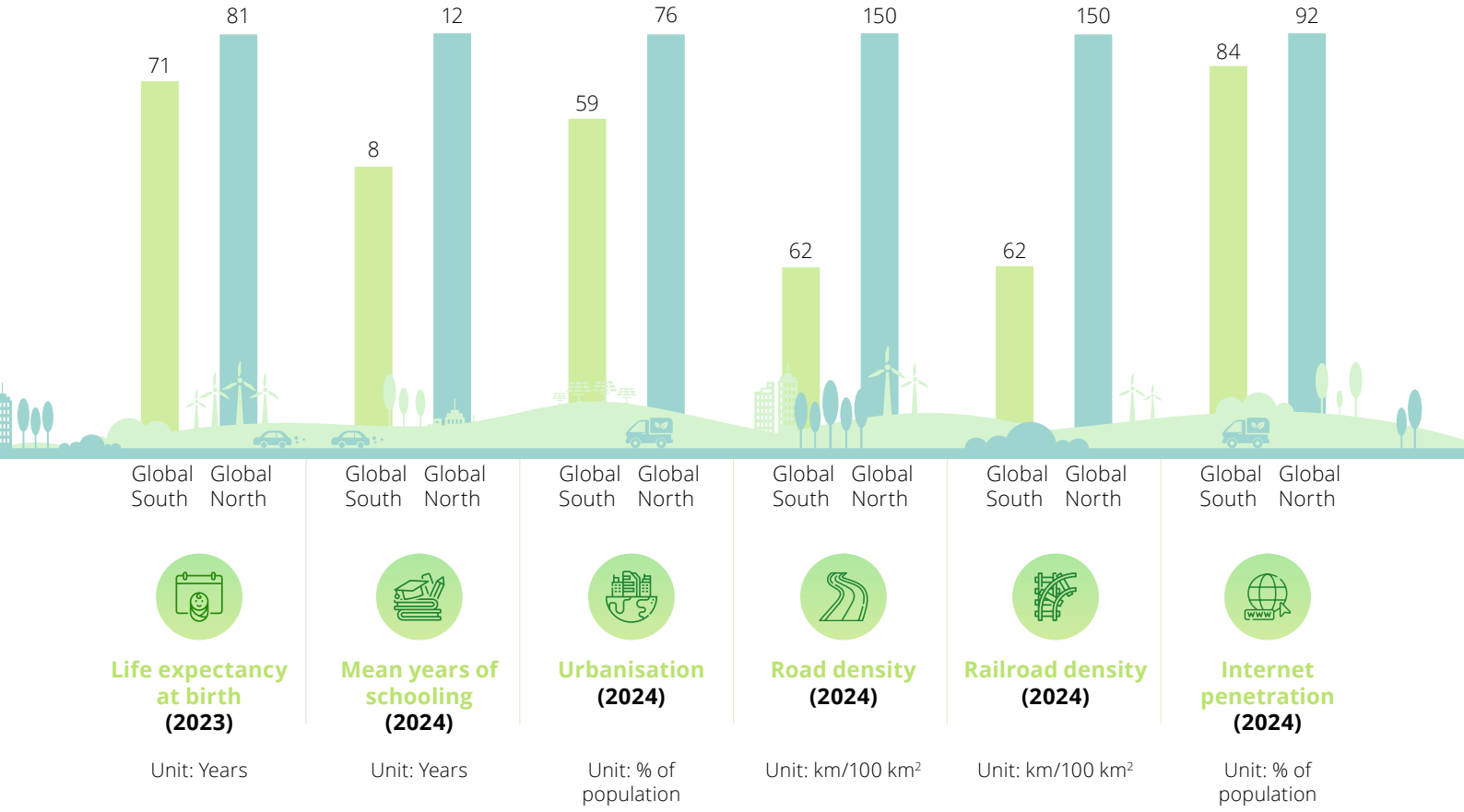
2.2 Significant risk posed by climate change to the Global South

Despite its rising economic significance, the Global South continues to face deep structural gaps in infrastructure and human development. Low- and middle-income countries face an estimated annual infrastructure financing gap of over US$1 trillion, particularly across power, transport, water, sanitation and digital connectivity.[21] Limited fiscal space often forces governments to prioritise basic service provision over long-term productivity or sustainability investments. For instance, nearly 600 million people in Sub-Saharan Africa still lack access to electricity, while large populations across South Asia and Africa remain without reliable water, sanitation and healthcare.[22]

While advanced economies benefit from decades of accumulated infrastructure and near-universal service coverage, many Global South countries face extreme development pressures to expand foundational systems while managing rapid population growth and urbanisation, and responding to rising climate risks.

EXHIBIT 6

Structural gaps continue to shape the Global South's development trajectory



Note: 1. China has not been included in the analysis
Source: World Bank Data, Deloitte Analysis

For emerging economies, these impacts are further compounded by the ongoing development pressures. These countries are simultaneously striving to expand economic opportunities, infrastructure and social services while confronting increasing climate hazards. The result is a **development resilience paradox**: economies exhibit high vulnerability to climate change and low readiness to invest in adaptation that provides coping infrastructure when disaster strikes.

As climate change intensifies, extreme weather events are becoming more frequent and severe, driving growing economic losses, displacement and human suffering worldwide. Economic losses from disasters have increased by about 2.5x over the last 25 years.[23] However, the distribution of impacts is highly unequal. While climate risks are global, **low-income communities and developing countries are disproportionately exposed to their most severe consequences.** Multiple climate–vulnerability indices, including the Climate Finance Vulnerability Index, identify that a large share of the most at-risk countries is in Africa, Asia and Latin America. Around two-thirds of the 65 highest risk nations are in Africa.[24] World Disasters Report estimates that ~90 percent of natural disasters and ~95 percent of disaster-related deaths occur in developing countries.[25]

This high **risk** to developing countries is a result of two levers- **exposure and limited capacity to respond.** These countries have inherently higher exposure to natural extremes, as they lie in **geographically vulnerable zones** such as monsoon belts and tropical cyclone paths, which are prone to frequent floods and cyclones. These economies often **lack infrastructure** such as robust early warning systems, disaster-resistant infrastructure, emergency response capacity and social safety nets, which can reduce the ability to quickly anticipate, absorb and recover from shocks. These vulnerabilities are amplified by climate change.

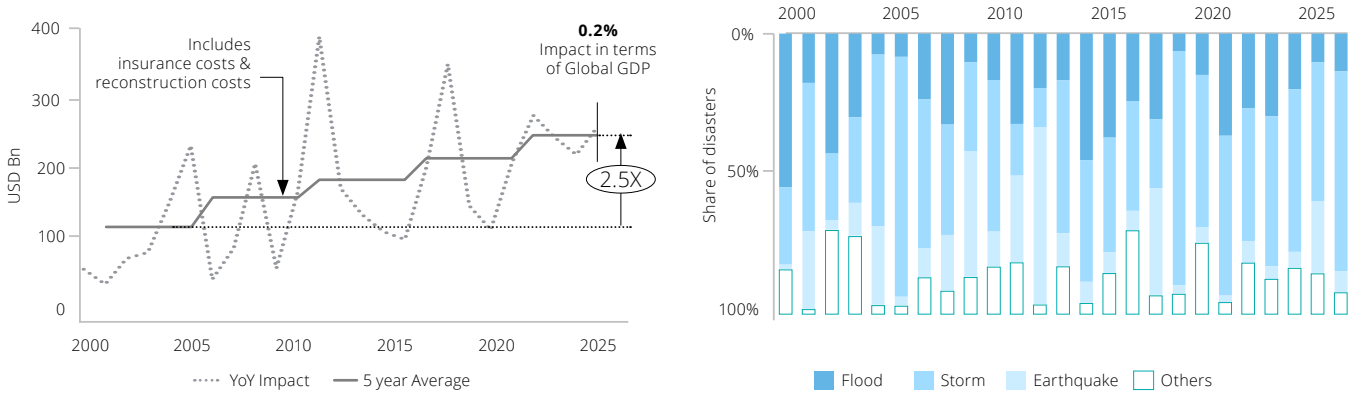
The **impact** of the disasters is also disproportionately high on developing countries. Many Global South economies rely heavily on **rain-fed agriculture and natural resources,** which are directly affected by droughts, floods and other climate extremes, exacerbating food insecurity and economic losses. The ripple effect of **loss of livelihood** is felt in the increasing quantum of Climate refugees.[26] UNHCR estimates that climate-related disasters **displaced ~250 million** people over the past decade, with most occurring in countries highly vulnerable to climate hazards and with limited adaptation capacity.[27]

The Global South faces development resilience paradox: economies exhibit high vulnerability to climate change and low readiness to invest in adaptation that provides coping infrastructure when disaster strikes.

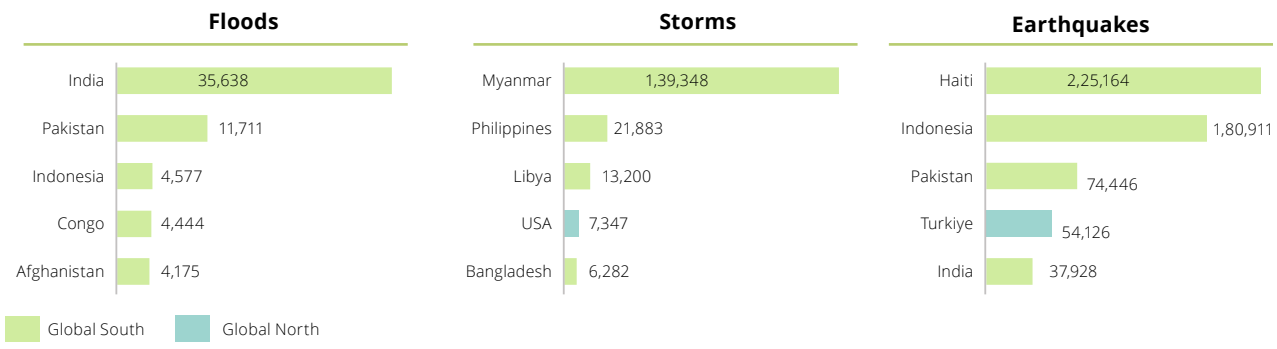
EXHIBIT 7

Economic losses due to natural disasters have grown 2.5x between 2000–2025; Global South countries bear a disproportionate share of the impacts from these disasters

Annual economic losses due to natural disasters globally, US$ billion, and share of impact across disaster types, %



Countries most affected (excluding China), 1999–2024, number of deaths



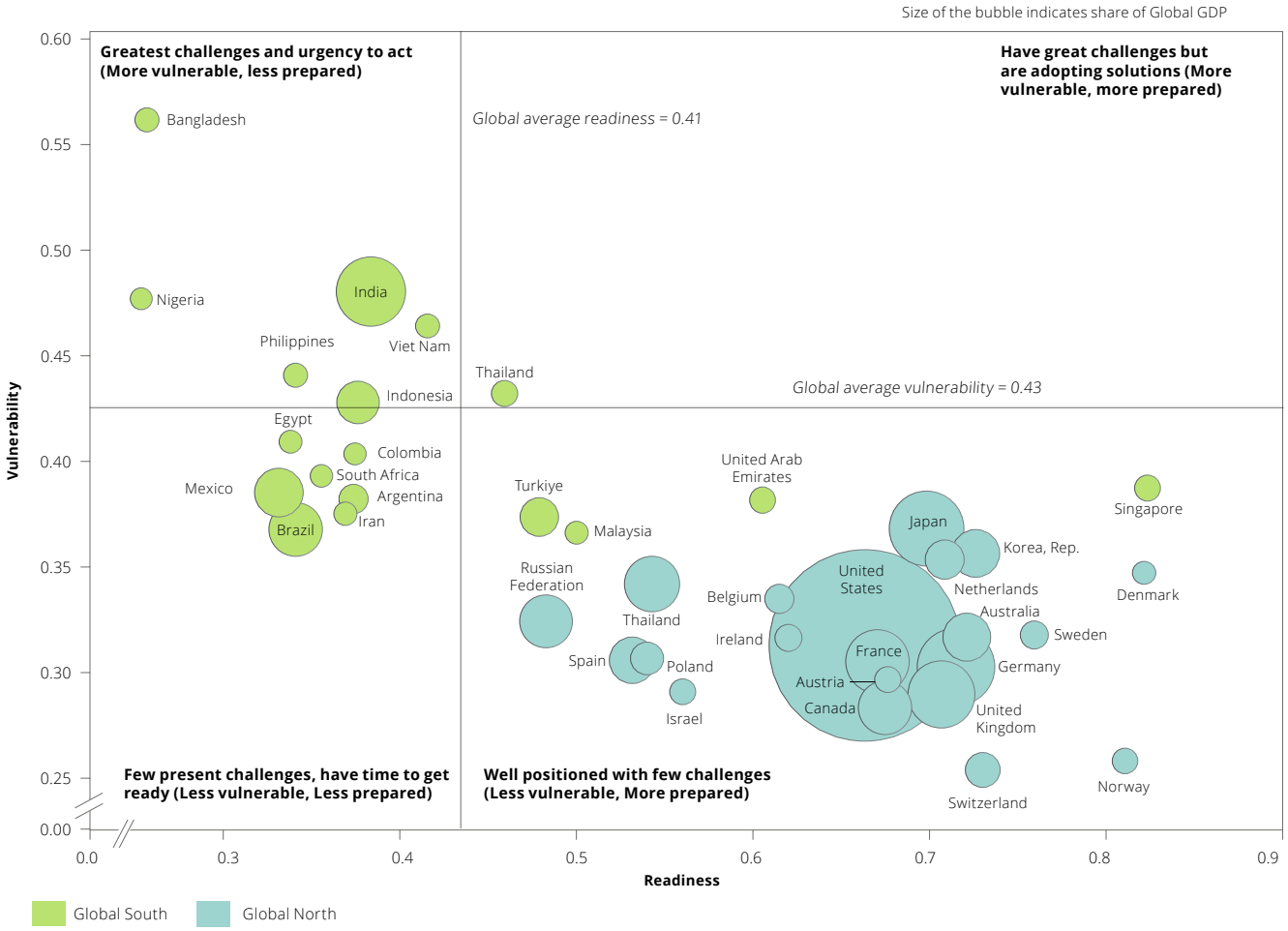
Source: EMDAT: The Emergency Events Dataset, Deloitte analysis

Composite assessments such as the Notre Dame-Global Adaptation Initiative (ND-GAIN) Index show that Global South countries are more vulnerable (0.46 vs 0.33 in the Global North) and less ready (0.35 vs 0.57 in the Global North) when it comes to climate change. This combination of higher exposure and lower preparedness creates a structurally asymmetric risk profile for the Global South.

EXHIBIT 8

Most Global South countries are more vulnerable and less ready on global resilience indices, exposing structural risks to climate shocks

Index across climate change vulnerability and climate change readiness indicators[1]



Note: 1. Countries considered capture 90% of Global GDP, China has been omitted from the chart. All figures are calculated for 2023. Global GDP share was calculated on the basis of GDP at current prices in USD. ND GAIN Vulnerability measure is composed of 36 indicators across Health, Food, Ecosystems, Habitat, Water, Infrastructure. ND GAIN Readiness measure is composed of 9 indicators across Social, Economic, Governance readiness.

Source: Notre Dame Global Adaptation Initiative (ND-GAIN) Index, World Bank Open Data, Deloitte Analysis

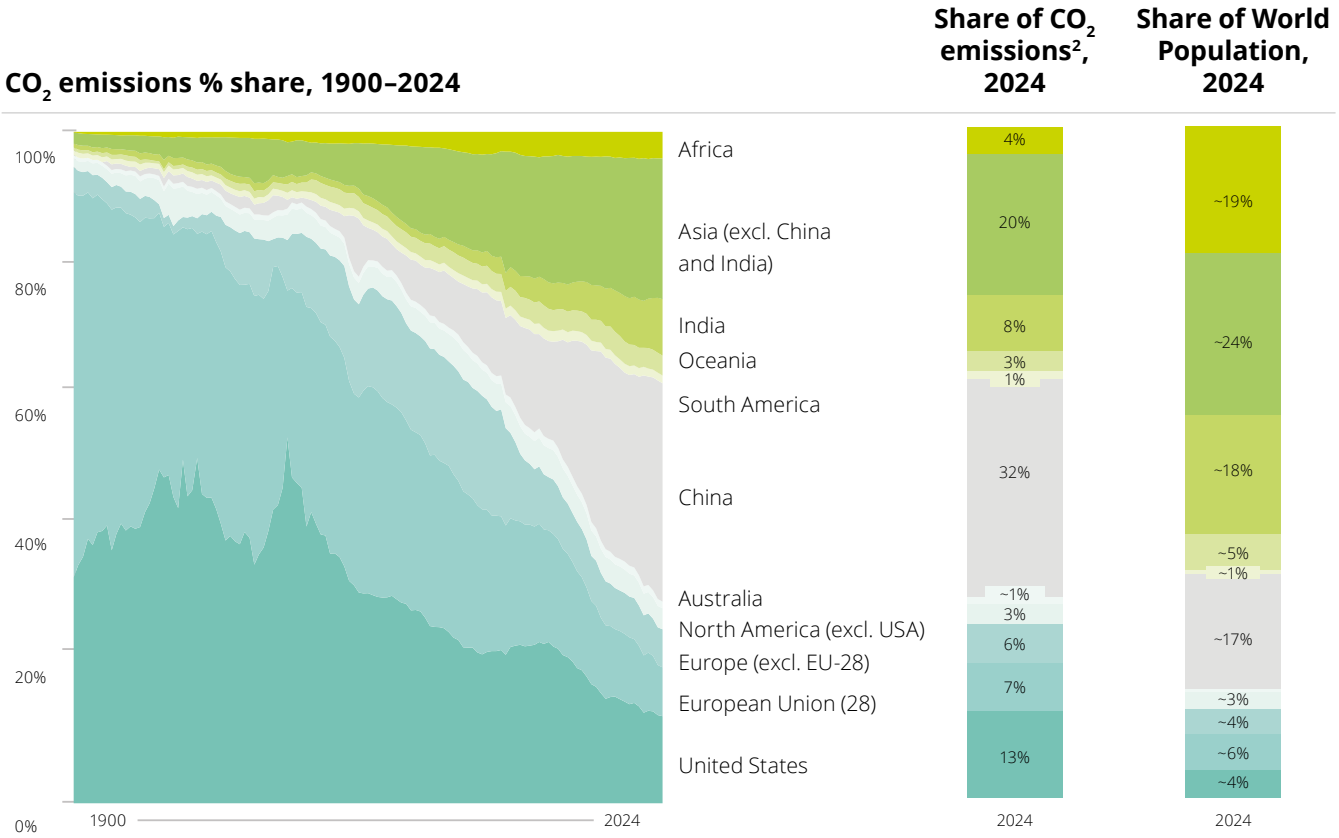
2.3 Development-driven pressures across food, urban and energy systems

The interaction between development and climate risk in the Global South is most visible in the rapid growth of energy demand and emissions alongside rising pressure across core systems. As development accelerates across emerging economies, expanding industrial activity, rapid urbanisation and rising household consumption are driving a sharp increase in energy use. As a result, the Global South economies account for a growing share of annual global CO_2 emissions, reflecting current development trajectories.[29] **Importantly, cumulative emissions remain heavily concentrated in Global North economies, underscoring a persistent asymmetry between where emissions are rising today and where historical responsibility lies.**

Historically, economic growth has been coupled with increases in emissions, driven by rising energy demand and overall consumption. Accelerating the development and mass adoption of clean technologies offers a path to change this trajectory and meet development needs with lower carbon intensity; a path which supports growth, while flattening the curve of emissions growth.

EXHIBIT 9

As development accelerates, energy demand in the Global South is rising, driving a growing share of global emissions, even though historical responsibility remains concentrated in the Global North



Share of GS¹ countries has been rising

Asia's contribution to global emissions went up from 1.6 percent in 1900 to 20.5 percent in 2024

Countries that emitted the most historically are not the highest emitters today

The UK's share in global emissions fell from 21 percent in 1900 to 1 percent today

Historically, the US has been the single largest emitter globally

Contributing >20 percent of cumulative global CO_2 emissions since 1900

Note: 1.GS – Global South; GN – Global North; 2. Values may not add up to 100 due to rounding.
Source: Our World in Data, Global Carbon Budget, UN World Population Prospects, EUROSTAT, Deloitte Analysis

In the Global South, development-driven pressures do not operate in isolation. They simultaneously strain food systems, urban environments and energy infrastructure, reinforcing vulnerability across multiple dimensions.

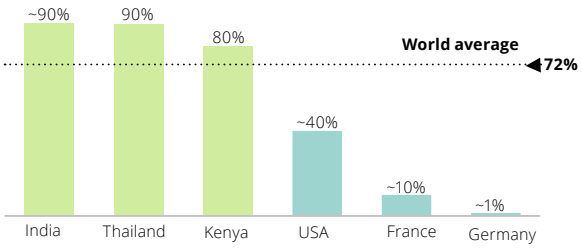
In food systems, agriculture continues to dominate freshwater use in many Global South economies, accounting for 80–90 percent of freshwater withdrawals in major Global South countries, compared with ~40 percent or less in advanced economies.[30] Despite this intensive resource use, productivity remains significantly lower. Crop yields across major cereals are typically 30–60 percent lower than in the Global North, reflecting gaps in irrigation efficiency and technology adoption.[31] These inefficiencies are compounded by food system losses. According to FAO estimates, up to 37 percent of food production in parts of Africa is lost due to gaps in storage, processing and logistics.[32] In addition to lost food, food waste also leads to loss of water, energy and the land embedded in production.

EXHIBIT 10

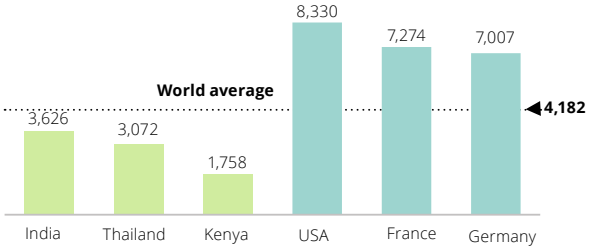
Development shifts in the Global South intensifies the pressures in food systems

Food production is more resource intensive in the Global South

Agriculture use of total freshwater withdrawals, 2022

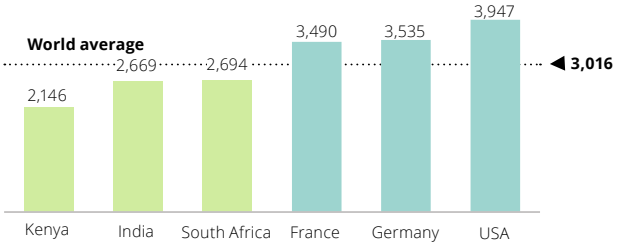


Cereal yield, kg/ha[1], 2023

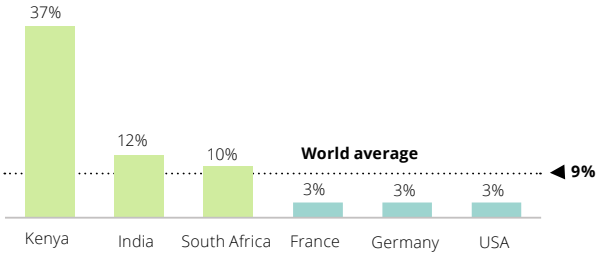


Access to nutritious food lags in the Global South

Food supply, kcal per capita per day, 2023



Prevalence of undernourishment, %, 2023



Global South Global North

Resource intensity

Agriculture drives freshwater withdrawals in the Global South, but yields are lower than the Global North countries

Lower food supply

Global South has less food supply per capita, making food systems even more vulnerable to extreme weather events

Undernourishment crisis

Countries with the highest undernourishment prevalence are in the Global South

Note: 1. ha: hectare
Source: FAO, World Bank, Deloitte Analysis

The lower productivity of food systems, combined with lower food availability compared with the Global North, puts food systems in the Global South at immense risk of climate vulnerability. Disasters can sharpen and amplify these effects, and damage to food systems can affect multi-period horizons. These point to the need for enhanced productivity and resilience within food systems in the Global South, which account for over 25 percent of GDP in low-income economies and over 60 percent of employment in some developing countries.[34]

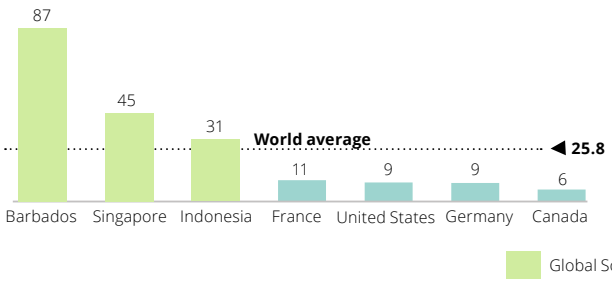
Urban systems face equally acute pressures. Rapid urbanisation in the Global South has outpaced the development of resilient infrastructure, green spaces and cooling systems, intensifying heat exposure in dense urban centres. Workers in major Global South economies lose between 150 and 400 work hours annually due to heat stress, compared with less than 30 hours in most Global North countries.[35] This translates directly into human and economic costs in rapidly growing cities in the Global South.

EXHIBIT 11

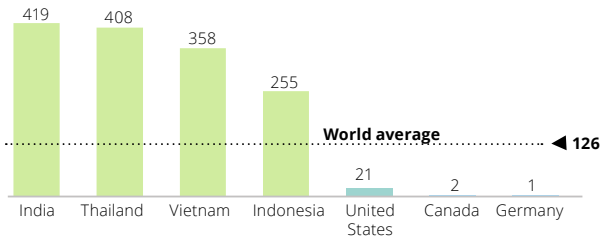
The impacts of extreme heat are disproportionately higher in the Global South than in the Global North

The Global South is more impacted by heatwaves than the Global North

Heat wave days attributable to climate change (2024)



Potential work hours lost due to heat stress/worker (2024)



Global South Global North

Productivity loss

Workers in major Global South economies tend to lose more work hours due to heat stress compared with Global North

Public health risk

People in the Global South face higher exposure to extreme heat and air pollution, resulting in higher health risks

Source: Lancet Countdown, Deloitte Analysis

Energy systems reflect a similar tension. Per capita energy consumption in the Global South remains less than one-third of that in advanced economies. More than 60 percent of energy consumption in many developing economies still comes from fossil fuels, while access to electricity remains uneven.[36] More than 600 million people lacked access to electricity, primarily in Sub-Saharan Africa.[37]

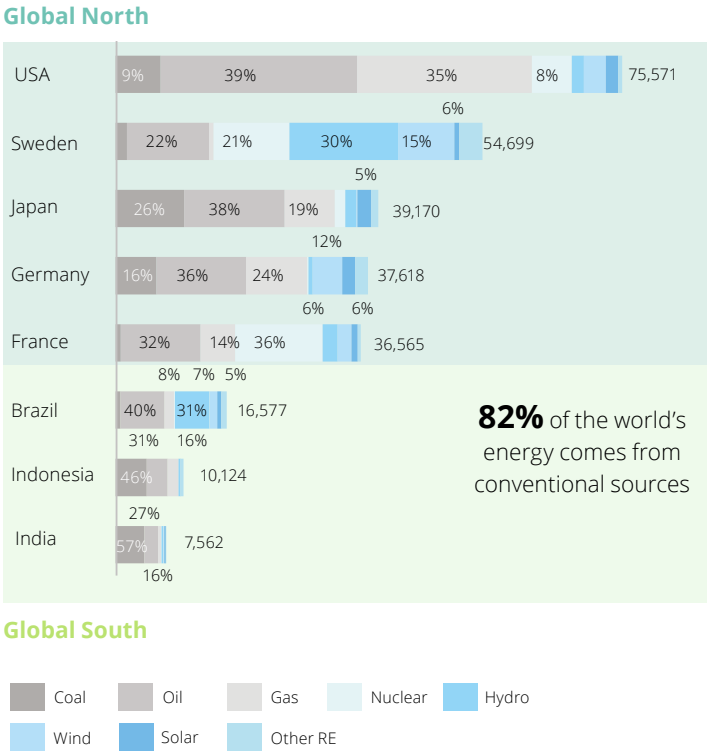
Workers in major Global South economies lose between **150 and 400 work hours annually** due to heat stress, compared with less than 30 hours in most Global North countries.

EXHIBIT 12

Per capita energy demand is lower in the Global South, yet the energy mix is geared towards conventional sources

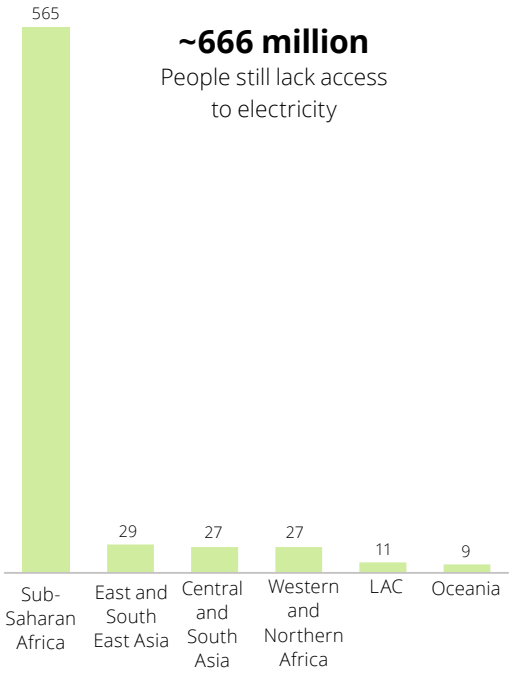
The Global South continues to rely on conventional energy sources

Per capita energy mix, KWh per person, 2024



Section of population in the Global South still lacks electricity access

People without electricity access[1], million, 2023



Global South is fuelled by conventional sources

The Global South is yet to decarbonise its energy mix

Global North consumes more electricity

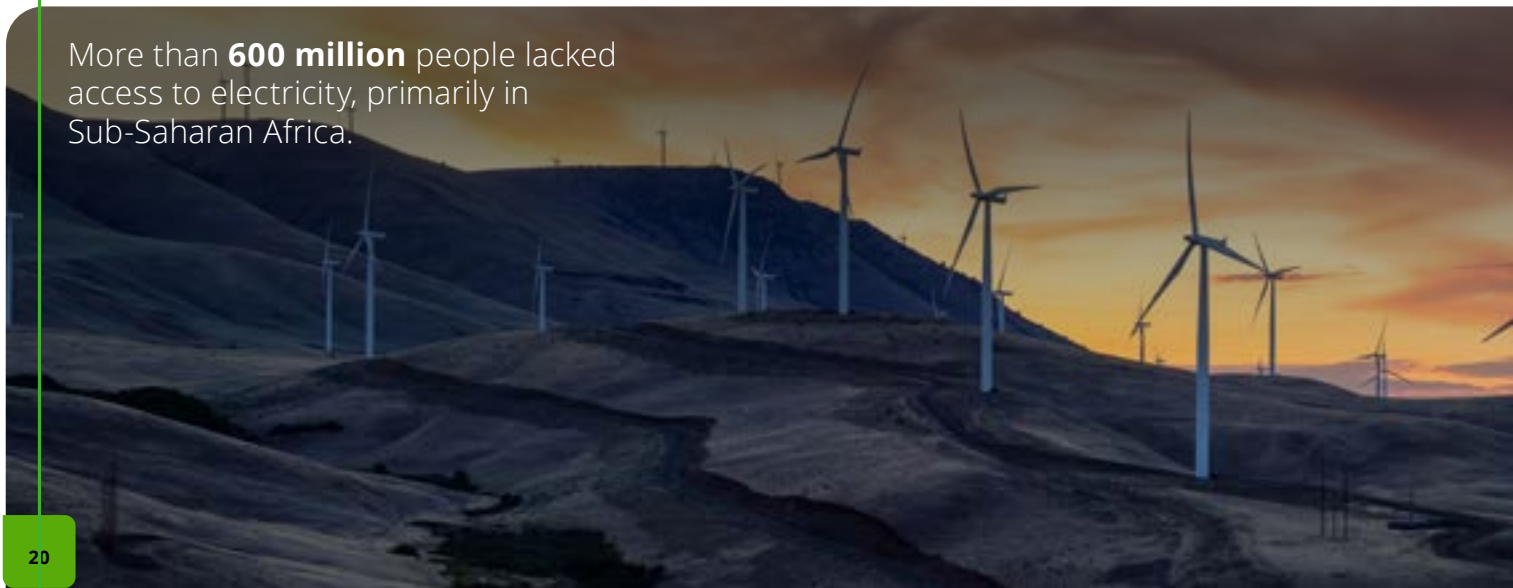
World average per capita electricity consumption is ~21,307 kWh vulnerable to extreme weather events

Millions lack electricity access

Over 666 million people, 565+ million in Sub-Saharan Africa, lack electricity access

Note: 1. The Global North has 100% electricity access.
Source: Energy Institute, World Bank, Tracking SDG 7, Deloitte Analysis

Across food, urban and energy systems, development is therefore increasing demand faster than resilience is being built, amplifying vulnerability rather than reducing it.



2.4 Bridging the climate financing gaps for adaptation and mitigation

Climate action broadly operates through two complementary levers: **mitigation and adaptation.** Mitigation focuses on addressing the causes of climate change by reducing GHG emissions and energy intensity through measures such as renewable energy, clean transport and energy efficiency. Adaptation focuses on reducing vulnerability to climate impacts that are already occurring or unavoidable, including flood protection, drought management, climate-resilient agriculture, heat mitigation and disaster preparedness.

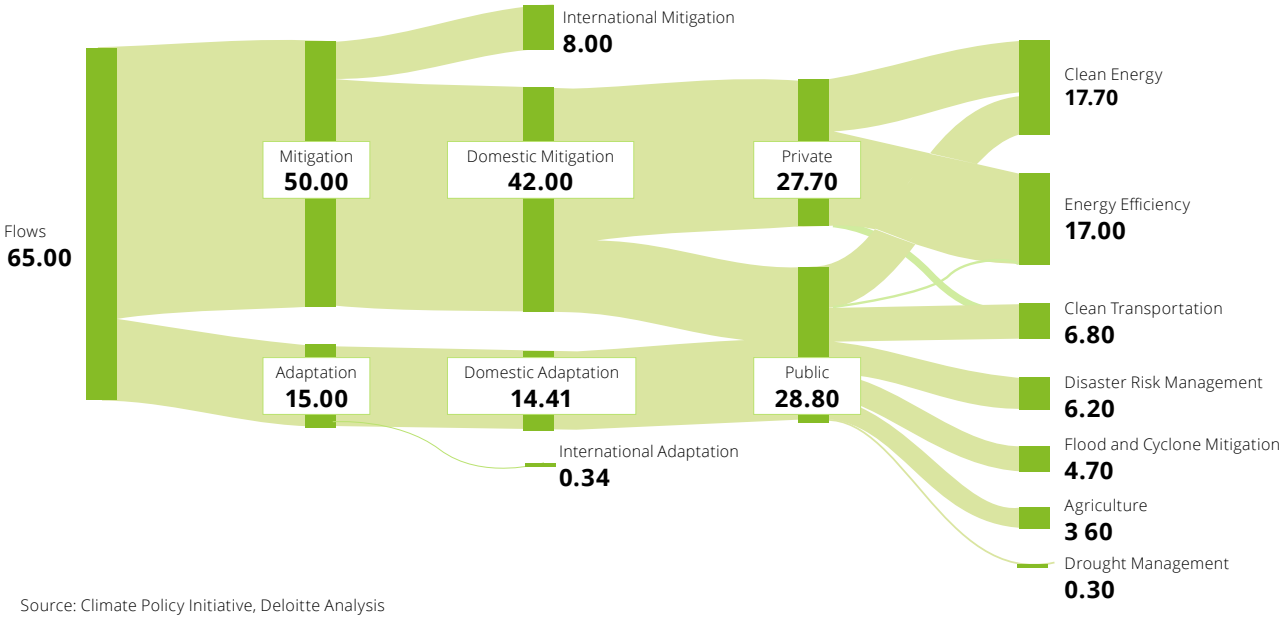
However, adaptation has its limits. According to the IPCC, for every fraction of a degree above pre-industrial levels, the potential for adaptation to significantly reduce impacts diminishes markedly, while some natural and human systems may reach "hard" limits beyond which adaptation is no longer feasible. Hence, global climate action must be a balanced mix of mitigation and adaptation approaches. This makes a balanced approach essential, combining strong mitigation with robust adaptation, particularly in the Global South, where climate resilience is lower, making the bloc more vulnerable.

One of the constraints to achieve this balance is **finance**. Despite the urgency of mitigation and adaptation, climate finance in the Global South remains significantly insufficient relative to need. Developing countries face an estimated **US$4.3 trillion annual financing gap** to achieve Sustainable Development Goals (SDGs) and Paris Agreement targets by 2030.[38] The gap is more pronounced for adaptation as a major share of financing flows to mitigation. In Latin America and the Caribbean, the share of mitigation in total climate finance flows was nearly 85 percent, while adaptation received only around 7 percent, with the remaining flowing to projects with dual benefits. In Sub-Saharan Africa, the share of mitigation in climate finance flows was 65 percent, while adaptation received around 25 percent.[39] In India, mitigation attracts more than three times the capital allocated to adaptation.[40]

EXHIBIT 13

In India, mitigation attracts more than three times the capital allocated to adaptation

Climate finance flows by mitigation and adaptation in India, US$ billion



Source: Climate Policy Initiative, Deloitte Analysis

Moreover, adaptation finance remains overwhelmingly public and insufficient: current public international flows meet only a small fraction of projected adaptation needs over the coming decade.[41] Based on research by the World Bank, the private sector participation gap in adaptation financing is due to broadly three barriers:

1. **Insufficient climate risk and vulnerability data** at the country and project level, limiting investors' ability to assess risk, price capital and identify viable adaptation opportunities.
2. **Limited visibility on public investment gaps and private capital needs** to achieve adaptation objectives.
3. **Low perceived or uncertain risk-adjusted returns,** driven by unclear revenue models, public-good characteristics of adaptation projects and challenges in monetising resilience benefits. Adaptation investments in projects such as early warning systems, climate-resilient infrastructure and improved dryland agricultural crop production often generate public goods benefits, but have diffused or indirect revenue streams and face high perceived risk.[42]

Private sector investment in climate adaptation is increasingly a strategic necessity and a commercial opportunity. Firms are motivated to invest in adaptation across three broad areas: strengthening the resilience of their own operations and supply chains, providing climate-adaptation goods and services and investing in the resilience of customers, communities and markets on which their businesses depend. Climate risks are already disrupting business continuity globally, with particularly severe impacts in low- and middle-income countries. Proactive investment in adaptation can help companies avoid rising risks of asset damage, reduced financial returns and potential loss of insurance coverage. Beyond risk avoidance, adaptation also opens new growth avenues by enabling the development of new products and services, expanding markets for existing solutions and enhancing brand value. As climate risks become more visible and financially material, adaptation needs to be increasingly recognised by the private sector, not only as a risk-management imperative, but also as a source of long-term value creation.

Private participation in adaptation finance can be encouraged through policy signals, risk-sharing mechanisms and government incentives that convince businesses to consider long- and medium-term horizons.

Governments, therefore, sit at the centre of the transition, as market shapers rather than financiers. Policy choices related to pricing, standards, subsidies, land use and infrastructure investment determine whether development pathways lock in future risk or build long-term resilience.

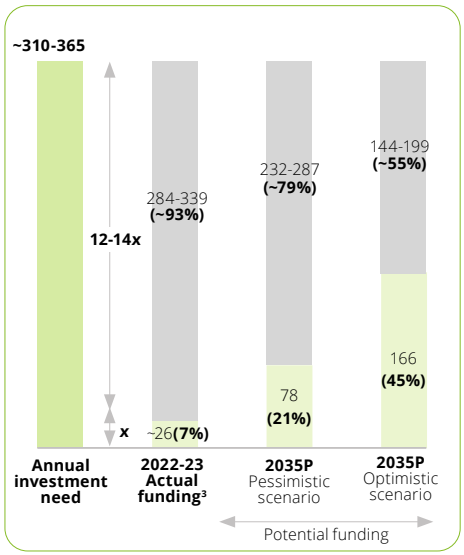
EXHIBIT 14

Only when governments set clear priorities and create affordability through policy will private capital scale, helping bridge the existing financing gap for the Global South and accelerating adaptation efforts

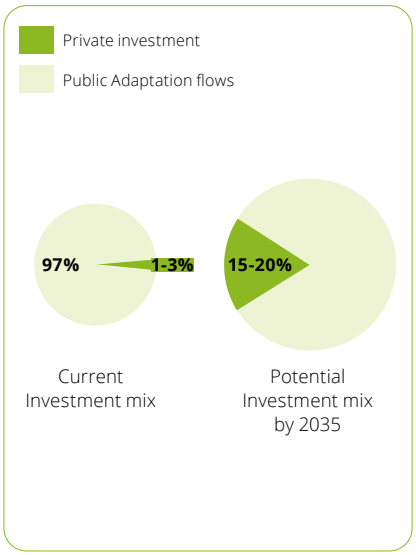
Developing countries have an adaptation finance gap of 12-14x to meet needs until 2035

By 2035, developing countries[1] would need up to US$365 billion a year in adaptation finance[2]

Annual adaptation investment needs in developing countries (US$ billion) vs actual funding, 2035



Opportunity to increase Private Sector Share of Public Goods Adaptation Finance, 2035



Private sector can scale 6x to 18% in public goods[2]
Indicating scope to de-risk investments in climate adaptation

Private sector scaling opportunity increases with income
Ranging from 4% in low-income countries to 22% in upper-middle income countries

Narrowing the adaptation finance gap requires urgent action
Blended finance and innovative models offer pathways

Note: 1. Developing countries, include low and middle-income countries, as per World Bank definitions. 2. Adaptation flows considered are for public goods including adaptation infrastructure, social protection, health, climate proofing infrastructure, climate-smart agriculture, increased water use efficiency. 3. Private and domestic finance flows are excluded. The USD 26 Bn quoted for 2023 quoted is inclusive of international public adaptation financing.

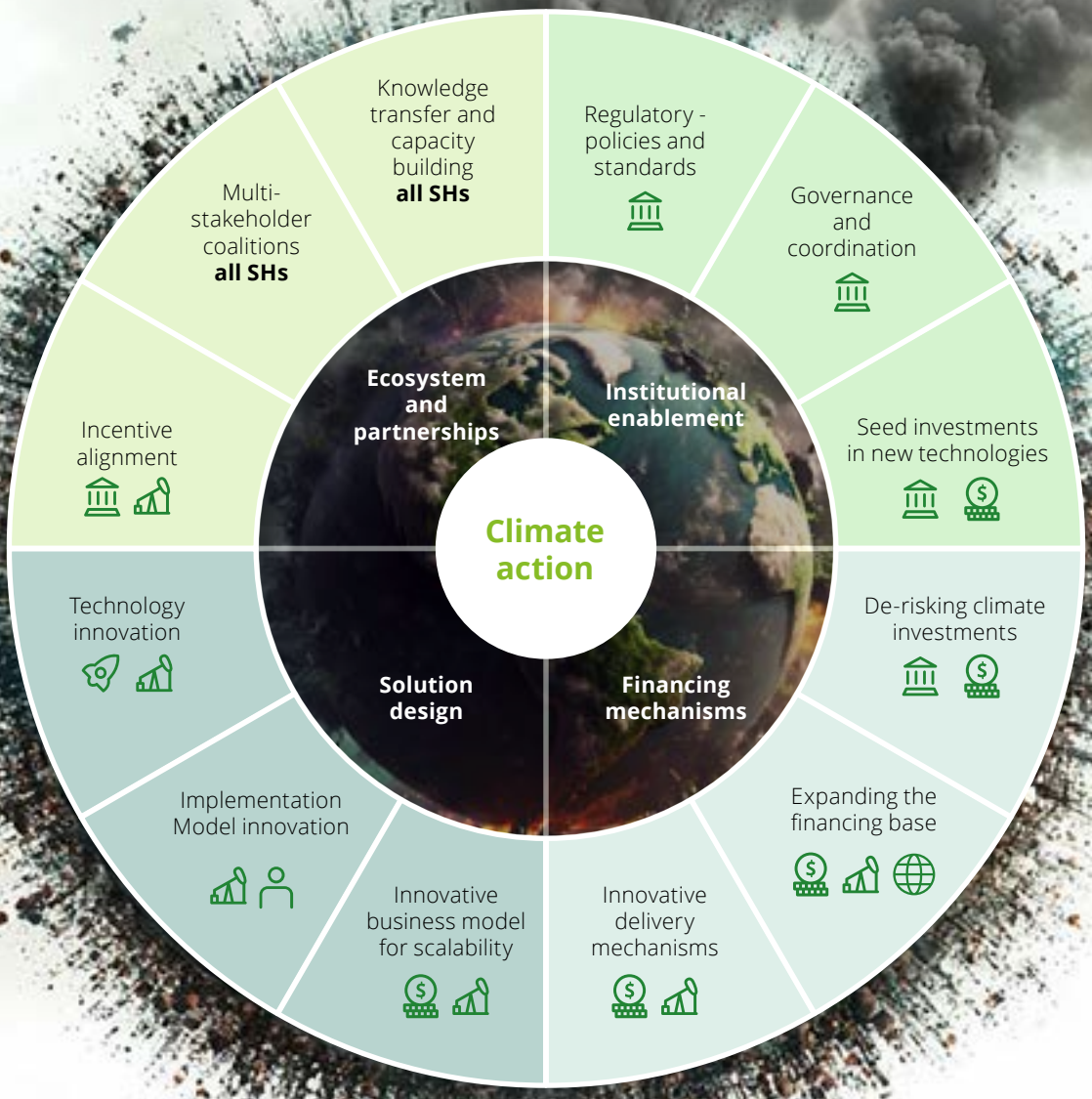
Source: UNEP Global Adaptation Gap report, Deloitte Analysis

Is there a magic pill?

3.1 Coordinated stakeholder action as the foundation for climate response in the Global South

EXHIBIT 15

Climate action map across stakeholders



Stakeholders (SHs)

- Businesses
- Communities
- Scientific community
- Private capital
- Governments
- Multilateral organisations

Source: Deloitte analysis

Responding to climate challenges across the Global South requires *participation, coordination and collaboration* across multiple stakeholders. Expanding participation from stakeholders accelerates lasting action and unlocks scale.

Ecosystems and partnerships enable outcomes no single stakeholder can independently deliver. All stakeholders contribute to *knowledge transfer and capacity building*, to aid implementation learning across contexts. *Multistakeholder coalitions* are particularly required for public scale and inclusive ambition setting. Incentive alignment across stakeholders ensures a balance in benefit accrual for sustained participation, with impetus from governments via policies and platforms and businesses via business models.

Institutional Enablement (IE) is anchored in government policies and actions since it entails acting in the public interest. IE can empower and enable other stakeholders. Regulatory policies and standards can unlock bankable demand signals in sustainable technologies, channelizing investments from businesses and private capital. *Governance and coordination* further enhance cross-agency responses and public-private-partnerships. Another important institutional lever entails the seed investments in new technologies which face challenges in large-scale adoption; a powerful space to unlock private financing.

Financing mechanisms are critical to provide the necessary capital for climate action to operate and scale, addressing limitations in risk absorption and delivery. Government and private capital can derisk climate investments, by identifying and mobilising concessional capital. At the origination side, there is scope for businesses, private capital, and multilateral institutions to *expand the financing base* by broadening the range of investors and instruments. Innovative delivery mechanisms ensure that underserved and disproportionately affected populations access instruments which match their needs.

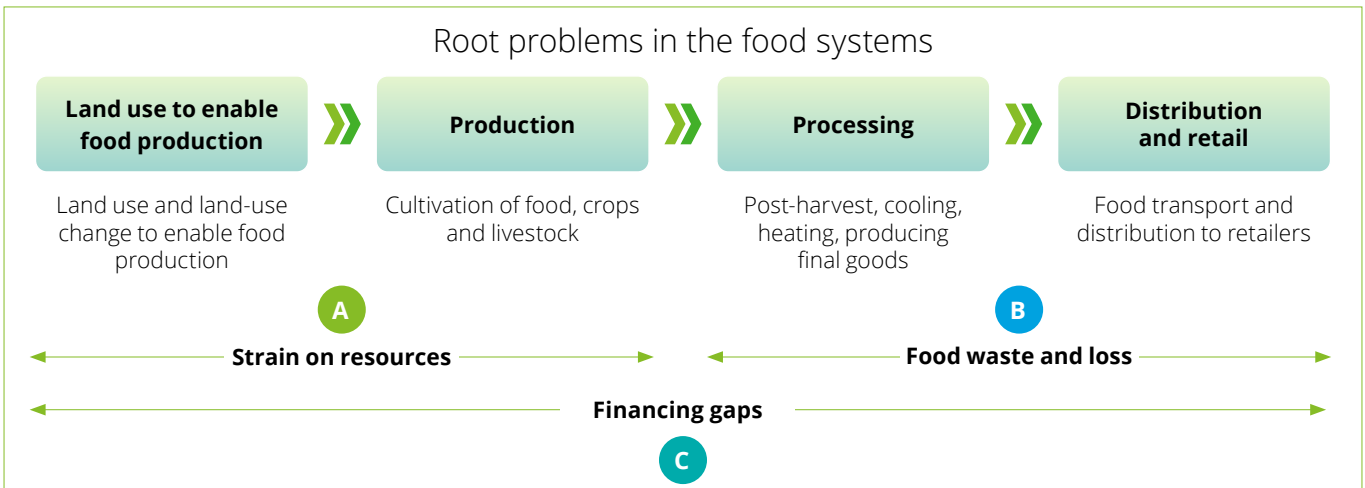
Solution design is where businesses can truly drive outcomes, combining technology, implementation and model innovations. The scientific community can push the frontiers of technological innovation to deliver solutions beyond what is presently imaginable. *Implementation model innovations* involve communities to deliver just outcomes within pre-existing technologies and solutions. Businesses and private capital can develop *innovative business models for scalability* to keep the wheel spinning, for what it does.

3.2 Food systems

In the Global South, a growing population amid changing land use puts **stress on resources –** necessitating greater efficiency in water use and yield. Lagging storage infrastructure in the face of climate-induced variability in yield leads to **food waste and loss,** with landfills mounting as millions go undernourished. Transforming food systems faces **financing gaps,** with agrifood systems being conventionally overlooked by private capital. Our solutions landscape addresses these challenges, which manifest across the value chain of food production.

EXHIBIT 16

Structural challenges across the value chain are unlocking distinct solution archetypes



Legend
- A/B/C indicates the mapped challenges
- Icon indicates primary solution archetype
- Flag indicates the country of implementation

3.2.1 Climate risks: Water scarcity, rising temperatures and inefficient irrigation are constraining agricultural productivity in the Global South

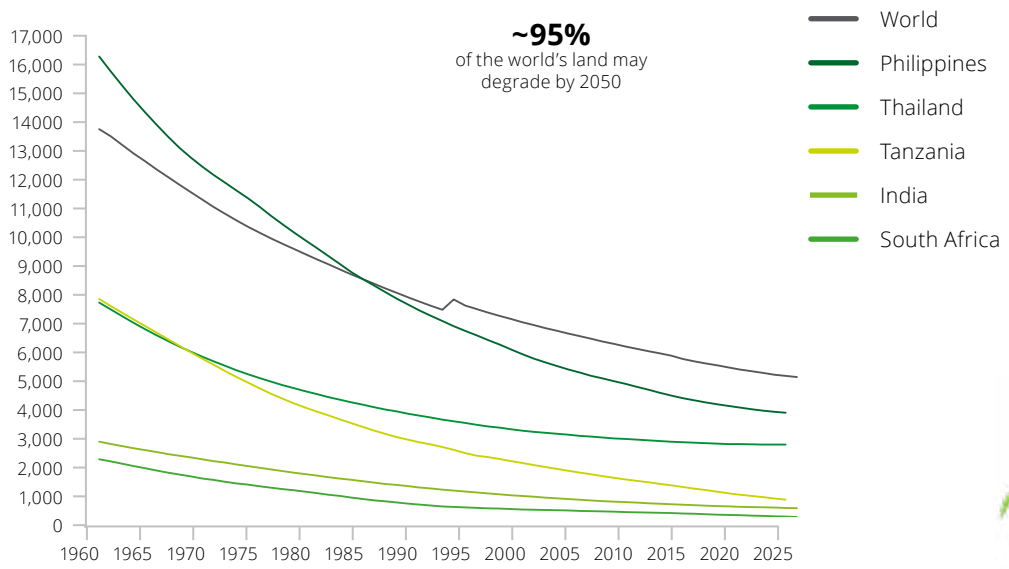
Food systems in arid and semi-arid regions in the Global South face acute shortages of inputs such as water and fertile soil. With rising temperatures, achieving good yields under open field farming becomes a struggle, limiting the ability of farmers to engage in high value horticulture. Erratic monsoon cycles compound the challenge, increasing the risk of crop failure.

Additionally, agriculture in the Global South puts severe strain on water, with water use *efficiency lagging* in Global South regions and flood irrigation still being predominant. Irrigation water use efficiency averages around ~US$0.7 per cubic metre in Global South countries, compared to ~US$1.4 per cubic metre in Global North countries.[43] Overextraction and excessive water use can severely deplete groundwater levels as well as soil quality, affecting the sustainability of food systems.

In such scenarios, technological and agronomic interventions have seemed to shield food production from climate vulnerabilities, thereby reducing risk and improving yield. At the same time precision agriculture goes a long way in reducing the burden on water.

Protected cultivation (eg: polyhouses) and precision irrigation (eg: smart irrigation) offer pathways to reduce water intensity in agriculture and are uniquely positioned to meet the Global South's need to produce food for a growing population while conserving resources.

Per capita renewable freshwater resources (m^3)



~72%
of the world's freshwater reserves are utilised for agriculture

~50–70%
of water used in irrigation is lost through evapo-transpiration

~14%
of global agricultural production in Latin America, the largest net exporter of food

~90%
economic losses in agriculture in Argentina are due to climate variability (droughts)

Source: FAO Aquastat, World Bank, Earth. Org, Deloitte analysis

Case study 1

Polyhouse farming - Protected cultivation systems enable climate-resilient, water-efficient agriculture

Image: Rainwater harvesting pond alongside polyhouse [Photo by Kishore Ravi for The Plate]

In Gurha Kumawatan, a village outside Jaipur, farmers have embraced protected agriculture, by growing crops in industrial-scale polyhouses (more than one acre in size), which shield from extreme heat and moisture loss. Around 1,200 acres have been brought under polyhouse cultivation in this region, contributing to an estimated 200,000 hectares under protected cultivation across India.

Polyhouses are greenhouses made of polyethylene sheets which last 5-7 years, allowing protected farming year-round, requiring a fraction of water and fertilisers vis-a-vis traditional agriculture.[44] Many polyhouses are accompanied by rainwater harvesting ponds, the size of tennis courts (~1/16th of an acre), providing up to a year's supply.[45]

Polyhouses were introduced in India through a knowledge-sharing initiative with Israel. Polyhouses receive government support at the state and central levels through the Mission for Integrated Development in Horticulture, greenhouse subsidies, NABARD's loans to commercial banks, and Agri Infra Fund's low interest loans.[46] In 2025, the Rajasthan government earmarked INR225 crore (equivalent to US$25.81 million) for the Green House Scheme, which includes polyhouses.[47]

Polyhouses have been adapted by research institutes for Indian conditions to support off grid solar. High-value crops such as cucumbers, tomato, chilli, brinjal and bell peppers are produced with much less water.[48]

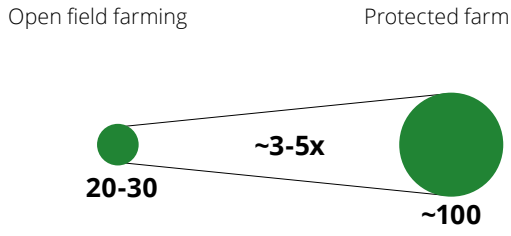
Polyhouses present an adaptation pathway, with mitigation co-benefits. While shielding crops from unfavourable and erratic heat and rain, polyhouses also reduce burden on water, providing high value horticultural crops.

Polyhouses have been gaining traction across the country, with adoption in several states including Karnataka, Maharashtra, and Gujarat.[49] Subsidies make polyhouses more affordable for farmers, who cannot otherwise bear the high set up costs. Internationally, FAO has advocated for locally adapted greenhouses in the Global South.[50]

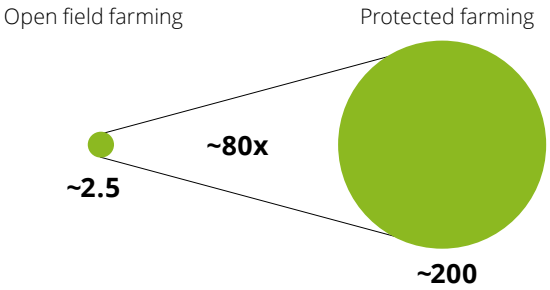
Polyhouses and greenhouses offer a model of climate-resilient agriculture relevant for regions in Africa, South Asia and Latin America which grapple with similar food production challenges. Low water and high yield farming protects smallholders from heat stress, erratic rainfall and soil degradation, while allowing diversification into high-value horticulture.

Impacts

Cucumber yield (tonnes per hectare)



Tomato yield (tonnes per hectare)



Polyhouse farming in Gurha Kumawatan

~500
farmers grow food in polyhouses

1,200+
acres under polyhouse cultivation

~US$28.68 million
(eq. INR250 crore) combined turnover of farmers using polyhouse farming

Note – Open field farming yields vary across regions, figures quoted are for arid regions similar to Gurha Kumawatan
Source – The Plate, Deloitte Analysis

Case study 2

AI-enabled irrigation - Digital water management systems enable precision agriculture beyond flood irrigation

Kilimo (Argentina) is a Software-as-a-Solution water management platform, integrating satellite data, weather forecasts and field information to produce a "water balance" for over 2000 farms where it is deployed.[51] By combining field data with proprietary algorithms, Kilimo provides farm-specific irrigation recommendations, driving shifts from flood to drip irrigation, irrigation scheduling and agronomic practices for water efficiency.[52] In combination with farm-level gains, Kilimo produces a watershed level vision for projects, targeting the most water-stressed basins in Latin America, engaging corporates, governments and NGOs to drive initiatives at scale.

In this way, Kilimo aids the transition to precision agriculture, which requires less water, and achieves less evapotranspiration compared with flood irrigation, via optimal scheduling and drip/sprinkler systems delivering water and nutrients directly to the soil with minimal runoff. When farmers engage in water saving practices, as per Kilimo's hyperlocal irrigation recommendations, they generate verifiable water savings, through the Volumetric Water Benefit Accounting (VWBA) method, which tracks water usage against baseline historical use. Corporates use these verifiable savings to offset their water use and become water positive. By funding irrigation projects, Kilimo enables farmers to overcome upfront costs which would otherwise hinder them from making irrigation investments.

What makes Kilimo distinctive is the finance-for-efficiency mechanism it drives. Companies can meet their water security goals by purchasing water credits from Kilimo, with a portion of water credit profits going back to farmers. Kilimo has helped achieve ~30 percent water savings for farms on average, with farmers netting 20-40 percent income.[53] Companies such as Microsoft, Coca-Cola and Intel have worked with Kilimo to meet their water security goals.[54]

Kilimo's innovation has been recognised by innovation accelerators such as World Economic Forum Uplink and HCL Aquapreneur and venture investors such as Emerald, Kamay, The Yield Lab and others.

While Kilimo is primarily an adaptation solution, as it strengthens water security at the farm and watershed level, the reduced burden on irrigation provides mitigation co-benefits.

> Farmers win because they get either free infrastructure or free technology for them to use it and improve their management and more resilience in their operation. Corporates win because they reduce the water risk in the watershed. The ecosystem wins because - if you're without water, ecosystem cannot function; you need water for ecosystem to function properly and the community wins - people that is sharing the land with those farmers and those companies have more water. Finding this model that is unique enough that five stakeholders win - that's something that we're very proud of and we think is going to keep scaling.
>
> **- Jairo Trad, CEO and Co-Founder, Kilimo**

Impacts

~72 billion+
litres of water saved until 2024 (Kilimo)

~8 million m³
of the watershed managed
(eq. 438,000 people's annual drinking water)

~2,000
farmers use Kilimo in 7 countries

~30%
water savings realised on farms, on average

20–40%
increase in farmers' income

Relevance to the Global South

Kilimo offers a model for financing precision agriculture in the Global South, developing a robust market mechanism to increase water use efficiency at farm and watershed levels. Many regions face similar water stress and climate variability. The Global South's substantial agrarian economy, depleting water levels, increasing food demand and limited private funding mechanisms makes Kilimo's model highly relevant. The model offers a pathway for surplus private capital in Global North to provide action-linked financing for sustainable irrigation in the world's most water-stressed areas.

Source – Kilimo, WEF, Deloitte Analysis

3.2.2 Climate risks: Weak post-harvest infrastructure is turning food surpluses into economic losses and climate liabilities

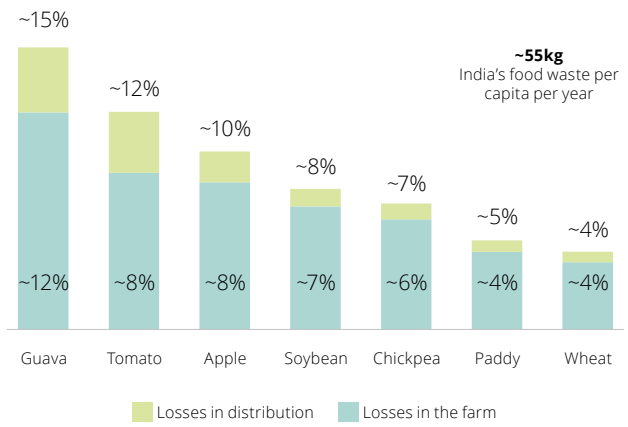
Food systems in the Global South face significant structural post-harvest losses due to inadequate storage, infrastructure and logistics gaps. Despite producing a third of the world's food, smallholder farmers operate on less than two hectares each, with limited access to storage, cooling, processing and organised markets.[55]

In economic terms, farmers are usually price-takers in fragmented supply chains, with limited bargaining power, often selling at distress prices. With quality deterioration materialising within hours of harvest, distance to processing facilities hinders preservation. Moreover, energy-intensive drying processes are inaccessible to most farmers. This can turn bumper harvests into a burden.

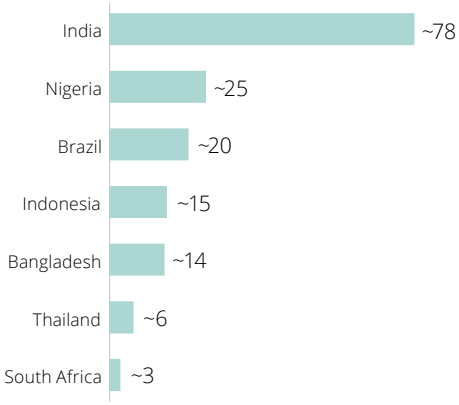
Perishable produce, which is not marketable, goes to food waste, accounting for almost 14 percent of global methane emissions, leads to severe environmental effects, since methane has **~84 times the warming effect of CO_2.**[56]

Robust supply chains (through aggregation, shared services and traceability) and sustainable off-grid on-farm solutions (such as solar drying) present pathways to reduce food loss and waste at the farm level.

Post-harvest losses in India, 2022



Annual estimate of household food waste (in million tonnes)



Source: UNEP, NABCONS, Factor E, Deloitte Analysis

Case study 3

Solar drying - Off-grid solar processing enables low-emissions, resilient post-harvest systems

S4S (Science for Society) is an Indian company providing on-farm solar conduction dryers which prevents food waste and preserves nutrient density, between 85-99 percent, [60] naturally for up to a year. The dryers are sold to women micro-entrepreneurs who source produce from women farmers, which would otherwise go to waste.

The dehydrated ingredients are bought back by S4S, aggregated, quality tested, and sold to 1100+ food and beverage companies,[61] with complete traceability, and safety assurances. The dried ingredients are preservative-free, and shelf- stable. In this way, S4S helps prevent food waste and loss, while also furthering the availability of nutritious instant food. S4S' processed ingredients have been used to produce ketchup, soups and ready-to-eat foods.

The microentrepreneurs who work with S4S are financed by Indian national banks and rural regional banks, through loans which help them cover the initial cost of solar dryers.[62] S4S was founded by university friends in 2013 and is on its way to be a soonicorn, being backed by Acumen, Factor E, The Global Innovation Fund and others. [63]

Image: S4S' solar conduction dryers can process excess harvest on farm [Photo by Earthshot Prize]

> It was very challenging, for us to first establish trust. But through our network partners like NGO, FPOs, government and other development finance organizations, it became a lot more viable for us.
>
> Most of these [entrepreneurs] were women, they don't have a tra Grameen Bank, where we started by providing a guaranteed structure. on, now there's no guarantee, but, because banks know that there is a cash flow coming to these farmers, they can easily get a loan.
>
> **-Nidhi Pant – Co-founder, S4S Technologies**

Impacts

~12,000 women farmers	**~10–15%** income increase
~40,000	tonnes of food loss prevented
~350,000	tCO_2 emissions avoided
~37,000	annual tCO2 emissions avoided

Earthshot Prize winner 2023 in "Build a Waste Free World" category

Relevance to the Global South

S4S innovatively combines climate action and gender justice through a for-profit model and has scaled significantly through its enterprise customers. The solution to realise value from produce which would have otherwise gone to waste is highly relevant for the Global South given quality fluctuations. The cost-effectiveness of the dryers, decentralised setup and zero electricity consumption makes this highly scalable for Global South countries, especially given existing S4S presence in 15 countries, primarily in the Global South.[64]

Source: S4S, Earthshot, Private Circle, Deloitte Analysis
Exchange rate is calculated on the base of 1 USD = 87.17 INR, yearly average rate for 2025.

3.2.3 Climate risks: Capital constraints and risk-misaligned finance are slowing climate-positive investments in food systems

Across the Global South, smallholder farmers often lack access to timely credit, hindering them from making investments that could improve farm productivity and reduce emissions, such as distributed renewable energy systems. Credit constraints are amplified by thin credit histories, limited collateral, and the high-cost barriers of microfinance. Even when financing exists, farmers' near-term expenses can take precedence over longer-horizon climate-positive investments, due to future cash flow uncertainties.

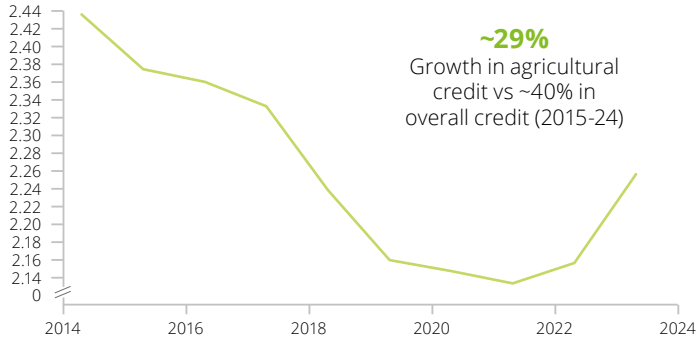
Food systems are highly dependent on public finance and are yet to unlock private capital. The flow of private climate finance to agri-food systems remains limited, at ~20 percent of private climate finance flows (US$19.2 billion in 2021-22) globally.[65] Moreover, only 3.8 percent of overall mitigation finance flows to agri-food systems, which contribute to 30 percent of emissions.[66]

Early-stage solutions in agri-tech require longer gestation periods, complex value chains and patient capital, which differs from mainstream finance expectations. This makes financing food systems transformation more challenging, and the role of venture capital has remained lower, compared to other sectors.

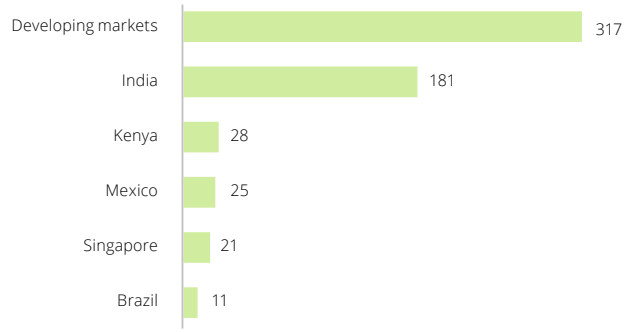
Less than 20 percent of smallholders, who produce a third of the world's food, are insured against extreme weather events, which have been on the rise. In India alone, there were 322 days of extreme weather events in 2024, damaging 4 million hectares of crops (84 percent increase in losses over 2023).[67] Though climate shocks are singular events, the impacts are enduring as recovery from crop damage, or a bad harvest can take years, making insurance coverage critical. Conventional insurance can pose delays in risk and claims assessment, which makes timely disbursement challenging.

The multipronged financing challenge necessitates a variety of patient and parametric instruments across equity, debt, and insurance which are geared towards the critical needs of sustainable food systems for the Global South. These measures require both private and public capital to come together, to address different parts of the challenge.

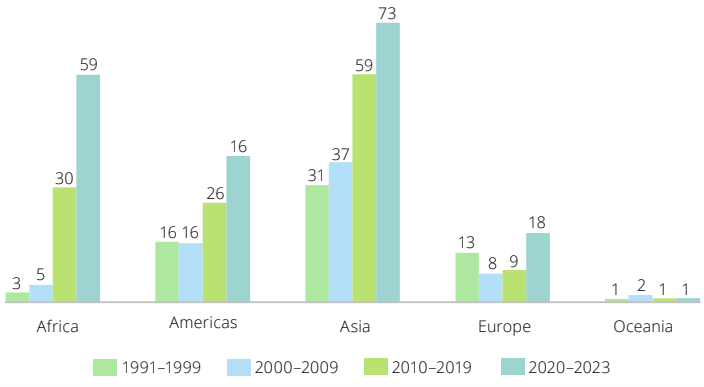
Agricultural credit as a share of total credit globally (in percentage)



VC funding to climate tech for agri-foodtech systems in 2024 (US$ million)



Mean annual agricultural production losses due to extreme weather events, (US$ billion)



Source: FAOSTAT, AgFunder, UNDP, FAO, PIB, Deloitte Analysis

Case study 4

Peer lending - Peer-to-peer finance platforms unlock patient capital for decentralised climate investments

Peer lending offers a promising path to meeting financing needs in agriculture, overcoming the limitations of conventional loans, which require heavy documentation and credit histories. By replacing physical asset collateral with social trust, partner vetting, and repayment track records, Rang De is a peer-to-peer platform which enables peer lending by connecting social investors with verified, underbanked, low-income borrowers who are traditionally excluded from formal finance.

Investors provide small amounts of capital, which is deployed as low-interest loans (0-9 percent typically, 8.5 percent through ~180 impact partners, including on-ground NGOs, social enterprises, farmer-facing organisations and philanthropic foundations. Impact partners identify micro-entrepreneurs who need credit, conduct due diligence based on underwriting policies, support entrepreneurs to ensure the funds are effectively utilized and facilitate timely repayments.[68]

Impact partners help identify beneficiaries through their deep knowledge of local networks. Borrowers use the loans to make investments in livelihood and repay them over a timeframe which matches their cash flows.

One of Rang De's thematic funds is the Powering Livelihoods Fund, which is a part of the Council on Energy, Environment, and Water (CEEW) and Villgro's *Powering Livelihoods* initiative facilitates small scale farmers to access Decentralized Renewable Energy (DRE) solutions.[69] Farmers have installed solar-powered hydroponic fodder units, and solar dryers and cold storage through Rang De's loans. These solutions improve farm productivity, and farmer livelihoods, while running on clean energy.

Image: Solar-powered hydroponic fodder unit, which increases dairy yields, financed by Rang De's social investors [From Rang De's website]

Rang De's business model is sustained by nominal platform fees to impact partners and borrowers, philanthropic and catalytic capital – including angel investors and institutional investors, CSR and blended finance partnerships, and loan recycling – where in place of repayment, social investors redeploy capital, to create cyclical impact.[70] Rang De complements the formal banking system, by developing credibility for its borrowers to further financial inclusion.

Rang De's success comes from stakeholder collaboration. Impact partners ensure last-mile delivery and manage repayment discipline. Social investors (individual and retail) provide patient, flexible capital deployable at small ticket sizes. Continuous philanthropic and CSR capital derisk lending. The Reserve Bank of India's regulatory framework played a critical role in formalizing alternative credit models strengthening protection, inclusion, and trust, which lends credibility to provide impact at scale.

Impacts

US$12.05 million
(≈INR1.05 billion) loans disbursed through RangDe since 2019

23
jobs created through the Powering Livelihoods fund

11,000+
entrepreneurs supported by RangDe's loans

28,000+
social investors

Relevance to the Global South

Rang De demonstrates a model of enhancing financial inclusion and bridging credit gaps through targeted lending, distributed through a strong partner ecosystem. Partner organisations aid with loan origination and disbursal accelerates the identification of beneficiaries and robust reporting enhances credibility within the system. The P2P model for green finance reduces reliance on donors and subsidies by crowding in patient social capital, from individuals, which offers a promising alternative path for climate finance.

Source – Rang De, The Better India, Deloitte Analysis

Case study 5

Venture investing - Venture capital enables end-to-end sustainable transformation of food system value chains

Omnivore is a "financial first" impact VC, investing in early-stage start-ups focused on food security, agricultural prosperity, resource efficiency and rural resilience. Founded in 2011 as a Corporate Venture Capital fund under Godrej Agrovet, Omnivore pioneered agri-foodtech investing in India, raising over US$300 million.[71]

Within the **inclusive fintech pillar,** Omnivore's portfolio companies serve underserved MSMEs and rural communities with tailored financial instruments. Arya Ag provides farmers with a grain commerce platform, which in addition to warehousing, provides access to credit using grain as collateral. DigiVriddhi adapts payments, credit, insurance, input access and market linkages to dairy value chains.

In the **digital value chains** pillar, companies organise fragmented ecosystems through technology, such as Stellapps in the IoT-enabled dairy value chain, deHaat in FPO-mediated agri-input and output markets, and Agrim in digital distribution of agricultural inputs.

Omnivore's **sustainable brands** pillar goes one step ahead in the value chain bringing responsibly sourced food to consumers through memorable brands such as Farmley for dry fruits and nuts, and Sid's Farm for premium dairy.

The emerging technologies pillar focuses on accelerating decarbonisation at scale. This includes solutions such as AgNext's computer vision-based food quality assessments, Pixxel's hyperspectral satellite earth imaging capabilities, altM's innovations in speciality chemicals from agricultural waste, Niqo Robotics' automated precision spray irrigation for farmers, and Ecozen's climate smart hardware for irrigation, cold storage and food processing.

Omnivore's funds were backed by institutional investors, including international development finance institutions, and corporates such as Godrej Agrovet.[72] In addition to providing capital, Omnivore recognises the need for mentorship, access to markets, and partner networks for visionary ag-tech startups to scale. Taken together, Omnivore's investments cover the entire value chain of food systems demonstrating how systemic change can also be driven by venture capital.

> Omnivore works closely with accelerators, angels, universities, and research institutes, and we're constantly engaging with founders who reach out when they're launching new solutions for agriculture, food, climate, and Bharat. Our role is to identify what fits our thesis, what can scale, and what can deliver real impact on the ground.
>
> **- Mark Kahn – Managing Partner, Omnivore**

Impacts

~US$300 million Invested in ~50 start-ups since 2011

~17 million Smallholders reached

~20.91 million Ha under sustainable agriculture

~55.89 billion litres reduction in water use

~US$5.43 billion economic value created for smallholders

~31,057 Rural MSMEs reached

~9,187 jobs created

~123.58 million MTCO2e GHG emissions avoided

~10.31 million MT of food waste avoided

~280 million Kg reduction in chemical use

Platinum Blue Mark Best Social Impact VC (IVCA)

Relevance to the Global South

Omnivore's core mission of improving smallholders' income by scaling enabling brands, technologies, and systems demonstrates the role of venture capital in building markets and overcoming structural frictions which cause losses between farm to fork. SMEs and start-ups can benefit from the mentorship provided, alongside the capital necessary to achieve scale. Across the Global South, private investment can help drive sustainable food systems innovations.

Source – Omnivore, Deloitte Analysis

Case study 6

Parametric crop insurance - Digitised, parametric insurance systems enable rapid scale-up of climate risk protection

The Pradhan Mantri Fasal Bima Yojana, a government crop insurance scheme based in India is the world's largest crop insurance scheme by enrolments , with 41.9 million farmers enrolled in 2024-25.[74] Farmers pay 1.5 percent of the premium for Rabi foodgrains, 2 percent of the premium for Kharif foodgrains and 5 percent of the premium for horticultural crops. The rest of the premium (over 95 percent is jointly shared by state and central governments.[75]

The scheme is triggered by weather events rather than traditional loss assessment, which expedites claims. PMFBY works with farmers, banks, other government agencies, including ISRO, and ag-tech, fin-tech and insure-tech players.[76]

Farmers enrol for the scheme through banks and common services centres. After reporting losses, insurers assess damage using surveys plus satellite imagery and remote sensing, paying claims via direct transfer to farmers' bank accounts. The process is digitised on the NCIP (National Crop Insurance Portal).[77]

PMFBY uses YES-TECH – a yield estimation system based on technology-weighted estimates, and WINDS (Weather Information Network and Data System), a network of automated weather stations for real-time yield modelling and farming advice for climate risk mitigation. Under YES-TECH, which was co-developed with UNDP, satellite, weather and field data together produce faster and more objective crop yield estimates.[78]

PMFBY presents a pure adaptation instrument, which assists rapid recovery in the face of climate shocks.

Impacts

~62 million
Hectares covered

~1/3rd
of India's gross crop area

~41.9 million
farmers insured in FY25

~784 million
Applications insured since 2016

~US$20.9 billion
(≈INR1.83 trillion) claims paid since 2016

Relevance to the Global South

PMFBY has successfully scaled due to continued policy support and tech deployment, which has accelerated claim disbursal. By providing a financial safety net, farmers are shielded from multi-year debt spirals due to an extreme weather event. Digitalisation in enrolment, direct benefit transfer, loss assessment reduces disputes and delays, while increasing trust and coverage.

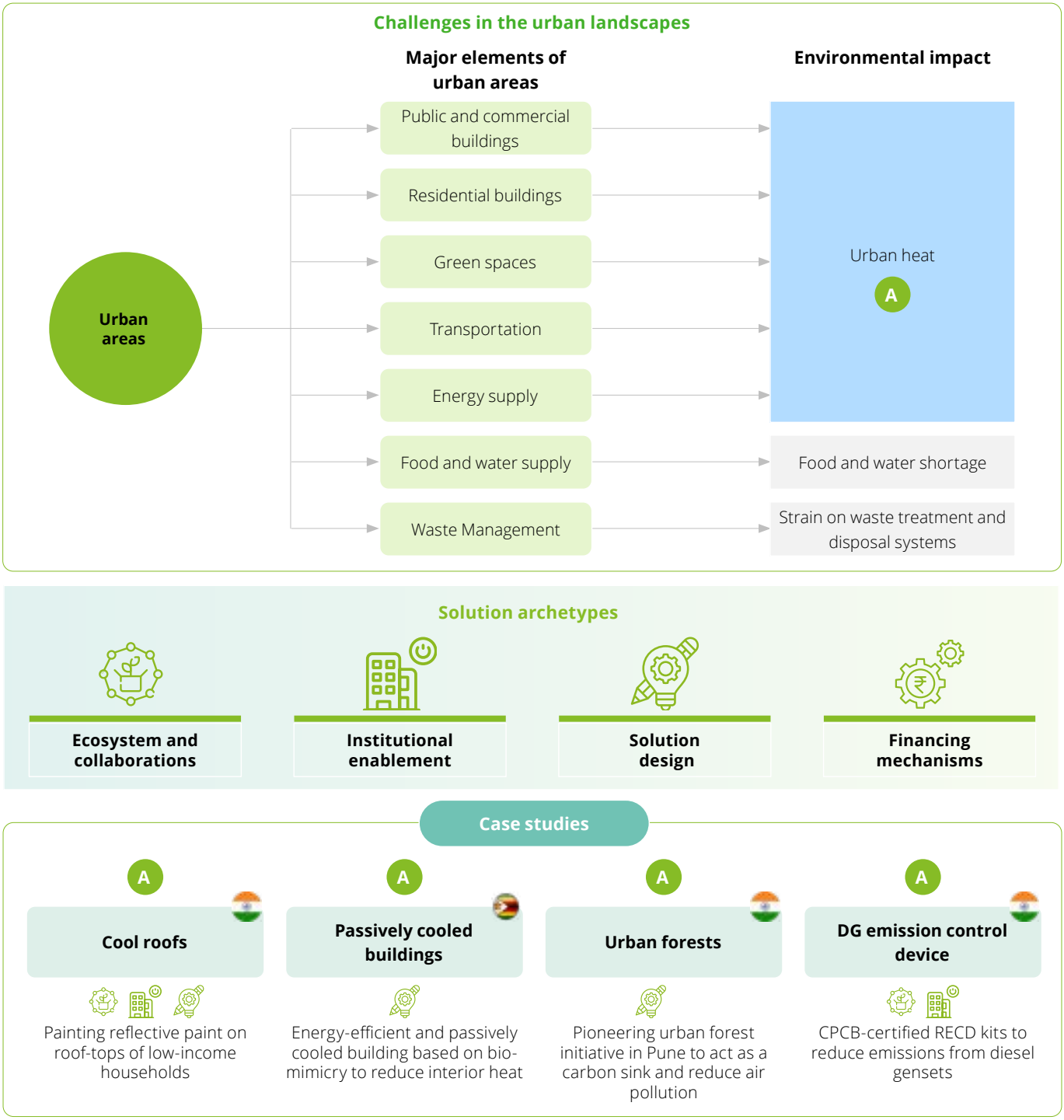
Source – UNDP, PIB, Deloitte Analysis
[6]Exchange rate is calculated on the base of 1 USD = 87.17 INR, yearly average rate for 2025.

3.3 Urban resilience

Economic and demographic growth have accelerated urbanisation across the Global South, resulting in heightened resource demands and substantial pressure on existing infrastructure. To accommodate expanding populations and increased demand for energy, land and mobility, deforestation has intensified and dependence on fossil fuels has grown. Rising transportation needs have further contributed to road congestion and elevated emissions. Simultaneously, the reduction of green cover, expansion of heat-absorbing concrete surfaces, and increased GHG emissions have led to higher urban temperatures and deteriorating air quality. The identified solutions address these challenges by reducing emissions and urban heat, while also enabling people to adapt to their evolving urban environments.

EXHIBIT 17

Structural challenges across the value chain are unlocking distinct solution archetypes



Legend
- A/B/C indicates the mapped challenges
- Icon indicates primary solution archetype
- Flag indicates the country of implementation

3.3.1 Climate Risks: Rapid urbanisation and global warming resulting in intensifying heat stress in urban areas

Most of the countries in the world are witnessing rapid urbanisation due to increasing population and economic growth. As green cover is replaced with dense clusters of buildings, roads and other heat absorbing surfaces such as concrete and asphalt trap solar radiation and release it slowly, resulting in higher ambient temperatures. These conditions along with emissions from continued use of fossil fuels create localised heat hotspots resulting in increased cooling requirements and heighten health risks for vulnerable populations, especially during summer. As cities continue to expand, managing urban heat islands will become a critical component of climate-resilient urban planning.

According to a World Bank report, the world's largest cities are expected to experience additional warming of over 2°C by 2050.

The increase in the use of air-conditioning due to rising temperatures is expected to increase energy demand by as much as 58 percent by 2050.

According to the World Health Organisation (WHO), the annual heat-related deaths are estimated to increase from 1,00,000 in 2030 to 2,50,000 by 2050.

Source: World Bank Report[79]

Case study 7

Cool Roofs Initiative to manage interior heat under extreme heatwaves in low-income households

Ahmedabad typically experiences very high temperatures, often exceeding 45°C in summer. In 2010, a major heatwave resulted in around 1,300 excess deaths.[80] The Ahmedabad Heat Action Plan was released in 2013 with input from experts and lessons from global best practices to provide a framework for planning and implementation of extreme heat response activities and reduce health impacts due to exposure to extreme heat. The Ahmedabad Cool Roofs Initiative was launched as a part of the Ahmedabad Heat Action Plan in 2017. It involves painting roofs with a coating of reflective paint to provide affordable cooling for vulnerable communities such as slum residents and protect them from extreme heat.[81]

As a part of the Cool Roofs Initiative, the Ahmedabad Municipal Corporation (AMC) aimed to cover 3,000 low-income households across six city zones and public buildings such as municipal buildings and government schools.[82] The initiative was envisioned as a public-private partnership with multiple stakeholders contributing to the execution of the project. Along with policy development, the Ahmedabad Municipal Corporation also designed information, education and communication materials to increase public awareness about cool roofs. A group of 50 volunteer students from local colleges in Ahmedabad joined the initiative to support the AMC in painting numerous rooftops. The AMC partnered with a local paint manufacturer which provided the reflective paint used for the first 10-15 pilot households free of cost.[83] The remaining households were painted with three layers of lime through contractors hired by the AMC.[84]

Image: Gautam Shah, Mayor of Ahmedabad, paints the first cool roof, May 2017 (Source NRDC)

The 2017 pilot was a larger initiative built upon a similar effort by Mahila SEWA Housing Trust, an NGO, which installed over 250 cool roofs based on a technology called ModRoof which uses coconut husk and paper waste.[85] Like Ahmedabad, Telangana launched a cool roofs pilot in Hyderabad in 2017, and in 2023 became the first Indian state to adopt an official Cool Roof Policy, mandating cool roofs for all government, commercial and non-residential buildings, as well as large residential buildings (plot area of 600 sq. yd. or above)[86]. Cool roofs are a cost-effective adaptation solution that reduces indoor temperatures and helps low-income households better withstand extreme heat.

Impacts

According to the Mahila SEWA Housing Trust, houses installed with ModRoofs, witnessed a drop in indoor temperature of **7–8°C**, compared with conventional concrete roofs.

According to a similar initiative conducted in Burkina Faso, cool roofs reduced indoor temperature by between **1.2°C** in tin- and mud-roofed homes, and **1.7°C** in tin-roofed homes over two years.

Relevance to the Global South

Cool roof solutions across the Global South could offer affordable, community-driven climate adaptation, especially where rising heat extremes are exacerbated by urban expansion and limited access to mechanical cooling. To scale such interventions, structured public–private partnerships could help mobilise financing, technical knowledge and community engagement thereby enabling wider deployment.

Source – Indian Institute of Public Health Gandhinagar[49], Reuters[87]

Case study 8

Biomimetic passive cooling systems enable energy-efficient buildings in heat-stressed cities

When it opened the Eastgate Centre was the largest office building and shopping center in Harare, Zimbabwe.[88] Designed by Mick Pearce in 1996, the building's design draws inspiration from the self-cooling mounds of African termites. Buildings with glass facades typically require energy intensive and expensive air-conditioning units to maintain at a comfortable temperature. The Eastgate Centre borrows the following design principles from African termite mounds for natural cooling and ventilation: Termite mounds have a chimney-like structure along with multiple exits and underground tunnels. During daytime, the structure absorbs heat and releases heat at night thereby making the air inside warm. During daytime, warm air is pulled out through the chimneys and cool air is drawn in through the underground tunnels. Similarly, the Eastgate Centre has multiple brick chimneys and underground chambers. During nighttime, the cool night air is captured in the underground chambers and released during the day through a network of pipes and tunnels.
The building also borrows from the heat-dissipating design of cacti.

Like the wrinkles and spikes on the surface of cacti, the building's façade is broken up by concrete projections and balconies allowing it to effectively dissipate heat and maintain the interior temperature.[89] Passively cooled buildings reduce dependence on mechanical cooling systems and enable occupants to adapt to extreme heat without incurring substantial energy or capital costs.

Image: The façade of Eastgate Centre in Harare, Zimbabwe (Source: Never Enough Architecture)

Impacts

90%
Lower energy consumption compared with conventional buildings of similar size

US$3.5 million
Savings for owners since air conditioning units did not have to be installed in the building

20%
Lower rent for tenants compared with occupants in surrounding buildings due to reduced energy consumption and the absence of air conditioning systems

Relevance to the Global South

The Eastgate Centre in Harare, Zimbabwe, demonstrates how passive cooling and climate-responsive design can reduce energy demand for commercial buildings in hot climates common across the Global South. By leveraging natural ventilation and biomimetic design principles, the building maintains comfortable indoor temperatures with dramatically lower mechanical cooling loads, supporting affordability and energy resilience in regions with unreliable or costly grid power.

Source – Inhabitat, Biomimicry

Case study 9

Urban forests in Pune to increase green cover and improve air quality

Rapid urbanisation and expansion of city limits in Pune resulted in the loss of green cover in the city. In 2015, TERRE Policy Centre, a NGO, collaborated with Tata Motors and Persistent Partners as CSR partners to develop an urban forest to improve green cover, combat urban heat and provide a site for recreation of urban residents in the city. A barren land of 16 acres belonging to the Maharashtra Forest Department which was used as a dump yard was chosen for the project.[92] More than 2,000 volunteers from Tata Motors planted over 50,000 indigenous saplings with a survival rate of 98 percent[93] Within 3 years, the project was scaled up to cover an area of 100 acres. As of 2020, the Smriti Van urban forest had a canopy cover of 40 percent and had a rich local ecosystem of 10 species of animals and reptiles, 50 avian species, 200 species of insects and 15 species of vegetation.[94]

The project stakeholders envisioned active public participation to maintain the urban forest and people were encouraged to adopt trees. More than 1,000 people visit the urban forest every day. In 2020, the Nagar Van scheme was launched by the Government of India based on the Smriti Van project with an aim to develop 200 urban forests across the country.[95] The project's implementation model of CSR participation and public volunteering made it a role model for the implementation of the Nagar Van scheme. Along with increasing green cover, urban forests also act as a mitigation solution that engages the public in improving air quality and combating urban heat in urban areas.

Image: A view of Smriti van urban forest in Warje, Pune (Source: Hindustan Times)

Impacts

100 acres
barren land converted into urban forest under the Smriti Van project

700T
overall annual oxygen production in Pune after the Smriti Van project in 2020

The Smriti Van project served as the model for the development of the **'Nagar Van' scheme** by the Indian Government, which aims to develop **200 urban forests across the country.**

300T
overall annual carbon sequestration in Pune after the Smriti Van project in 2020

Relevance to the Global South

Smriti Van demonstrates how urban forestry on degraded urban land can enhance microclimates, biodiversity and improve air quality. By using native species and low-maintenance ecological restoration, the model is cost-effective and feasible for resource-constrained environments. Public participation further reduces maintenance burdens and fosters long-term stewardship. As a result, Smriti Van represents a scalable nature-based solution for improving climate resilience and livability across the Global South.

Source – Tata Motors

Case study 10

Retrofit Emission Control Device (RECD) to reduce emissions from diesel generators

Diesel generator (DG) sets, widely used for backup power across residential, commercial and industrial settings, are significant hyperlocal sources of GHG emissions in India. In 2022, DG sets contributed to 42 Gg of particulate matter with a diameter of 2.5 µm (PM2.5), 23 Gg of black carbon and 877 Gg of nitrogen oxides (NOX) in India.[96] Chakr Innovation is an Indian start-up that develops emission control products. Its flagship product, Chakr Shield is India's first type-approved emission control device for diesel generators. The device is designed to reduce the concentration of pollutants such as carbon monoxide, hydrocarbons and particulate matter from diesel generator exhaust gases. Chakr's RECD has a modular design and can be fitted on DG sets of varying capacities. Instead of using a traditional filter, Chakr Shield uses a catalyst-based filtration system that significantly reduces the particulate matter in the emissions. This unique filtration system also gives Chakr's products a useful life of 10-12 years and requires minimal maintenance, thereby making it extremely cost-effective.

The company has also developed a suite of complementary products to create an ecosystem of pollution control equipment such as the following: (a) Chakr Dual Fuel Kit 2.0 reduces diesel consumption by enabling generators to run on a diesel–natural gas mix (b) Chakr DeNOx addresses harmful NOx emissions from diesel and gas engines (c) Chakr Emission Monitoring System offers real-time, CPCB-compliant monitoring solutions. The company has completed more than 5,000 Chakr Shield installations highlighting the strong demand for the product in the market.[97] RECDs serve as a cost-effective mitigation solution, costing only a fraction of a new generator.

Image: Chakr Shield RECD
(Source: Chakr Innovation)

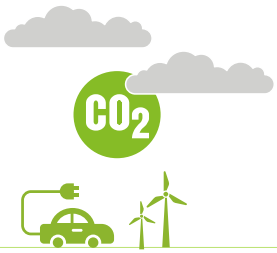
> "Customers increasingly prefer reliable and technically robust solutions over short-term compliance fixes. Unlike conventional systems, which are prone to choking, our durable and low-maintenance products align well with those expectations and enable customers to meet emission norms without having to purchase new generators."
>
> **-Alisha Agrawal, Head of Business Strategy, Chakr Innovation**

Impacts

70-90%
reduction in PM emissions from diesel generators

90%
reduction in CO_2 emissions from diesel generators

95%
reduction in HC emissions from diesel generators



Relevance to the Global South

RECD is relevant to Global South countries where unreliable grids and extensive diesel generator use drive hyperlocal GHG emissions. Its retrofit design, broad kVA compatibility, and low operating costs support scalable and affordable deployment across consumer and industrial settings. Also, RECDs enable owners to increase the useful lives of ageing diesel gensets which tend to violate increasingly stringent emission norms and are usually replaced.

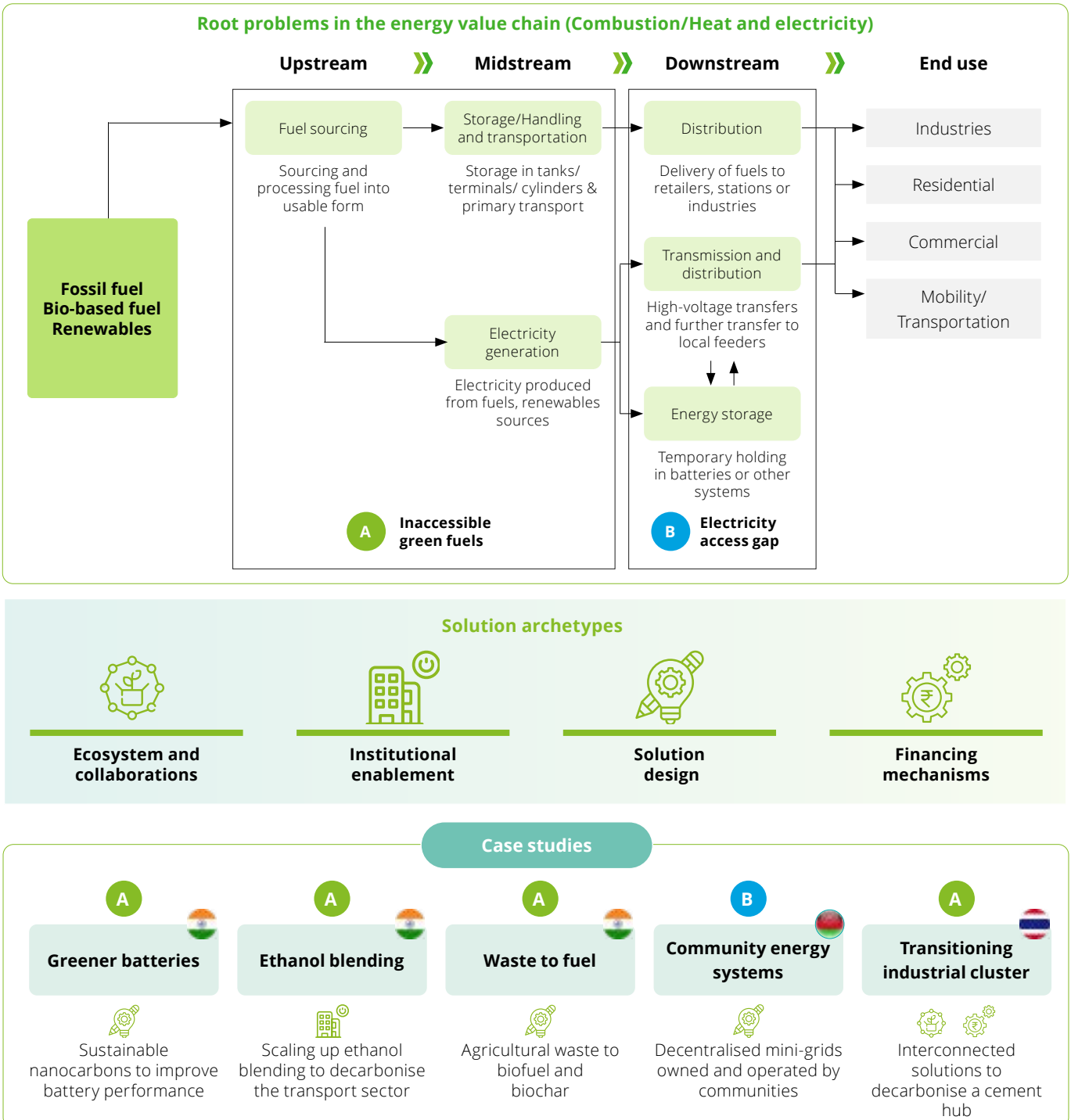
Source – Chakr Innovation

3.4 Energy transition

The Global South continues to rely predominantly on fossil fuels for energy generation, largely due to structural constraints within the energy value chain, including limited access to scalable, low-emission alternatives. This persistent dependence has contributed to elevated levels of significant GHG emissions. Although the deployment of renewable energy sources has increased in recent years, the pace and scale of adoption remain insufficient relative to growing energy demand. Accordingly, the identified solutions highlight unique and scalable approaches to accelerating the transition toward cleaner energy systems by addressing barriers to affordable green fuels and gaps in reliable electricity distribution.

EXHIBIT 18

Structural challenges across the value chain are unlocking distinct solution archetypes



Legend
- A/B/C indicates the mapped challenges
- Icon indicates primary solution archetype
- Flag indicates the country of implementation

3.4.1. Climate risks: Electrification will multiply battery demand by 2030; poor battery performance will result into supply insecurity in emerging countries, hindering their energy transition journey

Batteries are becoming a backbone of both transport and power systems, with global battery use in the energy sector exceeding 2,400 GWh in 2023 and is projected to rise to ~4,500–5,000 GWh annually by 2030.[98] As per UNCTAD & IEA, projected demand for critical minerals like Lithium could increase by 1500 percent by 2050 under the energy transition scenarios.[99]

At the same time, battery production and critical mineral processing are highly concentrated. China dominates most of the battery supply chain- it accounts for nearly 85 percent of battery cell manufacturing, as well as dominates most of the extraction and processing of critical minerals.[100]

As a result, most developing and emerging economies remain heavily dependent on imported batteries and battery materials. India imports around 75 percent of Li-ion batteries from China amounting to around US$2.2 billion.[101] The other Global south countries follow a similar trajectory.

Without further improvements in battery efficiency, durability, and material productivity, electrification in Global South countries will be vulnerable to supply chain risks and increasing scale of import dependence and Forex outflows.

Case study 11

Greener and more efficient batteries to fuel the Electrification drive in Global South

Cancrie's solution is a bio-based nanocarbon material derived from agricultural waste, primarily coconut shells, designed to enhance battery performance while lowering material intensity. The company's technology is currently commercialised in lead-acid batteries, where nanocarbon is used as an expander in the negative plate. It suppresses sulfation of battery plates, improving electrical conductivity and charge acceptance. The result is longer battery life, better performance and reduced replacement frequency, translating into lower volumes of battery demand annually. Additionally, converting agricultural residue into useful form of energy saves the emissions that would have added from residue burning, which is a prevailing practice in most agrarian countries.[102] To date, Cancrie's nanocarbon has been commercially deployed in almost 50,000 lead-acid batteries across electric two-wheelers, demonstrating real-world adoption in a cost-sensitive and highly competitive market. While the company is also exploring applications in multiple battery chemistries- Lead-acid, Na-ion, Li-ion, Redox-flow batteries and Super capacitors, these remain at the stage of commercialisation or at industrial trials/POC stage.[104] Customers to Cancrie currently include leading Battery manufacturers in India as well as MSMEs.

Government support has played a catalytic role in de-risking Cancrie's early innovation journey. The company has received several national-level recognitions, including the National Energy Efficiency Innovation Award from the Bureau of Energy Efficiency under the Ministry of Power and the Energy Transitions Innovation Challenge (ENTICE) backed by DPIIT, helping it to build credibility in Industry. [105]

Cancrie has successfully leveraged support from **Corporates** (Automotive and Energy Service providers) in field simulations of Cancrie powered batteries providing valuable user data and performance feedback. Additionally, Cancrie is actively engaging with **commercial partners** in the battery ecosystem to co-develop and manufacture Cancrie Nanocarbon-powered cells, enabling faster validation, and a clearer pathway to commercialisation.[106]

Private investors such as Root ventures have shown strong confidence in Cancrie's technology, recognising the scale of the battery market opportunity and the urgency of material-efficient solutions for the energy transition.

> We have worked with some leading corporates in both the automotive and solar sector, where we have directly used Cancrie powered batteries/ cells. This has helped us in accessing the end user data in order to bring back to battery manufacturers. **Hence, corporates must demonstrate a strong moat to support the startups/ideas, with clear milestones so that it becomes adoptable technology at scale and not just a CSR activity**. India faces acute scarcity of fabrication facilities for cylindrical and prismatic cells using advanced battery chemistries, both at laboratory and pilot scales, ...making access difficult for material innovators and early-stage technology developers. **This lack of shared infrastructure slows down rapid prototyping, validation, and collaborative development of next-generation battery technologies..."**
>
> **-Ms. Mahi Co-founder, COO, Cancrie**

Impacts

Performance

>15%

improvement in the energy density of battery

15-30%

increased lifecycle

Sustainability

700T

potential savings on critical mineral

4GT

CO_2e/ year potential reduction by 2050

Cost

>400k/ GWh

savings for battery manufacturer

Relevance to the Global South

Many Global South economies are agrarian, making agricultural residues a readily, strengthening supply security. At the same time, these markets are highly price sensitive, where adoption of batteries is driven by low cost of ownership rather than peak performance. Cancrie solution, hence, provides a right product market fit. In parallel, several Global South countries are actively seeking to localise lithium-ion cell manufacturing to reduce dependence on imports from China, supported by government-led policy frameworks such as India's ACC PLI scheme, Indonesia's battery value-chain strategy, and EV–battery incentives in Thailand and Vietnam. Together, these dynamics create a strong demand pull for material-efficient battery innovations like Cancrie's.[107]

Note: Performance claims are as stated by the startup; Deloitte has not independently assessed or validated these claims
Source – Company website and Secondary information

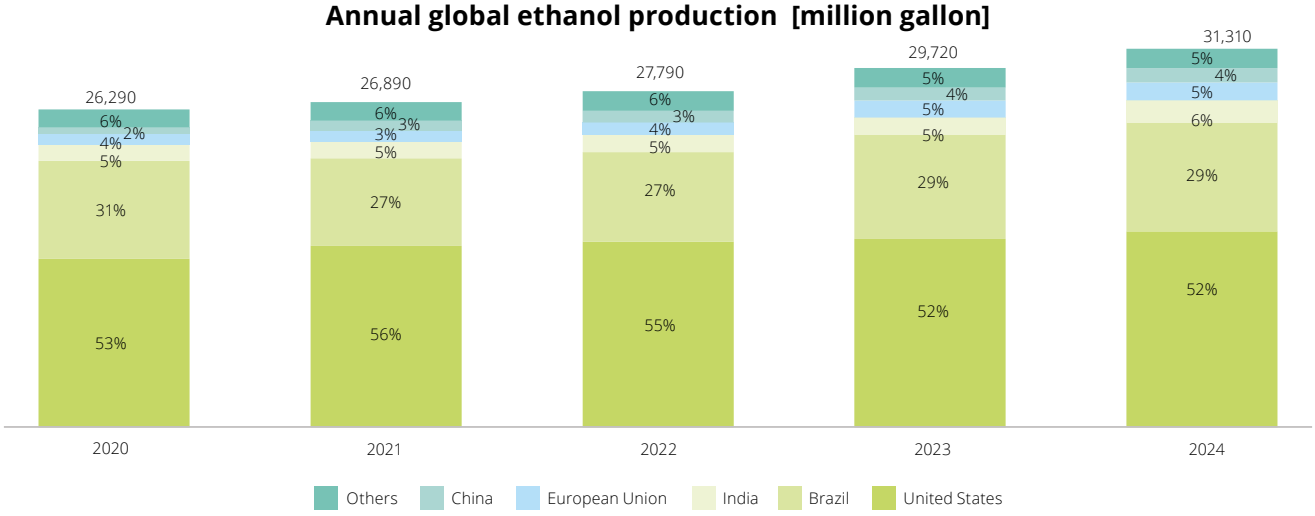
3.4.2 Climate risks: Rising fuel demand and high oil import dependence expose developing countries to energy security and emissions risks, in absence of a sustainable alternative

The global ethanol market is expanding rapidly, driven by energy security concerns, emissions reduction goals, and fuel-blending mandates. The US and Brazil together account for nearly 80 percent of global ethanol production, underpinned by long-standing policy certainty and mature supply chains.[108] In contrast, Asia–Pacific is expected to be the fastest-growing ethanol market.

This is happening against a backdrop where over 85 percent of global crude oil demand growth to 2030 will come from emerging and developing economies. Most of these economies, such as Bangladesh, the Philippines, and Kenya, import 70–100 percent of their crude oil, making them highly vulnerable to price volatility and supply shocks.

For Global South countries, ethanol blending offers a near-term solution to address both energy security and climate challenges. The transport sector already contributes ~15 percent of global energy-related CO_2 emissions, and in emerging economies these emissions are among the fastest growing, driven by rapid motorization.[109] Hence, emerging economies must scale ethanol blending quickly and efficiently, underscoring the need for a clear, time-bound ethanol roadmap to move beyond pilots, attract investment, and accelerate the transition at scale.

Annual global ethanol production [million gallon]



Source: US Department of Energy, Deloitte analysis

Case study 12

A policy-led, multi-stakeholder approach to scale-up Ethanol blending ecosystem, leading to decarbonisation of the transport sector

In July 2025, India successfully achieved nearly 20 per cent ethanol blending in petrol.[110] With that, ethanol blending in petrol increased from just 1.5 percent in 2014 to 20 percent in 2025 – a nearly 13-fold increase over 11 years.[111]

India achieved this feat by pairing a clear national target and time-bound roadmap with a multi-pillared implementation strategy. This approach enabled the development of a coordinated ecosystem in which government, oil marketing companies, producers, and financiers each played a defined role in balancing the supply and demand.

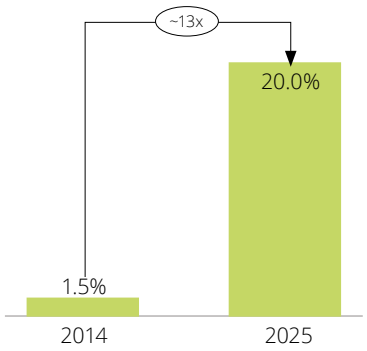
Interventions include:

- **Clear national targets (created certainty)-** The National Policy on Biofuels, 2018 set the strategic direction for ethanol blending, providing a clear 5-year roadmap (2020-25) laid down for E20 (20 percent blending target)
- **Guaranteed demand through OMC procurement (demand certainty)-** OMCs run the Ethanol Blending Petrol (EBP) procurement system, issuing annual tenders that created a reliable and bankable offtake channel for Ethanol producers.
- **Administered pricing mechanisms (revenue certainty)-** The government introduced administered ethanol prices by feedstock, reducing price volatility and ensuring predictable revenues for producers.
- **Feedstock diversification (supply chain certainty)-** To avoid being constrained by only sugar-molasses ethanol, policy enabled ethanol from Sugarcane juice/syrup, B-heavy molasses, sugar (sugar diversion route) and Grain-based routes (maize, damaged food grains, surplus rice, etc.) and broader biomass options (in policy design). This strengthened supply security.
- **Capital support for distillery capacity (Capacity expansion)-** Government introduced multiple Ethanol Interest Subvention Schemes (EISS) (2018–22); also, Government reduced GST to 5% for ethanol supplied under the EBP Programme.
- **Infrastructure roll-out (nationwide implementation)-** Investments in blending depots, storage, and logistics, led by OMC networks, enabled ethanol blending to scale across the country.

Image: Farmers load freshly harvested sugarcane into a tractor trolley during the harvesting season, in Karad, Maharashtra, on December 15. (Source: The Hindu)

Impacts[3]

Ethanol blending ratio achieved (%)



~US$413 billion
(≈INR36 trillion) saved in foreign exchange by reducing its dependence on crude imports

~US$13.77 billion
(≈INR1.2 trillion) paid to farmers for supplying feedstock to sugar mills/distilleries

~70 million
tonnesCO_2 emissions reduced

3. Exchange rate is calculated on the base of 1 USD = 87.17 INR, yearly average rate for 2025.
Source: Business India Special report

Relevance to the Global South

Countries such as Thailand, Indonesia, Bangladesh, Pakistan, Kenya, Nigeria and Ethiopia, which share characteristics such as strong state involvement in fuel markets, large agricultural sectors, and fuel import dependence, could adapt India's approach. The Global Biofuel Alliance (GBA) was launched at the 2023 G20 Summit to promote sustainable biofuels and adoption across countries- Bangladesh, Kenya, Guyana, Sri Lanka, Uganda etc. are actively engaging for cross learning and defining regulatory frameworks.

Case study 13

Technology innovation for scaling Waste-to-Fuel led by a startup to reduce dependencies on fossil fuels

Another technology-driven solution gaining traction in India and globally is the conversion of agricultural residues into biofuels and high-value bio-products such as biochar. This solution addresses two critical challenges simultaneously: it provides cleaner alternatives to fossil fuels, reducing GHG emissions and import dependency, as well as offers productive usage of underutilised agricultural residues, avoiding their open burning - a major source of climate emissions. In India alone, the Ministry of New and Renewable Energy (MNRE) estimates annual crop residue generation of ~500-600 million tons, of which around 90-100 million tons are burned, releasing ~40-50 million tons of CO_2 annually.[112] Scalable biomass-to-energy and biochar solutions can transform this untapped resource into renewable fuel and carbon-removal products, contributing meaningfully to both energy access and climate action.

MASH Makes uses a proprietary containerized pyrolysis system to convert biomass residues into advanced biofuel, EBC biochar suitable for organic farming (European Biochar Certificate) and carbon removal credits. The technology, designed at the Technical University of Denmark, is designed to be modular and deployable. The biofuel produced is used primarily in shipping and heavy manufacturing, while the biochar enhances soil fertility, moisture retention, and crop productivity. Additionally, it contributes to carbon credit generation, creating financial incentives for emission reduction. MASH Makes has pursued a deliberate and structured pathway to scale, centered on building replicable, industrial-scale waste-to-biofuel systems, wherein sourcing of biomass is done from crop processing industries in a consolidated manner, reducing logistical costs.

Private capital has played a central role in enabling MASH Makes' scale-up to date. The company raised a US$12.5 million Series A investment, led by a strategic corporate investor. The startup also has been supported by NEFCO (the Nordic Environment Finance Corporation - an international financial institution (IFI) established and owned by five public Nordic governments), alongside Nordic Green Bank in terms of debt financing. Participation in platforms like Green Fuels Alliance India and Green Transition Alliance India on green fuels and energy transition has helped align the company's activities with emerging policy priorities, without reliance on direct public subsidies.

Looking ahead, MASH Makes' near-term expansion is focused on replicating its existing platform across multiple regions in India, while continuing to enhance its technology to improve feedstock flexibility.

Image: MASH Makes' commercial pyrolysis facility near Udupi, Karnataka, India. (Source: Company website)

> Aligning investor interest and risk appetite is one of the biggest challenges in scaling CDR. Institutional investors have capital and want to invest but often lack the risk appetite for early-stage ventures, especially in the Global South. We feel it's time for institutional investors from the Global South to step up and support the sector in the Global South....
> The World Bank, for example, has been working to develop capital solutions such as debt financing to enable scale-up projects that support the green transition. These are called impact or outcome bonds. This instrument shows promise for scaling CDR in the Global South and could be promoted and accelerated, for example with similar support from regional development banks like the Asian Development Bank...."
>
> **-Mr. Ross Allen, Chief Impact Officer, MASH Makes**

Impacts

The Udupi facility in Karnataka has processed over 7,000 tons of biomass so far (from 2023) to produce 2,900 tons biochar and 1,050 tons biofuel from cashew chain residues. Phase 2 has been launched recently increasing the annual capacity to 7,000 tons of Biofuel and 14,000 tons of Biochar. Last year, the startup also successfully completed a world's first commercial vessel trial with global shipping company DS NORDEN, using a blend of MASH Makes biofuel produced via its carbon-negative thermochemical process.

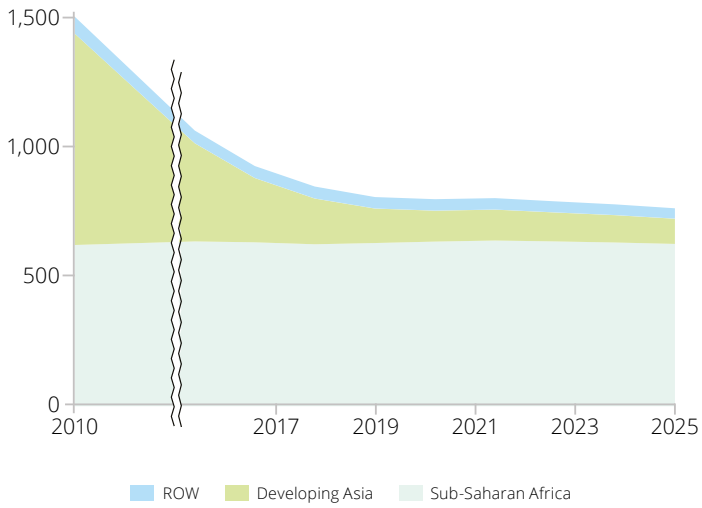
3.4.3 Climate risks: Climate vulnerability and weak grid infrastructure threaten energy access in the Global South

Sub-Saharan Africa continues to face profound challenges in achieving universal energy access, shaped by economic, geographic, and structural constraints. While global electricity access rose to nearly 92 percent in 2023, the progress has not been uniform; over 666 million people still lacked access to electricity that year.[113] Of the 20 countries with the largest access deficits, 18 were in Sub-Saharan Africa, underscoring the region's persistent energy poverty gap. The region has the lowest electrification rates in the world, with only around 53 percent of the population connected to the grid, compared to global access which is around 92 percent[114]

In addition to the electricity access gap, access to clean cooking fuels and technologies remains critically low, with more than 2.1 billion people globally still dependent on polluting fuels such as biomass, charcoal, and dung - a burden especially acute in Sub-Saharan Africa.[115]

As per the World Bank, investing in decentralized renewable energy, including standalone off-grid solar and mini-grids, together with electricity-as-a-service models holds significant potential to bridge this access gap.

Population without access to electricity [million]



Source: World Bank, Deloitte analysis

Case study 14

Community Energy Systems through mini grids to extend access to electricity in remote areas

Community Energy Systems (CES) are decentralised energy initiatives characterised by a high degree of community participation in ownership, management, and benefit sharing across the entire project lifecycle, ensuring that energy solutions are aligned with local needs and remain socially and financially sustainable.

In the planning phase, CES projects may originate as government-led initiatives or emerge directly from community demand. An example is the Chipopoma micro-hydro system in Malawi, which was developed and driven by the local community through a non-profit entity known as the **Village Energy Committee (VEC).**
By 2024, the project was operating a 53 kVA micro-hydro generator, supplying electricity to nearly 120 households, a school, a maize mill, two lodges, and several small commercial establishments. From construction through commissioning, the VEC took primary responsibility for project implementation, engaging external technical experts where required.[116]
This approach ensured local ownership of the asset while maintaining technical standards during installation and system integration. During the Operations and Maintenance (O&M) phase, electricity users typically pay a flat tariff, designed to cover routine O&M costs of the microgrid.

The **government** plays a supportive role by providing periodic grants for capacity expansion, including support for the installation of prepaid metering systems, strengthening the financial sustainability of the project over time.

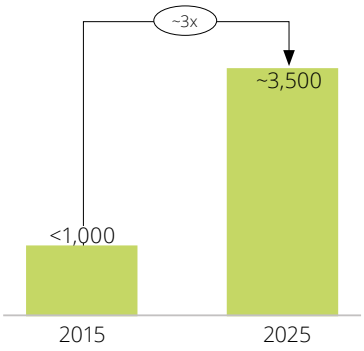
Multilateral agencies, as well as Government play an important role in Financing these mini or micro grid projects. While funding mobilization process was led by the VEC team of Chipopoma - resources were pooled from partners, including the United Nations Development Programme (UNDP), The Titus Foundation, and the US Embassy, highlighting the role of blended development finance in enabling community-scale infrastructure.

The distinctive implementation model of CES not only extends electricity access to remote and underserved areas, but also significantly strengthens community technical capabilities and project management skills. By building human and social capital, CES embeds greater resilience in local energy infrastructure, against natural disasters and geopolitical instability.

Image: Sitolo Solar Minigrid (Source: Community Energy Malawi)

Impacts

Scale up of mini grids, driven by communities



Source – Jacob's Ladder Africa

~10 million
people getting served by mini grids in Africa (2025)

~200 MW
capacity of mini grids in Africa (2025)

>60%
drop in costs of solar PV has improved adoption by communities, 2015–25

Relevance to the Global South

Community-driven mini grids are emerging as a core electrification pathway across the Global South, where extending national grids to remote and dispersed populations remains challenging. In Asia, countries such as Afghanistan, Myanmar, India, Nepal and China have the highest number of installed mini grids, while archipelagic countries such as the Philippines and Indonesia are witnessing rapid recent adoption. Looking ahead, around 210,000 mini-grid systems could be deployed by 2030, potentially connecting over 500 million people globally, highlighting CES as a scalable and essential.[117]

3.4.4 Climate risks: Industrial clusters present the development resilience paradox to GS countries; they contribute to development at the cost of sustainability

Industrial clusters account for a 15-20 percent of global CO_2 emissions, making them a high-impact target for climate mitigation. Even critical are the Hard-to-abate industrial sectors, including aluminum, cement, steel, chemicals, aviation, shipping and trucking- they sit at the core of the net-zero transition, accounting for nearly 40 percent of global greenhouse gas emissions. Decarbonising these sectors remains particularly challenging due to immature technologies, high upfront capital requirements, underdeveloped supply chains and slow or inconsistent policy and permitting processes.[118]

These barriers create uncertainty for investors and delay project execution- with an estimated US$30 trillion in additional investment required by 2050 to decarbonize hard-to-abate sectors, progress toward net zero will depend on stronger market signals, stable and enabling policy frameworks, and risk-reduction mechanisms that improve project economics.[119]

Without coordinated action, the transition of heavy industry risks becoming a critical bottleneck in achieving global climate targets.

Case study 15

Transitioning industrial cluster with coordinated public private partnership model

The Transitioning Industrial Clusters Initiative is a World Economic Forum (WEF)-led effort aimed at accelerating the decarbonisation and sustainable transformation of industrial clusters. A representative cement cluster, which is part of this initiative, has been deep dived, to demonstrate how coordinated cluster-based action can unlock large-scale emissions reductions while supporting economic competitiveness.

One such representative case is the Saraburi Sandbox initiative in Thailand. Launched in August 2023, Saraburi Sandbox is a public-private-people partnership (PPP) aimed at accelerating industrial decarbonization in Saraburi Province, which produces nearly 80 percent of Thailand's cement and is among the country's most emissions-intensive regions.[120]

The initiative targets carbon neutrality by 2050 and net-zero emissions by 2065. It is led by the Thai government, the Thailand Cement Manufacturers Association (TCMA), and 23 local agencies, with strong private-sector participation from companies such as Siam Cement Group (SCG) and CEMEX, operating under a "3C framework" of Communication, Collaborative Action, and Conclusion.

The programme focuses on five priority sectors: Industrial Processes and Product Use (IPPU), Energy, Waste, Agriculture, and Land Use, Land Use Change and Forestry (LULUCF).

Initiatives include:

- **Reduce clinker intensity** in cement production by adopting hydraulic and low-carbon cement formulations across manufacturing facilities.
- **Transition cement kilns away from coal** through the increased use of biomass and Refuse-derived Fuels (RDF); agricultural residues from surrounding regions converted into pellets
- **Develop low-carbon concrete solutions** by improving material efficiency, optimising mixing processes
- **Invest into on-site Carbon Capture, Utilisation and Storage (CCUS),** currently under research and feasibility assessment with a medium-term deployment horizon
- **Promote energy crop cultivation** (Napier grass) as a sustainable biomass feedstock for industrial use, with structured participation of local farming communities
- **Implement Land Use, Land Use Change and Forestry (LULUCF) programme** through a multi-year community forest development plan covering conservation, restoration
- **Promote circular economy** through community-led waste management systems by converting organic and food waste into fertilizers for Napier grass cultivation

The solution framework is backed by **robust blended financing mechanism,** with Siam Cement group investments, Public-sector funding, ESCO model financing, international funding through UNIDO, Community funding (Napier cultivation) playing
critical role.

Image: Renewable energy infrastructure by SCG (Source: SCG Cleanenergy)

Impacts

~1 million

tonnes CO_2 Emissions saves in 1 year's time from launch (2023–24)

~80%

construction projects in Saraburi now using hydraulic cement

~26%

share of alternate fuels and renewable energy by the cement industry

~6,000 acres of forest land being rehabilitated

Source – World Economic Forum

Relevance to the Global South

The Saraburi Sandbox demonstrates how an industrial cluster can function as a "living laboratory" to pilot advanced decarbonization technologies and test new engagement models in real operating conditions. Its multi-stakeholder, public–private–people partnership enables blended financing and risk sharing, which is essential for capital-intensive industrial transitions in emerging markets. Importantly, the model prioritizes community upliftment alongside emissions reduction, making it particularly relevant for the Global South.

4. Way forward

As climate risks intensify, **shifting from reactive climate actions to interconnected, system level solutions becomes increasingly crucial.** The path forward requires integrated solutions between **mitigation, adaptation, economic growth, and development outcomes.** This implies embedding climate considerations into core business strategies and national development planning, rather than treating climate action as a standalone or compliance-driven exercise. For example, integrated energy transition solutions such as combining renewable energy deployment with storage, grid strengthening, and decentralized access simultaneously reduce emissions, improve resilience to climate shocks, and enhance energy security.

Systemic climate solutions cannot be delivered by individual actors working in isolation. Scaling impact requires deliberate **coordination across governments, businesses, financial institutions, communities, and development partners,** anchored in a shared vision. Public institutions should continue their role as policy and market enablers by setting clear national targets, establishing stable regulatory frameworks and roadmaps, along with developing financial derisking mechanisms, rather than being direct financiers. Corporates need to deploy technology and innovative self-sustainable business models, supported by seed investments from Private capital and development finance institutions. Communities play a central role in co-designing solutions and ensuring local adoption. Overall, a balanced alignment of supply- and demand-side levers is essential to scale solutions and unlock a pathway to sustainable development.

It is imperative to acknowledge that climate solutions for Global South economies must be **compatible with their development goals,** rather than compete with them. Well-designed interventions can generate **multiple co-benefits,** improving livelihoods, reducing fiscal pressures, and strengthening resilience alongside fostering reduction in emissions. India's ethanol blending program illustrates this approach: it lowers lifecycle transport emissions while reducing oil import dependence, supporting farmer incomes, and strengthening domestic supply chains. Similarly, decentralised renewable energy systems in Sub-Saharan Africa expand electricity access, improve resilience to climate shocks and stimulate local economic activity, while avoiding long-term carbon lock-in.

Given the heightened climate vulnerabilities in the Global South, **mitigation and adaptation measures must be pursued together.** The Kilimo case illustrates how adaptation interventions can generate mitigation co benefits: reducing water use addresses current climate stresses while helping prevent future resource depletion. This initiative has scaled through effective incentive alignment across multiple stakeholders, including farmers, businesses, and governments. The immediate nature of climate risks makes **private sector participation critical, even in adaptation efforts.**

Together, the cases in this paper underscore a simple truth: only coordinated, development-aligned climate action can place the Global South on a resilient, low-emissions, and economically sustainable trajectory

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Glossary

#	Abbreviation	Expanded form
1	ACC	Advanced Chemistry Cell
2	AI	Artificial Intelligence
3	AMC	Ahmedabad Municipal Corporation
4	AR	Assessment Report
5	BAU	Business as Usual
6	CCUS	Carbon Capture Utilization and Storage
7	CEEW	Council on Energy, Environment, and Water
8	CEMEX	Cementos Mexicanos
9	CEO	Chief Executive Officer
10	CES	Community Energy Systems
11	CO2	Carbon Dioxide
12	CPCB	Central Pollution Control Board
13	CSR	Corporate Social Responsibility
14	DG	Diesel Generator
15	DRE	Decentralized Renewable Energy
16	DPIIT	Department for Promotion of Industry and Internal Trade
17	E20	20% Ethanol
18	EBP	Ethanol Blending Petrol
19	EISS	Ethanol Interest Subvention Schemes
20	EM-DAT	Emergency Events Database
21	ENTICE	Energy Transitions Innovation Challenge
22	ESCO	Energy Service Company
23	EV	Electric Vehicle
24	FAO	Food and Agricultural Organization
25	FPO	Farmer Producer Organization
26	G20	Group of 20
27	G77	Group of 77
28	GAR	Global Assessment Report
29	GBA	Global Biofuel Alliance
30	GDP	Gross Domestic Product
31	GHG	Greenhouse Gases
32	GN	Global North
33	GS	Global South
34	GST	Goods and Services Tax
35	GWh	Gigawatt Hour
36	HDI	Human Development Index
37	IE	Institutional Enablement
38	IEA	International Energy Agency
39	IEC	Information, Education and Communication
40	IoT	Internet of Things
41	INR	Indian Rupee
42	IPCC	Intergovernmental Panel on Climate Change
43	IPPU	Industrial Process and Product Use
44	ISRO	Indian Space Research Organization

#	Abbreviation	Expanded form
45	Li-ion	Lithium Ion
46	LULUCF	Land Use Land Use Change and Forestry
47	MIF	Marico Innovation Foundation
48	MSME	Micro, Small, and Medium Enterprises
49	Na-ion	Sodium ion
50	NABARD	National Bank for Agriculture and Rural Development
51	NABCONS	NABARD Consultancy Services
52	NCIP	National Crop Insurance Portal
53	ND-GAIN	Notre Dame - Global Adaptation Initiative
54	NDC	Nationally Determined Contribution
55	NOx	Nitrogen Oxides
56	NGO	Non-Governmental Organization
57	NRDC	National Research and Development Corporation
58	O&M	Operations and Maintenance
59	OECD	Organization for Economic Cooperation and Development
60	OMC	Oil Marketing Company
61	P2P	Peer-to-Peer
62	PLI	Production Linked Incentive
63	PM	Particulate Matter
64	PMFBY	Pradhan Mantri Fasal Bima Yojana
65	POC	Proof of Concept
66	PPP	Public-Private-People Partnership / Purchasing Power Parity
67	R&D	Research and Development
68	RDF	Refuse-derived Fuels
69	RECD	Retrofit Emission Control Device
70	RoW	Rest of the World
71	S4S	Science for Society
72	SCG	Siam Cement Group
73	SDG	Sustainable Development Goals
74	SEWA	Self Employed Women's Association
75	TERRE	Technology, Education, Research and Rehabilitation for the Environment
76	TCMA	Thailand Cement Manufacturers Association
77	UNDP	United Nations Development Programme
78	UNFCSSC	United Nations Finance Centre for South-South Cooperation
79	UNIDO	United Nations Industrial Development Organization
80	USD	US Dollar
81	VWBA	Volumetric Water Benefit Accounting
82	VC	Venture Capital
83	VEC	Village Energy Committee
84	WEF	World Economic Forum
85	WINDS	Weather Information Network and Data System
86	YES-Tech	Yield Estimation System based on Technology

References

1. "Emissions Gap Report 2024," United Nations Environmental Programme, 2024. https://www.unep.org/resources/emissions-gap report-2024
2. Sixth Assessment Report," Intergovernmental Panel on Climate Change, 2023. https://www.ipcc.ch/assessment-report/ar6/
3. "Rate and Impact of Climate Change surges dramatically in 2011-2020," World Meteorological Organization, 2023. https://wmo.int/news/media-centre/rate-and-impact-of-climate-change-surges-dramatically-2011-2020
4. "WMO confirms 2024 as warmest year on record at about 1.55°C above pre-industrial level," World Meteorological Organization, 2025. https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level
5. "The Paris Agreement," United Nations Climate Change. https://unfccc.int/process-and-meetings/the-paris-agreement
6. "Emissions Gap Report 2024," United Nations Environmental Programme, 2024. https://www.unep.org/resources/emissions-gap-report-2024
7. "State of the Global Climate 2024," World Meteorological Organization, 2025. https://wmo.int/publication-series/state-of-global-climate-2024
8. "Disaster Year in Review 2024," EM-DAT, 2024. https://files.emdat.be/2025/05/CredCrunch78.pdf
9. "Disaster Year in Review 2024," EM-DAT, 2024. https://files.emdat.be/2025/05/CredCrunch78.pdf
10. "Turning Point: A Global Summary," Deloitte, 2022. https://www.deloitte.com/global/en/issues/climate/global-turning-point.html
11. "International Energy Outlook," US Energy Information Administration, 2021. https://www.eia.gov/outlooks/ieo/consumption/sub-topic-03.php
12. "Net Zero by 2050," International Energy Agency, 2021. https://www.iea.org/reports/net-zero-by-2050
13. "Transforming Food Systems to return to Earth's limits," UN Food Systems Coordination Hub, 2025. https://www.unfoodsystemshub.org/docs/unfoodsystemslibraries/sac/sac-theme-2-policy-brief.pdf
14. "The Economics of Food System Transformation," Food System Economics Commission, 2025. https://foodsystemeconomics.org/wp-content/uploads/FSEC-Global_Policy_Report.pdf
15. "The Economics of Food System Transformation," Food System Economics Commission, 2025. https://foodsystemeconomics.org/wp-content/uploads/FSEC-Global_Policy_Report.pdf
16. "Global Assessment Report," United Nations Office for Disaster Risk Reduction. https://www.undrr.org/gar
17. "G-77 Countries, 2026," World Population Review. https://worldpopulationreview.com/country-rankings/group-of-77
18. "From Cambodia to Peru: G77 and China chair changes hands in Geneva," United Nations Trade and Development, 2025. https://unctad.org/news/cambodia-peru-g77-and-china-chair-changes-hands-geneva
19. "World Economic Outlook (WEO)," International Monetary Fund, 2025. https://data.imf.org/en/datasets/IMF.RES:WEO
20. "World Economic Outlook (WEO)," International Monetary Fund, 2025. https://data.imf.org/en/datasets/IMF.RES:WEO
21. "OECD Global long-run economic scenarios," Organization for Economic Cooperation and Development, 2025. https://www.oecd.org/en/topics/sub-issues/economic-outlook/long-run-economic-scenarios-2025-update.html
22. "Infrastructure Finance," World Bank, 2023. https://www.worldbank.org/en/topic/sustainableinfrastructurefinance/overview
23. "The Energy Progress Report 2025," World Bank, 2025. https://www.worldbank.org/en/topic/energy/publication/tracking-sdg-7-the-energy-progress-report-2025
24. EM-DAT. https://public.emdat.be/
25. "Climate Finance Vulnerability Index (CliF-VI)," Columbia Climate School. https://clifvi.org/
26. "World Disasters Report 2022," International Federation of the Red Cross and Red Crescent Societies, 2022. https://www.ifrc.org/document/world-disasters-report-2022
27. UNHCR. https://www.unhcr.org/what-we-do/build-better-futures/climate-change-and-displacement
28. "No Escape II: The Way Forward," UNHCR, 2025. https://www.unhcr.org/media/no-escape-ii-way-forward
29. Notre Dame Global Adaptation Initiative Index, 2025. https://gain.nd.edu/our-work/country-index/download-data/
30. "Global Carbon Budget," University of Exeter, 2025. https://globalcarbonbudget.org/
31. "CO2¬¬ emissions," Our World in Data, 2024. https://ourworldindata.org/co2-emissions
32. "Aquastat," Food and Agricultural Organization, 2025. https://www.fao.org/aquastat/en/
33. "Cereal Yield (kg per hectare.)" World Bank, 2025. https://data.worldbank.org/indicator/AG.YLD.CREL.KG
34. "India's Food Waste is Turning into an Environmental Time Bomb," 360 Info, 2025. https://360info.org/indias-food-waste-is-turning-into-an-environmental-time-bomb/
35. "Addressing Transportation Inefficiencies in Africa Crucial to Reducing Food Insecurity," World Bank, 2025. https://www.worldbank.org/en/news/press-release/2025/05/20/crucial-african-transport-hubs-food-security-efforts
36. "Agriculture, forestry, and fishing, value added (% of GDP)," World Bank, 2025. https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS
37. "Can Africa harness agriculture for decent job creation?" International Labour Organization, 2025. https://www.ilo.org/resource/article/can-africa-harness-agriculture-decent-job-creation
38. Lancet Countdown 2025, https://lancetcountdown.org/explore-our-data/
39. "Per capita primary energy consumption by source, 2024." Our World in Data, 2025. https://ourworldindata.org/grapher/per-capita-energy-stacked
40. "The Energy Progress Report 2025," World Bank, 2025. https://www.worldbank.org/en/topic/energy/publication/tracking-sdg-7-the-energy-progress-report-2025
41. "Financing for development: Reforming global systems to drive progress" https://unctad.org/news/financing-development-reforming-global-systems-drive-progress
42. "Global Landscape of Climate Finance Data Dashboard," Climate Policy Initiative, 2025. https://www.climatepolicyinitiative.org/resources/data-visualizations/global-landscape-of-climate-finance-data-dashboard/

43. "Landscape of Green Finance in India," Climate Policy Initiative, 2024. https://www.climatepolicyinitiative.org/publication/landscape-of-green-finance-in-india-2024/
44. "Adaptation Gap Report 2025," United Nations Environment Programme, https://www.unep.org/resources/adaptation-gap-report-2025
45. "Adaptation Gap Report 2025," United Nations Environment Programme, https://www.unep.org/resources/adaptation-gap-report-2025
46. "Aquastat," Food and Agricultural Organization, 2025. https://www.fao.org/aquastat/en/
47. "How Polyhouse farming in Rajasthan's desert in turning farmers into millionaires," The Plate, 2025. https://theplate.in/how-polyhouse-farming-in-rajasthans-desert-is-turning-farmers-into-millionaires/
48. "How Polyhouse farming in Rajasthan's desert in turning farmers into millionaires," The Plate, 2025. https://theplate.in/how-polyhouse-farming-in-rajasthans-desert-is-turning-farmers-into-millionaires/
49. "How Polyhouse farming in Rajasthan's desert in turning farmers into millionaires," The Plate, 2025. https://theplate.in/how-polyhouse-farming-in-rajasthans-desert-is-turning-farmers-into-millionaires/
50. "Press Note, Budget 2025-26," Government of Rajasthan, 2025. https://finance.rajasthan.gov.in/docs/budget/statebudget/2025-2026/pressnoteng2025-26.pdf
51. "How Polyhouse farming in Rajasthan's desert in turning farmers into millionaires," The Plate, 2025. https://theplate.in/how-polyhouse-farming-in-rajasthans-desert-is-turning-farmers-into-millionaires/
52. "Top five states leading India's polyhouse revolution," Agritimes, 2025. https://agritimes.co.in/top-5-states-leading-indias-poly-house-revolution/login.php/
53. "Smart greenhouses offer a path to safer farming in Uzbekistan and Vietnam," Food and Agricultural Organization, 2025. https://www.fao.org/plant-production-protection/news-and-events/news/news-detail/smart-greenhouses-offer-a-path-to-safer--farming-in-uzbekistan-and-viet-nam/en
54. "Kilimo - Paying farmers to save water," Uplink World Economic Forum, 2025. https://uplink.weforum.org/uplink/s/uplink-contribution/a012o00001pURnNAAW/Paying%20farmers%20to%20save%20water
55. Kilimo. https://kilimo.com/en/
56. "WEF Uplink Annual Impact Report 2025," Uplink World Economic Forum, 2025. https://reports.weforum.org/docs/WEF_UpLink_Annual_Impact_Report_2025.pdf
57. "Emerald invests in Kilimo to accelerate corporate investments in water conservation," Emerald VC, 2024. https://emerald.vc/emerald-invests-in-kilimo-to-accelerate-corporate-investment-in-water-conservation/
58. "Data-driven insurance is making India's smallholder farmers more resilient," Global Insurance and Risk Finance Facility UNDP, 2025. https://irff.undp.org/blog/data-driven-insurance-making-indias-smallholder-farmers-more-resilient
59. "Food Waste Breakthrough launches to help cities halve food waste, cut methane emissions and reduce hunger," United Nations Environment Programme, 2025. https://www.unep.org/news-and-stories/press-release/food-waste-breakthrough-launches-help-cities-halve-food-waste-cut
60. Sahyadri Farms. https://www.sahyadrifarms.com/
61. "Leading India's Fresh Produce Revolution and Paving the Way for Global Expansion," Sahyadri Farms, 2025. https://www.sahyadrifarms.com/pr-media-products/leading-indias-fresh-produce-revolution-and-paving-the-way-for-global-expansion
62. "10,000 FPOs Achieved under Government's Flagship Scheme," Press Information Bureau. https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2106913&reg=3&lang=2
63. "Agri-Tech Firm S4S Technologies is Combating Food Waste in India," Marico Innovation Foundation. https://www.maricoinnovationfoundation.org/scale-up/agri-tech-firm-s4s-technologies-is-combating-food-waste-in-india/
64. S4S technologies. https://s4stechnologies.com/
65. "Leading with Purpose: Nidhi Pant's sustainable vision for India's MSME and Agri sectors," Your Story, 2025. https://yourstory.com/smbstory/leading-purpose-nidhi-pants-sustainable-vision-s4s-technologies
66. "Leading with Purpose: Nidhi Pant's sustainable vision for India's MSME and Agri sectors," Your Story, 2025. https://yourstory.com/smbstory/leading-purpose-nidhi-pants-sustainable-vision-s4s-technologies
67. "Agri-Tech Firm S4S Technologies is Combating Food Waste in India," Marico Innovation Foundation. https://www.maricoinnovationfoundation.org/scale-up/agri-tech-firm-s4s-technologies-is-combating-food-waste-in-india/
68. S4S technologies. https://s4stechnologies.com/
69. "Landscape of Climate Finance for Agrifood Systems," Climate Policy Initiative, 2025. https://www.climatepolicyinitiative.org/wp-content/uploads/2025/05/Landscape-of-Climate-Finance-for-Agrifood-Systems-2025.pdf
70. "Landscape of Climate Finance for Agrifood Systems," Climate Policy Initiative, 2025. https://www.climatepolicyinitiative.org/wp-content/uploads/2025/05/Landscape-of-Climate-Finance-for-Agrifood-Systems-2025.pdf
71. "Data-driven insurance is making India's smallholder farmers more resilient," Global Insurance and Risk Finance Facility UNDP, 2025. https://irff.undp.org/blog/data-driven-insurance-making-indias-smallholder-farmers-more-resilient
72. "Impact Partners," Rang De. https://rangde.in/know-the-partner
73. "Powering Livelihoods Fund" Rang De. https://rangde.in/fund/powering-livelihood
74. "How a Bankless Loan Model Is Giving Indian Farmers Low-Cost Access to Climate-Smart Solutions," The Better India, 2025. https://thebetterindia.com/492080/rang-de-peer-to-peer-lending-model-of-loans-helps-farmers-purchase-decentralised-renewable-energy-solutions-like-solar-dryers-hydroponics-units/
75. "Frequently Asked Questions," Rang De. https://rangde.in/faqs
76. "India AgriFoodTech," AgFunder, 2024. https://omnivore.vc/uploads/AGF_India_2024_F_4_e433ee31ff.pdf
77. "Impact," Omnivore. https://www.omnivore.vc/impact
78. "Omnivore's quiet bet on India's rural transformation," ET Entrepreneur, 2025.
79. https://b2b.economictimes.indiatimes.com/news/entrepreneur/revolutionizing-rural-india-omnivores-pioneering-impact-in-agritech/125833990
80. "Impact," Omnivore. https://www.omnivore.vc/impact
81. "Independent Verifier Statement", Bluemark, 2025. https://bluemark.co/app/uploads/2025/09/omnivore-fund-2-fund-id-verifier-statement-09.12.2025.pdf

82. "Empowering Annadatas: Pradhan Mantri Fasal Bima Yojana," Press Information Bureau, 2025. https://www.pib.gov.in/PressNoteDetails.aspx?id=155010&NoteId=155010&ModuleId=3&reg=3&lang=2
83. "Empowering Annadatas: Pradhan Mantri Fasal Bima Yojana," Press Information Bureau, 2025. https://www.pib.gov.in/PressNoteDetails.aspx?id=155010&NoteId=155010&ModuleId=3&reg=3&lang=2
84. "Data-driven insurance is making India's smallholder farmers more resilient, UNDP Insurance and Risk Finance Facility," 2025. https://irff.undp.org/blog/data-driven-insurance-making-indias-smallholder-farmers-more-resilient
85. "Data-driven insurance is making India's smallholder farmers more resilient, UNDP Insurance and Risk Finance Facility," 2025. https://irff.undp.org/blog/data-driven-insurance-making-indias-smallholder-farmers-more-resilient
86. "Data-driven insurance is making India's smallholder farmers more resilient, UNDP Insurance and Risk Finance Facility," 2025. https://irff.undp.org/blog/data-driven-insurance-making-indias-smallholder-farmers-more-resilient
87. "Primer For Cool Cities Reducing Excessive Urban Heat - With a Focus on Passive Measures", World Bank, 2020. https://documents1.worldbank.org/curated/en/605601595393390081/pdf/Primer-for-Cool-Cities-Reducing-Excessive-Urban-Heat-with-a-Focus-on-Passive-Measures.pdf
88. "Ahmedabad's Heat Action Plan: Development and lessons learned," World Meteorological Organization, 2022. https://climahealth.info/resource-library/ahmedabads-heat-action-plan-development-and-lessons-learned/
89. "Ahmedabad: Cool Roofs Initiative with 5th Heat Action Plan," Natural Resources Defense Council, 2017. https://www.nrdc.org/bio/nehmat-kaur/ahmedabad-cool-roofs-initiative-5th-heat-action-plan
90. "Cool Roofs: Protecting Local Communities from Extreme Heat", Indian Institute of Public Health, Gandhinagar. https://iiphg.edu.in/images/pdfs/NRDC/cool-roofs-2018.pdf
91. "Cool Roofs: Protecting Local Communities from Extreme Heat", Indian Institute of Public Health, Gandhinagar. https://iiphg.edu.in/images/pdfs/NRDC/cool-roofs-2018.pdf
92. "Cool Roofs: Protecting Local Communities from Extreme Heat", Indian Institute of Public Health, Gandhinagar. https://iiphg.edu.in/images/pdfs/NRDC/cool-roofs-2018.pdf
93. "Cool Roofs: Protecting Local Communities from Extreme Heat", Indian Institute of Public Health, Gandhinagar. https://iiphg.edu.in/images/pdfs/NRDC/cool-roofs-2018.pdf
94. "The story of India's first state-wide cool roof policy", Natural Resources Defense Council, 2023. https://www.nrdc.org/sites/default/files/2023-12/cool-roofs-policy-factsheet-20231207.pdf
95. "Indian slums get 'cool roofs' to combat extreme heat," Reuters, 2025. https://www.reuters.com/world/india/indian-slums-get-cool-roofs-combat-extreme-heat-2025-03-10/
96. "Creating more resilient buildings inspired by nature," ARUP. https://www.arup.com/projects/eastgate/
97. "The Eastgate Centre," Never Enough Architecture. https://neverenougharchitecture.com/project/the-eastgate-centre/
98. "BIOMIMETIC ARCHITECTURE: Green Building in Zimbabwe Modelled After Termite Mounds," In habitat, 2012. https://inhabitat.com/building-modelled-on-termites-eastgate-centre-in-zimbabwe/
99. "Case Example: Sustainable building secrets of termites", Biomimicry 3.8. https://biomimicry.net/the-buzz/resources/case-example-sustainable-building-secrets-termites/
100. "Warje Urban Forestry,"Terre Policy Centre, 2017. https://terrepolicycentre.com/Warje-Urban-Forestry.php
101. "Tata Motors' continues to deepen its efforts to protect the environment in Pune," Tata Motors, 2020. https://www.tatamotors.com/press-releases/tata-motors-continues-to-deepen-its-efforts-to-protect-the-environment-in-pune/
102. "Tata Motors' continues to deepen its efforts to protect the environment in Pune," Tata Motors, 2020. https://www.tatamotors.com/press-releases/tata-motors-continues-to-deepen-its-efforts-to-protect-the-environment-in-pune/
103. "Urban forest scheme on Smriti Van model," Times of India, 2020. https://timesofindia.indiatimes.com/city/pune/urban-forest-scheme-on-smriti-van-model/articleshow/76225689.cms
104. "Switch on, smoke off: Reducing emissions from diesel generator sets," Centre for Science, Technology, and Policy, 2025. https://cstep.in/publication/switch-on-smoke-off-reducing-emissions-from-diesel-generator-sets/
105. "Chakr Shield RECD," Chakr Innovation. https://lightgoldenrodyellow-wallaby-427074.hostingersite.com/wp-content/uploads/2025/08/Chakr-Shield-RECD-Flyer-Digital-2025.pdf
106. "Status of battery demand and supply," International Energy Agency. https://www.iea.org/reports/batteries-and-secure-energy-transitions/status-of-battery-demand-and-supply
107. "Batteries and Secure Energy Transitions," International Energy Agency, 2024. https://www.iea.org/reports/batteries-and-secure-energy-transitions
108. "Status of battery demand and supply," International Energy Agency. https://www.iea.org/reports/batteries-and-secure-energy-transitions/status-of-battery-demand-and-supply
109. "China's dominance in EV supply chain a concern, says Economic Survey," Business Standard, 2024. https://www.business-standard.com/budget/news/economic-survey-ev-sector-china-dominance-india-125013101265_1.html
110. "Our Technology," Cancrie. https://www.cancrie.co/technology
111. "Cancrie is Making Batteries Greener & More Efficient Through Coconut Waste Recycling," Marico Innovation Foundation, 2025. https://www.maricoinnovationfoundation.org/scale-up/cancrie-coconut-battery-technology/
112. "Battery-Tech Startup Cancrie Develops Nanocarbon Technology to Boost Battery Efficiency," Silicon India, 2025. https://www.siliconindia.com/news/startups/batterytech-startup-cancrie-develops-nanocarbon-technology-to-boost-battery-efficiency-nid-234419-cid-19.html
113. "Our Technology," Cancrie. https://www.cancrie.co/technology
114. "Cancrie is Making Batteries Greener & More Efficient Through Coconut Waste Recycling," Marico Innovation Foundation, 2025. https://www.maricoinnovationfoundation.org/scale-up/cancrie-coconut-battery-technology/
115. "News," Cancrie. https://www.cancrie.co/news
116. "This Jaipur Based Startup Is Turning Coconut Shells into Battery Superchargers," Inc42, 2025. https://inc42.com/startups/this-jaipur-based-startup-is-turning-coconut-shells-into-battery-superchargers/
117. "Global EV Policy Explorer," International Energy Association. https://www.iea.org/data-and-statistics/data-tools/global-ev-policy-explorer
118. "Alternative Fuels Data Center," US Department of Energy. https://afdc.energy.gov/data/10331

119. “Emissions Gap Report 2024” https://www.unep.org/interactives/emissions-gap-report/2024/
120. Press Information Bureau. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2154355&reg=3&lang=2
121. “Ethanol fallout,” Business India, 2026. https://businessindia.co/magazine/special-report/ethanol-fallout
122. “National Policy for Management of Crop Residues” https://agriwelfare.gov.in/Documents/NPMCR_1.pdf
123. “The Energy Progress Report 2025,” World Bank, 2025. https://www.worldbank.org/en/topic/energy/publication/tracking-sdg-7-the-energy-progress-report-2025
124. “The Energy Progress Report 2025,” World Bank, 2025. https://www.worldbank.org/en/topic/energy/publication/tracking-sdg-7-the-energy-progress-report-2025
125. “The Energy Progress Report 2025,” World Bank, 2025. https://www.worldbank.org/en/topic/energy/publication/tracking-sdg-7-the-energy-progress-report-2025
126. “How to build resilient community energy systems? Lessons from Malawi and Ethiopia” https://iopscience.iop.org/article/10.1088/2634-4505/adb0eb
127. “The Power of Small: How Mini Grids Are Transforming Africa’s Energy Future,” Jacob’s Ladder Africa, 2025. https://jacobsladder.africa/the-power-of-small-how-mini-grids-are-transforming-africas-energy-future/
128. “From Blueprint to Reality: A Stronger Business Case for Shared Energy Infrastructure,” World Economic Forum, 2026. https://www.weforum.org/publications/from-blueprint-to-reality-a-stronger-business-case-for-shared-energy-infrastructure/
129. “From Blueprint to Reality: A Stronger Business Case for Shared Energy Infrastructure,” World Economic Forum, 2026. https://www.weforum.org/publications/from-blueprint-to-reality-a-stronger-business-case-for-shared-energy-infrastructure/
130. “India’s Ethanol Journey is Unstoppable: Shri Hardeep Singh Puri,” Press Information Bureau, 2025. https://initiatives.weforum.org/transitioning-industrial-clusters/project-details/saraburi-sandbox/a0sTG000001NnqfYAC

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