# TerraGreen

EARTH MATTERS

## SPECIAL ISSUE

# WORLD SUSTAINABLE DEVELOPMENT SUMMIT 2022

## TOWARDS A RESILIENT PLANET:
### ENSURING A SUSTAINABLE AND EQUITABLE FUTURE

teri | WSDS

# EDITORIAL

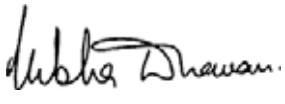
> TERI is committed to work to ensure energy and resource security, foster sustainable development, and combat climate change.

The Energy and Resources Institute (TERI) has successfully concluded the 21st edition of the World Sustainable Development Summit (WSDS). I inform all readers with immense pleasure that TERI received more than 12,500 registrations from 144 countries. We were honoured to receive the Inaugural Address from the Honourable Prime Minister of India, Shri Narendra Modi. We were privileged to receive messages from His Excellency Dr Irfaan Ali, President of the Republic of Guyana, and Ms Amina J. Mohammed, Deputy Secretary-General, United Nations at the inaugural session of the Summit. We received 17 Ministers/ Envoys in this three-day event as distinguished speakers. The participation and addresses of stakeholders of sustainable development and climate action truly enriched the dialogue and provided a broader perspective to all our participants. Over the years, the Summit platform has brought together thought leaders, heads of state and government, scholars, corporates, youth groups, and civil society representatives from across the world. The Summit series has established itself as a responsible and an effective platform for mobilizing opinion-makers to identify and advance pioneering actions to address some of the most relevant issues concerning sustainable development.

TERI is committed to work to ensure energy and resource security, foster sustainable development, and combat climate change. Through this Summit, we have launched a major initiative, "Act4Earth", to further the discussions from this Summit and build a knowledge base. This initiative will have two main components: COP Compass; and SDG Charter. The core objectives of this initiative are fast-tracking meeting of global goals on climate change and sustainable development; driving actions by governments at all levels; enhancing international, national and sub-national perspectives for paradigm shifts needed for achieving sustainable development and climate goals.

A healthy environment is a first and foremost requirement for sustaining life on this planet. So far, human actions have degraded environmental health in every respect, be it air, soil, water, or resources. As the father of the nation, Mahatma Gandhi has rightly said: "there is enough for everybody's need but not for everyone's greed". It is high time for us to introspect the normalized consumerism with the culture of excess. We need to explore the avenues for establishing a sustainable lifestyle as a novel culture. Our Prime Minister Shri Narendra Modi has also rightly stressed upon sustainable lifestyle for the environment several times. Our collective responsibility is to ensure environmental protection, climate action, and foster sustainable development. It is very crucial to bring all stakeholders to the table and consider their perspectives for meeting this endeavour.

This special edition of *TerraGreen* has covered a wide range of contributions on adaptation, biodiversity finance, India's leadership, climate resilience, and planetary health. These contributions make strong, informative, and well-analyzed suggestions for building climate resilience and fostering adaptation actions while safeguarding our biodiversity and the ecosystems.



**Vibha Dhawan**
Director-General, TERI

# WORLD SUSTAINABLE DEVELOPMENT SUMMIT 2022

## TOWARDS A RESILIENT PLANET:
### ENSURING A SUSTAINABLE AND EQUITABLE FUTURE

February 16-18, 2022

# ACT4EARTH MANIFESTO

## Presented at WSDS 2022 Valedictory Session

Through the 21st Edition of the World Sustainable Development Summit, The Energy and Resources Institute brought together stakeholders including representatives from international organizations, government, business & industry, research & academia, civil society and youth to deliberate on the modus operandi required for ensuring equitable responses to protect our planet through sustainable consumption and production, energy & resource security, climate justice, and the protection of global commons.

**We pledge to Act for Earth by:**

- Reinvigorating current multilateral systems by ensuring that climate negotiations and other norm-setting bodies are informed by principles of equity and climate justice, as well as with perspectives from developing countries to drive national and international action.
- Developing multi-level and poly-centric approaches to govern and protect our global commons, which is inclusive of all those who use and depend on these commons, including non-human species.
- Inviting stakeholders to generating financial capital and building capacities for developing green technologies, which helps in inclusive clean energy transitions.
- Avoiding wasteful consumption and promoting efficiency in production patterns, by raising awareness and promoting responsible practices among governments, businesses, and consumers.
- Advocating for paradigm shifts in the global narrative, which decouples the economic growth from environmental degradation.
- Critically examining the dominant narratives on traditional and non-traditional security to advance inclusive, concerted, coherent and effective efforts on sustainable development and climate action.
- Calling upon the global community to bridge the gap between mitigation and adaptation through effective means of implementation, including climate finance, innovation, and capacity building.
- Ensuring policy coherence through mainstreaming sustainable development into economic policy, including through SDGs-linked budgeting processes.
- Communicating issues related to climate change and sustainable development to all stakeholders effectively, through a balanced approach which instils hope, without losing our sight on the gravity of the climate change and limits to growth.

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# Biodiversity and Ecosystems

## Financing the Future

In this article, **Namita Vikas** opines that the world needs a significant investment to tackle the interlinked crises of climate, biodiversity, and land degradation. Research has shown this figure to be $8.1 trillion by 2050, with an annual global investment of $536 billion. An enabling ecosystem to foster partnerships between grassroots stakeholders, policymakers, and the private sector, can help biodiversity and ecosystem-oriented adaptation finance to flourish.

Ecosystems underpin the existence and functioning of all life forms by creating conducive environments for biodiversity to thrive in. In turn, biodiversity supports all the natural capital present in the world and consequently, the goods and ecosystem services they generate for humanity. An estimated $44 trillion[1] of economic value generation, that is, about 50 per cent of global GDP, is moderately or highly dependent on nature. Consequently, the global resource extraction rate has risen from 27 billion tonnes in 1970 to 92 billion tonnes in 2017.[2]

The inherent interlinkages between ecosystems, biodiversity, climate, and human life reveal the implications of climate change on living environments. With climate change rapidly escalating into a crisis, biodiversity loss ranks as one of the top five threats[3] to mankind

by severity or impact for the third year in a row for FY 2022–23. If 'business-as-usual' continues, then biodiversity loss will represent an economic loss of approximately $479 billion[4] per year.

Climate discussions and negotiations are moving towards mobilizing finance for climate action and transitioning to a low-carbon economy. Global climate finance, inclusive of public and private finance, reached $632 billion in the year 2019–20,[5] drastically falling short of the $5 trillion needed annually by 2030[6] to contain climate change. Moreover, over 90 per cent of climate finance in 2020—$571 billion—is largely skewed towards mitigation through renewable energy, green buildings. On

1 https://www.weforum.org/reports/new-nature-economy-report-series; last accessed on February 13, 2022.

2 https://www.resourcepanel.org/sites/default/files/documents/document/media/unep_252_global_resource_outlook_2019_web.pdf; last accessed on February 13, 2022.

3 https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2022.pdf; last accessed on February 15, 2022.

4 https://naturalcapital.finance/wp-content/uploads/2020/06/Beyond-Business-As-Usual-Full-Report.pdf; last accessed on February 13, 2022.

5 https://www.climatepolicyinitiative.org/wp-content/uploads/2021/10/Full-report-Global-Landscape-of-Climate-Finance-2021.pdf; last accessed on February 13, 2022.

6 https://www.reuters.com/business/cop/world-needs-5-trillion-annual-climate-finance-by-2030-rapid-action-2021-10-28/ last accessed on February 13, 2022; last accessed on February 13, 2022.

the other hand, a mere $46 billion went towards adaptation and $15 billion to cross-cutting sectors covering both mitigation and adaptation.[7] Financing climate adaptation is critical to prevent exacerbation of inequalities, reduce the social impacts of climate shocks on vulnerable communities, capture emerging opportunities, and improve overall resilience.

Biodiversity and ecosystem-based adaptation (EbA) provide irreplaceable benefits, to enable better human adaptation to climate change. Insurmountable risks are already in motion, such as atmospheric warming due to trapped carbon, leading to detrimental consequences for human systems. EbA and biodiversity protection is imminent to reduce climate risks to ecosystems and human systems. Yet funding for biodiversity and ecosystem adaptation made up only 1.4 per cent of the total climate finance flows.[8] The world needs a total investment of $8.1 trillion by 2050, with an annual global investment of $536 billion to tackle the interlinked crises of climate, biodiversity, and land degradation.[9]

Since finance flowing into nature protection is fledgling, committed majorly by public sectors, there is also an urgent need to bring in more private sector capital to diversify into EbA finance and close the investment gap. However, biodiversity and EbA finance comes with its own set of limitations.

## Challenges

The need for urgent scaling of biodiversity and EbA finance is evident, yet there is delay in meeting the funding

requirements for 2050 net-zero targets of climate actions. There are several challenges that make it difficult for climate finance to flow to biodiversity and EbA, including the following:

### Sectoral challenges

Policies that result in finance flows to incentives and subsidies that are potentially harmful to biodiversity (estimated at $500 billion per year globally),[10] are exacerbating biodiversity and ecosystem degradation. This could include support to mining, timber, and other extractive sectors

Support to fossil fuel production through subsidies, policies, tax abatements and more, are estimated as the third largest[11] direct cause of global biodiversity loss. For example, despite agreements over 'meaningful and effective actions' to mitigate climate crises, G20 nations have directed as much as $297 billion[12] of public financing towards fossil fuel production and consumption since the start of COVID-19

Lack of relevant empirical research to support policies that incentivize investments in nature projects through disclosure requirements, metrics to assess damage and incentives to reduce damage. The public sector's knowledge gap of risk assessment, environmental and social impact mechanisms, among others, often hinders budget planning, permittance and project design

### Challenges faced by private sector capital

Biodiversity and EbA projects tend to have multidimensional benefits, of which some are difficult to quantify, and hence monetize. While natural capital accounting is a work in progress, it is also tough to do, which likely influences investment decisions

Nature-related adaptation projects are often based on unproven concepts or technologies. This implies that developers are often unable to show a track record of cash-flow generating projects or scientific evidence/data, making them 'high risk' for investors. Investors may also be hesitant if credit worthiness is threatened by social challenges such as local community opposition and conflict around land titles, and more Most nature/ecosystem projects start producing cash flows only after a few years. Given that these are mostly long tenor projects, they may not be attractive for banks or investors looking for near-to-mid-term returns. There is a real need for long-term, patient capital, from institutional investors or pensions funds in this space Institutional capacities towards biodiversity and ecosystem protection are often not conducive to boost investments. Legal

7 https://www.climatepolicyinitiative.org/wp-content/uploads/2021/10/Full-report-Global-Landscape-of-Climate-Finance-2021.pdf; last accessed on February 13, 2022.

8 https://www.wri.org/research/public-international-funding-nature-based-solutions-adaptation-landscape-assessment; last accessed on February 14, 2022.

9 https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/36146/SFN_KF.pdf; last accessed on February 14, 2022.

10 https://www.oecd.org/environment/resources/biodiversity/report-a-comprehensive-overview-of-global-biodiversity-finance.pdf; last accessed on February 14, 2022.

11 Ibid

12 https://productiongap.org/wp-content/uploads/2021/10/PGR2021_ExecSummary_web_rev.pdf; last accessed on February 14, 2022.

and regulatory infrastructure that supports investment in this space is often lacking. Issues with property rights, contract enforcement, licence/permits, rule of law, data collection and reporting mandates, economic incentives, among others can increase the risk for investors, making this an unattractive proposition. Similarly, missing or deficient regulatory and policy frameworks (such as infrastructure codes/standards or environmental/social impact assessment laws) that are not tailored specifically to climate risks also create barriers to action and investment

Along with high dependency on externalities, the variables involved in biodiversity and ecosystem projects are many and are augmented by physical risks. A minor fluctuation to any one has the potential to reduce expected cash flows, impacting the risk profile and investor interest

## Rising to the Challenges

Nonetheless, headway has been made in financing ecosystem protection and recovering biodiversity.

### Policies and regulations

Preceding COP26, the UN Convention on Biological Diversity (CBD) debuted 21 targets to be achieved by 2030 in the Global Biodiversity Framework, including redirection and annual reduction by $500 billion of incentives harmful for biodiversity, and an increase of $200 billion in international finance flows from all sources.[13] Governments are also taking initiative, like the Biodiversity Strategy for 2030 by the EU, which elaborates on improving financing and investments to recover Europe's biodiversity by 2030.

To rectify the lack of disclosure frameworks and boost investors' confidence in nature-related projects, the Taskforce on Nature-related Financial Disclosures (TNFD) is set to launch its framework in 2023. Like the Taskforce on Climate-related Disclosures, the TNFD framework aims to relay the risks and opportunities arising from nature for financial institutions and companies, and vice versa. It includes a four-pillar approach that covers governance, risk management, strategy, metrics and targets to help organizations align with the "no net loss by 2030 and net gain by 2050" target set by Global Biodiversity Framework of CBD.

Payment for Ecosystem Services schemes are also proving to be effective for biodiversity conservation. For instance, the Costa Rican government, in partnership with private donors, rewards private landowners with financial incentives to sustainably manage ecosystems through forest protection, reforestation, agroforestry, sustainable forest management or regeneration of degraded areas. The programme has seen an investment of $524 million, benefitting over 18,000 families.[14]

### Capacity building

While such policy developments are welcome, they singlehandedly are not capable of augmenting finance into biodiversity and EbA. Building comprehensive local capacities and impact measurement technologies would strengthen investor confidence in nature-adaptation projects, especially from private sector investors.

Many livelihoods are intertwined with biodiversity and ecosystems. In India alone, around 200 million people directly depend on forests for their livelihoods.[15] To enable an integrated system of livelihoods and protection of local ecosystems, empowering local efforts by enhancing their skills, access to economic incentives, market access, inclusive social norms are an imperative. For instance, Livelihoods Carbon Fund has financed a project in eastern India that integrated marginalized tribes in a model that reforested their degraded land through planting of fruit trees and coffee plants, improving their livelihoods and food security.[16] In Zambia, the Community Markets for Conservation initiative enlists small-scale farmers into sustainable agricultural practices and sells their produce at premium prices across Africa. This training has resulted in food security, higher income levels and nutrient-rich farmlands for the farmers involved.[17] The initiative has also piloted a REDD+ carbon project, wherein local communities received payments for avoided CO2 emissions by reducing deforestation.[18]

Data monitoring technologies also stimulate private sector investment by overcoming the lack of reliable data. Risk assessment tools like the UN-backed Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE) provide financial institutions with data analysis of the potential impact to their portfolio

13 https://www.cbd.int/doc/press/2021/pr-2021-07-12-gbf-en.pdf; last accessed on February 14, 2022.

14 https://unfccc.int/climate-action/momentum-for-change/financing-for-climate-friendly-investment/payments-for-environmental-services-program; last accessed on February 15, 2022.

15 https://www.cbd.int/countries/profile/?country=in; last accessed on February 15, 2022.

16 https://livelihoods.eu/portfolio/naandi-india/; last accessed on February 15, 2022.

17 https://itswild.org/causes/sustainable-agriculture/; last accessed on February 15, 2022.

18 https://itswild.org/causes/carbon-project/; last accessed on February 15, 2022.

due to species extinction risk and ecological integrity.[19]

## Financial instruments

Financing for biodiversity and ecosystem protection is gaining rapid momentum. For instance, the Global EbA fund, implemented by UNEP and the International Union for Conservation of Nature (IUCN), provides financing support through seed capital to innovative EbA approaches, like a project in the Philippines that builds on governmental and local capacity to attract investments to safeguard Marine Protected Areas.[20]

Blended finance is proving effective in attracting private capital to relevant biodiversity and nature conservation initiatives while also supporting local communities. For instance, a GEF project in India's Andhra Pradesh and Karnataka aims to strengthen local economies by promoting sustainable agricultural production and reducing land degradation through sustainable market mechanisms and blended finance built on private sector capital.[21]

Innovations such as Forest Resilience Bonds and Environmental Impact Bonds (EIBs) are also viable to accelerate biodiversity and ecosystem protection. Through EIBs, the issuer raises risk capital from investors on a pay-for-success basis. In emerging markets like India, where the success of the proposed interventions is often uncertain or untested, these types of outcome-based financing instruments can be a practical route to raising private capital.

Asia's first Sustainability Bond in the forestry/plantations sector was issued by the Tropical Landscapes Finance Facility to fund Indonesia's first sustainable


natural rubber plantation. The project, which raised institutional capital from ADM Capital, a Hong Kong-based private sector asset manager, and backed by a partial guarantee by The United States Agency for International Development (USAID), is estimated to positively impact employment, welfare, and other livelihood opportunities for 50,000 people of the local community, apart from addressing issues such as land degradation, deforestation, and building biodiversity buffer zones.[22]

In a promising start to India's ecosystem-related agricultural adaptation, Chennai-based Samunnati launched a certified green bond, which was structured by Symbiotics on the latter's MSME bond issuance platform at the Luxembourg Stock Exchange, thus accessing dedicated pools of green capital. Proceeds from the $4.6 million bond will be used to support India's Farmer Producer Organizations in adopting climate-resilient farming practices.[23] The GCF, with the World Bank and the state government, has also co-financed a project in Odisha, India that addresses adaptation through groundwater recharge and solar micro-irrigation, improving income and water security and quality for 16 million people.[24]

## Need of the Hour

The momentum for financing biodiversity and EbA has picked up across policy circles, and both, the public and private sector, globally. For instance, nature was pivotal in the discussions at COP26; more than 30 financial institutions, with over $8.7 trillion in AUM, committed to tackle agricultural commodity-driven deforestation, indicating a spike in financing nature-based solutions and sustainable livelihoods.[25]

However, investments still lag in context to large investment gap, which the public financing cannot meet by itself. Without immediate investments, the world stands to significantly compromise food and water security, natural protection to extreme events, and more. This is apart from the opportunity to generate $10 trillion in business value and create close to 400 million estimated jobs.[26]

All in all, the case for investing in nature is significant. However, only an enabling ecosystem to foster partnerships between grassroots stakeholders, policymakers, and the private sector, can help biodiversity and ecosystem-oriented adaptation finance to flourish. ■

*Namita Vikas, Founder & Managing Director, auctusESG.*

19 https://www.unepfi.org/news/themes/ecosystems/cutting-edge-biodiversity-module/; last accessed on February 15, 2022.

20 https://globalebafund.org/3041170-2/; last accessed on February 15, 2022.

21 https://www.thegef.org/sites/default/files/web-documents/10204_MFA_India_PIF.pdf; last accessed on February 15, 2022.

22 https://www.tlffindonesia.org/project-pt-royal-lestari-utama-2020/; last accessed on February 15, 2022.

23 https://site.samunnati.com/symbiotics-and-samunnati-launch-indias-first-100-agri-green-bond/; last accessed on February 15, 2022.

24 https://www.greenclimate.fund/project/fp045#impact; last accessed on February 15, 2022.

25 https://racetozero.unfccc.int/leading-financial-institutions-commit-to-actively-tackle-deforestation/; last accessed on February 15, 2022.

26 https://www.unep.org/resources/state-finance-nature#:~:text=The%20State%20of%20Finance%20of,for%20governments%2C%20businesses%20and%20financiers; last accessed on February 15, 2022.

# Financing Climate Action in India

## Priorities and Reflections on COP26 by Indian States

In this article, **Rana Pujari** says that finance will catalyse acceleration of ambitious climate actions in the global south and India could lead the way for the world

2021 was a critical year for global climate diplomacy in decades. In the backdrop of rising incidences of natural calamities and the UNFCCC's revised NDC synthesis report highlighting the inadequacies of Nationally Determined Contributions (NDCs) to achieve Paris Agreement goals, COP26 was a chance for political leaders to acknowledge the climate emergency more purposefully and ratchet up their climate ambitions through bolder climate goals.

Among the range of key decisions agreed upon, which are now part of the Glasgow Climate Pact, climate finance remained as one of the key focuses and a long-pending ask by the developing countries from their developed counterparts.

Climate finance, as we know, will unlock opportunities and enable technology and knowledge transfer from the developed to the developing countries, which need capacity and resources to fight climate change at the pace the world demands today.

While India announced a set of more ambitious emission reduction targets

and joined the global bandwagon by announcing a net-zero goal by 2070, it is now important to demystify climate finance in the context of subnational climate action and regional priorities.

## Reflections from COP26: What does climate finance mean for Indian states?

Although national climate goals are set, and regulatory mandates are guided by the centre, implementation of policies and schemes happen at the state level and thus the role of subnational players is crucial in complementing the efforts of the national government. A recent analysis by the Council on Energy, Environment and Water's (CEEW) Centre for Energy Finance estimates that India needs $1.4 trillion of additional foreign support till 2070 to achieve the net-zero emissions target. Indian states are already taking bold actions through greater climate leadership. In the backdrop of a momentous COP26, India's renewed goals and the quantum of finance needs, it is important to bring out voices from the subnational actors and view the local perspectives more closely.

## Maharashtra

Maharashtra, under the dynamic leadership of the Hon'ble Environment Minister, Shri Aaditya Thackeray, is at the forefront of state climate action. The state has announced a slew of initiatives towards ecosystem restoration, urban resilience, sustainable transportation, and climate governance. Sharing reflections on COP26, Saurabh Punamiya Jain, Policy and Research Secretary to the Minister of Environment, Government of Maharashtra said, "In the backdrop of post covid recovery, COP26 was a much needed coming together of nations to gather momentum to meet the 1.5 degrees target. Large parts of the global north need to better their net-zero timelines and little has been done to


monitor and mobilize global climate finance." On Maharashtra's priorities and what net zero means for the state, Saurabh Punamiya said, "Maharashtra's leadership will focus on creating institutional capacity to mobilize green finance and spur up investments and innovation across sectors. Maharashtra will assume leadership in climate action and get to net zero earlier than 2070. While SAPCC will be guided by the NDCs, Maharashtra will lead climate action through its 43 AMRUT cities who will have a climate action plan aligned to UNFCCC's Race to Zero Targets."

## Chhattisgarh

In the eastern state of Chhattisgarh, a large percentage of the population is vulnerable to climate change due to their dependence on mining, minor forest produces and agriculture for livelihood. The state prioritizes actions around climate resilient agriculture, forest conservation and livelihood generation, apart from decarbonizing industry and transport. Cross-sectoral initiatives such as the Narva, Garva, Ghurva, Bari (Narva is streams, rivers and rivulets, Garva is livestock, Ghurva is compost pit and Bari is backyard farming) and the health department's commitment to achieve net-zero carbon emission by 2050 by endorsing the UNFCCC's Race to Zero campaign, the state is showcasing strong climate leadership. Chhattisgarh State Centre for Climate Change acting as the nodal agency is driving climate actions and policies in the state. Beyond leveraging state budgets and national financing schemes such as the National Adaptation Fund for Climate Change for adaptation projects, support through international financing is needed to enable the state take bolder climate ambitions beyond their State Action Plan on Climate Change (SAPCC).

## Odisha

The coastal state of Odisha is one the most vulnerable states in India which faces the twin challenge of tropical cyclones and droughts, nearly every year. Beyond severe loss to lives and property, this is an extreme stress on the state's exchequer and finances as well. Public expenditure has not received significant focus in the Indian context and spending on climate change issues still remains a challenge. To overcome this, the state undertook a rigorous cross sectoral analysis to come up with a Climate


Budget for 2020–21. Sharing about this and more, Priyambada Pattanaik, Junior Scientist (Scientific), Forest, Environment and Climate Change Department, said, "Odisha became the first Indian state to receive the international finance the Green Climate Fund (GCF) support and also mobilized state budget to undertake an extensive budget coding exercise to formulate the Climate Budget in 2018. Climate finance, both domestic and international, will remain at the core to build resilience as achieving the NDCs aligned with 2021–2030 action plan submitted to the national government."

## Bihar

Beyond its long strides in climate mitigation, Bihar is also prioritizing strengthening resilience of its natural resources and communities. With this in mind, the state has partnered with the United Nations Environment Programme (UNEP) to develop a low carbon development and resilience roadmap for the state by 2040. Sharing the state's climate ambition, Principal Secretary of Environment, Forest and Climate Change Department, Dipak Kumar Singh said, "We are committed to the cause of our local people and communities vulnerable to the impacts of climate change and the partnership with the UNEP stands testimony to that. COP26 was a momentous event and in terms of global south, I think, the climate finance deadlock is yet to be resolved. With India going net zero by 2070 now and states such as Bihar thinking beyond just the SAPCC, the country will need finance more rapidly to meet both, the national and subnational climate ambitions."

## Delhi

Apart from air pollution, rising greenhouse gas emissions, mainly from transport sector, is a serious concern for the Government of National Capital Territory of Delhi (GNCTD). GNCTD is aggressively pushing electric vehicle (EV) adoption through its ambitious EV policy and strategic campaigns such as Switch Delhi. Sharing views on Delhi's strategies and COP26, Reena Gupta, Advisor to the Government of Delhi said, "In setting a pathway for accelerated climate mitigation action in this critical decade, COP26 has been instrumental in demonstrating the work that cities around the world have undertaken to meet the 2030 NDCs through key themes such as climate financing, phasing down

of coal power, inefficient fuel subsidies and human health. Delhi as a signatory to C40's 'Deadline 2020' aligned to the Paris Agreement, has already committed to reducing 50 per cent sectoral emissions by 2030 and to achieve carbon neutrality by 2050. Delhi's comprehensive SAPCC focusses on a 10-year roadmap and will allocate funds for projects to help align with India's COP26 commitment of achieving net zero by 2070."

## Jammu and Kashmir

Jammu and Kashmir (J&K) remains eco-sensitive and vulnerable to climate change given its proximity to the Himalayas. With receding glaciers and rising average temperatures, climate change has already started impacting its water resources and horticulture and floriculture sectors. As an active Under2 Coalition member, the state is prioritizing capacity building through global peer learning and knowledge exchange. To preserve the beauty of Kashmir along with development of ecotourism, the government needs to allocate financial resources to undertake climate change adaptation and mitigation projects in the region. On J&K's climate strategy, Mutaharra Deva, Nodal Officer, Jammu & Kashmir Climate Change Cell shared, "There are 11 missions in the Jammu & Kashmir State Action Plan on Climate change (JKSAPCC), three more than the National Missions. We need to prioritize health, tourism and disaster management due to the nature of the economy. Baseline data on key environmental parameters is required to be collected besides capacity building of the local populace. To achieve all these, finance will remain at the core to meet the goals of JKSAPCC as well as implementing bottom-up capacity building projects in the region."

## Advancing State Climate Leadership

There is no denying that action needs to happen now without delay and states play the most important role when it comes to implementing both national and subnational climate policies. To realize India's medium term 2030 goals and long term 2070 net-zero goal, supporting state climate actions, capacity building and disseminating success stories will assume a greater role going forward in a geo-politically diverse country such as India. To this end, rapidly unlocking large scale finance will be a significant catalyst along with efforts through global initiatives such as the Under2 Coalition and others to drive subnational climate leadership in the region. ■

*Rana Pujari is Manager – South Asia Government Relations at Climate Group. Climate Group is the Secretariat to the Under2 Coalition.*

# A Vote for Radical Inclusion

## Re-Framing Adaptation in the Decade of Action

In this article, **UNICEF India WASH Team** says that with Prime Minister Shri Narendra Modi's spoken commitments and emphasis on adaptation, along with the global commitment to double funding for adaptation projects to $40 billion annually, have created the necessary momentum for a renewed discussion on what adaptation can look like in India, how to monitor it transparently and convergently, and how to reflect it in future NDCs and COPs.

The conclusion of COP26 in November 2021 came with some frustrations and some welcome surprises. While the summary of the discussions, published in the *Glasgow Climate Pact*, did indicate stronger global commitments to mitigation, adaptation and financial investments,[1] these were still considered to be diluted compared to the ambitions that were on the table. The United Nations Secretary General, António Guterres stated, "Science tells us that the absolute priority must be rapid, deep and sustained emissions reductions in this decade. Specifically—a 45 per cent cut by 2030 compared to 2010 levels. But the present set of Nationally Determined Contributions (NDCs)—even if fully implemented—will still increase emissions this decade on a pathway that will clearly lead us to well above 2 degrees by the end of the century compared to pre-industrial levels."[2] This is alarming for countries

1 Details available at https://ukcop26.org/wp-content/uploads/2021/11/COP26-Presidency-Outcomes-The-Climate-Pact.pdf; last accessed on February 22, 2022.

2 Details available at https://www.un.org/sg/en/node/260645; last accessed on February 25, 2022.

that may not have adapted adequately to deal with the future barrage of climactic events, which are to increase in frequency and intensity.

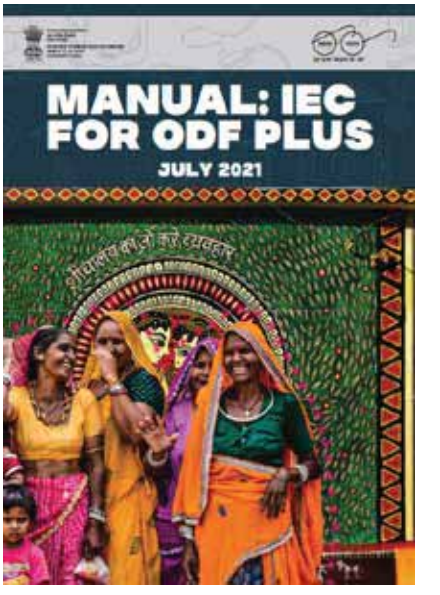
The South Asian region is particularly vulnerable to increasingly severe cyclones, floods and droughts because of its sizeable population and geography. Approximately 880 million children and young people—newborns to 24-year-olds— live in South Asia[3] and 45 per cent of the region's overall population could be at risk of water and food insecurity and/or climate-related displacement by 2050.[4] When it comes to the consequences of natural disasters hitting India, *GermanWatch* found it to be the 7th most affected country in

2019.[5] Flooding in India over the last decade caused $3 billion in damage; this makes up 10 per cent of the overall global cost incurred.[6] According to the Intergovernmental Panel on Climate Change (IPCC), increasing variability in rainfall is likely to further exacerbate drought or lean periods and flooding conditions over the subcontinent. Transcontinental trends in emissions will continue to increase sea surface temperatures bordering India's coastal lines, which in turn will affect the intensity and frequency of cyclones.

Traditionally, mitigation efforts have caught the attention of public and private sectors, which have been heavily funded emission reducing interventions with the hopes that they can slow down the rise in average global temperatures. Unfortunately, commitments and

the effort made by global leaders, especially of those from developed nations, have been underwhelming and thus the protective effects are not on track. Given the socioeconomic and health costs being suffered right now by the most vulnerable, we cannot wait for the rainbow at the end of the storm**.** Therefore, adaptation efforts strengthening a community's ability and coping capacity to withstand disasters and expediate recovery deserve renewed focus.

While the Indian govnment did not revise its 2016 NDCs[7] ahead of COP26, Prime Minister Shri Narendra Modi left a mark at the conference by committing to additional ambitions in the closing week. In addition to bringing down the emissions intensity of the economy by 45 per cent by 2030 (previously pegged at 33 to 35 per cent compared to 2005 level) and increasing energy share derived from non-fossil fuel sources to 50 per cent (up from 40 per cent in the NDCs). PM Modi also committed to making India net zero in emissions by




*Behaviour change is a core component for sustaining any adaptation intervention that builds community resilience against climate shocks. India's Ministry of Jal Shakti, as part of its roll-out of its waste management initiatives under SBM Phase II, has also earmarked funding to help communities navigate behaviour and social change activities promoting uptake of key management practices.*

2070—an ambitious and well received announcement. Just as importantly, he explicitly noted that adaptation will be key in the battle against increasing

3 UNDESA Population Dynamics 2020.

4 Details available at https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf; last accessed on February 22, 2022.

5 GermanWatch 'Global Climate Risk Index 2021'. Details available at https://germanwatch.org/sites/default/files/Global%20Climate%20Risk%20Index%202021_2.pdf; last accessed on February 23, 2022.

6 ODI 'Costs of Climate Change in India'. Details available at https://drive.google.com/file/d/1Vze7OxDJzgKOdNJwI77w9gyC25S_K8vK/view; last accessed on February 25, 2022.

7 Details available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/India%20First/INDIA%20INDC%20TO%20UNFCCC.pdf; last accessed on February 24, 2022.

climate change, in India and globally.

He said[8] (*in Hindi*), "Many traditional communities have the knowledge of living in harmony with nature. In our adaptation policies, the traditional practices should be given importance. To ensure this knowledge reaches the next generation, it should be added to the school syllabus." He also stated9 that "we have to make adaptation a key part of our development policies and projects. Projects like 'Nal se Jal' [Jal Jeevan Mission], Tap Water for All, 'Swachh Bharat' [Mission], Clean India Mission…. have not only provided adaptation benefits to our needy citizens but have also improved their quality of life."

Both Swachh Bharat Mission (SBM) and Jal Jeevan Mission are large-scale initiatives that exemplify how investment in climate adaptation can manifest in the everyday of governance and implementation. In part, it is because water, sanitation and hygiene (WASH) systems and services have great potential to protect the natural resources that are most impacted by climatic events. Additionally, to the damage caused by climatic shifts, villages and cities alike have lost their environmental sustainability due to the impact of various misguided development practices like growing water-intensive cash crops in drought-affected regions, and lack of sustainable water conservation practices and behaviours, which has had a direct and indirect impact on sanitation, access to potable drinking water and the ability to practice personal hygiene. Water scarcity has damaging knock-on effects as well, such as on air quality. Ungraduated water tariffs led to overexploitation and seasonal restrictions, which in turn increased crop burning practices by farmers trying to shrink the gap between harvest cycles.[10]

Without universally accessible and safe WASH practices in place, as aspired for under Sustainable Development Goal 6, public health challenges already affecting populations—especially children and marginalized communities—can have larger effects because lack of toilets and poor waste management is increasing transmission of pathogens and clean water is now contaminated. For instance, approximately 70 per cent of India's surface water is polluted, mainly because of unregulated emptying of wastewater, including sewage from toilets and greywater run-off.[11] Contamination from groundwater sources by arsenic, salinity and fluoride are increasing because of over-exploitation of aquifers in water-stressed areas, further reducing the amount of potable water available. Altogether, this affects the ability of communities to remain resilient through difficult times, recover quickly after emergencies, and grow their socioeconomic potential due to impacts on livelihoods and child growth.

SBM Phase II seeks to address this very problem by introducing a holistic approach to waste management that can be instigated at the grassroots level. SBM Phase I was inaugurated in 2014 with universal access to household toilets in mind. In the process of helping over 110 million households access an improved toilet by 2019, as per the government's reports, new challenges emerged. Users and regulators need to ensure continued access and use of toilets—to prevent slippage—and safely manage the waste generated. Therefore, SBM Phase II implementers, with the support of UNICEF and other partners, are now reaching out to districts and gram panchayats to help them optimize

8 Details available at https://www.hindustantimes.com/world-news/pm-modi-cop26-summit-adaptation-development-fight-climate-change-101635781592325.html; last accessed on February 24, 2022.

9 Details available at https://www.youtube.com/watch?v=so-30y8TspY; last accessed on February 24, 2022.

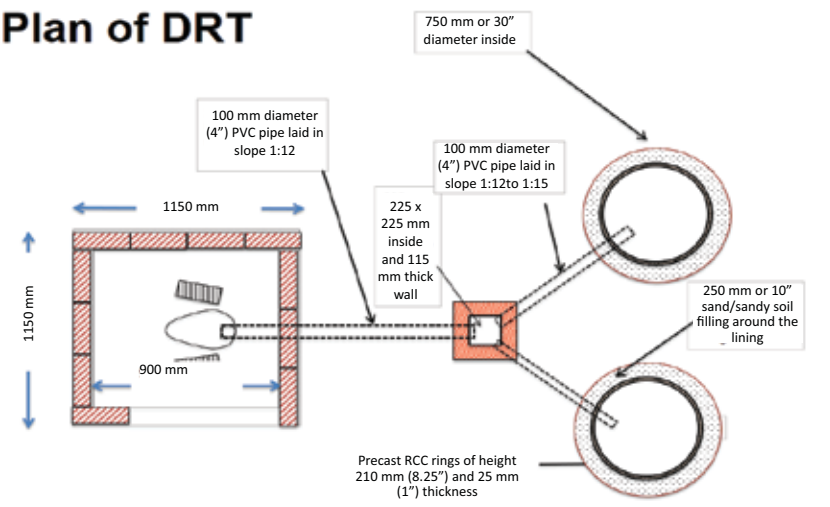
10 BBC article 'Air pollution: Delhi's smog problem is rooted in India's water crisis'. Details available at https://www.bbc.co.uk/news/world-asia-india-59808770; last accessed on February 24, 2022.

11 Asian Development Research Institute, 2021. Details available at https://www.adriindia.org/adri/india_water_facts; last accessed on February 24, 2022.

utilization of funds, availed through SBM and the 15th Finance Commission for WASH projects specifically, for solid and liquid waste and water resource management projects, in rural and urban settings. A large focus will be placed on building capacities to practice routine operations and maintenance on existing and new structures, which is an important investment for withstanding shocks.

The Indian government has similarly prioritized Jal Jeevan Mission (JJM), which aims to provide universal access to functional household tap connection in rural India by 2024. At the start of the Mission in 2019, only 17 per cent of rural households had tapped connections, which meant that significant and rapid scale-up of robust infrastructure connecting water sources to households was required if the target was to be met. Currently, just a year and a half into the work and after delays due to the COVID-19 pandemic, almost 46 per cent of rural households now have received tapped connections.[12] This not only ensures that water use is managed, thereby improving resource efficiency, but would also improve equity in water distribution. Additionally, it would remove undue stress from being placed on local aquifers and, with the complementary emphasis on source sustainability and conservation practices, will help them recharge for further generations' use. The hope is that this Mission, also supported by UNICEF, along with complementary initiatives such as Namami Gange (rehabilitation of watersheds around the river), Atal Bhujal Yojana (a key project focusing on groundwater management in overexploited aquifers), and the push to provide renewable power sources for water supply, will improve water security, particularly in India's 254 water-stressed districts, and also put in place redundant

12 Jal Jeevan Mission Dashboard, as of January 10. Details available at https://ejalshakti.gov.in/jjmreport/JJMIndia.aspx; last accessed on February 24, 2022.




*UNICEF and the Gujarat Institute for Disaster Management designed a disaster resilient toilet model (DRT) that was institutionalized and is undergoing piloting. New technology and designs need to be explored to further progress adaptation efforts. To read more about the process, you can read the field note here: https://www.unicef.org/rosa/media/11801/file*

water systems that can be leaned on during and after emergencies.

There are many other examples of adaptation efforts ongoing in India and globally, but are not being recognized for their contributions as such. One key challenge is the lack of monitoring systems in place that can help make the linkages between routine programmes, such as WASH initiatives, and their

*A labourer fixes a joint in of a 100mm Ductile Iron (DI) pipe line by using a tyton rubber to avoid any leaks in the DI pipes running through Azizabad village in Palwal, Haryana. Regular practice of operations and maintenance is a core exercise for ensuring that systems are more resilient. (Source: © UNICEF/UN0571250/Latif)*

*Cyclone Nirav hit Tamil Nadu on November 26, 2020 causing a lot of destruction. UNICEF partnered with on ground groups to provide relief to the cyclone hit families and children. (Source: UNICEF/UN0375440/Krishnan)*

contribution to adaptation more explicit. Another is the need to recognize the potential of these initiatives for contributing to the sustainable green economy that is often aspired for. A study in 2020 by UNICEF found that work done to achieve the goals of SBM Phase II generated 7.55 million full-time equivalent employment, directly and indirectly. SBM Phase II and JJM now also present opportunities through which the dignity of workers can be addressed while skilling them to construct climate resilient facilities and professionalizing them in the process. They can also collaborate with the entrepreneurs to identify design and technological solutions that can also build resilience.

It is not only important to push for greater focus on and investment in adaptation but also prepare for the upshot. Scaling up efforts for adaptation initiatives can easily leverage untapped potential of Indian youth, who make up approximately a third of its massive population. Maharashtra's Mahji Vasundhara provides a great model for children and youth engagement, including through educating them using environmental and climate change curriculum to promote greater understanding and inculcate green habits. Just as importantly, when communities at the grassroots level are able to recognize the multiple layers of protection that adaptation investment can provide them, they are more likely to take ownership of the process and the results. Future interventions could ensure that all educational and livelihood opportunities are provided utilizing a gender equitable approach. As Eddie Bautista, New York City's Environmental Justice Alliance Executive Director, rightfully said, "This is not about the environment, it's about the community, it's about jobs, it's about justice."

With Prime Minister Modi's spoken commitments and emphasis on adaptation, along with the global commitment to double funding for adaptation projects to $40 billion annually, it is the right time for a renewed discussion on what counts as adaptation within the country, how to monitor it transparently and convergently, and how to reflect it in future NDCs and COPs. Furthermore, political will and power behind the right interventions can help adapt currently entrenched behaviours, as is happening with changing perceptions around open defaecation. Doing so will not only make communities more resilient but will also put us more firmly on the path for achieving an equitable and sustainable future. ■

*Article by: UNICEF India WASH Team; Editor: Swathi Manchikanti, WASH Specialist*

# Proposed National Mission on Biodiversity and Human Well-being

## Glimpses from the Bio-economy Programme

In this article, **Nandan Nawn** dwells on the proposed national mission on biodiversity and human well-being and says that even with a clear scientific base, able and committed scientists, and assured State support, it may take several decades to marshal the gigantic effort—in the nature of a 'social movement'—to restore and sustain Nature for augmenting and sustaining human well-being in India.

## Agenda Setting

Nature supports *all* economic activities. It does not matter if it's a good or a service, produced in the formal or the non-formal parts of the economic system, embodying only use-value or also an exchange value, or whether consumed by the producer herself or by an 'alien' in a distant place. The extent and scale of support by Nature to specific economic agents are mediated by the rules, customs and norms, at both local (say, a common grazing ground) and global (ozone layer) scales. The support is manifested as 'sink' (say, ability to absorb the GHGs by natural carbon sinks) and 'source' (say, fodder).[1]

The 'allocations' of such support among economic agents—be it within or across generations —are arrived at a (albeit higher) social plane dictated by political priorities. Markets can hardly 'allocate' such supports provided by Nature to the economic (and other) activities (that are supported by Nature). Thus, the interventions by the State are necessary to ensure a steady (if not augmented) flow of such supports across agents.

Biodiversity represents the richness of Nature. A set of one or two attributes such as temperature and rainfall—as used in the 'climate change' discourse—can hardly capture such richness. Above anything else, such 'analytical simplification' can hardly address the root cause of the problem faced by *all* humans today, namely disruptions in and destruction of Nature.

In fact, it is not just a scale question alone, but involves serious trade-offs, among and within source and sink types of support. For example, carbon sequestration through fresh planting of non-indigenous species may facilitate one particular sink type of support, but in the process distorts several source types. Only a 'system-based approach' involving (natural and social) scientists can address trade-offs.

India hosts nearly 8 per cent of global biodiversity even though covering only

1 "A source is the part of the environment that supplies usable raw materials that constitute the throughput by which the economy produces and that ultimately returns as waste to environmental sinks. A sink is the part of the environment that receives the waste flow of the throughput and may, if not overwhelmed, be able to regenerate the waste through biogeochemical cycles back to usable sources". (Herman Daly and Joshua Farley. 2011. Ecological Economics: principles and applications, Second Edition. Washington, DC: Island Press).

about 2 per cent of global land area.[2] Sustained disruption of Nature in India (and many other parts of the global South that hosts most of the global biodiversity hotspots) is an irrefutable fact. Such disruptions have implications for sustainability of livelihoods of billions of people and consequently on India's GDP. Several commitments made by India in the international fora on Nature are unlikely to be fulfilled in case business-as-usual continues.

Fortunately, a new biodiversity science is emerging across the globe. It focuses on the many ways in which society is both shaping and responding to changes in biodiversity. It enables one to gain a much better understanding of ecosystem functioning—this in turn can help prudent management of India's diverse ecosystems to ensure the sustained flow of ecosystem services for a secure future.[2,3]

In short, this calls for conservation (as in sustainable livelihood based on bio-assets, sustainable agricultural practices) and *not* preservation (as in archives, monuments) of Nature. The proposed National Mission on Biodiversity and Human Well-being (NMBHWB) is a step towards this direction.

## A Brief Early History of the NMBHWB

The origin of the NMBHWB can be traced to a meeting of a group of scientists in Bengaluru on July 9, 2018 called by Kamaljit S Bawa, who prepared a concept note based on the ideas presented at this meeting and subsequent discussions. The note was later presented by Bawa and Uma Ramakrishnan at the inaugural meeting of the PM-STIAC on October 9, 2018. It was approved later.[4]

More scientists joined this group over time and the Biodiversity Collaborative (BC) was formed as "a group of institutions and individuals who are committed to furthering biodiversity science and advocating its use in the crafting of development, environment, and conservation policies and plans".[5]

Subsequently, the BC received a preparatory project grant from the Office of the Principal Scientific Adviser. This enabled many consultations with scientists from a range of national

2 K Bawa, N Nawn, R Chellam, J Krishnaswamy, V Mathur, S B Olsson, N Pandit, P Rajagopal, M Sankaran, R U Shaanker, D Shankar, U Ramakrishnan, A T Vanak, and S Quader. 2020. 'Envisioning a biodiversity science for sustaining human well-being' Proceedings of the National Academy of Sciences of United States of America 117 (42): 25951–25955. ISSN: 1091-6490.

3 K Bawa, A Sengupta, V Chavan, R Chellam, R. Ganesan, J Krishnaswamy, V B Mathur, N Nawn, S B Olsson, N Pandit, S Quader, P Rajagopal, U Ramakrishnan, G Ravikanth, M Sankaran, D Shankar, R Seidler, R U Shaanker, A T Vanak. 2021. 'Securing biodiversity, securing our future: A national Mission on biodiversity and human well-being for India' Biological Conservation 253: 108867. ISSN: 0006-3207.

4 PIB. 2019. "Nine science and technology missions with focus on science for people and people for science. Press Information Bureau, Government of India, New Delhi: PIB. Details available at https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1567633; last accessed on February 16, 2022.

5 Biodiversity Collaborative. 2021. "About the Biodiversity Collaborative". Details available at https://citsci-india.org/about/; last accessed on February 16, 2022.

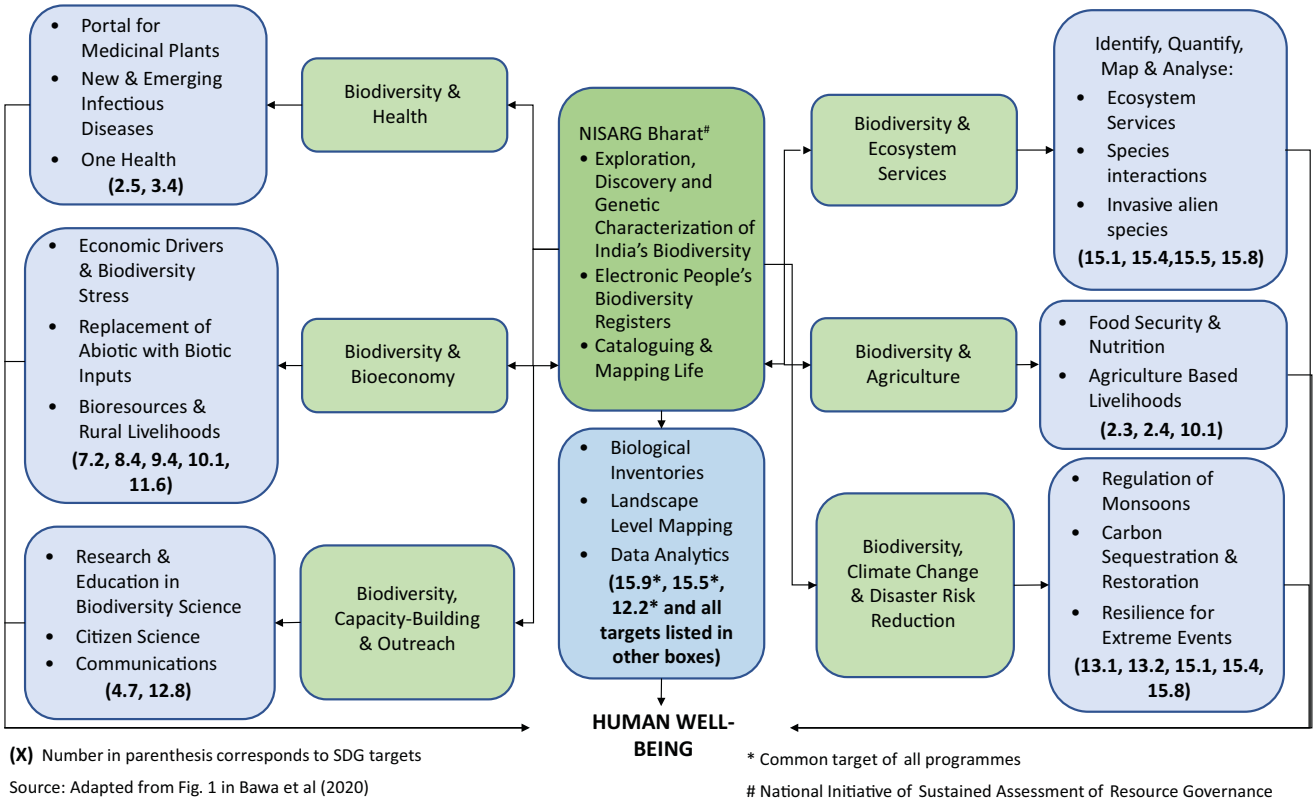



*Figure 1A: Programmes of the NMBHWB, Anticipated Societal Benefits and linkages to SDGs and targets*

institutions with expertise in biodiversity science (such as BSI, ZSI, WII, and NRSC). In total, more than 225 scientists from more than 100 institutions including State Forest Departments and State Biodiversity Boards have participated in consultations facilitated by the Chairperson of NBA, Vinod B Mathur.

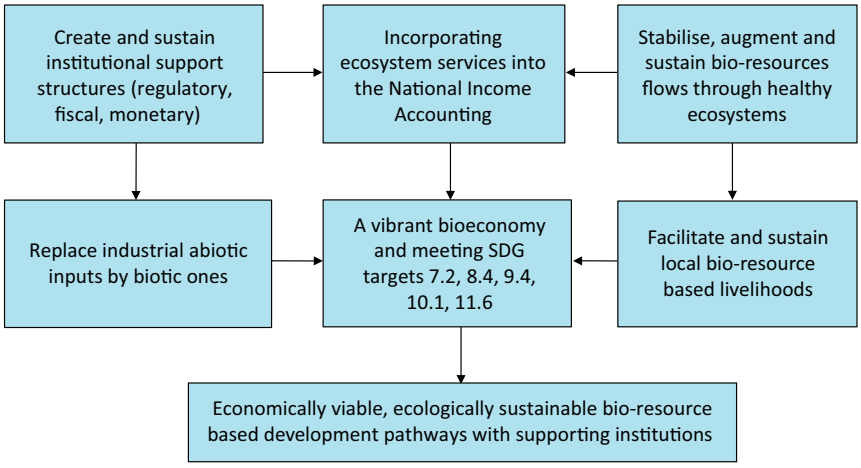
This was followed by several more stakeholder consultations including inter-ministerial ones facilitated by the Ministry of Environment, Forest and Climate Change (MoEFCC). All these enabled the BC with the guidance of Mathur to submit the final version of the Detailed Project Report, a necessary requirement for launch of any new 'scheme'. The remaining processes to 'launch' the Mission are expected to be completed soon.

The overarching objective of the proposed NMBHWB is to restore and enhance biodiversity and strengthen its sustainable use in India. The goal is to embed biodiversity as a key consideration in all development programmes, particularly in sectors such as agriculture, water resources, climate change mitigation, public health and bio-economy. It is expected that priority shall be given to the Aspirational Districts as they offer an excellent opportunity to mainstream biodiversity into development processes. The theories, concepts, methods, and tools offered by the new biodiversity science shall be employed.[6]

## Broad Framework of NMBHWB

The centrality of biodiversity–human well-being connection is obvious in the conceptual framework of the proposed NMBHWB. The specific modes and 'impacts' (Figure 1A) provide some ideas on the dimensions of human well-being that are expected to be augmented by NMBHWB, in case it is implemented in the most ideal manner (as in case of any theoretical approach).

6 The proposed Mission is expected to: "1. Transform biodiversity science in India by linking scientific research with mitigation of problems such as pandemics, climate change, economic insecurities, and realization of the UN SDGs and the UN Strategy for Living in Harmony with Nature; 2. Improve the prospects of meeting challenges in climate change, agriculture, and animal and public health using biodiversity and ecosystem services; 3. Strengthen public research institutions, academia and non-governmental organizations by adopting modern concepts and tools to explore, document, assess, monitor, and sustainably use India's vast but declining natural assets; 4. Create a cadre of hundreds of professionals trained in the new interdisciplinary science to protect, restore, sustainably use and secure India's biodiversity; 5. Place in public domain high quality and rigorously generated spatially explicit data and information on biodiversity and ecosystem services to enable management of environmental impact assessments and of development projects; 6. Initiate a mass movement to help every citizen feel pride in India's natural heritage, and to engage millions of people in appreciating, documenting, protecting and restoring life on earth." (Bawa, Sengupta, et al. 2021)




Source: Adapted from Fig. 6 in Bawa *et al* (2021)

*Figure 1B: Proposed schematic framework of the Bio-Economy programme of the NBMHWB*

NMBHWB is comprised of two major programmes, NISARG Bharat that shall act as the 'central spine' connecting all the other six programmes, including bio-economy. We turn next to the challenges that are expected to be faced in the 'roadmap', or the pathways for implementation, of the bio-economy programme, given the schematic framework (Figure 1B).

## Challenges to Implement the Roadmap of Biodiversity and Bio-economy Programme

Given that biodiversity can augment human well-being (HWB), sustained biodiversity can lead to sustained HWB. This warrants 'taking care' of investments—or making the investment *secure*—to augment biodiversity. It is possible if and only if secured and sustained benefits reach those (or incentivized otherwise) who can offer 'security' to such investments. The benefits can at times be only in use-value terms, and may not always yield exchange value.

Economic principles on investment decisions are quite clear: if the rate of return on an investment is expected to fall short of the rate used to discount future benefits and costs, the investment would not be undertaken.[7] The principle is same for both natural and physical assets, but 'security' differs for obvious reasons: the property regime[8] in the latter is mostly private while it is common or even public—if not *de jure*, but certainly *de facto* — in the former (at least in India).

Some more concerns arise if one dives a little deeper *vis*-à-*vis* the rate of return (present discounted value or PDV of Benefits/PDV of Costs) of investments to augment biodiversity. First, like any other climate change thwarting investment,[9] here too the stream of benefits will appear only later (say at time later than 5th year), while most large investments are to be made immediately (may be at time till 3rd year) and only some a little later. Second, there are many competing investments with similar temporal spread of benefits and investment (such as education, health and most other public goods) that are seeking State funding. Third, as it is well known, design of investment vehicles (given location, and specific quantum of investment) will determine the extent and spread of benefits (both spatial and temporal)—there is no guarantee that it will reach those who *can* offer 'security' to the investment. This will require, among others, for those who are making the investment, to trust those who can take care of it. India has a chequered history on this matter, as experience of joint forest management shows.[10]

In short, the following necessary conditions emerge to justify investments towards augmenting biodiversity: (a) Realization of benefits by those who can secure the investment; (b) Necessary permission to access the space to make the investments; (c) Budgeting for opportunity costs for use of the space to make the investments (for the *de facto* user rights).

A formal institutional framework is required to operationalize the first of these conditions— it will require a significant structural shift as every scholar of political economy of Nature in India knows. The second is administrative in nature, and involves substantial transaction costs. The third is of financial nature and can be subjected to serious questions (rightly) by the auditors.

Without these, the investments to sustained augmentation of biodiversity will not take place, and may remain only in paper as shown meticulously by Kukreti (2021)11 for 'compensatory

7 Partha Dasgupta. 2021. The Economics of Biodiversity: The Dasgupta Review. London: HM Treasury.

8 Arild Vatn. 2005. "Chapter 10: Resource Regimes" in Institutions and the Environment, 252-298. Cheltenham: Edward Elgar.

9 Eric Neumayer. 2013. 'Chapter 2: Sustainable Development: conceptual, ethical and paradigmatic issues' in Weak and Strong Sustainability: exploring the limits of two opposing paradigms, Fourth Edition, pp. 8-48, Chetelham: Edward Elgar. PDV stands for present discounted value—it's a tool to convert a stream of benefits and costs over time against an identical temporal unit to enable comparison.

10 Sharachchandra Lele and Ajit Menon, eds. 2014. Democratizing Forest Governance in India, New Delhi: OUP.

11 Ishan Kukreti. 2021. "India's ghost plantations in which millions of rupees have been sunk". Scroll.in. Details available at at https://scroll.in/article/1014823/indias-ghost-plantations-in-which-millions-of-rupees-have-been-sunk; last accessed on February 16, 2022.

*Sustainable Bio-economy at work at KNP, Bharatpur*

afforestation' where "Central government spent around ₹59,000 crore between 2009 and 2020" yielding 'ghost plantations'.

## Concluding Remarks

There are many *real* challenges. Sustained political will is necessary to address them. The roadmap prepared for bio-economy programme of this mission acknowledges these constraints.

Once the necessary approvals are in place, this programme can start with collection of information from selected People's Biodiversity Registers (PBR) in association with NISARG Bharat programme and other secondary datasets to evaluate the bio-economy potential of spaces under the jurisdiction of Biodiversity Management Committees (BMCs). The next task will be to locate pathways—through action-research mode—to ensure augmented benefits reaching those who are producing ecologically benign products using appropriate processes, sourced from the jurisdiction of BMCs, and accordingly certified by them. Lessons from a few pilots will enable exploring replication possibilities and its execution at the progressively higher scales.

Everyone connected with the preparatory process agrees that if Nature is to be restored, it will require a 'social movement': "Initiate a mass movement to help every citizen feel pride in India's natural heritage, and to engage millions of people in appreciating, documenting, protecting and restoring life on earth" is what the Mission is expected to achieve, among others.[12] The challenges are many as is well known to those who have initiated, participated in and sustained such movements.

A necessary condition for this 'social movement' is involvement of all those who care for Nature. Many such engagements, associations, and collaborations have been imagined in the roadmap. Stay tuned for updates. ■

12 Bawa, et al. (2021).

***Acknowledgements**: Bawa, et al. (2020) and Bawa, et al. (2021) are useful references on the DPR of NMBHWB. The author wishes to thank Ravi Chellam and Kamal Bawa, his colleagues at BC, Akshay M and Shreya Bedia, his 'associates' and Rukmini Sen, his partner, for their comments that improved the quality in multiple ways. An earlier version was released on author's blog, at https://nawnsense.medium.com/*

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# Fostering Sustainable and Resilient Agro-Food Futures in India

**Manish Anand** says adaptive measures need to be taken in India to achieve sustainable food security in the wake of threats posed by climate change. Further, there is a need to strengthen the capacity and tools to diagnose the challenges and map out integrated long-term strategies bringing coherence across the different dimensions of land-use, food systems, and climate change impacts.

Achieving the state of sustainable food and nutrition security remains a major challenge for India, which is home to about 17 per cent of the world's population given that 14 per cent of its population, continues to be undernourished.[1] The importance of stable access to adequate food supplies for sustained human development was highlighted by the World Bank (1986) when it defined food security as "access to adequate food to all people at all times for an active and healthy life" and the need to transform food systems, building resilience, inclusiveness and sustainability, through action driven at country-level by governments in their local contexts was called for in the recently held United Nations Food Systems Summit in September, 2021.

Although India is self-sufficient in foodgrains production in the macro sense (foodgrain production increased from 50.8 million tonnes in 1950 to an estimated 303.97 million tonnes in 2021–22), the constraints put on the natural resources, mainly land and water, can hinder the achievement of sustainable food security. According to estimates, of the 97.85 million hectare (mha) degraded land 37 mha is classified as agriculture unirrigated affected by various types of degradation including water erosion (80 per cent), wind erosion (17 per cent), alkalinity/sodicity in land (2 per cent), and water logging (1 per cent).[2] Depletion of natural resources, particularly groundwater, can pose a potential threat to a sustainable food security. Agriculture production, which accounts for more than 80 per cent of groundwater withdrawal in the country, may get affected due to an estimated decline in the availability of groundwater for agriculture use by 20per cent and by 68per cent in regions projected to have low future groundwater availability by 2025.[3]

Climate change-related events,

1 WHO. (2020). The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, Food and Agriculture Organization.

2 SAC. (2016). Desertification and Land Degradation Atlas of India (Based on IRS AWiFS Data of 2011-13 and 2003-05), 219 p. Ahmedabad: Space Applications Centre, Indian Space Research Organisation, Government of India.

3 Jain, M., Fishman, R., Mondal, P., Galford, G.L., Bhattarai, N., Naeem, S., Lall, U., Balwinder-Singh and DeFries, R.S. (2021). Groundwater depletion will reduce cropping intensity in India Science advances, 7(9), p.eabd2849.

for example, the onset of extreme weather, uncertainties surrounding water availability in the future and loss of productive land due to salinization resulting from salt water intrusion have a major impact on vulnerable households and have the potential to further aggravate the environment-related threats to food security. A productivity-based approach has resulted in input-intensive and environmentally exploitative agricultural production systems manifested in declining land productivity, soil erosion, tropical deforestation, drought, water deficits, desertification, and the loss of biodiversity.[4] Around 70 per cent of the poor in India live in rural areas, and 70 per cent of them are primarily dependent on agriculture. Amongst them, the single largest category of the population is the one that depends mainly on agricultural labour (approximately 55 per cent) for their livelihoods, with limited capacity to produce their own food. According to estimates in 'The National Family Health Survey 2019-21 (NFHS-5)'report, a considerable proportion of population is undernourished, with 18.7 per cent of women (15-49 years) and 16.2 per cent of men (15-49 years) and over 32 per cent of children below five years being underweight.[5]

With respect to the above, the importance of producing enough food for the present without damaging the environment and the natural resource base required for future food production has been highlighted through the concept of sustainable food security. The interlinkages between environmental sustainability and food security discussed above highlight the importance of sustainable land management and water

management practices in agriculture, and poverty reduction to ensure long-term food security for the country. The implementation of these is ought to have positive spins-offs in the context of climate change by contributing to both mitigation and adaptation capacities and the attainment of several of the Sustainable Development Goals (SDGs). Important strategies for the achievement of sustainable food security in India are proposed below.

## Management of Natural Resources

Given the importance of land in agriculture, its conservation becomes very crucial for long-run agricultural production. In this regard, development


4 Chand, R. (2017). Doubling Farmer's Income, Rationale, Strategy, Prospects and Action Plan. NITI Policy Paper No. 1/2017, National Institution for Transfroming India (NITI Aayog), Government of India.

5 IIPS & ICF. (2021). National Family Health Survey (NFHS-5), 20119-21: India. Mumbai: International Institute for Population Sciences.

and implementation of national land use policies and its integration to the policies on forest and water so as to provide coherence in management of these resources needs to be undertaken. Further, there should be laws related to land use so that the incidence of degradation of agricultural land and the shifting of agricultural land to non-agricultural uses could be checked. Water pricing for irrigation needs to reflect the real social cost of water, although mechanisms should be built into it such that harmony can be achieved between economic efficiency and social equity, keeping in mind the prevalence of poverty and the large number of small farm holdings in the region.

## Addressing Post-Harvest Losses: Adequate Storage and Distribution Facilities

National food security programmes should ensure the creation of a food grains buffer stock to cope with fluctuations in agricultural production and changes in weather condition. For this, safe, secure and hygienic storage facilities are required to minimize losses from improper food storage, a regular occurrence in India. Efforts should be made to economize on the cost of public distribution system by looking closely into existing arrangements for procurement, storage, and distribution. Food distribution systems are managed by the public sector: however, the system has displayed inefficiencies in service delivery. The option of Public Private Partnerships could therefore be explored for the distribution of food grains to the vulnerable.

## Technological Interventions for Agricultural Production

The green revolution areas, which was largely possible because of technological innovations in the form of high yielding varieties of crops, there has been a slowing down of productivity gains because of pressure on the natural resource base. Technology can also be used to address the problems of over-exploitation of resources in the region. Frontier technologies such as biotechnology, information and communication technology, renewable energy technology can provide ample opportunities to overcome the prevailing technology fatigue. In order to minimize the harmful effects of intensive use of chemical fertilizers and pesticides, a holistic view of soil fertility based on retaining its natural nutrients is required.

## Indigenous Knowledge and Traditional Agriculture

Historically, India has been an agrarian civilization and hence an indigenous knowledge in the country has a wide gamut. In general, traditional knowledge should be incorporated into new technologies, with civil society and multilateral agencies working in close association with locals to encourage further innovations. As a basic starting point, the body of indigenous knowledge in sustainable practices across the agriculture value chain should be researched extensively, formally recorded, and made freely available.

## Tackling the Threats of Climate Change

Adaptive measures need to be taken to achieve sustainable food security in the wake of threats posed by climate change. In this regard, crop diversification, adjustments in crops and sowing dates, use of drought and flood-tolerant varieties, pest, disease and salinity resistant varieties, improving crop and livestock through breeding (e.g., breeding of new rice varieties to minimize the risk of serious productivity losses caused by climate change), mixed and intercropping, and low cost post-harvest technologies, eco-farm technology (to reduce the effects of high temperature on crops) become essential.

Further, there is a need to strengthen the capacity and tools to diagnose the challenges and map out integrated long-term strategies bringing coherence across the different dimensions of land-use, food systems, and climate change impacts. ■

*Manish Anand, Senior Fellow, Centre for Resource Efficiency & Governance, The Energy and Resources Institute (TERI).*

# Making India's Infrastructure Climate-Ready

## What We Can Do

In this article, **Shreya Wadhawan** and **Abinash Mohanty** discuss the ways in which India can climate-proof its infrastructures. They feel that any further delay in climate-proofing of infrastructure will further risk lives, livelihood, and economies. Climate-proofing infrastructure against the impacts of changing climate scenarios is vital to prevent decades of development from collapsing.

India is the third-largest economy in Asia and is projected to be one of the top three economic powers globally over the next 10–15 years. India seeks to invest more than $1.5 trillion to build its infrastructure over the next ten years. India is also urbanizing fast, and hence its urban infrastructure will be pivotal to the economic manifesto. The Government of India has already invested more than $160 billion in creating and upgrading urban infrastructure over the last two decades; meanwhile, investments worth $28 billion are already in the pipeline for projects such as Smart Cities Mission. The numbers are quite promising, but are India's built-in and planned infrastructures climate ready?

Recently, India's megapolis cities came to a standstill due to severe flooding caused by overwhelming, incessant, and erratic rainfall during the retreating monsoons. India's vulnerability to climate extremities is breaching all thresholds and currently ranks seventh as per Germanwatch's Climate Risk Index. A recent study by the Council on Energy, Environment and Water (CEEW) suggests that more than 75 per cent of Indian districts are extreme events hotspots, and over 80 per cent of the Indian population is vulnerable to extreme climate shocks. While the spurt in climate extremities are overhauling the economic growth, developing economies such as India report direct damage to transport and power infrastructure worth more than $18 billion and indirect losses amounting to $390 billion annually due to extreme climate events, according to the World Bank. Direct infrastructure losses amounting to $79.5 billion have already been registered in the last two decades. The precarious situation puts a question mark over India's infrastructure investment strategy. The quality and standards of infrastructure have the potential to amplify or minimize climate-related disaster losses and disruption of basic public services. To become a leading global economy, India's growth needs to be backed by a disaster- and climate-ready infrastructure, which can be accomplished by 'climate-proofing'.

## How Can India Climate-Proof Its Infrastructures?

First, India needs to adopt a unified risk transparency mechanism to climate-proof its built-in and planned infrastructure. Given the uncertainties due to COVID-19 waves and the spurt in climate extremities, India needs to reassess the design, construction, location, operation and implementation of infrastructure projects through the lens of a unified risk transparency framework. Unified risk transparency entails two aspects: the ability to understand i) what, that is, identifying the risks and their compounding impacts; ii) how much, that is, quantum of probable loss and damage. Risk transparency calls for granular risk assessment. It can provide a double dividend of creating infrastructure that is tailor-made to withstand climate extremes in particular geographies, and attract private participation and investment. India has also spearheaded the launch of Infrastructure for the Resilient Island States (IRIS) at the recently concluded COP26. Furthermore, a unified risk transparency framework for climate-proofing of infrastructures will also aid the fulfilment of Sustainable Development Goals (SDGs) by promoting inclusive and sustainable growth, and ensuring accessibility and affordability of infrastructural services, thereby improving the quality of life.

Second, India needs to include nature-based infrastructure such as wetlands, mangroves, forest ecosystems, among others, under the ambit of critical infrastructure. Built-in infrastructure like buildings, roadways network systems, electric systems, dams and bridges are currently considered under the standard definition and practice of critical infrastructure. Broadening the definition of infrastructure to include natural ecosystems offers an opportunity to deploy and enhance nature-based solutions (NBS) to produce sustainable and climate-resilient responses. According to a recent study, wetland and ridge restoration could save $7 in avoided damages for every $1 invested. Further, more than 45 per cent of the climate risk over 20 years could be averted, saving more than $50 billion worth of damages against extreme flood events. Restoring, rebuilding and investing in NBS can make our cities and villages more climate-resilient and alter the adverse impacts of climate change.

Third, make risk insurance climate-responsive to enhance the implementation of climate-resilient

infrastructures, and mobilize both public and private investments. Globally, weather-related insurance losses have increased by five times to $55 billion since the 1980s. Insurance premiums are also rising steeply, especially in the most climate-vulnerable regions. Climate-responsive risk insurance calls for financial innovations that integrate physical climate impacts into investment decision-making. Climate-responsive risk insurance can reduce the cost of financing large-scale infrastructural projects and offer effective risk transfer mechanisms such as climate risk insurance, resilience bonds, and global risk investment pools. An efficient risk transfer mechanism will insulate both the public and private sectors from losses incurred due to the impacts of climate change. It can enhance Public-Private Partnership (PPP) models to finance climate-proofing projects based on effective risk transfer mechanisms. Further, the G20 countries, together with large private financial institutions, should incorporate climate-responsive risk insurance pools that can also provide a financial buffer against severe climate shocks and ensure building back better.

Any further delay in climate-proofing of infrastructure will further risk lives, livelihood, and economies. Climate-proofing infrastructure against the impacts of changing climate scenarios is vital to prevent decades of development from collapsing. ■

*Shreya Wadhawan is Research Analyst, and Abinash Mohanty is Programme Lead at the Council on Energy, Environment and Water (CEEW), an independent not-for-profit policy research institution. The views expressed are their own.*

# IFAT India

## Environmental Solutions for India

Nearing a decade IFAT India has been a hub for the environmental technology community, translating the passion of India's game changers and leading environmentalists to bring holistic, sustainable solutions to pressing environmental issues and create a cleaner, greener, and more sustainable India. Read on to know more…

From addressing sewage systems, adequate wastewater treatment, sustainable ways for water supply, holistic solid waste management and recycling solutions, IFAT India has showcased innovations and valuable insights from across the globe.

### World's Leading Network for Environmental Technology

IFAT India is a part of the world's leading network for environmental technology, active across the globe offering innovations, resources, and solutions, specifically to tackle those challenges present across various markets. Including the trade fair in Munich, IFAT hosts dedicated trade fairs in China, India, South Africa, and Turkey as part of a global network for decision-makers in businesses operating in the environmental technology sector.

### IFAT India 2019: reflecting the thriving spirit of the Indian environmental technology industry

The first edition of IFAT India was organized in 2013 with the primary aim to bring the global environmental

fraternity together to showcase latest technological advancements and discussing issues of the hour. The seventh edition, which concluded on October 18, 2019 in

Mumbai, saw a record figure of 9633 trade visitors and 311 exhibitors from 23 countries covering an area of 14,500 square metres. The trade fair highlighted how technology and innovation can lead the change towards achieving the UN Sustainable Development Goals, while focusing on solutions for developing sustainable waste management and modernizing the environmental infrastructure.

## IFAT India Online 2020 Connecting the Environmental Industry Digitally

IFAT India online, a digital platform, offered the environmental industry a unique opportunity to connect with partners, customers and with other relevant industries despite these challenging times presented due to onset of the pandemic. The online event took place from December 9–11, 2020 and was part of a cross-industry platform


of Messe Muenchen India, which drew on its extensive Indian trade fair portfolio.

## IFAT India 2021: successful restart, the environmental community comes face to face in Gujarat

On December 4, IFAT India—back in its physical avatar was held at the Helipad Exhibition Centre in Gandhinagar, Gujarat—concluded its special edition successfully. Continuing the bounce back sentiment, the business community enthusiastically took part, with over 85 exhibitors showcased their solutions and innovations to the visitors. In terms of visitors, the special edition for environmental technology witnessed successful numbers with more than 4000 attendees.

All the exhibitors, visitors, buyers and partners took full advantage of face-

to-face meetings on site. The industry not only exchanged information at the exhibition booths, but also at the dialogue platform organized concurrent to the trade fair. The special edition supporting programme focused on the topical issues—from Future of Water in India covering the future trends and next cutting-edge technologies; to policy driven topics of Swachh Bharat 2.0 the next version of government's successful Clean India Mission. It emphasized the learnings from the pandemic and the future roadmap punctuated with opportunities and challenges.

## IFAT India 2022: co-creating the future cleaner, greener, and more sustainable India

From September 28–30, 2022 in Bombay Exhibition Centre, Mumbai, IFAT India open its doors to the environmental community. It would showcase leading environmental technologies from across the globe, bringing together brightest minds and influencers from the industry to debate the trending issues whilst igniting hope and inspiration for a better tomorrow for all.

## About IFAT

IFAT is the world's largest and leading environmental technology trade fair. Every two years, the world-leading trade show presents solutions for water, sewage, waste and raw materials management as well as solutions to make maximum use of resources and to close raw material cycles. The 2018 edition attracted 3305 exhibitors from 58 countries and 142,472 trade visitors from 162 nations. The event occupied a completely booked space of 260,000 square metres, divided among 18 halls and an outdoor area. The next IFAT will be held at the exhibition centre in Munich from May 30 to June 3, 2022.

## About Messe Muenchen India

Founded in 2007 as a wholly-owned subsidiary of Messe Muenchen, Messe Muenchen India Pvt. Ltd. is one of the leading organizers of trade fairs in India with an extensive portfolio of B2B trade fairs covering various sectors: bauma CONEXPO India, electronica India, productronica India, MatDispens, drink technology India, LASER World of PHOTONICS INDIA, Intersolar India/ The smarter E India, IFAT India, analytica Anacon India/India Lab Expo, Pharma Pro Pack, Indian Ceramics Asia, Smart Card Expo, MatDispens, VRTECH India, World Tea & Coffee Expo, Pack Mach Asia Expo, and air cargo India. Messe Muenchen India works closely with industry stakeholders to develop well-researched trade fairs encapsulating the latest trends and innovations dominating the industry. Headquartered in Mumbai with offices in New Delhi, Bengaluru, Hyderabad and Ahmedabad, Messe Muenchen India connects global competence by bringing professionals together for business, learning, and networking.

## About Messe Muenchen

Messe München is one of the world's leading networking platforms. In a reflection of the slogan "Connecting Global Competence", Messe München serves as a global networking platform and brings together decision makers from all parts of the world. Messe München's portfolio comprises more than 50 trade fairs for capital and consumer goods as well as new technologies that focus on the latest social issues. These trade fairs include the world-leading trade fairs bauma, BAU, IFAT, and ISPO Munich. The roughly 200 events organized by Messe München each year attract about 50,000 exhibitors and 3 million visitors. Messe München has one of the most modern exhibition grounds in the world and with its four locations in Riem, the ICM—Internationales Congress Center München, the MOC ■

*Veranstaltungscenter München, and the Conference Center Nord, it is able to fulfil all its customers' requirements individually. Messe München is very successful in its domestic market in Munich as well as in other countries. It is active in all important growth markets: China, India, South Africa, Brazil, Russia and Turkey. Overall, Messe München, with its network of associated companies and foreign agencies, is present in more than 100 countries.*

# Combating Climate Change

## The Way Forward

Globally, diverse class of investors are eager to contribute towards the war against global warming, but they require credible local platform to effectively channelize funds. **Manish Chourasia** says Tata Cleantech Capital Limited (TCCL) has established itself as that ideal platform to intermediate global climate funds to Indian climate projects and companies. TCCL has developed a profound understanding of the rapidly evolving sector including technical, commercial, regulatory, contractual, and E&S expertise. Read on to know more...

Global warming is posing a real threat to the human life. According to the Intergovernmental Panel on Climate Change (IPCC), 1.5$^{o}$C temperature rise would be the tipping point. Human activity-induced climate change has its origin in the industrialization era that started from the 1800s. But the heightened spate of economic activity across advanced as well as newly emerged developing economies since the last three decades has accelerated emissions. To illustrate this with data, the planet had used only 32 per cent of the carbon budget until 1990. However, this doubled to 60 per cent within the last 30 years alone, leaving us with only 8 per cent of the carbon budget before circumstances become irreversible. Apart from emissions, land degradation, deforestation, waste discharges, extreme heat incidents, and sea-level rise have intensified in recent years.

In terms of absolute value, emissions were led by the advanced economies like the US, Russia and the EU. But battle to combat global climate change will have to be fought in developing countries. While India may have ranked lower in absolute terms, the outlook looks worrying. This is because in growth terms, India's emissions are estimated to rise by 25 per cent between 2020 and 2030, as per Global Carbon Atlas data. India has the unique opportunity to create growth, new infrastructure and meet the aspirations of its young citizens in a green, sustainable way.

The nature of issue to fight climate change globally is not macroeconomic. Globally, annual defence spends far exceed investments towards climate action. Global COVID-19 stimulus is around 3–4 times and annual global savings is around 5 times of the investment needs for climate action. The challenge is that this money is predominant in the developed economies while the climate investments are required mainly in the developing economies such as India, since going forward they will perhaps contribute more to global warming given the need to improve quality of life of their large population.

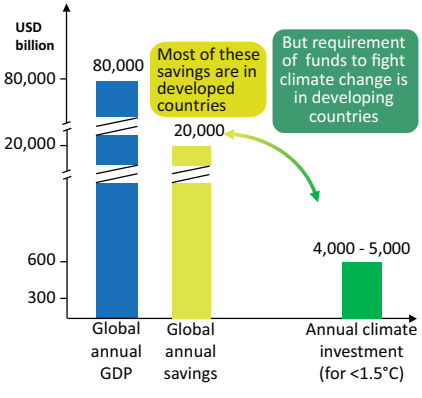



**Figure 1:** Fund required for climate finance vs global savings
*Source: Energy Transitions Commission (ETC)*

Globally, diverse class of investors are eager to contribute towards the war against global warming, but they require credible local platform to effectively channelize funds. *Tata* Cleantech Capital Limited (TCCL) has established itself as that ideal platform to intermediate global climate funds to Indian climate projects and companies.

World over, climate finance has always been viewed as a public sector initiative. India's ambitious plans were constrained by the inadequate capacity of such institutions to meet the agility, innovation, and deep understanding. There was a huge gap in sector understanding prohibiting professional capital to come in the sector.

TCCL addressed this by developing a profound understanding of the rapidly evolving sector including technical, commercial, regulatory, contractual, and E&S expertise. TCCL has built a robust risk diligence and complex monitoring framework to underwrite complex transactions.

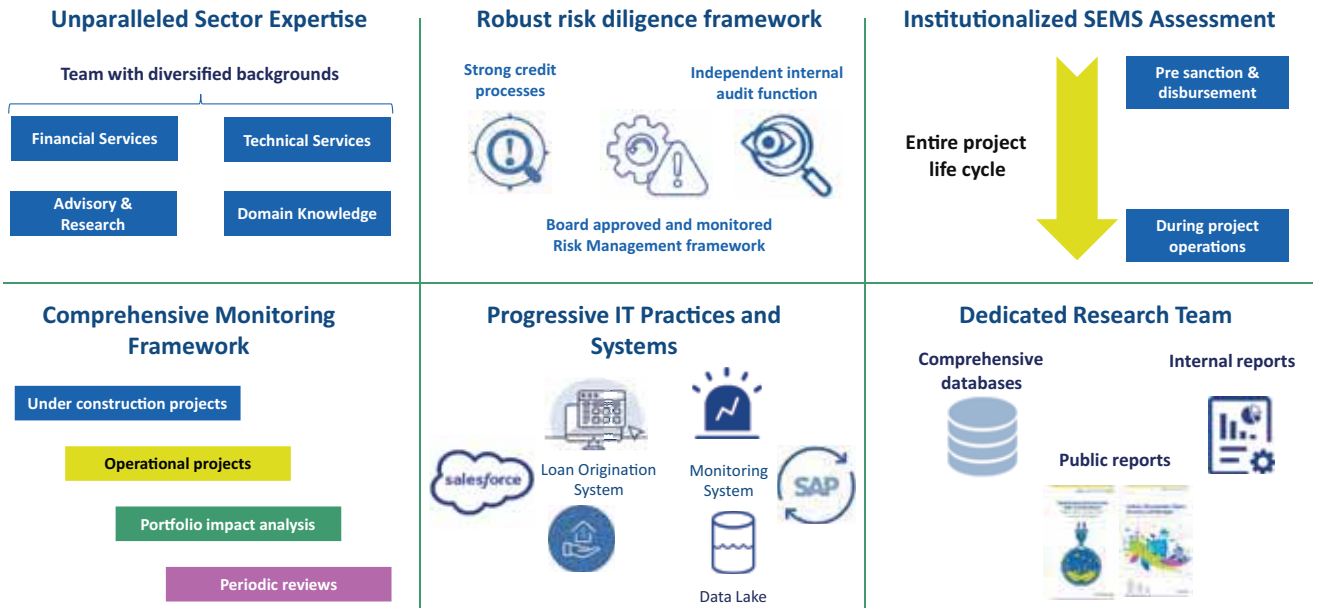



Figure 2: Key differentiators of TCCL

Further, TCCL has institutionalized E&S assessment for every project appraisal. TCCL is progressively vying to adopt cutting-edge technologies for making its business digital friendly and competitive. TCCL hired people not just from financial services but also from renewable industry to build a dedicated research team and unparalleled expertise of the segment. TCCL is also disseminating knowledge through its publications. TCCL has published White Papers in Cleantech segment, "Renewable Integration & Curtailment: Causes, Solutions and Impact on Project Bankability" and "Indian Renewable Open Access Landscape: Market Trend and State Comparatives". TCCL has also collaborated with a working group led by FICCI to publish a report on "India Roadmap on Low Carbon and Sustainable Mobility". Both the publications are available on the Company's website.

TCCL started its journey as a novel experiment in 2013 as a Joint Venture between Tata Capital Limited and International Finance Corporation (IFC). Since then, TCCL has come a long way having financed over 270 projects and 11.4 GW of renewable capacity and abatement of more than 16.9 million tonnes of carbon emissions as of December 2021. Further, TCCL prides itself by endeavouring to mainstream such sectors of climate finance, which are yet not attractive for traditional banks and finance institutions. It is working aggressively to develop markets for emerging sectors such as solar rooftop, energy efficiency, electric mobility, and wastewater treatment.

Even while TCCL is contributing to the green developmental agenda of the nation and the globe, it has made handsome returns for its investors. Over the past five years, the Company has exhibited strong growth on all parameters, with the total loan portfolio growing from US$175 million to US$912 million over the period FY 2015–16 to FY 2020–21. TCCL has delivered significantly higher ROE than industry while maintaining the best in class asset

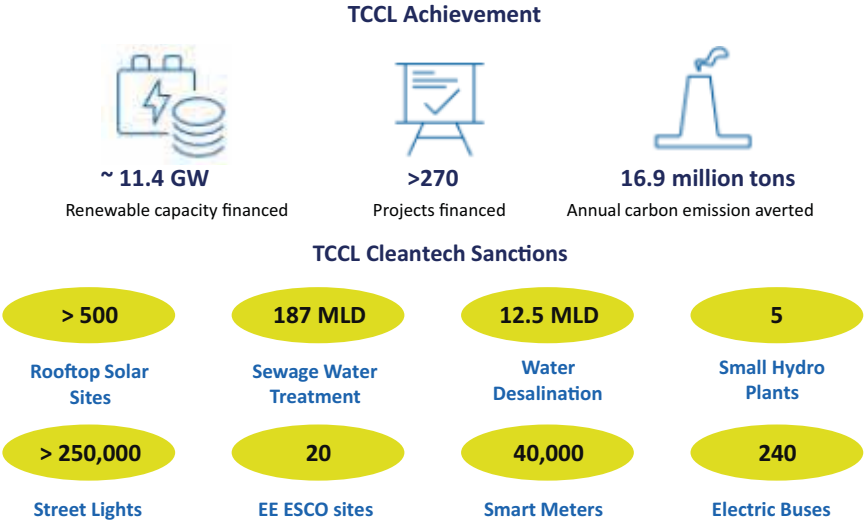



Figure 3: TCCL achievement and mainstreaming activities

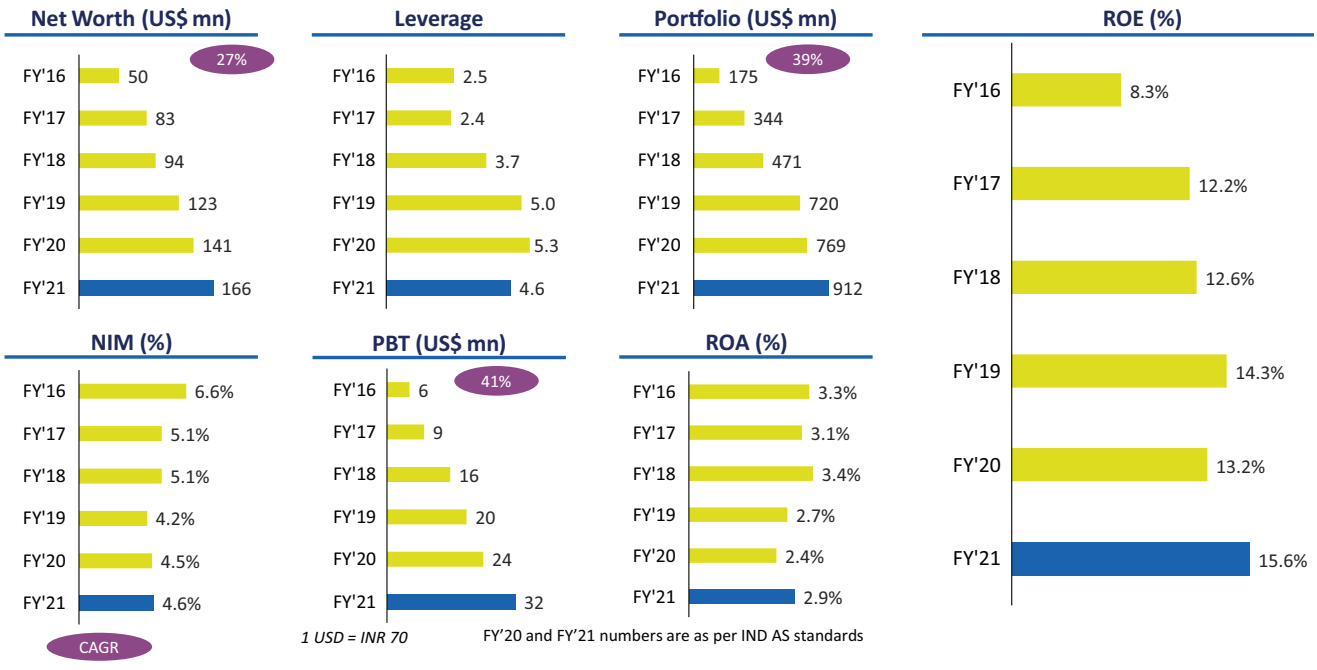



Figure 4: TCCL's financials

portfolio and is rated AAA by CRISIL.

TCCL charted the strategy of collaboration with investors, clients and regulators from the very beginning. It has entered into partnerships with reputed Indian Institutions such as IREDA (Government owned Leading Renewable Energy Financier), EESL (Government owned Super Energy Services Company) and Bureau of Energy Efficiency (Govt. body mandated to set Energy Conservation Standards). In addition, TCCL is the only private sector institution in India to have received a line of Credit from the Green Climate Fund (GCF, the largest global fund dedicated to help fight climate change). This $100-million facility will be used to develop and mainstream the rooftop solar financing in India.

TCCL has been able to further strengthen its global footprint by being inducted into the Green Bank Network. TCCL is the first Private Sector Climate Finance Institution in the Green Bank Network and the first Indian financial institution to enter the coveted network.

With such abundance of sunshine and wind, India has large untapped potential. From the current 98 GW of solar and wind capacity, India is set to reach 165 GW to 180 GW in the next 5 years. Further, the Indian government is targeting capacity of 500 GW from solar and wind by 2030. Similar opportunities await in the energy efficiency space (through programmes such as Smart meters, Industrial Energy Efficiency), water, and the e-mobility space. In all, investment required in sustainable infrastructure could well exceed $1.5 trillion as per estimation of TCCL. Of this, two-thirds would be required in commercially-viable sectors such as solar, wind, electric mobility, and energy efficiency. Other emerging areas such as water, city gas distribution, waste treatment, smart cities, green hydrogen, and co-firing would require some support to become viable (see the figure given below).

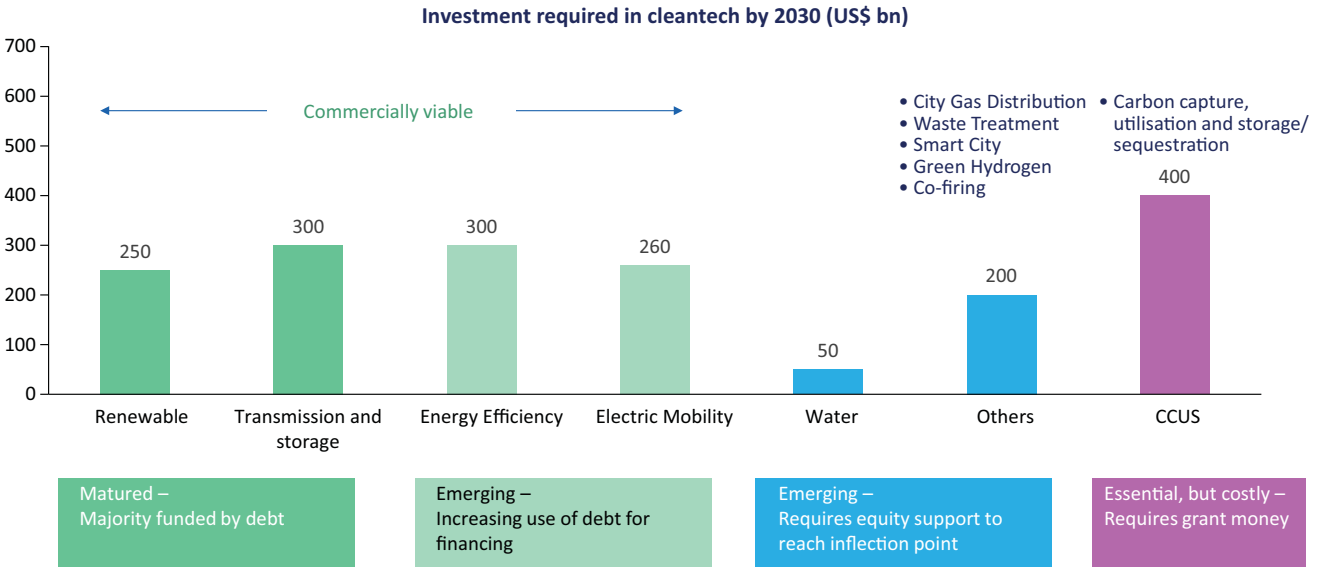
The key ingredient to provide a bridge between potential and implementation is finance. To put this into context, the investment required makes up ~60 per cent of the current total assets of all commercial banks in India. The public sector will be unable to meet the sheer size of this investment, which implies crowding in of investment from the private sector. In this regard, TCCL has so far played a pivotal role. TCCL has disbursed more than double of its total portfolio (disbursed over $2 billion and portfolio of $912 million as of March 2021) and created the framework for other players to enter in the segment.

Developing countries face another fundamental challenge. First, green technologies have higher capital cost in comparison to conventional technologies, which often makes it prohibitive to invest in these. Secondly, developing countries have higher cost of capital making green investments costlier. Even if India can raise low cost international capital, the cost of hedging, ranging from around 3 per cent to 6 per cent for Indian companies, negates the lower cost advantage. A de-risking mechanism is another imperative for finance energy transition in India. Given the scale of requirement of climate finance, the collaboration of the developed world is essential.

India will also need to strengthen the domestic bond market to facilitate

## Would availability of finance be a challenge?

### Though quantum is huge, commercially viable technologies can itself address over 60% of the issue




Source: TCCL Research

more green bond issuances, a product largely dependent on global pools of green capital as of now. Further, capital flow from Indian insurance and pension funds need to be promoted. India would also need to create right processes to enable the channelization of funds from developed countries. Though investment required is huge, business models and payment security mechanisms are yet evolving. In addition, industry will need to be vigilant of continually evolving policy environment and incongruous liability profile.

Over the past few years, industry has the following long-term sustained reforms in target sectors:

- **Renewable energy**: Feed-in-tariff regime to auctions, solar parks and increase in scale of operations
- **Road**: Emergence of Hybrid Annuity Model (HAM) and higher upfront clearance
- **Water**: Emergence of HAM, higher upfront clearance, and industrial projects
- **Transmission**: PPP model and faster clearances

Similarly, there have been reforms in financial markets and legal frameworks. New class of platforms such as IDF, AIF and Infrastructure Investment Trust (InVit) have emerged attracting capital from domestic and offshore players. Legal reforms such as IBC and NCLT along with sanctity of contracts being upheld have paved the way for faster resolution of disputes. But for really scaling up, strengthening of public institutions such as DISCOMs, municipalities and urban local bodies is required. Weak financials and rising liabilities of these institutions creates threat of non-payment. Cleantech projects have higher upfront costs and require longer contracts for viability. However, nature of technology is such that, future prices could be much more attractive than that of today. In the absence of contract enforcement framework, viability of cleantech projects could be jeopardized.

Another missing framework to attract green investment is the harmonization of taxonomies or comprehensive classification systems with relatively precise and consistent definitions to rate an investment as 'green'.

All of this presents an unprecedented opportunity in terms of scale and longevity but TCCL needs to stay focused in its carefully chosen current and future sectors and markets. TCCL seeks to differentiate itself by focussing on risk distribution as against risk aggregation.

In addition to its lending business, TCCL has also expanded its offering in financial and cleantech advisory services. Over the years, TCCL has been proud to work not only with leading multilaterals such as the World Bank, IFC, ADB, GIZ and DFID, but also with leading corporate institutions. TCCL joined the Technical Advisory Board of a joint Engineering and Physical Sciences Research Council (EPSRC, UK) and industrially funded Prosperity Partnership project between Oxford University and Oxford PV Ltd. Going forward, TCCL shall strive to provide services in the areas of facilitation of green finance, conceptualization of pilot projects, market entry strategy, mergers and acquisitions, and fund raising.■

*Manish Chourasia, Managing Director, Tata Cleantech Capital.*

# Towards a Resilient Planet

## Through Public Health

The public health field is growingly being recognized in climate change policy. In this article, **Drishya Pathak, Komal Mittal,** and **Philo Magdalene A**, say that there is a need for developing interdisciplinary public health frameworks to reduce the vulnerabilities to climate change. A well-defined public health framework would redress the social and environmental determinants of health and allow officials to build strategies and programmes to aid communities to acquire knowledge of climate resilience and prepare them for the health effects of climate change.

Rapid, radical, and systemic changes in every field have been considered the need of the hour to address the code red for humanity: climate change. Such a response requires deliberate consideration with regard to reorganization of resources, funds, and priorities, without trade-offs in the incumbent areas of health, education, and other social measures. In this race against time, a pragmatic approach, especially for governments, would be to incorporate climate change response frameworks and strategies into existing systems and projects, rather than solely piloting new initiatives.

In this regard, the public healthcare system offers robust opportunities to incorporate climate change mitigation and adaptation measures. It already contains a framework, infrastructure, tools, and other essential resources that, if evolved to accommodate the climate change response framework, can economically scale up climate action efforts to pave the way for a resilient, sustainable, and equitable future.

## Public Health: A Key Player

Advancing the existing public health system framework into an interdisciplinary climate-oriented one is crucial given the inherent linkages between climate and health. The latest "Lancet Countdown on Health and Climate Change" report declares a "code red for a healthy future" revealing an unabated increase in the health impacts of climate change and the current health consequences from "delayed and inconsistent response" of countries across the globe.[1]

1 Details available at https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01787-6/fulltext; last accessed on February 27, 2022.

The Third National Climate Assessment report, assessing the climate change impacts in the United States, noted that due to a combination of forecasted changes in climate-related exposures (e.g., temperature, precipitation, and sea-level rise), there will be an exacerbation of existing health risks and emergence of new risks with a high degree of spatial variability.[2] Figure 1 represents how climate-based vulnerability to the health system is collectively influenced by the key linkages between exposure, sensitivity, and adaptive capacity.

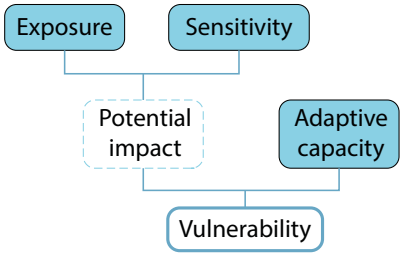



**Figure 1:** Vulnerability determined by exposure, sensitivity, and adaptive capacity
***Source:*** *Created by authors. Based on D. Schroter and the ATEAM consortium 2004, Global change vulnerability—assessing the European human–environment system, Potsdam Institute for Climate Impact Research*

This adds further evidence to the WHO estimate, wherein between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year, resulting from malnutrition, malaria, diarrhoea, and heat stress.[3] Serving as an imperative for accelerated action, *the Lancet* report

exposes the opportunity to redefine the social and environmental determinants of health in the changing context.

The public health field is growingly being recognized in climate change policy. Growing number of literature observes that the field of public health is poised to both identify and communicate towards targeting vulnerability and building local resilience.[4] Public health has thus become a key player in tackling the risks associated with climate change.

## Envisioning a Climate-Health Framework

The environment shapes our health systems. Climate change poses disastrous risks to human health and welfare and can adversely affect a healthcare system's ability to meet patients' needs. Hence, healthcare organizations have both an opportunity and an obligation to take action to protect patients from climate-related health catastrophes.[5] In this regard, there is a need for developing interdisciplinary public health frameworks to reduce the vulnerabilities to climate change. A well-defined public health framework would redress the social and environmental determinants of health and allow officials to build strategies and programmes to aid communities to acquire knowledge of climate resilience and prepare them for the health effects of climate change.

Mapping some initial efforts taken in this direction, the US Agency Center for Disease Control and Prevention (CDC) developed a five-step process called the Building Resilience Against Climate Effects (BRACE) framework. BRACE allows the incorporation of complex climate projections into public health planning and epidemiologic analysis to anticipate, prepare for, and respond to a range of climate-sensitive health impacts.[6] While comprehensive policy frameworks like BRACE still remain at a nascent stage, there is evidence of independent measures being developed by countries through stakeholder engagement. For

2 Details available at https://www.cdc.gov/climateandhealth/pubs/AssessingHealthVulnerabilitytoClimateChange.pdf; last accessed on February 27, 2022.

3 Details available at https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health; last accessed on February 27, 2022.

4 Details available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6765852/#B2-ijerph-16-03232; last accessed on February 27, 2022.

5 Details available at https://www.commonwealthfund.org/blog/2018/be-high-performing-us-health-system-will-need-adapt-climate-change; last accessed on February 27, 2022.

6 Details available at https://www.cdc.gov/climateandhealth/BRACE.htm; last accessed on February 27, 2022.

example, a study conducted in 2019 showed how the health and climate sectors in the Small Island Developing States (SIDS) of the Caribbean have partnered to co-design climate services for the Caribbean public health sector and to support the interdisciplinary and intersectoral 'communities of practice'. The study showed how nations can have greater capacity for climate change adaptation through effective use of climate information within health policy, research, and practice.[7]

Another step towards this is the growing recognition of the inherent linkages between climate and health from different vantage points. A 2019 Canadian study looked at how climate change affects different dimensions of food security, complexly impacting the health outcome in the country.[8] Such literature on the climate change and human health nexus can be utilized to address the knowledge gap among public health officials, researchers, and relevant stakeholders in order to inform and advance public health mechanisms in the context of climate change.

## India and Way Forward

According to the Fifteenth Global Climate Risk Index that measures the level of vulnerability of nations to severe climate events, India was the fifth most affected country by climate change in 2018. Quantifying the impacts of climate change through economic fatalities, India suffered a loss of 0.36 per cent of Gross Domestic Product (GDP).[9] Given the high stakes involved, it would be beneficial for both climate and health if


India increases its health spending to 2.5 per cent of its GDP while embracing the climate response framework. This would be a significant improvement from the annual expenditure of 1 per cent of the country's GDP for more than a decade. The three-tier health system of the Indian public health framework can offer an opportunity for integration of climate change response and furthermore, promote direct engagement of the communities, as community-driven climate-response measures can be driven and tested at these levels. The mechanism of mainstreaming the climate information and integrating it into the public health framework would be a strategic move to both strengthen the healthcare system and adapt to the change in climate in the country.

The existing climate-resilient public health frameworks developed by CDC (BRACE) and WHO (Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities) do act as guidelines to enhance the capacity of healthcare facilities to protect and improve the health of their target communities in an unstable and a changing climate. However, these frameworks tend to centre around the healthcare facility and focus on select climate-related health risks of communities specific to regions. A similar approach is adopted by the National Programme on Climate Change & Human Health (NPCCHH) launched by the Ministry of Health and Family Welfare, India in 2019 aiming to identify, communicate, regulate, and evaluate climate-sensitive illnesses under the umbrella of public health.[10] There is still a need to move beyond this primary scope and explore the untapped potential of the public health system in driving climate mitigation and adaptation.

An integrated public health and climate action framework that can be adapted internationally is key and would be a significant step towards addressing the problem of reorganization of resources and priorities (trade-offs). The scope of the public health system to evolve, adopt, and economically scale-up responses that benefit both climate and health is a resilient approach that can overcome problems of resource management and allocation in the long run.■

*Drishya Pathak, Komal Mittal, and Philo Magdalene A. are all Youth Mentors, The Protect our Planet (POP).*

7 Details available at https://pubmed.ncbi.nlm.nih.gov/31658267/; last accessed on February 27, 2022.

8 Details available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6678521/; last accessed on February 27, 2022.

9 Details available at https://germanwatch.org/sites/germanwatch.org/files/20-2-01e%20Global%20Climate%20Risk%20Index%202020_10.pdf/; last accessed on February 27, 2022.

10 Details available at https://ncdc.gov.in/index1.php?lang=1&level=1&sublinkid=876&lid=660; last accessed on February 26, 2022.

# "The Moment to Accelerate the Energy Transition is Now!"

'A quicker and more equitable energy transition is in reach—not only for high-income countries where carbon reduction is the priority, but also for the developing and emerging world where a green energy transition can expand inclusive economic opportunities and provide access to energy that powers job creation and boosts livelihoods for hundreds of millions of low-income people.' This is the view of the newly launched Global Energy Alliance for People and Planet (GEAPP).

As the world reflects on the commitments made in Glasgow and looks ahead to Sharm El-Sheikh where the Conference of Parties will meet again, it is clear that unprecedented partnerships and bold commitments with rapid follow-through are needed if the world hopes to achieve the Paris Agreement.

The clock is ticking. An analysis by the GEAPP made clear that while energy poor countries contribute to 25 per cent of global CO2 emissions, their share of global emissions could grow to 75 per cent by 2050. Yet these countries currently receive just 20 per cent of clean energy financing, despite representing nearly half of the world's population.

In 2009, at COP15 in Copenhagen, wealthy countries agreed to scale-up their level of support to mobilize $100 billion per year by 2020, but this climate finance pledge has not been realized. The continued under-investment in developing countries' energy transitions is due to myriad reasons and international investors point to investment, off-taker, foreign exchange, and contract risks, among other challenges in the enabling environments of emerging markets' renewable energy sectors. The Alliance's view is that these issues can be addressed.

*To learn more about the GEAPP's vision and mission for 2022 and beyond, we asked Sundaa Bridgett-Jones, Chief Partnerships & Advocacy Officer, five questions.*

**Can you tell us more about the ambition and the partners that have come together to form the Global Energy Alliance for People and Planet (GEAPP)?**

The Alliance aims to accelerate an inclusive energy transition, which can serve as an on-ramp for human opportunity for families and communities everywhere. For the first time in history, advancements in energy technology allow us to achieve an inclusive energy transition that reduces emissions while also dramatically expanding energy access for populations that have long been excluded. This means that today, an accelerated energy transition that creates good, green jobs is within our reach.

As an alliance we've set out to achieve some bold targets. The Alliance aims to avoid and avert 4 billion tonnes of greenhouse gases. We aim to extend sustainable, reliable, productive-use energy to 1 billion underserved people and, by implementing renewable energy solutions across industries in emerging and developing economies, and have the potential to enable 150 million green jobs that generate inclusive economic growth.

We will achieve these goals by delivering transformational programmes

in 60+ priority countries together with philanthropic, government, donor, multilateral development bank, development finance institution, and

private sector partners.

We launched the Alliance at COP26 with anchor philanthropic organizations such as ***IKEA Foundation, Bezos Earth Fund*** and The Rockefeller Foundation; investment partners such as the African Development Bank Group, Asian Development Bank, European Investment Bank, Inter-American Development Bank, International Finance Corporation, UK's CDC Group, US International Development Finance Corporation, and the World Bank; as well as delivery partners Sustainable Energy for All, the Energy Transition Council, International Solar Alliance, IRENA, and RMI. We were delighted to have the support of COP26 co-hosts Italy and the UK.

We've mobilized over $10 billion for this effort, and working together, over the next decade, we aim to unlock $100 billion in public and private capital to help achieve our shared ambitions.

**What challenges will this alliance address?**

Let's start by acknowledging the fact that the fight against climate change cannot be won unless this is a truly urgent and global effort. Until now, unfortunately this has not been the case. Efforts to protect the planet have excluded the energy needs and economic aspirations of billions of people across the developing and emerging world.

We strongly believe in the power of renewable energy and the opportunities it brings for the environment, society, and the economy. Hence, the Alliance will focus on three key issues: carbon, access, and jobs. When it comes to carbon emissions, developing and emerging nations face unique challenges when it comes to galvanizing an equitable energy transition. Although they account for only a quarter of global greenhouse gas emissions today, they could account for up to 75 per cent by 2050 if we do not act swiftly and aggressively to ensure a green trajectory. Currently, these countries only receive 13 per cent of clean energy finance, despite representing 48 per cent of the world's population, with the highest rates of population growth. Without large-scale and ambitious support, these countries are projected to add significant fossil fuel energy sources as they develop, and many will struggle to provide sufficient access to the reliable, clean power that is necessary to end energy poverty, drive economic growth, and create clean jobs.


The second area of focus is energy access. A total of 3.6 billion people still lack reliable, affordable, and consistent access to electricity in one form or another and are therefore constrained in their economic prospects. This figure accounts for people in developing and emerging economies who either do not have access to electricity whatsoever, have unreliable or unstable access to electricity, or are underserved by their access.

We aim to positively impact jobs and livelihoods. Living in a community with unreliable power supply reduces the probability of employment by 35 per cent, and self-employment by up to 47 per cent. To make matters worse, the COVID-19 crisis has had an enormous impact on the global labour market. Millions of workers have lost their jobs in developing countries, with vulnerable groups hardest hit, including young people, women, and low-paid and low-skilled workers. A report from the Alliance and partners in 2021 showed that these developments are not inevitable and that a significant scale-up of investment in renewable energy solutions can create millions of jobs, 30

times the number of jobs that would be created by a comparable investment in fossil fuels.

At its core, the Alliance will be a vehicle for delivering best-in-class renewable energy solutions alongside country partners and addressing the fragmentation of the sector. By playing this coordination role, the alliance will be well placed to drive the adoption and scale -up of the data, technology, and financial innovation that increases the pace of equitable energy transitions around the world.

**What types of renewable energy projects will the Alliance focus on?**

We will focus on three types of energy projects: fossil fuel transitioning, grid-based renewables, and distributed renewables. To support nation's fossil fuel transitioning the Alliance will develop innovative mechanisms to accelerate and incentivize utilities to decommission or repurpose aging coal plants before the end of their economic lives, as well as large installed diesel or heavy fuel oil assets. The Alliance will support facilities and advance innovative pilots to take bold action on decommissioning plants and retraining workers in the supply chain. These will create lighthouse cases that can enable scale. The Alliance will also use its voice and collaborative relationship with countries to advocate for national-level policy solutions.

The second area of focus for the Alliance is on grid-based renewables. Both in the context of replacing fossil fuels and in building up net-new generation capacity, the Alliance will help countries develop and deploy large renewable power plants, and associated transmission and distribution schemes. The Alliance will focus on serving communities in energy deficit contexts with high $CO_2$-intensity and growing demand for electricity. The Alliance will also target auxiliary grid-connected distributed renewable generation and storage to diversify the energy mix of larger utilities, while improving reliability and coverage.

Thirdly, we will further scale-up the proven technology of distributed renewable energy (DRE). We will support the widespread rollout of standalone DRE systems, large-scale aggregated mini-grid programmes and rooftop solutions that provide reliable power to underserved communities, SMEs, and local institutions in rural, peri-urban, and urban settings.

These three renewable energy pillars are intrinsically connected and mutually reinforcing. For example, the decommissioning of fossil fuel plants creates the need for replacement capacity and increases appetite for public and private participation in funding grid-based and distributed renewable generation and storage. Conversely, the strong deployment and lower cost of renewable assets emboldens countries to take more decisive action in phasing out high-emitting fossil fuel plants. Across all three pillars, the Alliance will lock in the economic benefits of equitable energy transition projects by investing in energy consumption and livelihoods at project sites and creating jobs across the energy value chain.

**What is the Alliance's roadmap to accelerate the energy transition and where do you expect to achieve early results?**

In addition to our clear remit in terms of the types of energy projects we will develop, we have a clear geographical focus. The Alliance has identified countries we hope to partner with. These markets present the greatest potential for impact across carbon, access, and jobs, as well as the political vision, commitment, and leadership necessary to advance our shared objectives.

To accelerate project development, we will build on the success of our partner organizations initiatives. In the case of India, The Rockefeller Foundation, one of the anchor partners of the Alliance, has been working through its Smart Power India (SPI) initiative to support last-mile electrification, promoting an ecosystem for local enterprises to thrive in rural India. To date SPI has supported the establishment of 500 operating mini grids benefiting more than half a million people in the states of Bihar, Jharkhand, and Uttar Pradesh. It has also kick-started last-mile electrification pilots with utilities in Bihar and Odisha, improving the reliability

and quality of grid electricity supply for 650,000 people, and increasing electricity consumption by 20 per cent.

By providing the business case and technical knowledge, SPI initiative paved the way for the launch of a groundbreaking joint-venture with the private sector, with India's largest integrated energy company: Tata Power. TP Renewable Microgrid, is building 10,000 microgrids to sustainably power the lives and livelihoods of 25 million people over the next 5 years, creating 10,000 new green jobs, supporting 100,000 rural enterprises, delivering irrigation for 400,000 local farmers and supplying potable water to their communities, reducing yearly carbon dioxide emissions by 1 million tonnes and reducing the amount of diesel burned each year by 57 million litres annually.

In addition to India, in Asia we are exploring collaboration with Indonesia, Vietnam, Philippines, Pakistan, Bangladesh, and Myanmar; and in Latin America and the Caribbean with Colombia and Haiti.

Many of these countries face great challenges when it comes to their energy transition. Indonesia is the third largest coal producer, with over 60 per cent of its electricity generation based on coal. To address this, we have a great partner in the Asian Development Bank (ADB).

At COP26, the ADB launched the Energy Transition Mechanism (ETM) to develop and implement a package to accelerate the closure of at least 10 coal plants and finance replacement renewable energy, by providing grant funding for initial project development and grant subsidies to leverage low-cost debt needed. This will reduce 5.2 GW of coal generation capacity from 10 decommissioned plants and avoid 620 million tonnes of $CO_2$ emissions.

**President Joko Widodo** *of the Republic of Indonesia* **noted for the launch of the Alliance at COP26 that** "Indonesia is proud to endorse the Global Energy Alliance for People and Planet, which is holding the G20 Presidency in 2022. The initiative brings together the critical stakeholders that must align and co-create a sustainable path for our nations and for our grandchildren. It is our task to restore the triple happiness envisaged by the Balinese Tri Hita Karana three balances—people with people, people with nature, and people with spiritual harmony."

To me this shows the momentum we have in 2022, and the enormous potential of this Alliance to make real, urgent progress on countries' energy access and transition goals. We anticipate that rapid and deep collaboration with countries will provide clear near-term opportunities to build transformational programmes on-the-ground and will establish these countries and their programmes as lighthouse cases for the Alliance's sustained effectiveness and impact.


By acting with agility and focusing on impact, we will demonstrate the importance of a systemic approach to unlocking transformational projects. The Alliance will then deploy these best practices in partnership with national partners worldwide.

In Africa, where most of the world's population without any access to electricity lives today, we are exploring work with the governments of Nigeria, Ethiopia, Democratic Republic of Congo (DRC), Malawi, Uganda, Sierra Leone, and South Africa.

To show the potential here, let's take a closer look at DRC. The DRC is one of the largest countries in Africa, where 85 per cent of people lack access to energy, over 50 million people live more than 15 km away from the grid, and 73 per cent live on less than $2 a day. It's our goal to work with a consortium of Alliance partners to develop and finance renewable energy 'metro grids' in 25+ cities, through funding feasibility studies for expansion cities, providing grant financing to increase the viability of these projects, and helping to aggregate the $1B in concessional and commercial capital needed. These efforts have great promise to improved energy access for 4 million people and 30,000 businesses in 25+ cities, and avoid 4.6 million metric tonnes of $CO_2$. These are real impact numbers.

**How can country governments work with the Alliance to access funding and technical support?**

Countries are in the driver's seat when it comes to designing their own equitable energy future, setting bold climate, and energy access targets. The Alliance is truly a country-led and partnership endeavour that seeks to realize the ambitions of developing and emerging countries with respect to their energy, climate, and jobs goals, which is why we will be collaborating with countries to design a custom support package to achieve their visions for a more rapid and equitable energy transition. The Alliance will work in countries with the highest level of political support for this transition and we are already proactively building initiatives at the top-level of government in key geographies.

There are prerequisites for success from both the public and private sectors that holds parties accountable to one another to deliver results. In terms of the public sector, these prerequisites can include public financing, policy protections, or ensuring efficient permitting and licensing procedures.

To advance our work with countries we've just launched a Call for Country Partnerships (CCP). Countries who are keen to collaborate can submit their Expression of Vision (EV). Submitting an EV kicks off a collaborative process with the Alliance, in which we will jointly explore an energy programme, define success, and for those selected, assemble a support package to deliver results.

In the lead-up to this launch we have been exploring opportunities to fast-track projects, pilots, and breakthrough business models. Now, by working with governments to design and implement their de-carbonization plans and enhance their domestic policy, planning, and regulatory frameworks, the Alliance will help create more favorable investment environments and enable the end-to-end delivery of national transformational programmes.

These programmes will include the identification, development, execution, monitoring, and scaling of programmes, which will unlock greater levels of investment in clean power sector assets, accelerate equitable energy transitions, and achieve near-term carbon reductions. As part of these programmes, the Alliance will also de-risk expensive early stages of project development by helping countries test strategies and innovative technologies that may have a higher initial risk profile. Solutions that work can then be scaled.

We are looking forward to the year ahead, and as we embark on this vital mission with partners around the world we invite governments, investors, private sector partners, and philanthropies to join us and change energy for good.■

# Fostering Community-based Conservation in Nagaland, Northeast India

In this article, **Siddharth Edake** highlights TERI's project titled "A Tradition in Transition: Understanding the Role of Shifting Cultivation for Sustainable Development in North East India" that is envisaged to gather wisdom pertaining to traditional agriculture in the form of shifting cultivation in Northeast India, providing useful knowledge and lessons so that traditional practices and knowledge will contribute to sustainable development in India and beyond.

In Nagaland, located within the Indo-Burma and Eastern Himalaya biodiversity hotspots in India, customary rights are protected under Article 371A of the Indian Constitution, and the majority of natural habitats (88.3 per cent) are owned and managed by individuals and clans overseen by village councils, district councils, and other traditional institutions. These natural habitats comprise of a mosaic of different vegetation types and can be broadly categorized as primary forests, secondary forests, agricultural land (comprising mostly of shifting cultivation and to a small extent of terrace cultivation) and plantations. However, in the absence of alternative livelihood options, most of the economic activities in the villages are based upon utilization of natural resources. This has led to deforestation, degradation of forest resources, change in land-use patterns, uncontrolled hunting as well as aggressive fishing and

*CCA landscape*

*Forests c onserved*

an illegal trade of wild flora and fauna that pose as major challenges for the local fragile ecosystems.

However in Nagaland, traditional conservation practices have helped protect biodiversity, and there are records of Community Conservation Areas (CCAs) being declared in the early 1800s, especially in response to forest degradation and loss of wildlife. Thus, the revival of traditional conservation practices through the creation of CCAs, offer hope for conservation and ecosystem resilience, as communities set aside parcels of forests within productive, shifting cultivation landscapes.

TERI in partnership with the Nagaland Forest Department carried out the first ever state-wide documentation of CCAs in Nagaland in the year 2014 in order to estimate their number, their nature, management and degree of functionality. Since almost every village in Nagaland has some form of conservation history and activity managed through the traditional institutions, each of the inhabited 1428 villages in 11 districts were visited by the TERI professionals.

Detailed study analysis by TERI revealed that one-third of Nagaland's villages (407 villages out of 1428 in 11 districts) have constituted CCAs and as many as 82 per cent of these 407 CCAs have completely or partially banned tree felling and/or hunting within the CCAs, and enforce various regulations for conservation. These CCAs covering more than 1700 sq. km accounting to 18.5 per cent of the total recorded forest area in the State, also contribute to carbon storage (an estimated 120.77 tonnes per ha), and are an important mitigation and adaptation strategy for climate change.

However, these CCAs face numerous challenges in their creation, effectiveness and sustainability and require sustained efforts for their conservation. The foremost challenge faced by 81 per cent of CCAs is providing alternative livelihoods and intrusion from other villages for illegal animal poaching and fishing. Morever, these CCAs are isolated dense patches of forests and there is a need to ensure conservation of large contiguous forest areas by enabling the formation of jointly managed CCA.

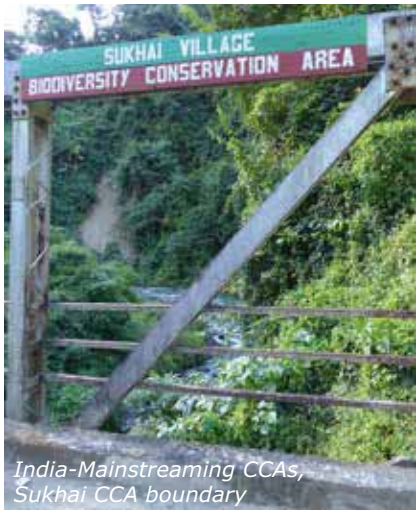
Hence, while we were thinking of demonstrating the effectiveness of initiating Joint CCAs, the village of Sukhai in Zunheboto district approached us to assist them in conserving their landscape. In 2012, this village, realizing that it had undergone considerable transformation in the landscape, in its land use and cropping patterns, its use of fishing methods and in its approach to conservation, passed a notification that puts a complete ban on hunting and fishing, felling of trees and protects the area's biodiversity. However, due to an informal understanding and absence of a well-delineated programme to safeguard ecosystems and conserve biodiversity led to an unsuccessful attempt to execute the ban. Thus, TERI decided to revive this movement by assisting the villagers along with two other neighbouring villages—Kivikhu and Ghukhuyi as it was imperative to garner their support as the natural resources like forests, rivers and biodiversity is shared beyond village

boundaries. The forests owned by these three villages acts as an important green corridor between the biodiversity-rich forests of Satoi range and Ghosu bird sanctuary and harbours endangered and threatened species like the Blyth's Tragopan (Tragopan blythii), fishing cat (Prionailurus viverrinus), and Chinese pangolin (Manis pentadactyla). The River Tizü, which flows through to these villages, harbours a number of IUCN Red List fish species.

Thus, a pilot project was initiated in three villages of Sukhai, Kivikhu and Ghukhuyi in Zunheboto district of Nagaland, which aimed at creating and linking Community-Conserved Areas across the landscape and supporting conservation through livelihood creation. The model adopted aimed at strengthening the resilience of these mountain communities and their forests by rejuvenating traditional conservation practices and providing supplementary livelihoods. Activities included compiling information on Indigenous Ecological Knowledge (IEK), developing long-term ecological monitoring mechanisms, motivation and sensitization on landscape conservation and capacity building of the community members in biodiversity identification, documentation and monitoring, as well as promoting ecotourism as a livelihood option. Today, the project has yielded positive results in terms of sustainable use of biological resources by adopting long-term sustainability, enhanced governance and effective conservation of the landscape. Around 222 species of birds, 200 species of butterflies have been documented and protected by declaring 939 hectares as community conservation reserve and banning hunting and destructive fishing across the remaining landscape of forests and rivers (total area being 3751 hectares).

This project is just the start of what we hope will be a movement for conservation in the State of Nagaland. Long-term sustainability, enhanced governance and effective conservation outcomes for wild fauna and flora, however, require sustained effort, motivation, awareness, and capacity building. To ensure the future of Nagaland's CCAs and thereby its biodiversity, the Government of Nagaland needs to pass a special policy to mainstream this model of biodiversity conservation within the governance mechanism and up-scaling it through a multi-pronged approach including financial support and legal recognition. Furthermore, local communities must be trained to monitor their resources, and to develop nature-based tourism, which will help generate support for conservation. The network of CCAs in Nagaland, which is at par with India's Protected Area (PA) network, provides a wonderful example of a fledgling people's movement for conservation that deserves to be strengthened and supported.

*India-Mainstreaming CCA, Conservation Team*




*India-Mainstreaming CCAs, Sukhai CCA boundary*

Currently, TERI is implementing a project titled "A Tradition in Transition: Understanding the Role of Shifting Cultivation for Sustainable Development in North East India" supported by Japan Fund for Global Environment of the Environmental Restoration & Conservation Agency (JFGE) that is envisaged to gather wisdom pertaining to traditional agriculture in the form of shifting cultivation in Northeast India, providing useful knowledge and lessons so that traditional practices and knowledge will contribute to sustainable development in India and beyond. The three main components of the project are: 1) the production of an edited academic volume on traditional farming for sustainable development in North-East India; 2) compilation of knowledge in Nagaland and elsewhere in India; and 3) knowledge exchange with other regions. These components are inter-related sets of activities that compliment each other and intend to understand the Role of Shifting Cultivation for Sustainable Development in North East India.■

*Siddharth Edake is former Fellow & Area Convenor, Centre for Forest Management & Governance, The Energy and Resources Institute (TERI).*

# Climate Consequences

## If India Sneezes

As 2022 starts, India faces the combined challenges of the COVID-19 and the climate crisis. Yet, India continues to fight the pandemic and climate change, as demonstrated by heroic efforts by public health officers and strong climate commitments. Given these commitments, 2022 is a critical year for implementation in India and around the world. As the warning goes, "when Paris sneezes, Europe catches a cold," the same is true for India and the rest of the world when it comes to climate change. Read on to know more in this article by **Anjali Jaiswal, M Joshi,** and **S Kwatra**.

While India is rapidly developing, the choices made today in terms of energy sources will have profound impacts on the world. Communities are already seeing the catastrophic impacts of climate change from unprecedented flooding to record-breaking heatwaves across India. The sobering 2021 Intergovernmental Panel on Climate Change (IPCC) report[1] finds that if we do not radically change course, there will be dire climate change induced consequences for the world. India, a major economy where a large portion of the infrastructure needed for the future is yet to be built, is critical in this equation.

*Traffic at Income Tax Charrasta*

## India's Climate Targets

By definitively committing to 50 per cent of India's electricity generation from non-coal or gas sources by 2030 is nothing short of transformative. India is a leader in clean energy, especially solar and wind energy. India is largely on track to meet its Paris Agreement targets, as discussed in recent analysis[2] by NRDC and partners. The Prime Minister of India, Shri Narendra Modi, is sending a clear signal to business, industry and world leaders that India is moving forward with decarbonization and building a clean energy economy.

India also strengthened its Paris target by committing to: further reduce the carbon intensity of its economy to less than 45 per cent, from the earlier target of 33 to 35 per cent, from 2005 levels by 2030; increase non-fossil energy capacity to 500 GW by 2030, formalizing India's earlier renewables commitment; and reduce India's total projected carbon emissions by one billion tonnes from now to 2030. India also joined other nations in announcing a net zero emissions target by 2070.

India's energy demand and emissions

1 Details available at https://www.ipcc.ch/report/ar6/wg1/; last accessed on February 28, 2022.

2 Details available at https://www.nrdc.org/sites/default/files/road-from-paris-202009.pdf; last accessed on February 28, 2022.


in a business-as-usual scenario are projected to double if not triple by 2050, despite the COVID-19 economic downturn. While per capita emissions are low at present, India is already the third largest single-country emitter of greenhouse gases and has the second largest population in the world at over 1.3 billion. India's cities are rapidly urbanizing and bearing the brunt of the climate crisis, making sustainable cities and employment with healthy communities a central priority.

## Big Opportunities for 2022

India now has several major national programmes with the aim of growing the economy while fighting climate change: Clean Air Mission, National Electric Mobility Mission Plan, National Solar Mission, the Indian Cooling Action Plan, among others.

Here are five big ideas to advance on clean energy, climate, and health solutions in India.

### Fighting air pollution

With dangerously high air pollution levels and continued respiratory threats from COVID-19, the need to protect public health in India is urgent. Aiming to reduce air pollution, India recently announced plans to scale clean air programmes to a national mission, "Clean Air for All". Elevating India's clean air programmes to "mission-mode" is significant, as demonstrated in the past by the National Solar Mission and other missions.

The new mission combined with the National Clean Air Programme (NCAP) is active in 132 Indian cities with city-level Clean Air Plans (CAPs) aimed to reduce ambient particulate matter (PM) concentrations. Ambitious actions to implement pollution control strategies can deliver transformative improvements for public health and the climate crisis.

### Ramping up electric mobility

India has one of the lowest motorization rates in the world, but is set to take off in a similar trajectory as China and the US. Motor vehicles are already driving the air pollution crisis in India. The Indian government has introduced programmes to advance cleaner vehicles through the National Electric Mobility Mission Plan, Faster Adoption and Manufacturing of Hybrid and EV (FAME) scheme, the vehicle scrappage policy, charging infrastructure programmes, among others. Several states in India have adopted electric vehicle (EV) policies.

A widespread, accessible public charging infrastructure network is needed to support a robust EV market —as evidenced by experiences around the world. In India, EV sales would need to reach 30 per cent for private cars, 70 per cent for commercial cars (i.e., delivery vehicles, fleets, and taxis), 40 per cent for buses, and 80 per cent for two and three-wheelers by 2030 to achieve the government's electric mobility goals, according to analysis by the Indian government. Expanding charging infrastructure along with vehicle supply and strong policy implementation is critical to achieving India's climate goals.

### Building an energy efficient economy

Building on successful programmes in the states of Telangana and Andhra Pradesh, states and cities across India could scale up efforts for energy efficient buildings. Buildings account for more than 30 per cent of India's electricity consumption and the total built-up space in the country is growing at a tremendous rate.

Energy efficient building codes can transform the way buildings are constructed and unleash significant energy savings while growing the economy and combating pollution. Major states such as Gujarat, Maharashtra and Uttar Pradesh, among others, can set examples of cities of the future with energy efficient and less polluting buildings.

### Growing clean energy jobs in rural India

To achieve India's clean energy goals, innovative financing solutions are vital. India's clean energy market is growing rapidly with more than 13 gigawatts of installed grid-connected solar capacity in 2017, and record-low bidding prices below ₹3.0 per kilowatt-hour (kWh) (~$0.04) for utility-scale solar. India has moved from a scenario of power

shortages to a power surplus, and increased clean energy in the grid. However, distributed solar energy, in particular rooftop solar installations, are lagging far behind the national target, barely reaching 1 GW of the total 40 GW target.

The cumulative investment in rooftop solar is much lower than the needed $48 billion. Key financing solutions, such as a green investment fund that can amplify the impact of limited government funds by using public funds as a financial lever to attract private investments for clean energy development. Rural programmes such as, Hariyali Green Village Plans,[3] shows that investing in women-led programmes can shift villages to clean energy while improving livelihoods. Achieving India's new climate target could create 3.5 million jobs.

## Keeping India cool

Air conditioning use in India is also expected to rise dramatically in the next decade as the subcontinent continues to experience dangerously high temperatures. The India Cooling Action Plan (ICAP) aims to phase down super-pollutants hydrofluorocarbons (HFCs) and reduce cooling demand through energy efficient room and mobile air conditioners, cold chain advancements, and reducing cooling demand through improved building energy efficiency and cool roofs.

Brutally hot weather is a major health threat in India. Climate change is fuelling more frequent, intense, and longer heat waves. In response to this mounting threat, cities and regions across India are taking concrete actions to build resilience and better prepare and protect communities. A combination of strategies, such as the ICAP, Heat Action Plans, cool roof programmes are critical to beat the heat and provide life-saving and sustainable cooling. Research shows how heat action plans[4] can help avoid heat-related deaths and build resilience to extreme heat across India.

India's active participation in implementing climate solutions is critical to prevent the world from "catching a cold." NRDC is honoured to work with expert partners in India to implement and expand pioneering climate solutions that grow the economy and build healthy communities. ■

*This article is based on Jaiswal, A., Joshi, M., Kwatra, S. Climate consequences: If India sneezes, May 2019, Jindal Global Law Review, DOI:10.1007/s41020-019-00089-y*

3 Details available at https://www.nrdc.org/experts/anjali-jaiswal/clean-energy-path-economic-recovery-rural-india; last accessed on February 28, 2022.

4 Details available at https://www.hindawi.com/journals/jeph/2018/7973519/; last accessed on February 28, 2022.

# Sustainability and Businesses

## An Ecological Conundrum

In this article, **Arghadeep Das** highlights the potential of the private sector in enterprising green growth and their crucial role in helping address pressing environmental challenges.

The private sector is widely connoted with unsustainable business practices accounting for a significant share of environmental challenges, including pollution, ecological degradation, and biodiversity loss. However, in recent decades, the role and contribution of private enterprises towards sustainability have become more pronounced with the apprehension of the climate crisis and linked adversities and potential economic gains in seeking sustainable solutions to address the global complexities.

According to the Boston Consulting Group, "focusing on sustainability in business models and corporate governance enables businesses to gain a lasting competitive advantage".[1] Given the hefty contribution of the private sector to the global economy and unique market positioning, businesses play a crucial role in steering green investments, expanding the green private industry and facilitating development and transfer of technologies to harness climate-friendly solutions. Recognizing the private sector's opportune global disposition, public bodies are progressively engaging with private players and industries. The goal is to foster partnerships towards building climate-resilient and sustainable economies to help countries track their economic progress and meet their commitments to the Sustainable Development Goals (SDGs).

The private sector and businesses are particularly consequential for developing countries deficient in technical and financial mechanisms to chart a path towards climate-friendly circular economies. Pursuing sustainable and transparent business models could enable companies to tap economic opportunities worth at least $12 trillion a year by 2030 and create up to 380 million jobs, especially in developing countries.[2]

The urgency to act for sustainability issues are now definably perceived and endorsed by the private sector globally owing to sustainable business conduct and corporate social responsibility (CSR). In addition, the financial sector has also acknowledged that tackling global sustainability challenges such as environmental change and resource depletion is key to managing business risks and ensuring long-term returns on investment.

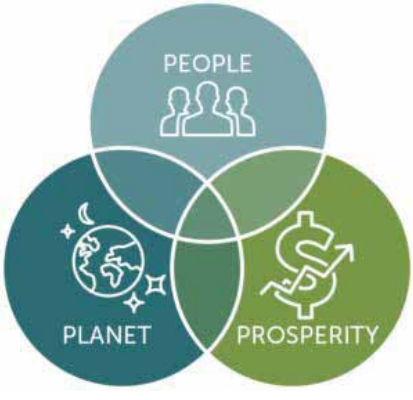



**Figure 1:** Triple bottom line
***Source:*** *University of Wisconsin Sustainable Management*

To illustrate the potential of the private sector in enterprising green growth, let's look at their crucial role in helping address pressing environmental challenges.

## Green Investments

Green investments finance green growth in the economy. The proportion of green

1 In the Face of Climate Change, Leaders Act. Report by Boston Consulting Group. Details available at https://www.bcg.com/capabilities/social-impact-sustainability/climate; last accessed on February 24, 2022.

2 Report from the Business & Sustainable Development Commission. Details available at https://www.wbcsd.org/kuenx; last accessed on February 24, 2022.

investments required to transition from the current carbon-intensive grid to carbon neural landscape are enormous and cannot be realistically financed by the public sector in totality. Private entities help mobilize green investments towards reducing dependence on carbon-intensive practices such as coal-driven thermal electricity to environment-friendly sources such as wind and solar energy. Such a green transition also creates job opportunities and ripple benefits that ultimately benefit people at large.

## Sustainable Supply Chains

Businesses are progressively adapting to the customer's demands for environmentally sustainable products, ensuring zero wastages and a clean energy supply until the last mile. Large multinationals around the world, such as Disney, ITC and Apple, have goals set to achieve carbon neutrality by the next decade. Achieving carbon neutrality will also compel supply vendors to go carbon neutral, thereby creating a spiralling effect.

## Innovation

Businesses are striving to innovate their practices to stand out, and by doing so, they are developing technologies and strategies that harness resources effectively and efficiently without wastefulness. Businesses are constantly reviewing their existing processes to seek better and efficient, greener alternatives. From reducing carbon footprint to reducing packaging wastes, innovation underpins a sustainable transition.

## Green Sector Development

The private sector and businesses collaborate and work in partnerships with the public sector to support the development of the green industry. This includes policy reforms such as helping phase out fossil fuel subsidies, increasing the cost-effectiveness of green energy investment and creating feed-in tariffs for specific renewable energy technologies. Businesses assist political units and states with new markets and much-needed institutional and technical knowledge, enabling them to mobilize and sustain green investments over time.

## Scaling New and Existing Technologies

Private sectors and businesses can spearhead new and existing technologies and help scale them to make them more affordable and easily accessible to all. Scaling up would also mean re-energizing green investments in billions that will create a ripple effect of positive returns, including the creation of 25–45 million green jobs globally each year.[3]

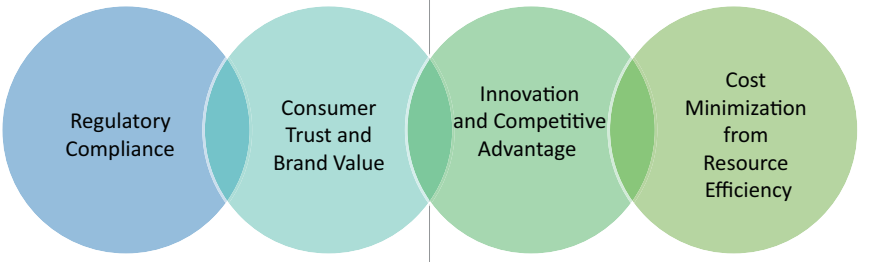



**Figure 2:** Benefits of sustainable business practices

The decisive role of the private sector and businesses in tackling sustainability challenges offers the much-needed reassurance of business ethics and CSR. Notwithstanding the gains, there is further scope for enhancing industrial commitments.

## Improving Supply Chain

Businesses are often culpable for 're-doing' their books and greenwashing supply chains. The private sector and businesses must take CSR principles intently, undertaking necessary reforms in the supply chain and strategically working to ensure clean supply chains.

## Data Transparency

The availability of data for measuring impact and metrics for investigating evidence of contribution towards net-zero emissions remains a key concern for the private sector and businesses. While there is evidence of green finance flow between different corporations and entities, there is a severe paucity of data that sheds light on the impact of utilizing such green financial instruments towards tackling sustainability challenges.

The way forward to transitioning from unsustainable development practices to a carbon-neutral landscape requires inordinate green investments, technological and managerial innovation, and clean supply chains to ensure a truly circular economy. But even more decisive are political motivation, critical policy review, and public–private partnerships that foster sound environmentally conscious decisions while achieving desired growth targets. To drive lasting positive environmental impact, the private entities must adopt and promote sustainable business models and policy frameworks that guarantee environmentally positive impact, are financially feasible and lead to the creation of clean and well-paying jobs, which helps to raise the overall economic contribution and yet at the same time, safeguard the environmental resources for future generations.■

*Arghadeep Das, Postgraduate Diploma in Environmental Law and Policy.*

3 Report by World Business Council for Sustainable Development. Accessed on December 28, 2021. http://lctpi.wbcsdservers.org/wp-content/uploads/2015/11/LCTPi-PWC-Impact-Analysis.pdf

# Humans for Earth

## Finding the Voice of the Ordinary

In the words of Lord Robert Baden- Powell—"Try and leave this world a little better than you found it and when your turn comes to die, you can die happy feeling that at any rate, you have not wasted your time but have done your best."

At the World Sustainable Summit 2020, amidst all the discussions and workshops there was one epiphany that left an indelible impact on my mind, "No matter in which corner of the world you reside in, or what your income is, climate change and its devastation does not discriminate based on caste, creed, and colour and it is here to stay and change our lives in some unfathomable ways." As the world moved indoors given the pandemic, the thought became a stronger force to delve down and find out how the problems of global warming are impacting the lives of people like you and me at the ground level. How is an ordinary housewife switching to sustainable options at home or how are children adapting to the drastic change in seasons, or how is a street hawker attempting to discard plastics—these were few of the questions that arose, that looked urgent, in fact very urgent to be answered.

So what does one do, to get the opinions and thoughts of people from across the world? The answer was simple, leverage the power of social media! Just like "Humans of New York" captures the beats of New Yorkers, one story at a time, I decided to start my own Instagram blog "Humans For Earth" using the power of storytelling to create a change. With my sister on board, we decided to interview common people and climate change activists from bustling cities such as New Delhi and New York to the quiet and quaint towns in New Zealand and Bulgaria, the idea was to amplify the voices of people who are directly impacted by global warming and sustainability.


When we initially started with just two of us on board, it was just one story a week, that is all we got, however as we reached out to more and more bloggers, sustainable business owners, climate change activists, and even ordinary people, we were bombarded with a dozen stories every week, with vociferous opinions that resonated with the global climate change movement. With each story, our team expanded and transcended borders! Today, we have college undergraduates and enthusiastic young people from New York and Sydney, working as small teams alongside our main base in India. It is better to have a local interacting because they know the nuances of the place or the neighbourhood.

It is just one simple question that we ask everybody, no matter how old or young the person is, how rich or poor, "What does climate change mean

to you"? And you have to sit back and just let the answers trigger awe and inspiration in your heart, as people pour their hearts out. Since the time I attended the World Sustainable Summit in 2020, the stories that I have captured through this blog have also given me some deep insights about the global environmental movement at the grassroots level, somewhere they are small indicators of how the global policies can be aligned to have a more significant impact. For example, according to a report by World Wildlife Fund "By fighting for their lands, indigenous people are fighting to save the planet. Although they comprise less than 5 per cent of the world population, indigenous people protect 80 per cent of the Earth's biodiversity in the forests, deserts, grasslands, and marine environments in which they have lived for centuries." For most people, climate change and global warming are only about the environment and pollutions, but somewhere we have to understand that there is a bigger picture that involves indigenous communities that will be facing the devastating effects of climate change, and would be reduced to utter penury; then there are women and children who are more likely to face the futile consequences of harsh weathers, and at the end, it will change the course of biodiversity of our world.

Each story that we covered each day reminded us that it isn't about pollution and rising temperatures anymore but also includes equal access to education, sanitation, clean water, and equal job opportunities. The simple blog on Instagram has now started giving us very important insights such as accepting that women are the forerunners against fighting climate change and developing a more sustainable society. They are the ones who are shaping a more sustainable society.

The best part about running the blog



across four continents is the fact that it is solely handled by young people. The passion, energy, and social media dexterity that comes in our generation is our biggest asset in creating awareness, connecting with people, and focusing on making a difference at our levels. Our virtual summits with similar young activists and sustainable business owners have empowered us to view this movement as a coalition to amplify voices and make ourselves heard to political leaders.

## Conclusion

Till the time humanity comes together to unite and fight as one team against all discrimination we at 'Humans For Earth' will continue to share the extraordinary efforts of ordinary humans taking part in the climate movement one story at a time. We as the current generation in power have to paint a powerful picture of hope and not breakdown like the ice sheets in the Antarctic. We have to act upon that picture. Our hope for a better world should be like a never-ending quest. We are the flag bearers of a greener, cleaner, and beautiful earth that we can hand over to our successors.■

*Article contributed by Aparna Choudhuri.*

# Responsible Business Action

## Must Be Taken to Avert Environmental Crisis

In this article, **Ryan Pathak** says plastic pollution is engulfing our planet and concrete steps such as raising awareness must be taken and business companies should be held accountable. Company employees, including those in executive positions, must be educated on environmental issues, counting the consequences of their company's decisions, including its carbon footprint. Businesses must have appropriate external entities that impose putting stricter restrictions on their actions, increasing their duty to be accountable.

Climate change is one of the most formidable challenges mankind is facing in this era and that is because it exploits our two most common and basic flaws that fuel each other—the lack of patience and the lack of foresight. Patience is a virtue, many of our old philosophers have spoken about while foresight is treated as the premier skill of man but truth be told, in today's time, both of these are limited due to the presence of a constant rat race dictating our life. Our lives are controlled by this rat race, a constant rush to keep growing without thinking what gets trampled, destroyed or left behind. In our eyes, above these deceitful illusory heights, we believe there to be something worth the heavy cost of destruction and chaos we leave behind. While we could, of course, convince ourselves by saying that we could prevent us losing our very sense of reality, truth is that we are, in fact, human. Behind the glass towers and nameless companies, people are sitting. People, who are trying to grow in a world where the definition of personal growth has been twisted, people who forget the background reality in the hopes of a better future.

Hence, the very attitudes of companies are shaped by people who aren't aware of the complicated game of dominoes, which is looming above them and the planet below. A great example to view this perspective is the plastic industry. For years, the fear of plastics has been embedded in our minds and we have been taught about the importance of recycling plastic. While the fear is warranted, the solution is, unfortunately, inadequate to address the problem. Plastic recycling is indeed an exaggerated remedy to the issue, out of all plastics, only a measly 9 per cent is recyclable. Ninety-one per cent of plastic wastes end up in landfills or end up polluting our natural environment and to make matters worse, most of the recyclable plastics have limited cycles of recyclability after which they are degraded to a level in which they can no longer be recycled. Sadly, even that measly 9 per cent doesn't get completely utilized, out of all plastic wastes,

approximately only 1 per cent ends up getting recycled more than once.

These are shocking figures that should alarm any individual who is concerned about the environment but to the layman, these figures are unknown though they are present in plain view due to the simple reason, as Larry Thomas, one of the retired heads of the plastic industry's lobbying group for more than a decade put forth- "If the public thinks the recycling is working, then they're not going to be as concerned about the environment." The public, unfortunately, has been misled by the plastic industry which has spent years trying to hide its role in environmental damage and trying to put the fault on the consumers. While it is true that everyone must do their share, the plastics sector has cleverly avoided being held accountable. They not only spent years campaigning for this lack of accountability, but they also purposefully misled consumers by using convoluted markings to indicate recyclability, such as the Resin Identification Codes (RIC), which are often indecipherable by the average individual.

This brings us to the main issue in these businesses: the first is that people in these businesses have a reluctance to change, or more precisely, a lack

of patience to see new sustainable methods, such as in the case of the plastic industry, which could have gone down a more fruitful path by investing in better recyclable materials or resin, but instead, to keep the old system going and keep production costs low, towards a more ignominious route. Secondly, despite the flaws in their system and the difficulties that result from their tactics, they want to expand with no concerns, demonstrating an obvious lack of foresight that is magnified by their lack of accountability.

The only way to combat this is to take concrete steps, the first of which is to raise awareness and hold people accountable. Company employees, including those in executive positions, must be educated on environmental issues, counting the consequences of their company's decisions, including its carbon footprint. People can only put thinking into decisions they once deemed viable without recognizing the underlying damage they could do if they are aware of the possible environmental risks.

Second, businesses must have appropriate external entities that impose putting stricter restrictions on their actions, increasing their duty to be accountable. A possible way to go about it may be through environmental organizations providing proper assessment over major decisions and matters, which should be taken into account as a priority while working on the tasks.

These are just a few options for businesses to consider, and in reality, most businesses already have the resources to invest in such sustainable measures; all they need is a push, and once some of the major corporations do so, others will be inspired to follow suit, resulting in these sustainable methods becoming the industry standard. As a result, it may pave the way for a brighter future not just for us but the planet as a whole.■

*Ryan Pathak is a student of St. Joseph's College (Autonomous), Bengaluru. He is currently in 2nd year and pursuing a BSc degree in CBBT (Chemistry, Botany, Biotechnology).*

# Save Soil Movement

## A Race to Save the Planet

For all of Hollywood's apocalyptic hyperbole, turns out reality is much more terrifying than celluloid doomsday fantasies. A silent catastrophe is unfolding across the globe: **Soil extinction.** The alarmingly rapid deterioration of cultivable soil could lead to massive species extinction, trigger global food and water shortage and set off unimaginable conflicts and suffering for humanity. This is not an ecological challenge but a very real existential threat to humanity. The Save Soil Movement is a global race against time to avert soil extinction.

### Soil Extinction—the Invisible, Silent Catastrophe

The United Nations Convention to Combat Desertification (UNCCD), the global body working towards restoring and halting land degradation, estimates that by 2050, 90 per cent of the earth's soil could become degraded. In other words, the planet will lose its ability to grow food; 95 per cent of our food comes from soil. For agricultural soil to yield nutritious crop, it has to contain a minimum of 3–6 per cent organic content. It is estimated that most agricultural soils in the world have a little more than 1 per cent organic content leading to severe depletion in the nutritional value of food around the world and accelerating malnutrition. Globally, 25 per cent of the earth's fertile land has already turned to sand in which nothing can grow.

"It is a major issue that we are dependent on this thin layer that is sometimes just a couple of centimetres,


sometimes several metres, but a very vulnerable, living skin," says Prof. Nico Eisenhauer, of Leipzig University, one of the lead authors of a UN Food and Agriculture Organization (FAO) report on soil biodiversity.[1] This "living skin" is what is keeping you and me and 87 per cent of life on the planet alive. By killing it, we are—quite literally—committing suicide and taking all life forms with us as we go down.

Even as humanity faces its gravest challenge yet—soil extinction—that is unfortunately the lesser worry. The greater is that most populations around the globe know little about the magnitude of this disaster and even less about its impact. A handful of soil takes thousands of years to form. Yet, we are losing 75 billion tonnes of a resource we can never replace within our lifetime.

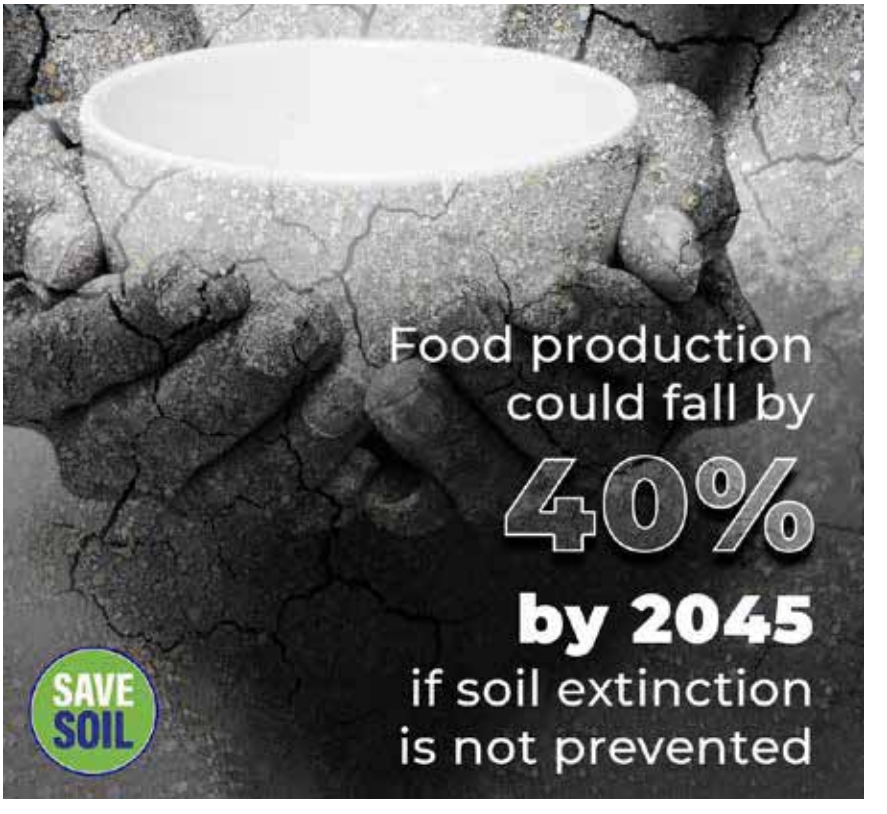
1 Details available at https://www.theguardian.com/environment/2020/dec/04/global-soils-underpin-life-but-future-looks-bleak-warns-un-report; last accessed on March 3, 2022.

## How Did Humanity Go Down This Path?

Three years ago, Prof. Ron Milo, at the Weizmann Institute of Science in Israel, published the results of his groundbreaking study[2] that set out to estimate the weight of all classes of living species and their impact on the planet's ecosystem. His study revealed that even with an impressive headcount of 7 billion, human beings account for just 0.01 per cent of all living things. But our insignificance hasn't really dulled our ingenuity: 83 per cent of all wildlife and 50 per cent of all plant life have been destroyed by human activity.

"I would hope this gives people a

2 Details available at https://www.theguardian.com/environment/2018/may/21/human-race-just-001-of-all-life-but-has-destroyed-over-80-of-wild-mammals-study; last accessed on March 3, 2022.

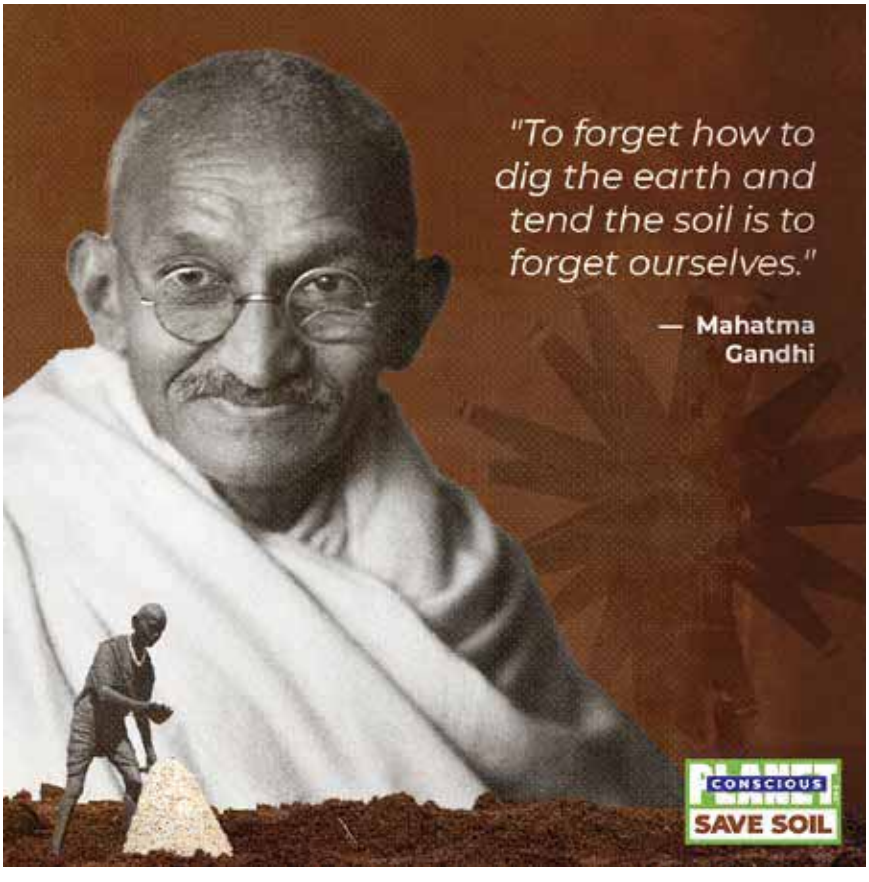


perspective on the very dominant role that humanity now plays on Earth," says Prof. Milo. It will take much more than Hope to Save Soil and turn back from this path of self-destruction.

## The Conscious Planet Movement to Save Soil

This March, Sadhguru, Founder-Isha Foundation and one of the most respected contemporary spiritual leaders in the world, will unveil a global movement—the Conscious Planet Movement to Save Soil—whose objective is to re-create a planet of people whose conscious, purposeful activity will allow the planet to heal and restore itself—for the planet is nothing but soil. "Actually turning around the soil health is not as complex as people think it is. It can be easily done," said Sadhguru in a recent conversation with Dr Vibha Dhawan, Director General, TERI, at the 21st edition of the World Sustainable Development Summit.

In the last two decades, Isha's environmental initiatives in soil revitalization have transformed the lives of hundreds of thousands of farmers by introducing them to regenerative farming practices that have yielded rich economic and ecological dividends. "We've already done it with 125,000 farmers—we have converted them into tree-based agriculture or no-till kind of agriculture where without the plough, you can grow," Sadhguru says adding that the model has contributed to a significant rise in farmer income "anywhere between 300 and 800 per cent in 5–7 years' time." In addition to increasing soil organic content, the model has also contributed to increasing the nutrition value of food, the market value of products and increase in the groundwater table. Intercropping trees with crops on farmlands will ensure





that the soil is under shade, keeping it rich and moist. "One thing that needs to happen is all agricultural land which accounts for nearly 70 per cent of the land on the planet, is it is not left open to sunlight," says Sadhguru because when soil is moist, "the bioactivity will pick up in a phenomenal way. Within 3–4 years, maximum 6–8 years you will have the needed carbon content in the soil, most of the land can be operated without fertilizer or with very minimal usage of fertilizers and above all without irrigation," he says as rich soil can absorb rainwater and retain soil moisture.

The Save Soil Movement will urge the leaders of all nations to act now by formulating effective policies and enacting laws to Save Soil and protect and halt further soil degradation in their country. 192 countries have been enlisted in the effort. Sadhguru will embark on a lone motorcycle journey of 30,000 km across 25 nations in 75 days in an effort to build consensus for policy-driven action to Save Soil. The objective is to activate citizen support in all these nations to enable leaders to act.

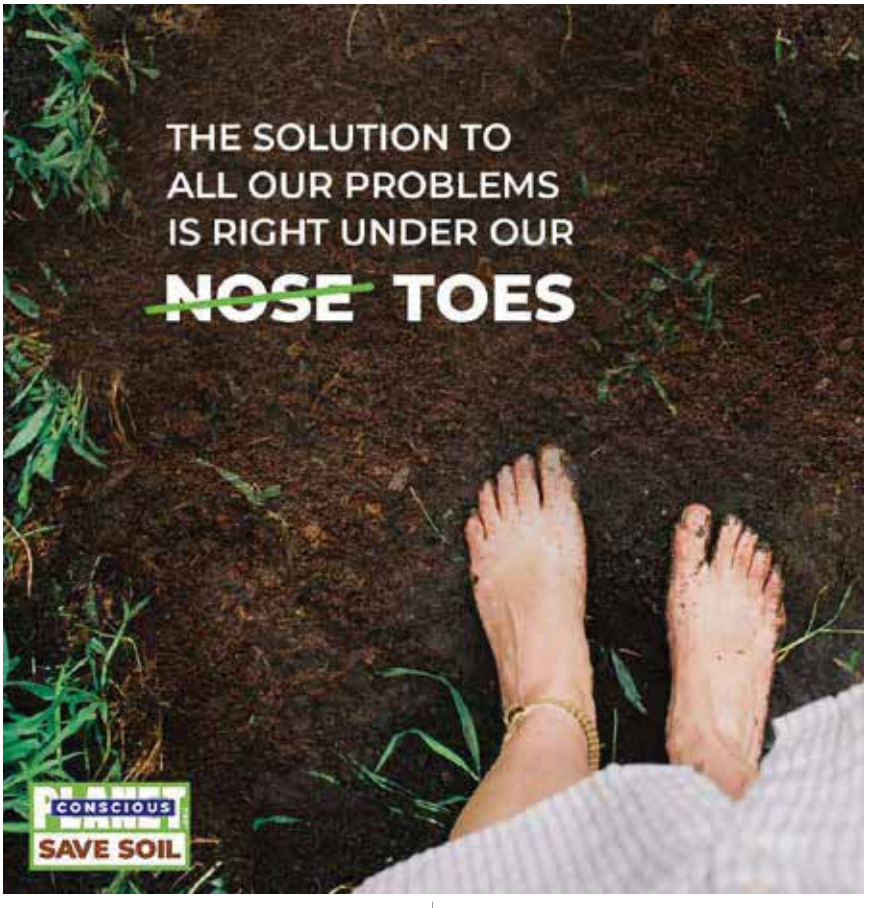
## Crafting an Environmentally Responsible World

So what will it take to make the world rally behind the cause to Save Soil? One, the citizens of the world must become aware of soil extinction and its impact. And two, they must explicitly ask their


leaders to act now to Save Soil. "Many governments in the world, the leaders, understand this and they want to do this, but the problem is people have not spoken," Sadhguru says referring to the effort to make Save Soil a global people's movement. "Unless people say 'we are willing to go through some short-term changes in our lives for long-term well-being of our lives and the future lives on this planet', the democratically elected leaders cannot do much because essentially they are supposed to manifest the will of the people."

Many countries are now moving towards policy formulation as a swift and comprehensive measure to combat soil extinction. This month (February 2022), the US Department of Agriculture announced that it "will invest $1 billion in pilot projects that promote farming, ranching and forestry practices that cut greenhouse gas emissions or capture and store climate-warming carbon."[3]

In Africa's Sahel region, which is currently facing one of the worst food crises the planet has seen, the World Food Programme has worked with local communities over the last three years to transform 270,000 acres of barren land into productive agricultural land.[4] It has

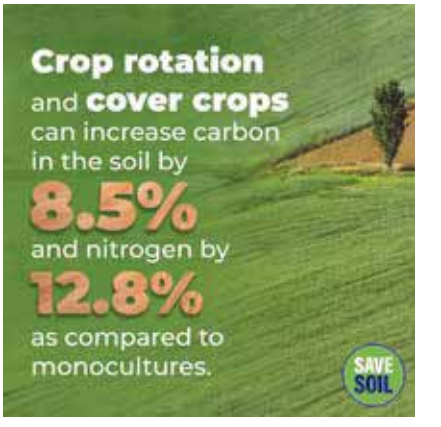



changed the lives of 2.5 million people while also enriching the soil.

In Latin America, several countries are incentivizing ecological preservation through policy formulation with economic benefits for local communities and ecological benefits for the land.[5]

Though governments, individuals and institutions have launched several initiatives for soil conservation around the world, the issue of soil extinction has not garnered the kind of attention it deserves globally. The Save Soil Movement will attempt to change this through awareness, education, engagement, and finally policymaking.

Beyond all this, its larger goal is to re-establish Humanity's lost connection with soil. "Soil is a living entity," says Sadhguru. "We as a life are




a consequence of that life—not only today. Even in the evolutionary scale of things, we have become who we are only because of the biome activity in the soil. So keeping the soil strong is important for our lives being strong and every life being strong." ■

*Conscious Planet - Save Soil Movement, Isha Outreach*

3 Details available at https://money.usnews.com/investing/news/articles/2022-02-07/usda-to-spend-1-billion-to-promote-climate-friendly-agriculture; last accessed on March 3, 2022.

4 Details available at https://news.un.org/en/story/2022/02/1112122; last accessed on March 3, 2022.

5 Details available at https://www.youtube.com/watch?v=Dr0NKCC8U-8; last accessed on March 3, 2022.

WORLD SUSTAINABLE DEVELOPMENT SUMMIT 2022

TOWARDS A RESILIENT PLANET:
ENSURING A SUSTAINABLE AND EQUITABLE FUTURE

February 16-18, 2022

# Act4Earth Strategy Paper: Knowledge Driven Policy and Action

The Energy and Resources Institute (TERI) launched a major initiative titled, "Act4Earth" in the valedictory session of the 21st Edition of World Sustainable Development Summit (WSDS). Building on the discussions from the Summit, this initiative will seek to continuously engage with stakeholders across the board on issues related to sustainable development and climate action. Being a major platform in the Global South, Act4Earth together with WSDS will seek to pioneer conversations that will drive ambition and action on climate change and sustainable development needs. The Act4Earth platform will have two main components: COP Compass; and SDG Charter.

## Objectives

The overarching objective for Act4Earth would be to drive ambitious and urgent action on climate change and sustainable development through knowledge, dialogue, and capacity building.

**The objectives of Act4Earth initiative include:**

- [Objective 1] Fast-track meeting of global goals on climate change and sustainable development through a continuous process of 'talking to walking' by strengthened stakeholder engagement.
- [Objective 2] Drive actions by governments, at all levels by strengthening research-based understanding of sustainable development policies and initiatives from countries across the world.
- [Objective 3] Enhance international, national and sub-national perspectives for paradigm shifts needed for achieving sustainable development and climate goals through creation and dissemination of knowledge.
- [Objective 4] Accelerate solution-based approaches for addressing new and emerging challenges through capacity building and nudging action.

## Theory of Change

Based on the deliberations at WSDS 2022, TERI envisages the two components of Act4Earth platform, namely the COP Compass and SDG Charter, will seek to drive change:

- Through engagement for knowledge creation, dissemination and dialogue, the COP Compass will seek to inspire and mobilize leadership at all levels for inclusive transitions through ambitious and informed policies and measures which will enable paradigm shifts towards meeting the Paris goals through mitigation, adaptation and means of implementation.
- Through developing inclusive and ambitious policy frameworks, SDG Charter will seek to ensure that sustainable development is further mainstreamed in government agendas, which will lead to enhanced environmental, social and economic outcomes.

## COP Compass

With the efforts of the international scientific organizations and bodies, including the Intergovernmental Panel on Climate Change (IPCC), climate change has gone from being a fringe issue to global priority. The latest IPCC report shows that the world will probably reach or exceed 1.5 °C of warming within just the next two decades. Under a high-emissions scenario, the IPCC finds the world may warm by 4.4°C by 2100 with catastrophic results.

For nearly three decades, member states have met under the umbrella of the United Nations Framework Convention on Climate Change for the Conference of Parties (COPs). World leaders need to raise ambition and take urgent climate action. While countries shift to a net-zero economy, it is imperative to have inclusive transition plans at heart of policies and programmes. Both adaptation and mitigation measures need to be at an equal footing so that there are sufficient safety nets and no one is left behind.

There are presently a lot of discussions around net-zero without a critical examination of holistic measures and leadership needed in the short, medium and long term. There is an urgent need to inform leadership on coherence required for inclusive transitions from the lens of both mitigation and adaptation. The present narrative is also too focused on narrow conceptions around a few technologies and there is a need to enrich the conversations by critically examining solutions at hand to arrive at paradigm shifts and means of implementation needed. Keeping in view the importance of injecting these aspects into the COP and related discussions, this knowledge component will have the following themes, activities and outputs.

### COP Compass: Themes, Activities and Outputs

| Themes | Activities | Outputs |
|---|---|---|
| • Climate Negotiations and Means of Implementation<br>• Global Commons and Climate Action<br>• India's Leadership | • Research<br>• Outreach and Engagement | • Policy briefs<br>• Policy dialogues<br>• Management Development Programme |

## SDG Charter

In 2015, the General Assembly adopted the 2030 Agenda for Sustainable Development that includes 17 Sustainable Development Goals (SDGs). SDGs are a call for action by all countries to address prevailing inequalities while protecting the planet. These goals provide a framework with targets and relevant indicators which can be followed by governments, businesses, civil society and the general public to work together to build a better future for all. The Decade of Action calls for accelerating sustainable solutions to address all the world's biggest challenges ranging from poverty, gender gap and inequality to climate change and inclusive transitions. There is a need to mobilize actors from all levels and spheres of action-global, regional, national, sub-national, community, organizations and individuals.

Prior to COVID-19 pandemic, progress in achieving SDG-linked targets was being made in many aspects, albeit not at the speed or scale required. But the global health crisis has either put a stop, or worse, has undone much of this progress. The pandemic has shown that a health crisis has quickly exposed the fault lines in our existing systems and can trigger a human and socio-economic crisis. While the crisis is imperilling progress towards the SDGs, it also makes their achievement all the more urgent and necessary. It becomes extremely necessary to act towards the achievement of these goals while engaging agents of change. Against this background, the SDG Charter will seek to engage policymakers through research and outreach.

### SDG Charter: Themes, Activities and Outputs

| Themes | Activities | Outputs |
|---|---|---|
| • Sustainable consumption and SDG 12<br>• Inclusive energy transitions and SDG 7<br>• Mainstreaming SDGs is economic policy processes | • Research<br>• Outreach and Engagement | • Policy briefs<br>• Policy dialogues<br>• Management Development Programme |

## Partnerships

Partnership for Act4Earth comes with a pledge for promoting knowledge driven environmental stewardship and stakeholder engagement for collective action. Act4Earth activities would involve research and advocacy by engaging with governments, international organizations, business & industry, research & academia and civil society.

## ACT4EARTH MANIFESTO

### Presented at WSDS 2022

Through the 21st Edition of the World Sustainable Development Summit, The Energy and Resources Institute brought together stakeholders including representatives from international organizations, government, business & industry, research & academia, civil society and youth to deliberate on the modus operandi required for ensuring equitable responses to protect our planet through sustainable consumption and production, energy & resource security, climate justice, and the protection of global commons.

We pledge to Act for Earth by:

- Reinvigorating current multilateral systems by ensuring that climate negotiations and other norm-setting bodies are informed by principles of equity and climate justice, as well as with perspectives from developing countries to drive national and international action.
- Developing multi-level and polycentric approaches to govern and protect our global commons, which is inclusive of all those who use and depend on these commons, including non-human species.
- Inviting stakeholders to generating financial capital and building capacities for developing green technologies, which helps in inclusive clean energy transitions.
- Avoiding wasteful consumption, and promoting efficiency in production patterns, by raising awareness and promoting responsible practices among governments, businesses and consumers.
- Advocating for paradigm shifts in the global narrative which decouples the economic growth from environmental degradation.
- Critically examining the dominant narratives on traditional and non-traditional security to advance inclusive, concerted, coherent and effective efforts on sustainable development and climate action.
- Calling upon the global community to bridge the gap between mitigation and adaptation through effective means of implementation, including climate finance, innovation, and capacity building.
- Ensuring policy coherence through mainstreaming sustainable development into economic policy, including through SDGs-linked budgeting processes.
- Communicating issues related to climate change and sustainable development to all stakeholders effectively, through a balanced approach which instils hope, without losing our sight on the gravity of the climate change and limits to growth.

*This piece was written by Dr Shailly Kedia, Senior Fellow and Associate Director, Sustainable Development and Outreach Division, TERI; Ms Nivedita Cholayil, Research Associate, Sustainable Development and Outreach Division, TERI; and Ms Anuradha Mathur, Associate Fellow, Sustainable Development and Outreach Division, TERI.*

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## *TerraGreen* (WSDS Special Issue)

The Twenty First Edition of the annual flagship event of The Energy and Resources Institute (TERI), the World Sustainable Development Summit (WSDS), was held from 16th to 18th February, 2022 in a virtual format. The Summit deliberations focussed on the umbrella theme: Towards a Resilient Planet: Ensuring a Sustainable and Equitable Future.

The onslaught of extreme weather events around the world has brought to the forefront on how human well-being and the health of our planet are inextricably linked. Just and equitable implementation of climate and environmental policies need to go hand in hand with broader sustainable development objectives. The present state of planetary health along with pandemic-driven socioeconomic crises call for a revisit on questions related to global ambition and measures for sustainable development. Responses should be viewed from the perspective of planetary resilience, and responses to the pandemic must be right for humans as well as Planet Earth. This WSDS special edition of *TerraGreen* covers a wide range of contributions on adaptation, biodiversity finance, India's leadership, climate resilience, and planetary health.

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