CLIMATE SPECIAL

1-15 NOVEMBER, 2021

Down To Earth

FORTNIGHTLY ON POLITICS OF DEVELOPMENT, ENVIRONMENT AND HEALTH

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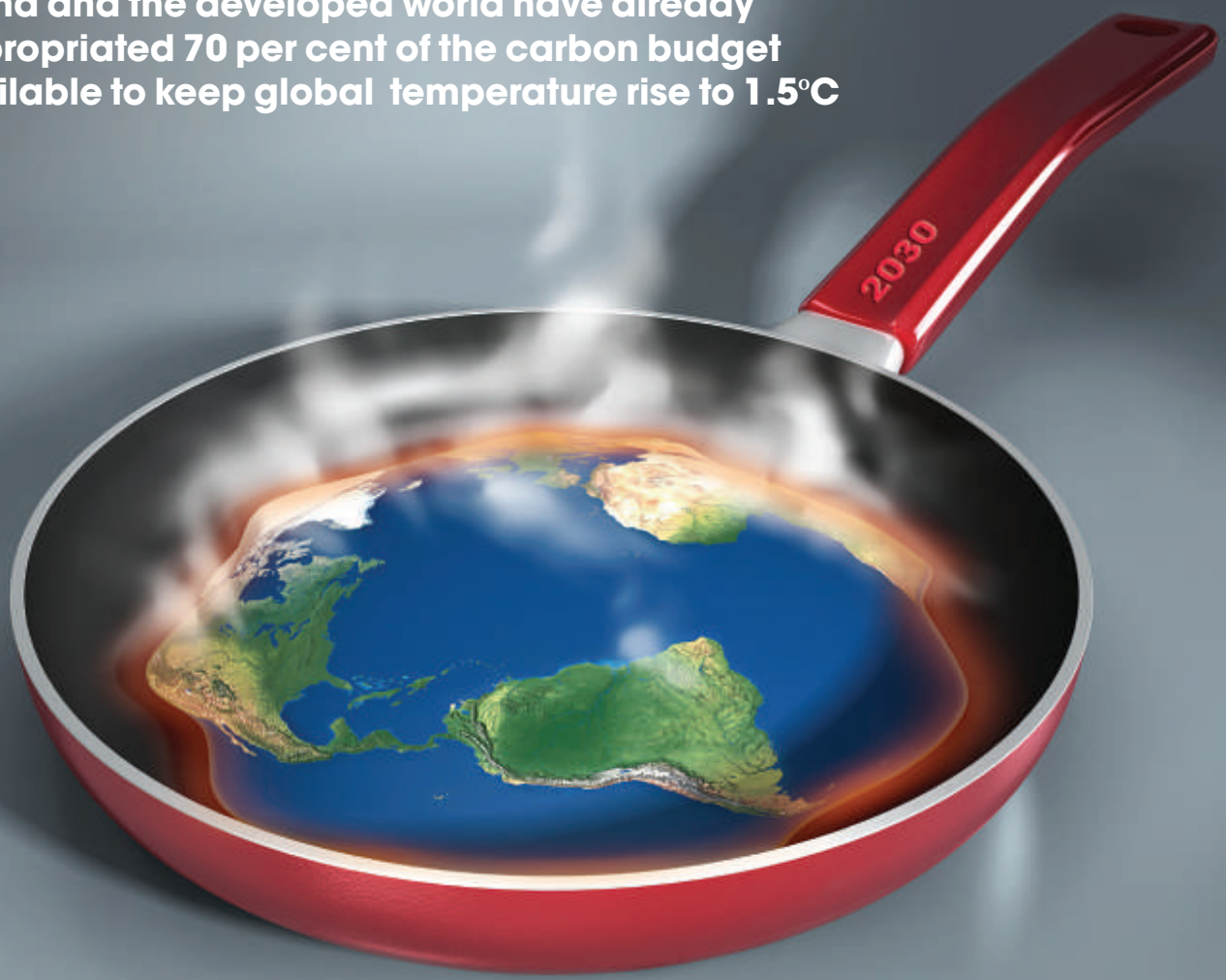
CARBON SPACE WAR

China and the developed world have already appropriated 70 per cent of the carbon budget available to keep global temperature rise to 1.5°C



AAETI

INTEGRATED ONLINE AND ONSITE TRAINING PROGRAMME ON ENVIRONMENTAL IMPACT ASSESSMENT

CSE has launched an integrated online and onsite training programme on EIA. The training programme will comprise of two parts: Basic learning (online platform) and Advanced learning (at our residential campus). The course is designed to provide an overall understanding of the EIA process which includes theoretical knowledge via lectures from experts and firsthand experience through group exercises, discussions and case studies.

PROGRAM DESIGN

PART A

BASIC LEARNING (ONLINE PLATFORM)
DECEMBER 8-17, 2021

- Includes sessions on methodology for preparing an EIA, approach for baseline data collection, identification and assessment of impacts alongwith the Environmental Clearance process and understanding of EIA process and legislation in developed countries.
- Conducted on Moodle Platform where participants will be provided with reading / audio-visual training material which they are expected to self-study. The course material will be for the duration of 2-3 hrs/day.
- Top performing participants (30 no) from online course will be invited for advanced course on scholarship.

COURSE FEE

Rs 5000/- (Indian participants)
USD 100/- (Non-Indian participants)

PART B

ADVANCED LEARNING (ONSITE)
FEBRUARY 1-4, 2022

- Includes practical experience on assessing impacts for a project and developing its Environmental monitoring & management plans, reviewing EIA reports, working on case studies, various problem solving group exercises and discussions with experts.
- Conducted at CSE's residential campus, Anil Agarwal Environment Training Institute (AAETI) in Tijara, Alwar, Rajasthan.

COURSE FEE

Full scholarship for selected participants.
The scholarship covers boarding & lodging costs and training kit fees. **It does not include** to & fro Delhi travel (from your respective location) costs.
Only shortlisted participant will be informed.

WHO CAN APPLY

Industry professionals, environment consultants, environment engineers, researchers, academicians and students aspiring to work in the field of environment.

LAST DATE TO APPLY: DECEMBER 5, 2021

PARTICIPANTS WILL BE AWARDED THE CERTIFICATE OF COMPLETION

FOR ANY QUERY, KINDLY CONTACT

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Contents

CLIMATE SPECIAL

WORLD IS ON THE LINE AT GLASGOW

Sunita Narain

IT'S A make-or-break time for the world. When leaders gather in Glasgow, Scotland, for the 26th conference of the parties (COP26) to the UN Framework Convention on Climate Change (UNFCCC), they meet with the recognition that time has run out. Science has already spoken about the dire emergency that stares us in the face; the UN chief has sounded "Code Red for humanity" based on the findings of climate scientists. But we no longer need scientists to tell us this. We can see the devastation in our world—every day there is news about another region that has faced an extreme weather catastrophe. As I write this, my mind is numbed by images from the northern Indian Himalayan state of Uttarakhand and the southern state of Kerala, where mountains have crashed and lives and homes have been lost. The sheer fury of nature must make us think about what the future will be like and about the crises we must avert at all costs.

COP26—meeting as it is, though delayed by a year due to COVID-19—has the task to rework its own agenda and functioning. But the fact is negotiations on climate change are going nowhere. If you read the papers prepared by the secretariat of UNFCCC, you would understand that these are written by people from another planet.

Over the past few decades, climate negotiations have been ossified to such an extent that they have kind of lost their purpose. A myriad of committees, institutions and funds have been set up purportedly to manage climate change—but this maze is just full of papers and wordage. You could say that the impacts of climate change have outgrown the global institutions, or that these institutions have become detached from reality. This is why the negotiations are lost in fights over commas, full-stops and other punctuations, and discussions and decision papers that make no sense to even most negotiators. They have literally become meaningless.

COP26's top agenda should be to reclaim its leadership and voice to rebuild the trust of people—both rich and poor. This means making the agenda for action clearer and much more focused on what needs to be done—now, not even tomorrow.

The first step is to lose the endless process, which turns everything into nothing. This is not about taking climate negotiations out of the UN. In fact, I believe such negotiations demand multilateralism, which requires global institutions to be in the lead. But these negotiations, which are now behind the crisis, must shape up and take charge. They must build trust and be sharply focused on what needs to be achieved; by whom; and how. They must also hold the powerful polluters to account; not just bully the poor into submission.

Second, there is a desperate need to front-load action on mitigation—to plan for 2030, and to ensure that China, which will occupy 30 per cent of the already-shrunk carbon budget between 2020 and 2030, is in the spotlight. China is yesterday's USA and it is important to speak truth to this power. Then there is a need to discuss the remaining carbon budget, necessary to limit the temperature rise to 1.5°C, and how it should allocated—not just appropriated. We cannot have an ambitious agreement unless it is equitable. So, COP26 must not repeat the mistakes of the past by trying to erase equity and climate justice.

The Paris Agreement may be lauded by rich countries because it managed to expunge any mention of historical emissions; it may be celebrated because it said that any discussion on loss and damage cannot be seen as a way to affix liability or to demand compensation; it may be the best treaty achieved because it allowed countries to set low and inadequate national targets and because it did nothing to finance adaptation or mitigation. But it does not matter. In five years, events have overtaken the Paris Agreement.

COP26 MUST NOT BE LOST TO PREVARICATION IN NEGOTIATIONS AND TO PUSILLANIMOUS LEADERS

The fact is that the carbon budget of the world has been appropriated by a few countries and only crumbs are available for the rest of the world. This part of the world will need to exercise its right to development and in the process will exceed the available budget. This means, all will be at risk in an interdependent world.

We know countries like India must not make the same mistakes that the already-rich have made. The world needs to secure pathways for low-carbon growth and to pay for this transformation in the still developing world. Finger-pointing and shaming the emerging world for future and inevitable emissions will cut no ice with them. At COP26, we need to confront the reality of this inequity and ensure that it is addressed.

Third is the agenda for "how" this will happen. The availability of finance must be made transparent and measurable —it will help overcome the trust deficit. So, it is not just the scale of finance that has to be discussed and agreed upon, its rules must also be made so that this fund transfer can be counted and verified. It is not enough to preach the need for transparency; there is a need to act on it.

The "how" agenda is also connected to the discussions on markets—Article 6 of the Paris Agreement—which is on the table at COP26. The current effort is to find smart and cheap ways to build a market instrument that will reduce the cost of carbon purchase from the developing world. A repeat of the complicated, convoluted and cheap Clean Development Mechanism (CDM) must not be allowed again. The reality is this time, unlike when the Kyoto Protocol's CDM was finalised, all countries have to take on emission reduction targets. Therefore, there is no reason any country should agree to "trade" and "sell" their cheap options for carbon abatement. This must be done through climate finance for transition. The market should be used for transformational action so that projects that will bring "big bang" carbon reductions can be paid through this instrument. The market must be driven by public policy and intent, and not left to discover new scams in the name of carbon offsets.

This is also where discussions on nature-based solutions, or REDD+, must be firmly rooted. We must not miss the wood for the trees—literally in this case. There is an opportunity to use the ecological wealth of poor countries and communities for mitigation as trees and natural ecosystems sequester carbon dioxide. So, this should not be viewed as carbon sticks but as opportunities for livelihoods and economic well-being of the poor. The rules for carbon offsets for forests must be developed with this in mind—deliberately and with statecraft.

All this then brings the world to the discussions on adaptation and loss and damage—completely lost in the multiplicity of institutions, committees, funds, and all without any money or impact in the real world. This agenda needs to be rescued desperately—just try and make sense of the technical paper to measure the progress on Global Adaptation Goal and you will understand what I am saying. The elephant in the room (that we would like not to discuss) is finance—this is where the discussions must be on adaptation and on loss and damage. We do not need rocket science to calculate the crippling losses being suffered by countries and communities because of climate change-induced extreme weather events. This is why COP26 must not be lost to prevarication in negotiations and to pusillanimous leaders. Let's hope that this COP stands out and is counted as different. It is the order of our times. DTE @sunitanar

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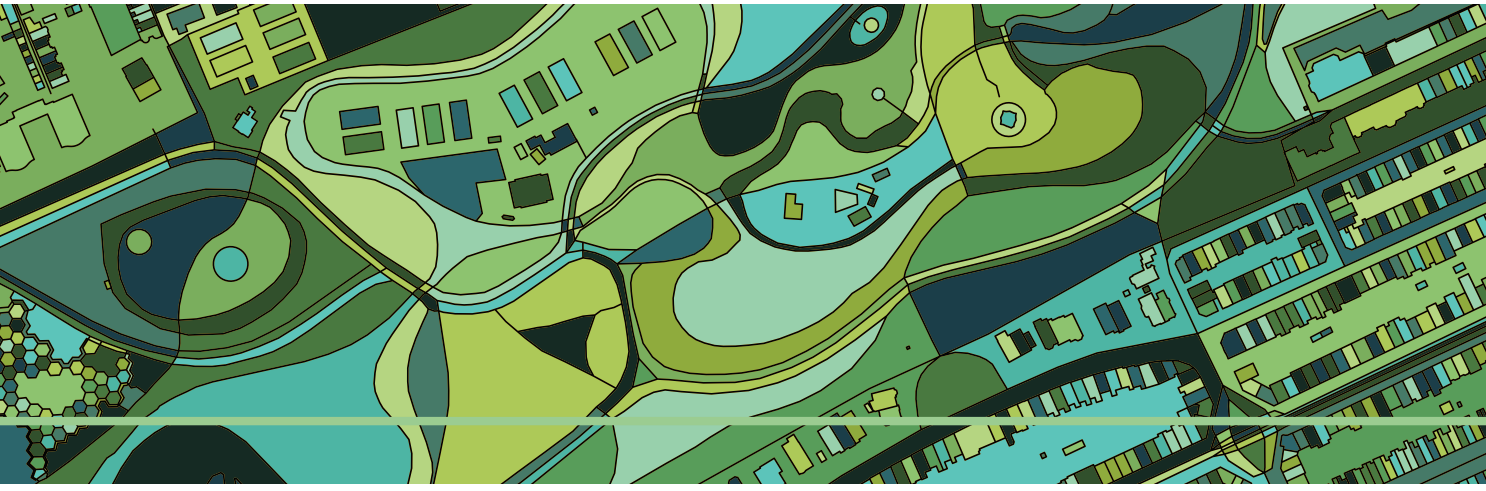
C-GINS

Compendium of Green Infrastructure Network systems

https://www.cseindia.org/c-gins/home



What is C-GINS?

C-GINS (Compendium of green infrastructure network systems) is the repository for best practices, projects and approaches in support of Green Infrastructure (GI) and Water Sensitive Urban Design and planning (WSUDP) principles. C-GINS is an open platform where the latest thinking on natural capital, ecosystem services and nature-based solutions is brought together.

It provides a knowledge marketplace, which showcases case examples of GI and WSUDP to simplify how we share, obtain and create knowledge to better manage our urban environment. Each of the case examples provides an overview of the intervention, timeline, authorities/ stakeholders involved in the project, outcomes and learnings tips for user education. The preference for sustainable technologies is mainly due to CSE's continuous motivation towards usage of sustainable and environmentally harmonious interventions.

How to use C-GINS

With an objective of disseminating knowledge and good practices for sustainable water management, the particular case study can be explored on C-GINS on the basis of:

- Geographic location with the interactive map
- Scale of intervention
- Water management objectives

FOR DETAILS VISIT C-GINS AT
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CLIMATE SPECIAL

CARBON BUDGET

THE NUMBERS BEHIND CLIMATE CHANGE

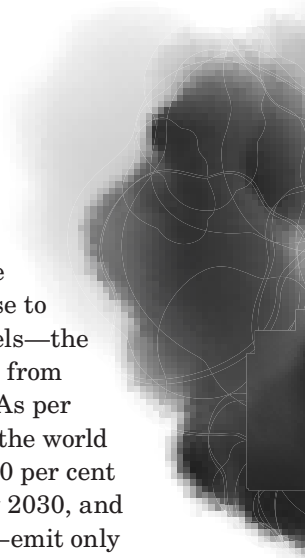
The planet can barely afford any more carbon emissions. But we need to continue to emit for our survival and development. What is the carbon budget available to us? More importantly, who should be allowed to emit and how much? An analysis by **Sunita Narain** and **Avantika Goswami**

DEATH RACE

Our annual carbon dioxide (CO_2) emissions have grown about 70 times since the pre-industrial era, reaching nearly 36.4 gigatonnes (Gt) in 2019. Unless we bring them down to 18.22 Gt by 2030, we are headed for catastrophic climate events

Source:
Analysis by *Down to Earth* and Centre for Science and Environment, Delhi, based on data from Climate Watch and Our World in Data

Infographics: Sanjit/CSE



CLIMATE CHANGE is real. We now know that for certain. We are already experiencing doomsday scenarios that climate scientists had projected for the distant future. The UN's top climate science body, Intergovernmental Panel on Climate Change (IPCC), in its latest Sixth Assessment Report (AR6), *Climate Change 2021: The Physical Science Basis,* only confirms what we already know and see in the world around us: wildfires triggered by extreme heat and moisture loss; devastating floods caused by extreme rain events; and tropical cyclones powered by the changing temperatures between the sea and land surface. The report also clearly says that human activities, for certain, are to be blamed for these climate events. Anthropogenic carbon dioxide (CO_2) and other greenhouse gases (GHGs) have warmed the planet beyond its tolerance level. In May this year, the atmospheric CO_2 level reached 419 parts per million (PPM), as measured by the US' National Oceanic and Atmospheric Administration's Mauna Loa Atmospheric Baseline Observatory in Hawaii. This is nearly 45 per cent above IPCC's accepted pre-industrial baseline of 278 PPM in 1750.

What's even more worrying is that the world is running out of carbon space and time to fix the problem. Currently, we release about 36.4 gigatonnes (Gt) of CO_2 every year into the atmosphere. IPCC says we need to budget our carbon emissions based on the planet's processing abilities to keep the average global temperature rise to 1.5°C above pre-industrial levels—the guardrail of keeping the world from catastrophic climate impacts. As per its estimate provided in 2018, the world needs to cut emissions by 45-50 per cent compared to the 2010 levels by 2030, and by 2050 turn carbon net-zero—emit only what can be "soaked up" by natural sinks like forests or oceans or what can be "cleaned" through still-experimental technologies, like carbon capture and storage. AR6 says that starting 2020 the world is left with a total carbon budget of 400 $GtCO_2$ for all times to come. This means that once we cross this threshold, whenever we cross it, we are headed to a temperature rise of more than 1.5°C.

All this information coming from the world of buttoned-up scientists should scare us into action that is real and meaningful. Instead it has turned into an intense battle between different blocks of countries, and scientists discussing climate change are forced to confront the politics of who emits how much. There are also huge uncertainties (*more on this later*) in the planet's carbon budget.

Three reasons make this budgeting complex. One, the pollutants—primarily GHGs like CO_2 and methane—have an extraordinarily long life. CO_2 emitted in, say, 1900 will still be in the atmosphere. Historical emissions (see 'Unsparing gases') continue to warm up the

Since emissions are due to wealth generation, combating climate change is about sharing growth between nations—which means sharing the carbon budget

UNSPARING GASES

While CO_2 is the most emitted greenhouse gas, there are several others with a higher warming potential

CARBON DIOXIDE (CO_2)
LIFESPAN
150-200 years
WARMING POTENTIAL
1

METHANE
LIFESPAN
12-15 years
WARMING POTENTIAL
28 times CO_2

NITROUS OXIDE
LIFESPAN
120 years
WARMING POTENTIAL
265 times CO_2

FLUORINATED GASES*
LIFESPAN
3.2-10,000 years
WARMING POTENTIAL
151-23,900 times CO_2

*It is a family of gases containing fluorine
Warming potential values are for 100-year time horizon

Source: UN IPCC reports

planet just like current emissions.

Two, these pollutants are linked to economic growth. The bulk of the CO_2 emissions are from burning of fossil fuels, which are used to generate electricity, transport goods and power our houses and factories. So, when the world discusses climate change, it is discussing the economy, and not just the ecology, of the planet.

Three, since GHGs persist in the atmosphere and the emissions are due to wealth generation in countries, combating climate change is about sharing growth between nations—which means sharing the carbon budget.

In an extremely unequal world, this is a most inconvenient reality, especially if we factor in the issues of equity and climate justice. The science and the politics of climate change are so infused that they cannot be separated. We, therefore, try to decode the following:

- **Then and now**: who have been the big emitters through the centuries, and where do they stand today? Who stands where in per capita emissions and which countries need a larger share of the carbon budget to develop?
- **National targets**: What climate trajectory will total/partial achievement of Nationally Determined Contributions—voluntary national goals, part of the 2015 Paris Agreement—lead us to? Which countries have set tough targets and which ones are sitting easy?
- **Carbon budget:** What is the carbon budget to keep the world to 1.5°C? Which country has appropriated how much of the budget?
- **Target 2030:** Going forward, which countries are likely to hog the carbon budget in 2020-30?

THEN AND NOW

PRIME POLLUTERS

China, US and EU-27 (excluding the UK) currently emit over 50% of the world's 36.44 $GtCO_2$

Africa and India, each with 17% of the world's population, contribute just 4% and 7%

The developing world has a right to economic growth without pollution, which requires unprecedented funding

THE WORLD released 36.4 gigatonnes (Gt) of CO_2 in 2019—the last year for which global data for the GHG is available—in fossil fuel emissions and from the cement sector. Of this, China alone emitted 28 per cent of the GHG. Add the US and EU-27 (minus the UK), and the countries account for 50 per cent of the world's CO_2 emissions. If we add Russia, Japan, UK, Canada, and Australia, the share goes up to 62 per cent (see 'Current culprits').

India, which is the fourth largest (third, if we do not account for EU-27 as a group), contributed some 2.62 Gt of CO_2 in 2019—compared to China's 10.17 $GtCO_2$ and US' 5.28 $GtCO_2$. It added 7 per cent to the world's CO_2 emissions in 2019.

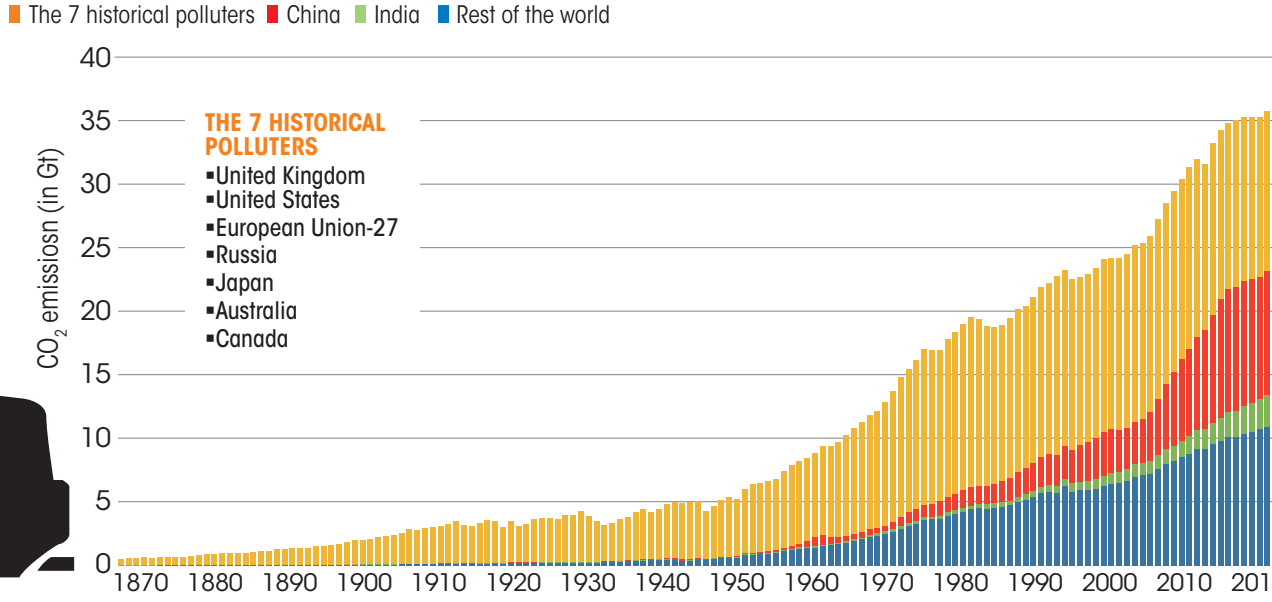
The entire continent of Africa, with 17 per cent of the world's population, contributed a mere 4 per cent to the emissions in 2019.

Let's look at it from another perspective. India and Africa are quite low in the human development index. They need to grow economically, provide energy to their people, industrialise and urbanise. All of this will add to the emissions because CO_2 emissions are still directly linked to a country's gross domestic product. And this when the world is running out of carbon budget—the IPCC 2021 report has already declared "code red" and said that humanity is hurtling towards a climate catastrophe.

We, therefore, have two choices: either accept climate apartheid, or enhance efforts to ensure economic growth without pollution, so that the developing world is given the right to develop. The latter option means funding the transformation in these nations at a scale never done before.

HISTORICAL DEFAULTERS

Developed countries (in orange) were responsible for almost entire CO_2 emissions till the 1980s...



Source: Our World in Data

NATIONAL TARGETS

OFF BY A MILE

Even enhanced Nationally Determined Contributions are not nearly enough to limit global temperature rise to 1.5°C

Many poor countries, with low annual emissions, have pledged higher targets than rich countries

This is a mockery of the principle of Common but Differentiated Responsibilities and a human rights concern

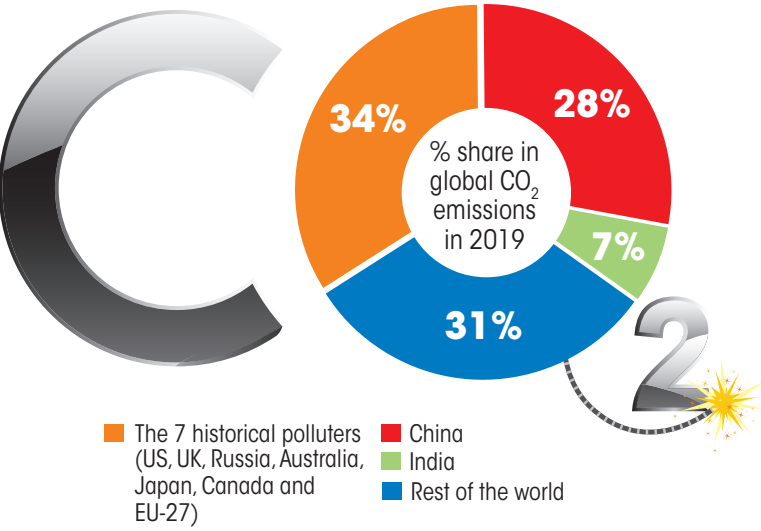
UNDER THE Paris Agreement, adopted in 2015 as an international treaty to limit and cut greenhouse gases, countries agreed to provide voluntary targets called Nationally Determined Contributions (NDCs) for how they will limit or reduce emissions (see 'Route to NDC'. The agreement also stated that NDCs would work to achieve the goal of keeping global temperature rise this century to well below 2°C above the pre-industrial level and to pursue efforts to limit the rise to 1.5°C.

As per the agreement's "ratcheting mechanism", nations are expected to submit progressively more ambitious NDCs every five years. Accordingly, countries had to submit their second NDC by 2020, but of the 192 parties to the Paris Agreement a majority did not meet the deadline. As of October 15, 2021, a total of 113 countries (112 countries plus EU-27) have submitted new NDC targets, while 49 countries have not, as per *Climate Action Tracker*, an independent scientific analysis produced by two Germany-based research organisations, Climate Analytics and New Climate Institute

EU-27 and the UK submitted more ambitious NDCs of reducing GHG emissions by 55 per cent and 68 per cent below 1990 levels by 2030. The US, under the new President Joe Biden, has

CURRENT CULPRITS

..Since 2000, China has been the foremost polluter



Source: Our World in Data

ROUTE TO NDC

Key milestones in framing Nationally Determined Contributions (NDCs)under the Paris Agreement

2015
Countries are invited to submit Intended Nationally Determined Contributions (INDCs); The Paris Agreement is adopted, 191 countries ratify the Agreement

2018
Talanoa Dialogue takes stock of how close the countries are to achieving the goals of the Paris Agreement

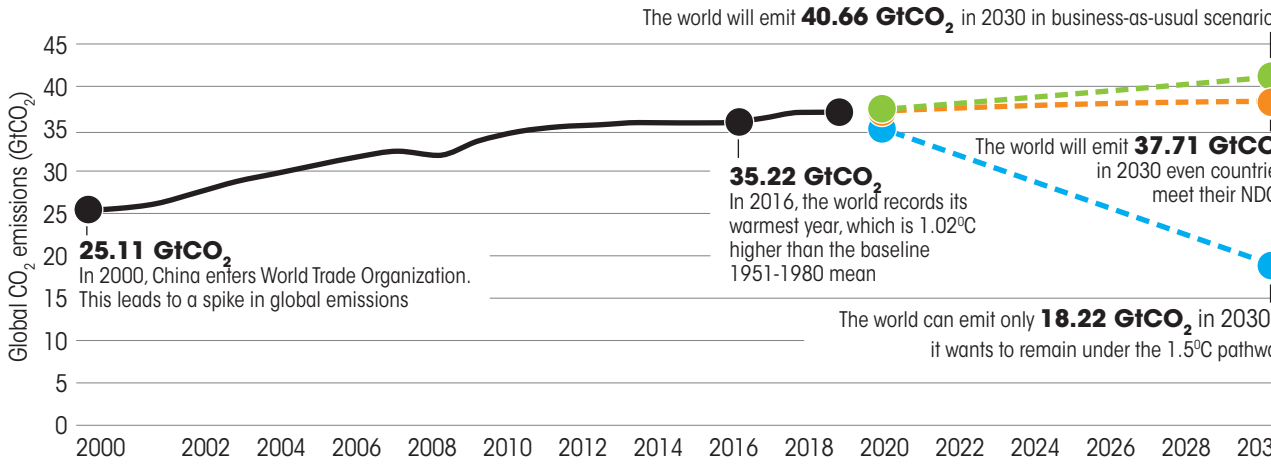
2020
Formal NDC cycle begins; countries must submit new or updated NDCs

2021
UNFCCC NDC Synthesis Report 1 (released in February) and Report 2 (prior to COP 26) will be published with updated NDCs

2023
Global Stocktake will evaluate collective progress towards achievement of the Paris Agreement's goals

NOT NEARLY ENOUGH

The world will cross the 1.5°C threshold by 2030 even if countries meet their enhanced nationally determined targets



Source: Analysis by *Down to Earth* and Centre for Science and Environment, Delhi, based on data from Climate Watch and Our World in Data

upped its target and pledged 50-52 per cent reduction below 2005 levels by 2030. Japan has proposed a stronger NDC target of 46 per cent reduction of GHG emissions below 2013 levels by 2030 but is yet to formally submit it.

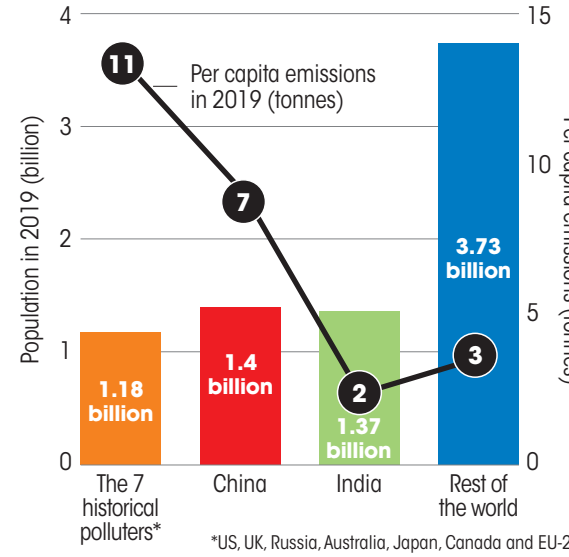
Down To Earth and Centre for Science and Environment, Delhi, have attempted to project the emissions of 45 countries—a mix of developed and developing economies, including EU-27—for 2020-2030. For this, the percentage reduction targets for GHG emissions under the NDCs submitted by these countries have been considered. Where available, updated or second NDCs, as of September 2021, have been considered. The remaining countries have been considered as "rest of the world". Since India and China have emission intensity targets (reduction of CO_2 emissions per unit of GDP) for their NDC, we have not applied any emissions reductions and assumed that their emissions remain the same in both the scenarios for simplicity of analysis. It is important to note that in many cases, countries have provided "conditional" NDCs—they will enhance their ambition if climate finance and other support is provided. For instance, Ethiopia has said it will reduce emissions by 14 per cent (unconditional) and 68.8 per cent (conditional) by 2030 as compared to the "business as usual" scenario. Zambia commits to reduce its emissions by 25 per cent (under limited international support) and towards 47 per cent (with substantial international support). For calculating NDCs, we have assumed these conditions will be met.

We project their emissions for 2020-30 in two scenarios:

(i) Assuming that the NDCs are fully achieved by 2030, or the NDC scenario: As per IPCC, global emissions need to reduce by 45 per cent over 2010 levels by 2030 to keep the temperature rise to 1.5°C. In 2010, global CO_2 emissions

UNEQUAL WORLD

Developed nations enjoy high per capita emissions



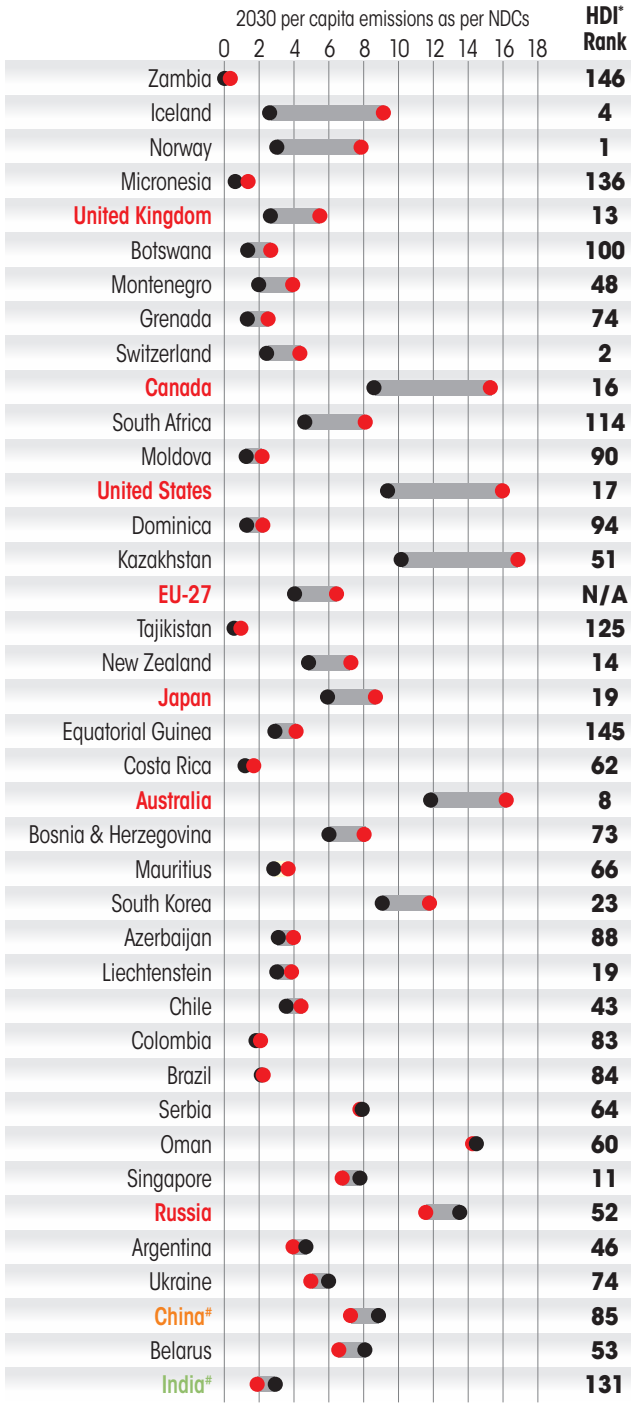
*US, UK, Russia, Australia, Japan, Canada and EU-27

Source: Our World in Data

LOW ON AMBITION

Developed countries have pledged lower emissions reduction by 2030 than many developing countries

● 2030 per capita emissions as per NDCs
● 2019 per capita emissions



#For China and India, business-as-usual scenario has been used
*Human Development Index rates countries on the basis of life expectancy, education, and per capita income indicators; Source: Analysis by *Down to Earth* and Centre for Science and Environment, Delhi, based on data from Climate Watch and Our World in Data

were 33 Gt. Therefore, the world needs to keep its annual CO_2 emissions under 18.2 Gt in 2030 to meet this target (see 'Not nearly enough'). But even if it achieves the enhanced NDCs, it would be emitting 37.71 $GtCO_2$ in 2030. This is more than double the amount of CO_2 the world should be emitting in 2030. To put it in another way, if the NDCs of these 45 nations are fully implemented, the world will emit 409 $GtCO_2$ in 2020-30, against the available budget of 400 $GtCO_2$.

(ii) Assuming that no emission reduction efforts were undertaken, or "business as usual" scenario—where we have taken the median rate of change of emissions annually over the past decade (2010-2019): Under the "business as usual" scenario, the world would emit 425.73 $GtCO_2$, which is just 16.70 $GtCO_2$ higher than the NDC scenario, in 2020-2030.

BURDEN OF GROWTH

Comparison of per capita emissions in the 45 countries in 2019 and then again in 2030, if the NDCs are achieved, reveals how skewed the global burden of CO_2 reduction is against developing countries (see 'Unequal world'). Zambia and Micronesia, ranked 146th and 136th in Human Development Index (HDI), have pledged to reduce their per capita emissions by over 50 per cent, while Japan and Australia will reduce them by 30 per cent by 2030 (see 'Low on ambition'). Russia will increase them by 16 per cent.

Botswana, ranked 100 in HDI, has committed a 15 per cent reduction in GHG emissions by 2030 as compared to 2010 levels. The country's total emissions in 2010 were 0.0045 $GtCO_2$ and would be 0.0039 $GtCO_2$ in 2030. Its per capita emissions in 2010 were 2.28 tonnes and would be reduced to 1.39 tonnes in 2030. Under the "business as usual" scenario, it would have increased its per capita emissions to 7.54 tonnes by 2030. Instead it will reduce them to even below the 2010 levels.

Clearly, countries low on HDI and with minuscule per capita footprint, are shouldering the burden of emissions reductions, while historical polluters play a small part. This is not only a mockery of the principle of Common but Differentiated Responsibilities, but a serious human rights concern as poor nations attempt to constrain their developmental health in trying to abide by the Paris Agreement.

CARBON BUDGET

UNFAIR SHARE

Till 1989, the original seven emitters appropriated 77% the world's carbon space

Between 1990 and 2019, China, along with the original seven, was behind 67% of the world's emissions

The remaining world, about 66 per cent of the people, emitted only 33%

THE CARBON budget is constructed on the premise that there is a linear relationship between rising global temperatures and the level of accumulated atmospheric CO_2. As CO_2 level rises, atmospheric temperature rises as well—thus a higher temperature threshold like 2ºC allows us to emit a higher amount of CO_2. These are carbon budgets rather than GHG budgets (which would include methane, nitrous oxide and other GHGs) and the large range for 1.5°C budgetary allocations (of CO_2) partly reflects varying assumptions on how fast non-CO_2 GHG emissions can be mitigated. Fossil CO_2 emissions accounted for less than 68 per cent of GHG emissions in 2018. Thus, while the carbon budget as a concept is useful for policy making in key sectors such as energy, total GHG emissions and the overall emissions budget is equally critical.

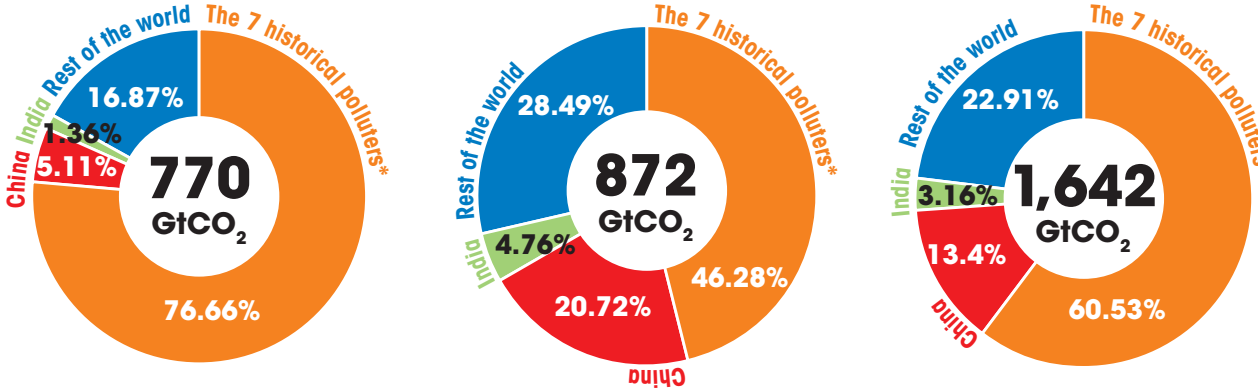
IPCC's Fifth Assessment Report (AR5), published in 2014, found that the world can emit 2,250 $GtCO_2$ between 1861 and 2100 for a 66 per cent chance of staying within 1.5ºC. IPCC AR6 published in 2021 revealed a revised estimate. Starting 2020, the world now has a total budget of 400 $GtCO_2$ for a 66 per cent probability to stay below 1.5°C. But before we assess the remaining carbon budget, we must see which countries have used up the available budget to keep the world temperature rise to 1.5°C. Unsurprisingly, historical emissions from 1870 to 2019 reveal a deep inequity:

BEFORE CLIMATE CONVENTION (BCC): 1870-1989

From 1870 to 1989—three years before the United Nations Framework Convention on Climate Change (UNFCCC) was drafted and decided on an international treaty to combat human interference with the climate system—six countries (UK, US, Russia, Japan, Australia and Canada)

PROBLEMATIC TWO

The developed countries and China are responsible for over 70 per cent of CO_2 emissions so far



*US, UK, Russia, Australia, Japan, Canada and EU-27
Source: Analysis by *Down to Earth* and Centre for Science and Environment, Delhi, based on data from Climate Watch and Our World in Data

Positions open at ICSF: *Join ICSF to support and build equitable, gender-just, self-reliant and sustainable fisheries!*

The International Collective in Support of Fishworkers (ICSF) Trust, based in Chennai, India, works to further the welfare of marine and inland fishing communities through education, research, documentation and training. ICSF Trust aims to improve working and living conditions in fisheries along the value chain; to ensure fair access to fisheries resources and markets; and to improve fisheries management from a conservation and sustainable use of biodiversity perspective.

Staff Positions: Programme Officer and Programme Associate
ICSF is looking for candidates keen to engage in research, communication and capacity-building efforts related to fisheries policy and legislation. This will include social development of fishing communities, and conservation and sustainable use of aquatic biodiversity from a participatory approach. ICSF would prefer candidates comfortable and competent in the field, also with an interest in gender issues.

Job Description and requirements
Both positions are full time, based in Chennai, India, and will involve reporting to the Executive Trustee and working closely with the ICSF team. Fluency in English and competence in other languages are desirable. Both positions would require domestic and international travel to attend meetings and conferences.

Evaluations of performance will be held after three months, and also after one year. Salary and benefits will be commensurate with the candidate's competence and experience.

Programme Officer - senior position
- A postgraduate degree and at least **three to five** years of work experience in natural resources management - areas related to public policy, sustainable development, community-based resource management and poverty eradication are preferred.
- Commitment of **four** years from the candidate.
- Ability to coordinate and work closely with fishing communities and civil society organizations
- Ability to assist with governance of the organization, including administrative and financial management.
- Ability to develop a coherent set of communication activities including case studies, reports, multimedia products and the triannual SAMUDRA Report and Yemaya Newsletter.
- Ability to network and build partnerships
- Ability to develop core campaigns on food security, climate change and tenure tights.

Programme Associate - junior position
- A postgraduate degree and at least **one** year of work experience in natural resource management - areas related to public policy, sustainable development, community-based resource management and poverty eradication are preferred.
- Commitment of **three** years from the candidate.
- Ability to assist with all ICSF activities, particularly in the area of advocacy.

Application procedure
To apply for the position, please send the following to ICSF Trust at icsf@icsf.net by 30 November, 2021.
- Resume (not more than 2 pages)
- Cover letter (stating reasons for wanting to work with ICSF Trust)
- Short note on your current employment, responsibilities and work profile
- Two writing samples displaying good analytical and communication skills

The subject line should say: Application for **Programme Officer** or for **Programme Associate**. The application should be addressed to:
Executive Trustee, ICSF Trust, Number 22, Venkatarathinam Nagar, Adyar, Chennai 600 020, Tamil Nadu, India.www.icsf.neticsf@icsf.net

Shortlisted candidates will be interviewed on the telephone/via Zoom call and tested on analytical and writing skills.

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Email: cse@cseindia.org Website: www.cseindia.org

and the EU contributed 77 per cent of the world's total CO_2 emissions (see 'Problematic two' on *p*16). The US alone contributed 31.26 per cent, while China's figure stood at 5.11 per cent. The rest of the world, including India, did not matter.

AFTER CHINA (AC): 1990-2019

Between 1990 and 2019, there was a new entrant—China—which increased its share in global emissions from 5.1 per cent to 20.7 per cent in the three decades. The big jump came after China joined the World Trade Organization in 2000 and its share of emissions rose with its economic and trade might. In 2005-19, its emissions' share increased to 26 per cent.

China's emissions increased but those of the rest of the already-rich world did not decrease substantially. In fact, they only adjusted to make way for China—the country that had quickly become the cheap manufacturing centre of the world and where goods were now made for export. By 2019, the carbon space was occupied by the original seven and China. These countries contributed some 67 per cent of the emissions between 1990 and 2019. The remaining world, with 66 per cent of the population, was left to occupy some 33 per cent of the carbon space.

BCC+AC: 1870-2019

The carbon budget appropriation is even more stark if you take the entire period—the beginning of the industrial revolution in 1870 to current times, 2019. From 1870 to 2019, US, EU-27, Russia, UK, Australia, Canada and Japan, with less than 15 per cent of the world's population (in 2019), contributed 61 per cent of the total emissions. Once you add China to this, the contribution rises to 74 per cent of the total CO_2 emissions by some 34 per cent of the world's population. India, the third- or fourth-largest emitter, has taken up a mere 3.16 per cent of the pie, despite having 18 per cent of the world's people.

Taking IPCC's 2014 CO_2 budget of 2,250 Gt (1870 onwards) to keep the global temperature rise to 1.5°C means that the world has exhausted 73 per cent of the budget by 2019. And these countries (original 7+China) have appropriated 54 per cent of this budget. It would be an understatement to say that the historical division of the carbon pie has been extremely inequitable.

PAST PRIVILEGE

The developed world grew on unfettered fossil fuel consumption and CO_2 emissions since the 1870s, leaving little carbon space for the rest of the world

	% of total emissions for BCC (1870-1989)	% of total emissions for AC (1990-2019)	% of total emissions for BCC + AC (1870-2019)	% share in the world population in 2019
US	**31.26**	**19.32**	**24.92**	**4.28**
EU	**23.21**	**12.06**	**17.29**	**5.83**
Russia	**8.31**	**5.72**	**6.94**	**1.88**
UK	**7.18**	**1.80**	**4.32**	**0.87**
Japan	**3.59**	**4.24**	**3.93**	**1.65**
Canada	**2.17**	**1.88**	**2.02**	**0.49**
Australia	**0.94**	**1.25**	**1.11**	**0.33**
7 historical polluters	**76.66**	**46.28**	**60.53**	**15.33**
+ China	**5.11**	**20.72**	**13.40**	**18.21**
7 historical polluters + China	**81.77**	**67.00**	**73.93**	**33.54**
Rest of world (excluding China)	**18.23**	**33.25**	**26.07**	**66.46**
of which				
India	**1.36**	**4.76**	**3.16**	**17.81**
South Africa	**1.08**	**1.42**	**1.26**	**0.76**
South Korea	**0.38**	**1.62**	**1.04**	**0.67**
Brazil	**0.58**	**1.23**	**0.92**	**2.75**
Vietnam	**0.09**	**0.33**	**0.22**	**1.26**
World Emissions in gigatonnes				
World	**769.92**	**871.78**	**1641.69**	**-**

Source: Analysis by *Down to Earth* and Centre for Science and Environment, Delhi, based on data from Climate Watch and Our World in Data

TARGET 2030

HOW IT ENDS

In coming 10 years, China will take up 33% of the remaining carbon budget

Despite heavy reduction targets, the original seven, along with China, will occupy 62%

The remaining world, with 66% of the population, will be left with 38%

WHAT THEN is the carbon budget that remains—the amount of carbon dioxide we can emit going forward if we are to limit temperature rise to 1.5 °C?

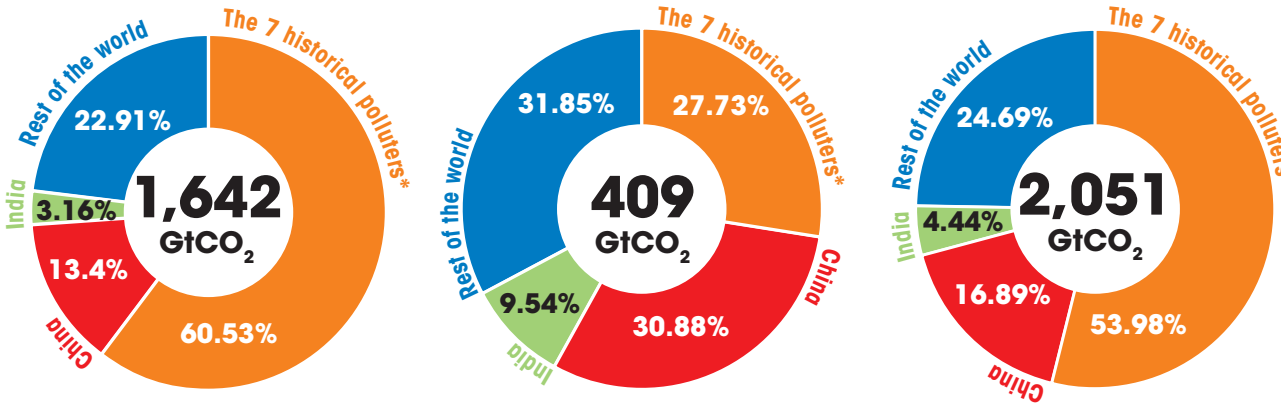
In its Sixth Assessment Report (AR6), IPCC does not include the historical budget but states that the remaining budget is 400 Gt of CO_2 for the world to have a 66 per cent probability of staying below 1.5°C. Till 2019, the world had emitted 1,642 $GtCO_2$ (see 'Unchanged future'). If the IPCC Fifth Assessment Report (AR5) budget is used, then this would mean that 73 per cent of the budget had been exhausted and 608.3 $GtCO_2$ remains. But now we know that only 400 $GtCO_2$ remains to keep the world below 1.5°C rise, according to the revised estimate published in AR6. Then we need to know that this carbon budget includes emissions from land use, land-use change and forestry, roughly 3.3 per cent. If this is deducted, then the world has a remaining carbon budget for fossil fuel emissions of 387 Gt from 2020 to keep it below 1.5°C, as per AR6.

It should not be a surprise to learn that the world will exhaust the remaining carbon budget before 2030—even assuming the implementation of the full NDCs by countries. This itself is a huge question mark because big emitters, like the US, have ambitious plans, but as yet these seem to be stuck and it is difficult to say if the scale of reduction will be achieved at all.

In the current decade—billed rightly as the last chance to avert catastrophic climate change—we see some change.

UNCHANGED FUTURE

China and the developed world are likely to account for almost 70 per cent CO_2 emissions from 1870 to 2030



*US, UK, Russia, Australia, Japan, Canada and EU-27

Source: Analysis by *Down to Earth* and Centre for Science and Environment, Delhi, based on data from Climate Watch and Our World in Data

PERPETUAL GAP

Even in NDC scenario, developed countries and China will continue to emit almost 60 per cent of future CO_2 emissions

	% of total emissions for BCC + AC (1870-2019)	% of total emissions if NDCs are met 2020-2030	% of total emissions for BCC+AC+NDC (1870-2030)
US	24.92	11.27	22.20
EU	17.29	6.24	15.09
Russia	6.94	4.87	6.52
UK	4.32	0.73	3.60
Japan	3.93	2.39	3.63
Canada	2.02	1.23	1.86
Australia	1.11	1.00	1.08
7 historical polluters	**60.53**	**27.73**	**53.98**
China	13.40	30.88	16.89
7 historical polluters + China	73.93	58.60	70.87
Rest of world (excluding China)	26.07	41.40	29.13
of which			
India	3.16	9.54	4.44
South Africa	1.26	1.04	1.22
South Korea	1.04	1.44	1.12
Brazil	0.92	1.27	0.99
Vietnam	0.22	1.28	0.43

Source: Analysis by *Down to Earth* and Centre for Science and Environment, Delhi, based on data from Climate Watch and Our World in Data

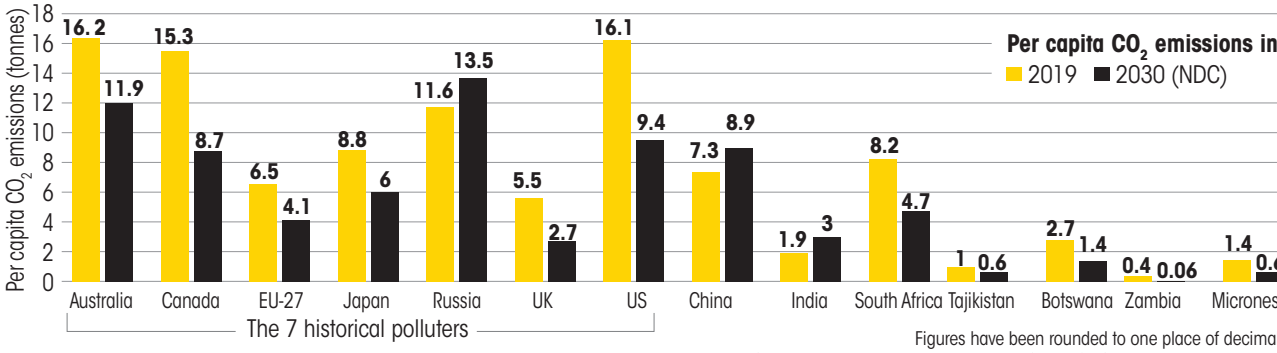
Of the historical emitters, US, EU-27, UK and Canada have put forward substantial reduction targets. If these are realised—and there are still questions about this—the contribution of this group of countries to the world's emissions in the decade will reduce from 21.19 per cent to 19.47 per cent. However, this is still not a "fair share"—not by a stretch—if you take the contribution of these countries to the stock of emissions already in the atmosphere, which is in fact the cause of the temperature rise. Between 1870 and 2030, these countries with minuscule global populations will still account for nearly half the CO_2 emissions in the atmosphere even if their NDCs are achieved (see 'Perpetual gap').

But what makes the last-chance decade even more inequitable is the enduring rise of the world's next superpower, China. In this decade, China has not given any emission reduction targets—only a commitment to reduce its carbon dioxide emissions per unit of GDP by 65 per cent from the 2005 levels. According to our estimate, China's emissions in 2030 would be 12.65 Gt—up from 10.17 Gt in 2019. This is also what has been estimated by *Climate Action Tracker*. The tracker says that "under China's most binding peaking and non-fossil share NDC targets, the country's emission levels would reach between 13.2 to 14.0 $GtCO_2e$ in 2030, an increase of 20% to 28% from 2010 levels."

Based on our estimate, China will emit 126 Gt of CO_2 in the coming 10 years. This

STARK CONTRAST

Per capita emissions of developed countries and China will remain high even in 2030



Figures have been rounded to one place of decimal;
Source: Analysis by *Down to Earth* and Centre for Science and Environment, Delhi, based on data from Climate Watch and Our World in Data

ONLINE TRAINING ON

WATER AUDIT AND CONSERVATION IN INDUSTRIES

Course Date: November 22 – December 5, 2021 | **Online Course Duration:** 24 Hours (12 Hours Per Week)
Last Date To Apply: November 17, 2021 | **Course Fee:** INR 3,500/- (Indian Participants) / USD 100 (Global Participants)

BACKGROUND

Increasing industrial production especially in water intensive industries (like thermal power plants, pulp & paper, textiles, fertilisers, etc.) is already putting pressure on the limited freshwater resources in India and worldwide. This coupled with increased water demand from other sectors like infrastructure development, agriculture, domestic, etc. is leading to major conflicts over water availability. Sourcing water and managing wastewater is becoming increasingly difficult & expensive and hence is an important aspect for sustainability of any industry. Industries which are heavily dependent on water for their production have to cut down on their production at times due to scarcity of water mainly during summer season. Such scenarios have become more frequent in the past few years due to increasing water stress. Therefore, it is very critical that industries use water judiciously and reduce its water footprint as much as possible in order to be sustainable in future.

Water use optimisation, improving water accounting systems, identifying water losses and opportunities for water savings can serve as an effective approach for reducing water consumption. Also, efficient wastewater treatment technologies and recycling and reuse practices can further bring down consumption and effluent generation. Further, substantial costs which are associated with water & wastewater management like water sourcing, cost of pumping, cost of water treatment (chemicals), cost of effluent treatment & disposal, etc. can be effectively reduced through better water and wastewater management and through periodic conduction of water audits.

Understanding the relevance of the subject, Centre for Science and Environment (CSE) has developed a two week online course with the aim of providing a wider understanding on the above aspects of water audit, wastewater management and recycling.

The course will be conducted online through technological learning tools such as recorded video presentations, discussion with experts and reading material. Upon completion of course, participants will receive e-certificate of completion.

WHO CAN APPLY?

Industry professionals, EHS officials, environmental consultants, environment engineers, environment regulators, environmental laboratories, academic institutions and others aspiring to work in water audit and wastewater management field.

KEY LEARNINGS FROM THE PROGRAMME

- Water audit – Introduction, Scope and Methodology
- Preparing industry specific water audit questionnaire
- Water audit instrumentation, metering and accounting
- Preparing water circuit diagram and water balance with industry-specific case studies
- Specific water consumption & benchmarking
- Water audit, wastewater recycling and reuse – Regulatory aspects
- New CGWA notification covering mandatory water audit
- Understanding water utilities basics - pumps and cooling towers
- Advanced water & wastewater treatment technologies with a focus on zero discharge technologies
- Industry specific case studies on opportunities identified for water savings through water audits;
- Water and wastewater costing and cost benefit analysis of water saving schemes
- Case studies/Assignments/Exercises

MODE OF TRAINING

The online course is self-paced wherein pre-recorded video sessions from experts, presentations and other reading material will be uploaded on CSE's online training platform on daily basis. Additionally, 2-3 live online sessions will be organized over weekend with all the experts for taking up queries. The course is designed in a manner to help participants in attending it along with their regular work and study the course material at their own convenience.

CLICK HERE TO REGISTER

COURSE COORDINATOR

Divyansh Upadhyay, Sr. Research Associate, Industry Unit | Centre for Science & Environment
Email: divyansh.u@cseindia.org; **Mobile:** 8382954042

THE STORY IN NUMBERS

China and the developed world will continue to have the lion's share of the planet's carbon budget in 2020-30, while the burden of reducing emissions will be borne unfairly by many developing countries

Carbon budget

400
gigatonnes (Gt)
is the remaining carbon budget for the world, starting 2020, to have a 66% probability of staying below 1.5°C

36.4 Gt
is the annual amount of anthropogenic CO_2 (from fossil fuel and cement) the planet emits

At the current rate, we will run out of the planet's carbon budget in 2030, even if we achieve nationally determined contributions

Budget hoggers

33%
of the carbon budget for the 1.5ºC trajectory will be consumed by China's emissions in 2020-30

29%
of the carbon budget for the 1.5ºC trajectory will be consumed by the original 7 polluters (US, UK, EU-27, Russia, Japan, Australia, Canada) in 2020-30

38%
of the carbon budget will be available for the rest of the world in 2020-30

NDCS not ambitious...

18.2 $GtCO_2$
is what the world needs to emit in 2030 to keep the temperature rise to 1.5°C

37.71 $GtCO_2$
is what the world will emit in 2030 even if it achieves enhanced NDC

...And the burden is unfair

85%
is the reduction in per capita emissions by 2030, compared to 2019 levels, as per NDCs pledged by Zambia

53%
is the reduction in per capita emissions by 2030, compared to 2019 levels, as per NDCs pledged by Micronesia

30%
is the reduction in per capita emissions by 2030, compared to 2019 levels, as per NDCs pledged by by Japan and Australia

16%
is the hike in per capita emissions by 2030, compared to 2019 levels, as per Russia's NDCs

means that its emissions will take up 33 per cent of the left over carbon budget, as per AR6. As a result, the original 7+China will occupy 62 per cent of the budget, for this decade. Seen as a whole—from 1870 onwards to 2030, even if NDCs are achieved—these countries will be responsible for 71 per cent of the world's emissions.

In 2030 the per capita—carbon dioxide emissions by the population will remain inequitable (see 'Stark contrast' on *p*20).

How fair is this? In what world, language or situation can this be called okay?

The problem is not even a theoretical or moralistic idea. The fact is that roughly 30 per cent of the carbon budget is available for the vast numbers of people in the world, who still do not have access to energy and are way down on any human development indicator. Now unless we can tell these billions to stop breathing, or stop development, or stop everything that we know today makes the world economy prosperous, they will emit. As a result, the world will breach the guardrail of 1.5°C temperature rise.

This is why equity is a pre-requisite to an ambitious and effective climate agreement. It is not something that can be diluted, discarded or erased. Dissect, dice and slice the data any which way and the conclusion will be the same—few countries have appropriated the carbon budget and their accumulated emissions are the cause of the temperature increase, which is taking the world towards catastrophe.

There is the other inconvenient truth that if the rich (including China) polluted yesterday and today, then the remaining world (roughly 70 per cent of the world still needs right to development). This part of the world cannot be wished away, it cannot be shouted and screamed at and bullied, into a low-carbon pathway.

This transformation—growing, but with the emissions that will further jeopardise the world—will need huge funding and technology support. This is not about charity, but about fixing what has been broken, in the interest of all. DTE @down2earthindia

FOSSIL FUELS

Borrowed time

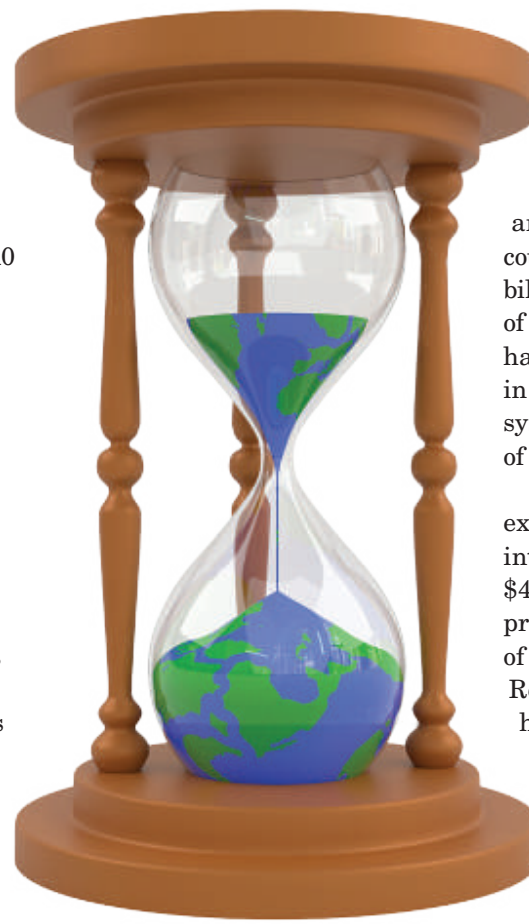
The world is set to produce over twice the amount of fossil fuels in 2030 than would be consistent with limiting warming to 1.5°C

RAJIT SENGUPTA NEW DELHI

ONE OF the unfortunate aspects of the climate crisis is the fact that early intervention could have prevented it. While governments world over have been discussing how to handle the crisis for more than three decades now, they continue to fixate on fossil fuel-led development.

The United Nations' "Production Gap Report 2021", released on October 20, factors in the economic impact of the COVID-19 pandemic, and states that countries are on the path to producing more than double the amount of fossil fuels (around 110 per cent) in 2030 than would be consistent with the median 1.5°C-warming pathway, and 45 per cent more fossil fuels in 2030 than would be consistent with the median 2°C-warming pathway (see 'Out of control' on *p*24).

What is worse, the gap will grow post-2030 because of the renewed investments in fossil fuels made by several countries after the pandemic. By 2040, countries' plans and projections show 190 per cent more fossil fuels than would be consistent with the median 1.5°C pathway, and 89 per cent more than the median 2°C pathway, says the report, which looks at by how much the governments intend to exceed the supply of fossil fuels that can be safely burnt in the coming decades.



"As part of their COVID-19 responses, governments have provided support to the production of fossil fuels through new tax incentives, guarantees, regulatory changes, and other financial support, largely without accompanying social, economic, or environmental requirements," says the report. Between January 2020 and June 2021, as many as 31 countries have added over US $55 billion in support of the production of fossil fuels. Such commitments have long-lasting impacts "locking in fossil-fuel-intensive energy systems with equipment lifetimes of 10-50 years".

The commitments include, for example, a special COVID-19 tax introduced in Argentina to raise $479 million for new gas production and Canada's creation of the Oil and Gas Industry Recovery Assistance Fund, which has allocated $241 million to activities such as facility maintenance and upgrades for an offshore energy sector. Meanwhile, China is touting unconventional gas

as clean fossil energy, and Russia is branding its Arctic oil as green. Norway and the UK intend to maximise economic recovery of their remaining oil and gas resources, as per Ploy Achakulwisut, one of the lead authors of the report.

While fossil fuel production continues unabated, individual commitments made by countries to cut their emissions are also far from satisfactory. This is worrisome as these voluntary commitments are in fact much more ambitious than the current production levels.

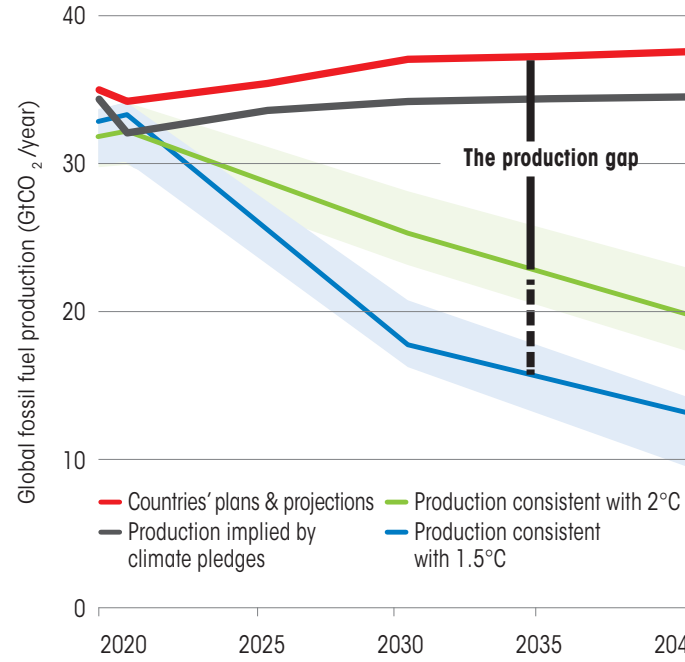
The "Emissions Gap Report 2021", another UN report released a week later, shows that the new nationally determined contributions (NDCs), combined with other mitigation pledges, put the world on track for a global temperature rise of 2.7°C by the end of the century, even if all new unconditional commitments are met.

"Additional implementation of net-zero targets could reduce global warming by another 0.5°C, but these plans are currently ambiguous and not fully reflected in NDCs. To keep global warming below 1.5°C this century, the world needs to urgently put additional policies and actions in place to almost halve annual greenhouse gas emissions in the next eight years," it says.

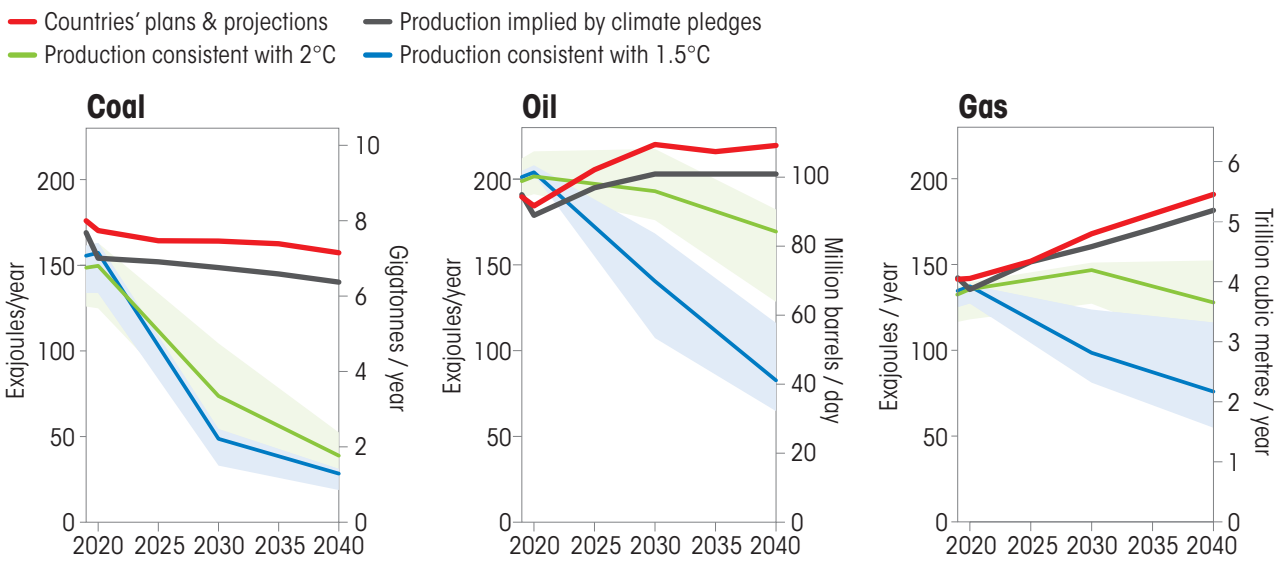
OUT OF CONTROL

Only nine years are left for countries to limit global temperature rise to 1.5°C above the pre-industrial level. But they are on path to produce more fossil fuels

World's fossil fuel ambition is out of sync with 1.50C or 20C pathways

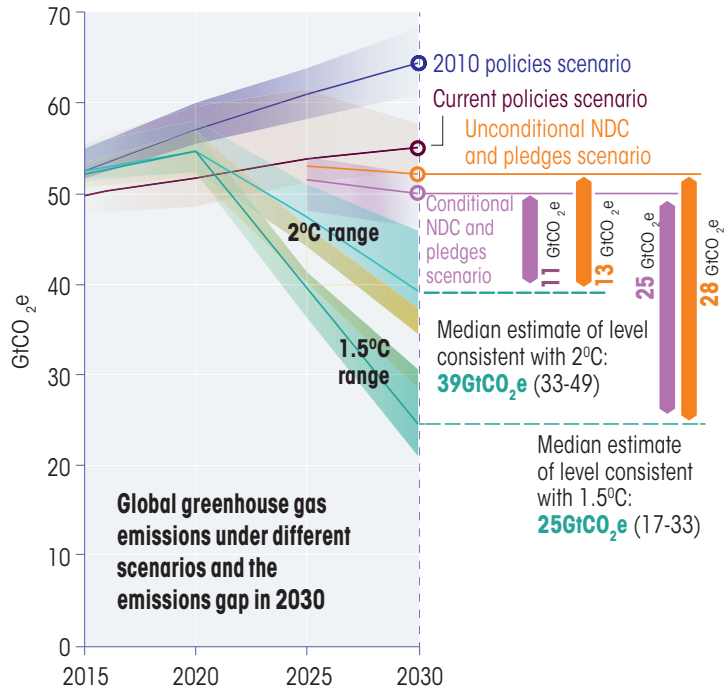


Coal production will be 240% higher by 2030; oil and gas will be over 50% higher



Note: 1 barrel is 158.98 litres

Nationally Determined Contributions (NDCs) updated this year cut 2030 emissions by 7.5%, as against 55% needed to meet the Paris goal



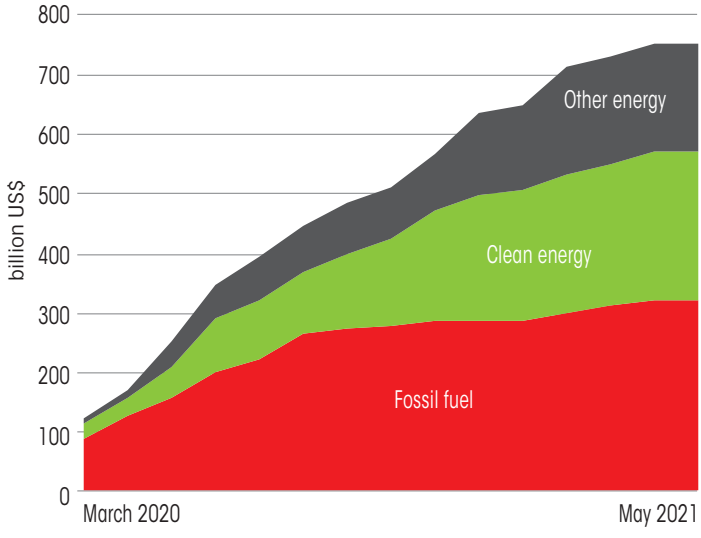
Turquoise area shows pathways limiting global temperature increase to below 2°C with about 66% chance.

Green area shows pathways limiting global temperature increase to below 1.5°C with 66% chance by 2100 and minimum 33% chance over the course of the century.

Note: CO_2e measures emissions of other greenhouse gases as against carbon dioxide

Several countries prioritised fossil fuel production in their pandemic recovery plans

Cumulative public money commitments (billion US$)



Sources: United Nations 2021 Emissions Gap and Production Gap reports

DELIBERATE OVERSIGHT

The inaction by countries world over is unpardonable, as fossil fuels are something governments have substantial control over. Countries, either directly or through state-owned companies, are responsible for over half of the world's fossil fuel production. The remaining half is closely moderated by their policies and permits.

To quantify the production gap, the UN report looks individually at three fossil fuel components: coal, oil and gas. It says that global coal, oil and gas production should annually decrease by 11 per cent, 4 per cent, and 3 per cent respectively between 2020 and 2030 to limit warming to 1.5°C.

The reality is much worse. By 2030, the world, at the current pace, would produce 240 per cent more coal, 57 per cent more oil, and 71 per cent more gas than consistent with the median 1.5°C-warming pathway; and 120 per cent more coal, 14 per cent more oil and 15 per cent more gas than consistent with the median 2°C-warming pathway.

The low commitment levels can be gauged by the fact that countries are planning to produce 5.3 gigatonnes more coal in 2030 than would be consistent with the median 1.5°C-warming pathway. The surplus is roughly equivalent to 75 per cent of current levels of global coal production.

The production gap for oil is also substantial. Nations are planning on producing around 40 million barrels (6.36 billion litres) per day more oil than would be consistent with the 1.5°C pathway in 2030. This excess is roughly equivalent to half of the current global oil production. Similarly, for gas, countries are planning on producing 2 trillion cubic metres more in 2030 than would be consistent with the median 1.5°C-warming pathway. This excess is roughly equivalent to half of the current global gas production.

As the world meets at the 26th Conference of the Parties (COP26) to the UN Framework Convention on Climate Change with this high fossil fuel dependency, it is going to be the last opportunity for the world to limit global warming. DTE @down2earthindia

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The Pandemic Journal

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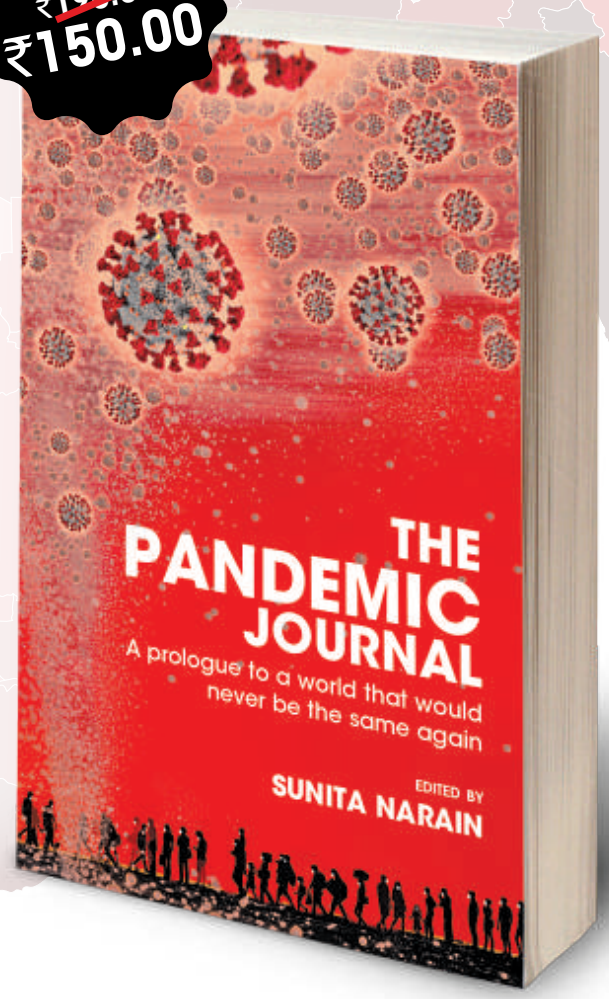

The world is living a nightmare. Something which it had only imagined in its wildest fantasies, something which was merely the stuff of countless films and fiction till now, is unfolding as a horrifying reality. In just over 500 days since it sprung out of China, this once-in-a-century pandemic has brought us grovelling to our knees, drastically transforming the way we live, work, and relate to nature and to our Earth.

The Pandemic Journal is an exhaustive recounting of this nightmare, its history, evolution, impacts, and much more. Over 100 journalists have contributed to this enormous and intense chronological saga of a world teetering on the edge. These chroniclers have seen and covered it all – the virus in its various avatars and mutations - The exodus of the hapless millions from our cities - The heart-rending cries for help from thousands who saw their loved ones fall prey - The extreme vaccine chauvinism and meltdown of the globalised world...

It is all here... A story that goes way beyond all the other stories that may have been written on this crisis... A prologue to a world that would never be the same again, even if we celebrate a waning of the pandemic in the near future...

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AGENDA FOR COP26

THE 26TH session of the Conference of the Parties (COP26) to the UN Framework Convention on Climate Change is being held at a time when the impacts of global warming are more palpable than ever—both for the poor and the rich. Scientists mince no words while attributing extreme weather events to past greenhouse gas emissions and say this decade is our last chance to stay under 1.5°C, beyond which extreme weather will take hold. Poor and developing economies, shaken by the COVID-19 pandemic, are growing frustrated like never before. They demand that rich countries, who are largely responsible for the stock of greenhouse gases in the atmosphere, commit to their pledge and transfer funds to cope with climate crisis as well as for a green recovery.

Down To Earth and **the Centre for Science and Environment, Delhi,** have prepared a list of agenda items that must be brought to the table at COP26 to ensure that the world turns a corner on climate crisis at this summit in Glasgow, Scotland.

AGENDA 1: CARBON NET ZERO

PATHWAY UNCLEAR

Emissions must be negated by absorption or removal of an equivalent amount of CO_2 by various means

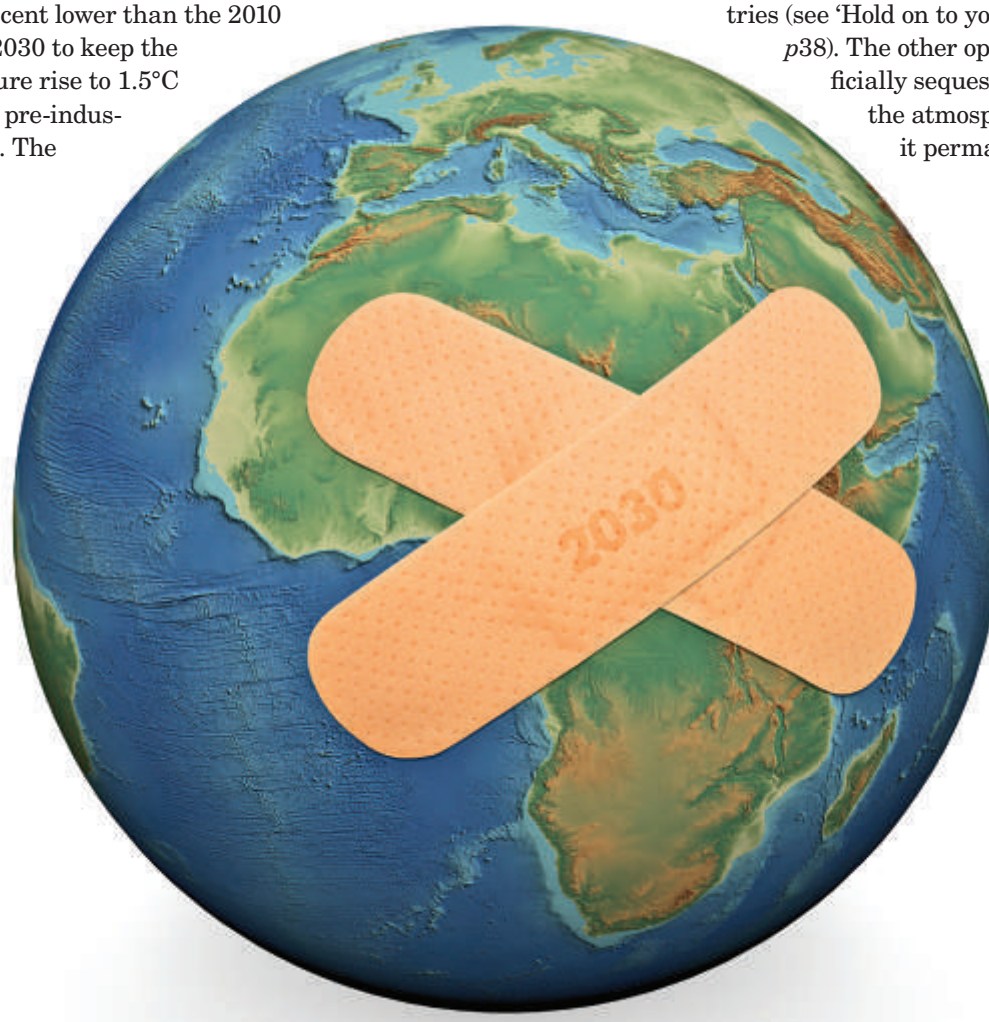
The world must become a net-zero carbon emitter by 2050 to limit the temperature rise to 1.5°C

Most nations do not have a clear plan on how to be net zero by 2050, or in the case of China, by 2060

THE RACE to "net zero" has become a rallying point for leaders and civil society alike. But this call for action, however shrill, discounts what it means for the rich and poor countries to get the world to the point when, as the Intergovernmental Panel on Climate Change (IPCC) says, "human activities result in no net effect on the climate system."

Net zero is not part of the Paris Agreement, an international treaty on climate change, adopted in 2015. It emerged as a concept in IPCC's 2018 special report "Global Warming of 1.5°C" (SR1.5), which said global emissions need to be 45 per cent lower than the 2010 levels in 2030 to keep the temperature rise to 1.5°C above the pre-industrial level. The world must also become a net zero carbon emitter by 2050, the report said. To stay under 2°C, it has to be net zero between 2070 and 2085.

This means carbon dioxide (CO_2) emissions must be negated by an equivalent amount of CO_2 absorbed or removed by various means. To keep emissions "net-net", countries can either plant trees and restore ecosystems in their territories for sequestering CO_2 (see 'Nature's army' on *p*49), or increase the carbon offset programme of the world so that trees planted in the homes and habitats of poor countries are accounted in the carbon balance sheet of the rich paying countries (see 'Hold on to your stocks' on *p*38). The other option is to artificially sequester CO_2 from the atmosphere and bury it permanently in the



ground using carbon removal technologies.

Of the 192 countries who have signed the UN Framework Convention on Climate Change, 65 have announced national net-zero targets (see 'Walk the talk' on *p*30). By 2021, Bhutan and Suriname are the only two countries that have achieved net zero—meaning, they sequester more carbon in their forests than they emit. Uruguay has set an ambitious net-zero target for 2030, and the rest of the countries have said that they will get there by 2050. China has set a target of 2060.

It is clear that the idea of net zero is aspirational. It provides momentum for change. Some countries have strengthened this intent through national legislation. In fact, 21 per cent of the world's 2,000 largest public companies have also announced net-zero targets as of March 2021.

BUT HOW TO GET THERE?

Most countries do not yet have clear plans on how to achieve net zero by 2050, or in the case of China, by 2060. Most projections rely on removing CO_2 from the atmosphere by enhancing the planet's natural carbon sinks or through carbon removal technologies.

Let's analyse the natural sinks. Land and the oceans absorb carbon and thus play a key role in the carbon cycle. However, even in the best-case scenario, major components of the land-based sinks, such as forests and soil, cannot sequester all the carbon we currently emit. IPCC estimates that through afforestation and reduced deforestation, forests can sequester between 0.4 and 5.8 gigatonnes (Gt) of CO_2 a year; and through sustainable land management policies, soil can sequester between 0.4 and 8.6 $GtCO_2$ a year. By comparison, the energy sector emitted 33 $GtCO_2$ in 2018; coal alone accounted for over 10 $GtCO_2$ of this. Besides, forests are already under threat from wildfires, drought, rising temperatures and industrial logging.

No doubt, preserving natural intact forests and promoting responsible use of forests and agro-ecology in partnership with communities has countless co-benefits. But this cannot act as a substitute for emissions reductions.

Now, let's analyse carbon removal technologies. The best-known technologies are: Carbon Capture and Storage (CCS), Direct Air Capture and Storage (DACS) and Bioenergy with Carbon Capture and Storage (BECCS). CCS captures waste CO_2 from large sources such as factories or fossil fuel power plants and stores it underground. IPCC's SR1.5 report sees a limited role for it because electricity production needs to be largely shifted to renewable sources by 2050. Coal power plants, even with CCS, need to be completely phased out by 2050. CCS will also not have much impact when used in natural gas power plants as its share in the electricity mix, as IPCC indicates, will be be limited to 8 per cent by 20250. Despite its existence since the 1970s, CCS is yet to scale up to levels adequate to meet IPCC's goals. As of 2020, the world had 26 operational CCS facilities capturing 36-40 megatonnes of CO_2 per year, according to the Global CCS Institute, an international think tank. Of them, 24 were in industries and two in coal power plants.

Direct Air Capture and Storage (DACS) technology, as the name suggests, sucks CO_2 directly from the air. Among the various carbon removal technologies, DACS is the only one that can remove carbon at climate-significant scales. If it is run on renewable energy, it could deliver negative emissions. However, it consumes large amounts of electricity, making the technology expensive—US $94-232 per tonne of CO_2e.

The planet's emissions are too much for its forests to sequester and carbon removal technologies are too expensive to be used at scale. There really is no substitute to reducing emissions

WALK THE TALK

54 parties, representing 65 countries and 58.3 per cent of global GHG emissions, have communicated a net-zero target

Source: Climate Watch Data, as on October 23, 2021

If the world needs to be net zero by 2050, developed countries should have already turned net zero or do so latest by 2030

Bio-Energy Carbon Capture and Storage (BECCS), which captures CO_2 from biomass-based power plants, has been granted a bigger role in IPCC's SR1.5 report. It says BECCS needs to sequester up to 8 $GtCO_2e$ each year by 2050, but currently all active BECCS projects sequester a total of 0.0015 $GtCO_2e$ per year. Economic viability of the technology is also highly uncertain—the cost is estimated at $15-400 per tonne CO_2e. Besides, BECCS threatens food security by promoting diversion of land for biofuel production. It is estimated that rolling out BECCS at scale will require up to 3,000 million hectares—about twice the land currently under cultivation globally.

NET ZERO INEQUITABLE

IPCC states that the world must reach net zero by 2050. Given the highly disproportionate emissions between developed countries and the rest of the world, it would be logical to say that if the entire world needs to be net zero by 2050, developed countries should have already turned net zero or do so latest by 2030. This would provide space for countries like India—way below in the list of countries responsible for historical emissions and current emissions—to set their net-zero targets by 2050.

In today's scenario, when rich countries are dragging their feet on net zero emissions, what could or should India do? Should it set its net-zero goal for 2070—20 years after the US and Europe and 10 years after China? What should countries of Africa do? Declare net-zero by 2080? What will this mean for climate crisis and the need to keep temperature rise to 1.5°C?

Then there is the question of the carbon budget, which is limited and has already been appropriated. IPCC says to stay below 1.5°C rise, the world is left with a carbon budget of 400 Gt from 2020. The net-zero plans of the historical polluters and China shows that these countries would continue to occupy and even appropriate more carbon space. So, at COP26, the world must focus on plans and targets for 2030 and make sure that these are achieved. Otherwise, the world will lose more time. This clearly is not an option.

AGENDA 2: COAL

FUEL OF COMFORT

Coal has fuelled developed nations' prosperity; developing nations still need it for economic growth

The fuel accounts for 34% of the world's electricity production in 2020

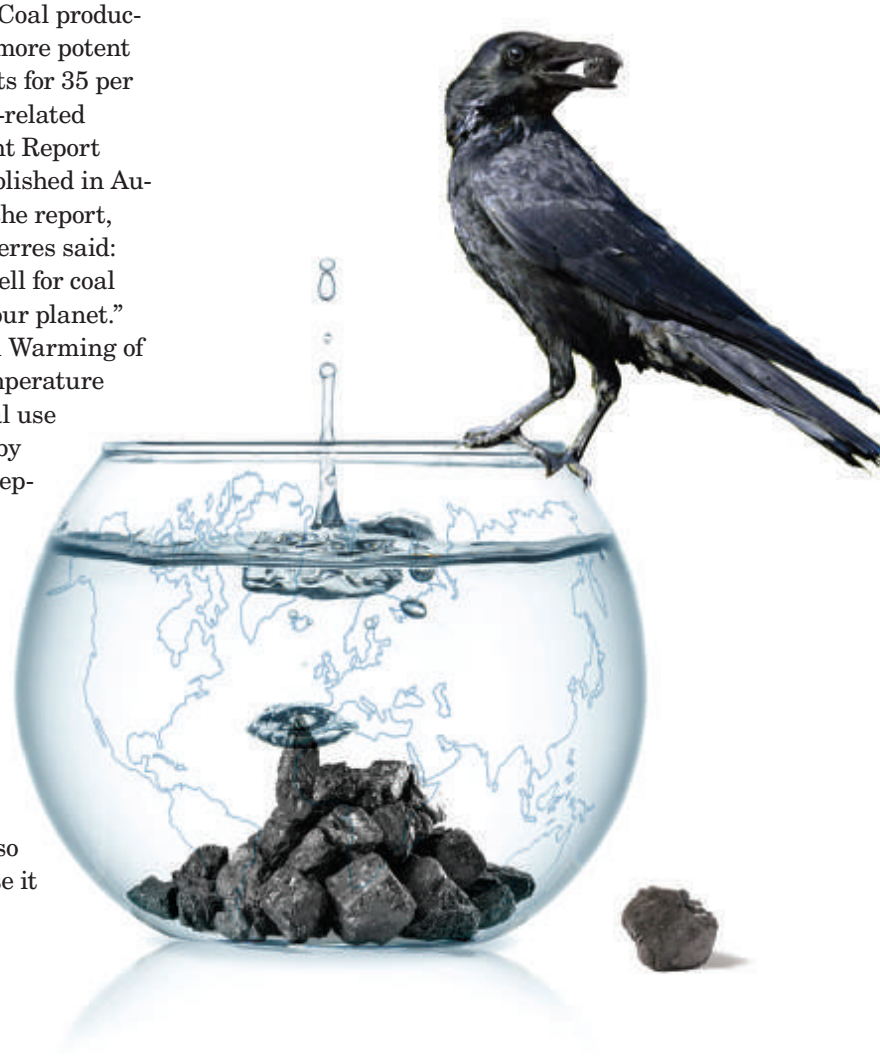
Its share in electricity mix should reduce to almost 0% by 2050 for the world to stay on the 1.5°C path

THE HOTTEST and most contentious issue that is not on the formal table of negotiations but is on the public-political radar is the phasing out of coal—not just in the developed world but also in the world where energy is still scarce and coal is the cheaper and preferred option over new renewables. There is no question that coal is bad for climate.

Among fossil fuels, coal has the highest contribution to carbon dioxide (CO_2) emissions. Of the 36.44 gigatonnes (Gt) of CO_2 emitted from the burning of fossil fuels in 2019, almost 40 per cent came from coal-fired power plants and industry (see 'Fossil dependent', *p*32). Coal production also releases methane (CH_4), a more potent greenhouse gas than CO_2; it accounts for 35 per cent of CH_4 emitted by all fossil fuel-related sources, says IPCC's Sixth Assessment Report (AR6), the first part of which was published in August 2021. Following the release of the report, UN Secretary General Antonio Guterres said: "This report must sound a death knell for coal and fossil fuels before they destroy our planet."

IPCC's 2018 special report "Global Warming of 1.5°C" (SR15) states that to limit temperature rise to below the threshold level, coal use for power generation needs to peak by 2020. Its use should then reduce steeply in all 1.5°C-consistent pathways and its share in electricity mix should reduce to close to 0 per cent by 2050 (with 66 per cent reduction by 2030). The report also provides a region-wise schedule. OECD countries (Organisation for Economic Co-operation and Development) and the former Soviet Union countries should be the first ones to phase out coal, and they need to be so by 2031. Latin America should phase it out by 2032, West Asia and Africa by 2034, and non-OECD Asia by 2037.

No doubt that coal—black gold of yesterday—has taken a hit. According to the AR6 report, fossil CO_2 emissions have slowed down in the past decade. CO_2 emissions from coal use grew at 4.8 per cent per year in the 2000s but slowed to 0.4 per cent per year in the 2010s. The global pipeline of proposed coal power plants has collapsed by 76 per cent since the Paris Agreement in 2015, and 1,175 GW of planned coal-fired power projects have been cancelled in this period, said analytics group E3G in September 2021.



The countries occupying the majority of the world's remaining coal pipeline are China, India, Vietnam, Indonesia, Turkey and Bangladesh—predominately Asian countries. Chinese President Xi Jinping announced at the UN General Assembly in September 2021 that China will no longer build coal-fired power projects abroad. He did not however say anything about the coal power plants in his country. China alone contributed 50 per cent of the world's CO_2 emissions from coal in 2019, and runs over half of the world's operating fleet, which is still growing.

Other major consumers of coal are Japan, South Africa, Russia and South Korea. None of them have a target date to phase out coal. Within the EU-27, Germany has the largest coal fleet—its phase-out target is 2038, with added effort to advance the date to 2030.

Despite the progress, coal still accounts for 34 per cent of the world's power production in 2020. The 2021 Production Gap Report by the UN Environment Programme (UNEP) warns that production plans and projections by governments would lead to around 240 per cent more use of coal in 2030 than the levels consistent with limiting warming to 1.5°C (see 'Borrowed time' on *p*23).

EMPTY GRANDSTANDING

Unabated coal use fuelled the industrialisation of now-developed nations and enabled their path to prosperity. Till 1970, the EU, US and Russia were the largest consumers of coal. In subsequent decades, they reduced their dependence on it due to the availability of abundant, cheaper natural gas. Developing nations, however, continued to rely on coal to fulfil their economic needs. As a result, today Asia Pacific is the highest consumer of coal. Within the region, China, now a global superpower and developed nation, uses the lion's share; in 2020, it accounted for 68 per cent of the 33,604 terawatt-hours (TWh) of coal power generated in the region.

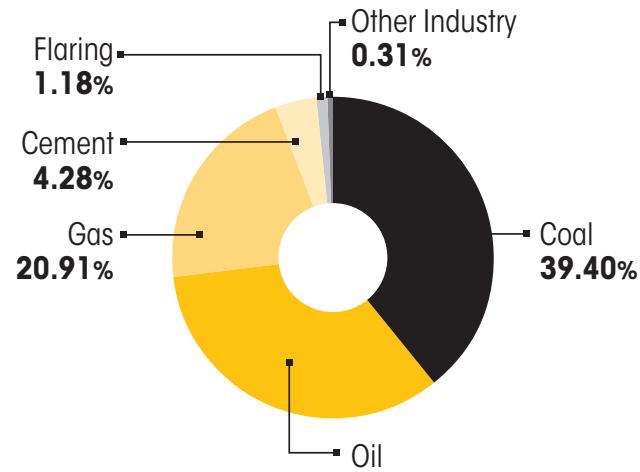
Coal will be a key point of discussion at the 2021 UN climate change conference (COP26) in Glasgow, Scotland. Developed countries such as the US and UK have the loudest voices in the chorus against coal. US Special Presidential Envoy for Climate John Kerry attempted to remind economies like India and China about the perils of relying on coal during his diplomatic tour in early 2021. A key focus of his trip was "supporting India in mitigating its fossil energy use", a US embassy spokesperson said. This is not misplaced, considering that India still gets over 70 per cent of its energy from coal. But the US itself is not free of coal, let alone other fossil fuels. While it has drastically reduced the use of coal since the early 2000s due to a boom in shale gas, its coal consumption in 2020 was about 2,556 TWh, compared to India's 4,871 TWh. Thus India does use twice as much coal but with a population four times larger than the US.

In August 2021, UK Prime Minister Boris Johnson said, "We know what must be done to limit global warming—consign coal to history and shift to clean energy sources, protect nature and provide climate finance for countries on the frontline". But the UK's energy mix is still heavily dependent on oil and gas—natural gas is not a "clean energy source", regardless of what is said about its potential as a "bridge fuel" towards renewables. Even as Johnson's government prepares to host COP26, UK, has turned its coal-fired power plants back on because of record high nature gas prices.

So, there is still a long way to go before the world can meet to discuss climate crisis and the light bulbs are not powered by coal.

FOSSIL DEPENDENT

Coal, oil and gas accounted for over 90 per cent of the world's CO_2 emissions in 2019



Source: Global Carbon Project

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Our Founding Dean **Armin Rosencranz** *(A.B., Princeton University; J.D., M.A., PhD, Stanford University)*, is one of the leading global experts in environmental law, policy and climate change. Apart from being a Trustee member of Stanford, he has taught Environmental and Natural Resources Policy, Energy Policy and Climate Change at Stanford University and University of California at Berkley for close to three decades and has been teaching at Jindal Global Law School since 2014/15.

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AGENDA 3: CHINA

RISE OF DRAGON NATION

By 2005, China's CO_2 emissions surpassed the US' and the country is currently the world's largest emitter

China says it will not build coal-fired power projects abroad but is silent about such plants at home

Despite its renewable energy plans, China will not be carbon neutral unless it curbs its coal power production

THERE IS a before-China and after-China period in climate change. Till the early 2000s, the US, EU, UK, Russia, Australia, Canada and Japan dominated global emissions. But this has changed significantly from the time China joined the World Trade Organization and became the factory of the world. By 2005, China's carbon dioxide (CO_2) emissions surpassed the US and the country is currently the world's largest emitter.

Between 1990 and 2019, China increased its share of global CO_2 emissions from 5.11 per cent to 20.72 per cent (see 'Chinese domination' on *p*35). In 2019 alone, it emitted roughly 28 per cent of the world's emissions—a whopping 10.17 gigatonnes (Gt) of CO_2. Because it has not set a quantifiable target for reduction—its Nationally Determined Contribution (NDC) is based on carbon intensity reduction—its emissions are expected to continue to grow in this decade.

According to an analysis by *Down To Earth* and the Centre for Science and Environment in Delhi, China will emit another 126 Gt of CO_2 and occupy 30 per cent of the remaining carbon budget for this decade (see 'The numbers behind climate change' on *p*8).

China's rapid growth is visible in terms of the fact that it has exceeded emissions of the other developed countries in a matter of two decades or so. By comparison, the historical emitters had over a century to reach this level. On cumulative terms, however, China's contribution is lower than the other historical polluters.

In terms of per capita emissions, China emitted 10.5 tonnes in 2019—five times that of India's meagre 1.9 tonnes of per capita CO_2 emission. This is despite the fact that both the countries have a comparable population.

This is also because China is the world's manufacturing hub, producing industrial and consumer goods used by most other countries. So, if the carbon accounting was done based on the consumption of goods then China's share in emissions would go down. This outsourcing of emissions is reflected in international trade—the import of consumer goods and services by the developed world. According to estimates of *Our World in Data*, an online data-based publication,

China in 2018 had the highest net exported CO_2 emissions (net value of -9.9 $GtCO_2$ derived from subtracting export-related emissions from those related to imports).

A more recent report by Lucas Chancel, a French economist, finds that if the carbon emissions embedded in goods and services imported and exported was accounted in carbon emission estimates, then EU emissions would be 25 per cent higher than reported. And China's emissions would go down in this way of carbon accounting—an inconvenient truth about the international trade.

HOLLOW GOALS

China's official NDC (Nationally Determined Contribution), submitted in Paris in 2016, is based on a carbon intensity target. In September 2020, President Xi Jinping announced that China will "aim to have CO_2 emissions peak before 2030 and achieve carbon neutrality before 2060". Xi Jinping also announced at the UN General Assembly in September 2021 that China will no longer build coal-fired power projects abroad. He did not, however, say anything about the coal-fired power plants in his country.

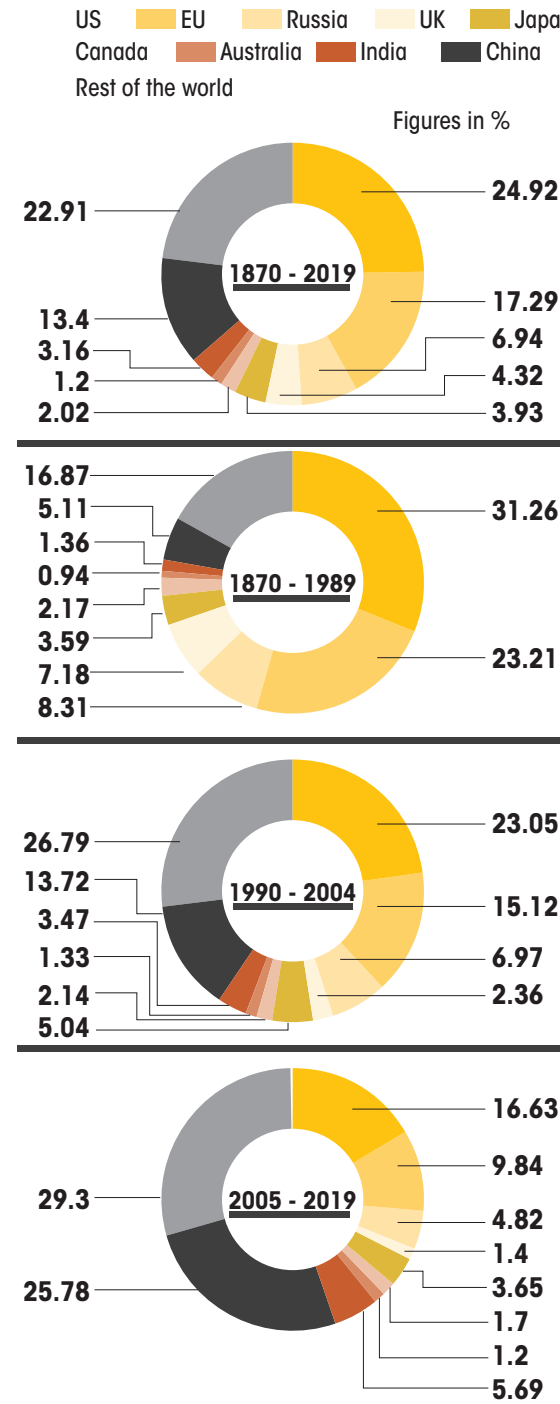
There is no doubt that China's announcement to halt the building of new coal power plants abroad is significant. More than 70 per cent of all coal plants built are reliant on Chinese funding, according to news outlet *Quartz*. China, mainly through its Belt and Road Initiative, has committed over US $50 billion in state finance to build 26.8 gigawatts (GW) of overseas coal facilities across 152 countries since 2013. These coal-based power plants were being built in energy-starved regions of the world.

But China's own domestic coal consumption is equally gargantuan. The country still runs over half of the world's operating coal fleet, which is growing. China's total installed coal capacity is estimated at 1,050 GW in 2020, half of the global total.

In 2020, China put another 38.4 GW of new coal-fired power capacity into operation—more than three times the amount that is being built elsewhere around the world. And so, despite all the talk about China's renewable energy, it is still dependent on coal for power—60.75 per cent of its electricity came from coal in 2020 while

CHINESE DOMINATION

From 5.1 per cent in 1870-1989, China's share in global CO_2 emissions has increased to over 25 per cent in 2005-2019



Source: Analysis by *Down To Earth* and Centre for Science and Environment, Delhi, based on data from Climate Watch and Our World in Data

If its current emissions continue, China could eat into one-third of the remaining carbon budget in this decade itself. This must be in the spotlight at the 26th session of the Conference of the Parties

20.02 per cent came from low-carbon sources like solar, wind and hydropower. India's non-fossil energy generation capacity is in fact higher than that of China.

This is when IPCC in its 2018 special report "Global Warming of 1.5°C" states that there must be a near-total reduction in coal use for electricity generation by 2050, with reductions of approximately two-thirds by 2030. Research by the Chinese Academy of Sciences in Beijing suggests that to achieve the Paris Agreement's goals, China would need to reduce its demand for coal to nearly zero by 2050, rather than increase it. The country will also need to cut its total CO_2 emissions and energy consumption by more than 90 per cent and 39 per cent by 2050. But all this suggests that China can continue to grow in this decade and contribute to the stock of greenhouse gas emissions in the atmosphere.

Given that the carbon budget is limited and given that the life span of CO_2 is long—it can stay in the atmosphere from 150 to 200 years—China must "front-load" its emission reduction in this decade itself.

RENEWABLES CAN'T OFFSET CARBON

Other than coal, China has made massive investments in renewable energy and electric vehicles, and surpasses all other countries in production capacity. This means, China will also be in the forefront to supply the world with clean energy technology, and in this way benefit from the climate mitigation efforts of the world.

China dominates every step of the global solar supply chain. For solar photovoltaic cells, Chinese companies have the lion's share of global manufacturing—it ranks first in the production of wafers, cells and modules globally. This market capture means that the world is heavily reliant on China for its ambitious renewable energy needs. Polysilicon, produced from silicon dioxide, is the key feedstock for solar cells. Xinjiang in Northwest China produces nearly half the world's polysilicon supply.

Business news network *Bloomberg* reports that these factories are also accused of using forced labour from the Uyghur community, an ethnic minority in China. In the lithium-ion battery supply chain, China controls 80 per cent of the world's raw material refining, 77 per cent of the world's cell capacity and 60 per cent of the world's component manufacturing, according to data from BloombergNEF, research service of the news network.

In terms of domestic renewable energy, China has an installed capacity of 253 GW of solar energy and 288 GW of wind energy by 2020. And as per its NDC, the plan is to augment the capacity to 1,200 GW by 2030, as against India's plan for 450 GW by 2030.

Despite its lofty renewable energy plans, China's goal for carbon neutrality will be unachievable unless it curbs its growing coal power production. To accelerate its efforts, it has announced massive tree planting initiatives—3.6 million hectares of new forest a year. But decarbonising its energy and industrial sectors must remain its top priority.

As the new global superpower and polluter, China's emissions will have a significant impact on the world's ability to achieve its climate goals. If its current emissions continue, it could eat into one-third of the remaining carbon budget in this decade itself. Clearly, this decade must belong to China and its drastic efforts to reduce greenhouse gas emissions. And this must be in the spotlight at the 26th session of the Conference of the Parties (COP26) to the UN Framework Convention on Climate Change meet at Glasgow, Scotland.

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AGENDA 4: MARKET MECHANISMS

HOLD ON TO YOUR STOCKS

The developed world hopes to invest in emissions reduction in Global South via markets for carbon credits

The developing world needs finances to build low-carbon economic pathways

But since all countries have emission reduction targets, selling credits can be a judgement call

MARKET IS the way the developed world hopes it will be able to invest in emission reduction in the countries of Global South and get credits in its carbon balance sheet. The Paris Agreement includes "market mechanism" as the tool to make this happen and at COP26, this component of the Paris Rulebook (Article 6)—on how to work the markets—needs to be finalised.

The Kyoto Protocol, the first accord under the UN Framework Convention on Climate Change that came into force 2005, had established Clean Development Mechanism (CDM) for this carbon purchase. The Paris Agreement includes provision for two types of market instruments—Internationally Transferred Mitigation Outcomes (ITMO) under Article 6.2 and Sustainable Development Mechanism (SDM) under Article 6.4 (see 'Market matters' on *p*39).

Under ITMO, the aim is to establish bilateral or mini-multilateral markets—similar to the EU Emissions Trading System. It is also about securing overall mitigation in global emissions. While finalising its text at the 2019 UN climate change conference (COP25), parties were "strongly encouraged" to cancel a portion of traded offsets to support overall mitigation. The other politically fraught issue was setting aside a share of the proceeds from Article 6 for adaptation activities in the most vulnerable countries. This was supported by the African group of countries, the G77 and China, and was opposed by developed

countries including the US and Europe as they saw it as a "transaction tax".

Under SDM, the aim was to create a new international carbon market for the trade of emissions cuts, created by the public or private sector anywhere in the world, shaped on the previous CDM. This sub-article is clear that there cannot be "double-counting"—a carbon credit can only be counted towards achieving the national target (Nationally Determined Contribution, or NDC) of a country. Preventing double-counting is harder under the Paris Agreement than under the Kyoto Protocol. This is because, unlike Kyoto Protocol, all countries have taken on national targets (NDCs) under the Paris Agreement.

The carbon market mechanisms are thus fraught with the following issues:

- NDCs of Parties are not standardised which makes the counting of carbon credits difficult.
- Should carbon credits from CDM under the Kyoto Protocol be allowed to be carried forward to SDM under the Article 6.4?
- Can the credits generated be used across NDCs and should their value change with the increasing ambition of the NDCs?
- How can we ensure overall mitigation is achieved under the market mechanisms?
- How can the highest possible share of proceeds be assured for adaptation activities in the countries most vulnerable to climate change such as those part of the AOSIS?

In the pre-COP26 discussions held in Italy, Ministers were asked to focus on three issues: avoiding double use through the Article 6.4 mechanism; the use of pre-2020 units to meet NDCs; and supporting adaptation finance through Article 6. Their positions remain divergent. Many ministers expressed their view that the options for compromise were not consistent with the aim of raising ambition, including in the context of the Paris temperature goal. So negotiations on this issue will continue at COP26.

The question is not the use of the "market" but what the market is meant for? This is where the world needs to learn from the previous experiment with CDM. It was designed to capture the lowest cost options but did not lead to real mitigation and transformation. It is clear that the developing world needs finances for building a low-carbon economic pathway and in this the market, the use of carbon credits can play a role. But this time, unlike Kyoto Protocol, all countries are expected to take emission reduction targets and so, it is not in their interest to "sell off" their lowest cost options. Instead the market should be designed so that it can invest in high-cost and transformational sectors so that economies can be re-engineered for the future challenges. It should be robust, but simple and driven by policy imperatives for transformation.

Sadly, the discussions are mirroring the past. CDM was plagued by the problem of excessive control, multi-layered and costly verification, and convoluted rules. It did not work for transformation, but for transactions that were mutually beneficial to corporations in the North and the South. It would be disastrous if COP26 was to construct another CDM-type market mechanism. This is not what is needed today, or tomorrow.

MARKET MATTERS

There are two types of market instruments under the Paris Agreement

Internationally Transferred Mitigation Outcomes		Sustainable Development Mechanism
Bilateral and multilateral	TYPE OF MARKET	Global and centralised
No direct precursor but it would apply to markets like the EU Emissions Trading System	PRECURSOR	Clean Development Mechanism
Internationally Transferred Mitigation Outcomes; not standardised	UNIT	Article 6, para 4, emission reduction; Equivalent of one
●Promote sustainable development ●Ensure environmental integrity ●Avoid double counting	TRADING SHOULD	●Foster sustainable development ●Ensure overall mitigation of global green house gas emissions
No provision	SHARE OF PROCEEDS	Will go toward adaptation in developing countries

Source: UNFCCC

AGENDA 5: CLIMATE FINANCE

NO SHOW

Several institutions and funds have been created, but the flow of real money is still illusionary

Paris Agreement says rich nations must transfer $100 billion annually through 2025 to poor countries

Only Germany, Norway and Sweden are paying their fair share of the $100 billion a year

IT IS CLEAR that the world cannot combat climate crisis without the transfer of funds from developed countries. These are countries whose stock of emissions in the atmosphere has already forced temperatures to rise also in developing countries. The UN Framework Convention on Climate Change (UNFCCC) when established in 1992 had recognised finance and technology transfer as two critical pillars for transformation—the idea is if funds are provided, developing and emerging economies whose emission footprint is still small can grow, but differently. Then, of course, there is the need for funds for adaptation and to pay for loss and damage in these countries. Finance is thus a key element of the climate change conundrum.

Over the years, much has been said about the need to secure this fund transfer. Several institutions and funds have also been created. But the flow of real money is still illusionary and inadequate.

In 1994, Washington-based Global Environment Facility (GEF) was given the charge to manage financial transfers under UNFCCC. In 2001, the Adaptation Fund was set up under the Kyoto Protocol to finance concrete adaptation projects and programmes in developing countries. At the 2010 UN climate change conference (COP16), the Green Climate Fund (GCF) was established. It was made a designated entity of the financial mechanism in 2011 with the setting up of two funds under it: Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF). At COP16, parties to the convention decided to set up the Standing Committee on Finance (SCF) to help them make informed decisions on funding. So, there is no dearth of mechanisms to fund adaptation projects. Rather, availability of funds is the problem.

At COP15 in Copenhagen in 2009, developed countries committed to a goal of jointly mobilising US $100 billion per year by 2020 to address the needs of developing countries. Article 9 of the Paris Agreement also stipulates, "Developed country Parties shall provide financial resources to assist developing country Parties with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention." The Paris Agreement reiterated the goal set by the Copenhagen Accord that $100 billion must be transferred annually through 2025 by developed nations, after which it would be revised upwards from a floor of $100 billion.

But several details were not clarified, such as the financial instruments that could be used, and the types of projects that could be counted as eligible for climate finance. As a result, a number of anomalies crept in. Funds that were loans were counted as climate finance; even commercial agreements were bundled into finance. So, there

The fact that two-thirds of climate finance comes in the form of loans also creates a 'climate debt trap' which is worsening the financial harm caused by COVID-19

is no real accounting or verification of what has actually been transferred and no clarity on whether the fund is related to climate change or commercial activities.

DOWN THE DRAIN

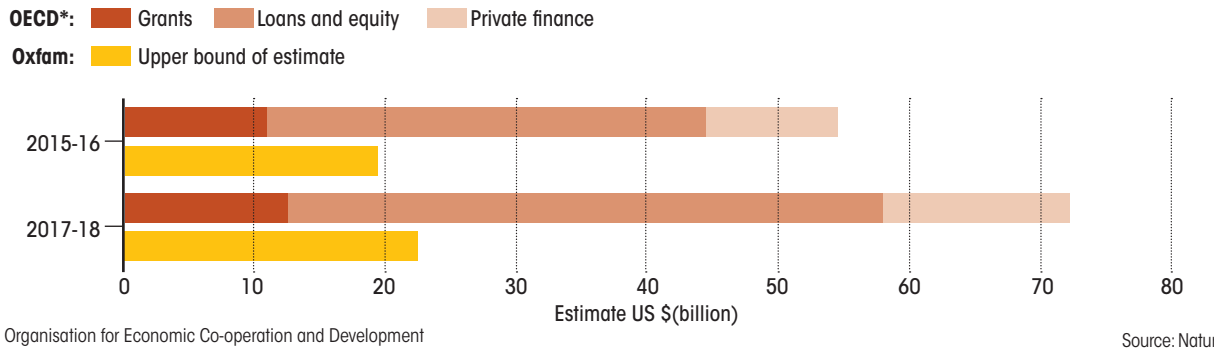
India's finance minister Nirmala Sitharaman called this out recently, when she told the media during her visit to Washington DC that there was a complete lack of clarity on what measures would be used to account for climate finance and if it is part of the $100 billion commitment.

It is for this reason that there are different estimates of the volume of climate finance that has been generated and transferred—all adding to the trust deficit between countries. If the estimate from the OECD countries (Organisation for Economic Co-operation and Development), which represents the club of rich countries, is considered, they have contributed $80 billion in climate finance to developing countries in 2019, up from $78 billion in 2018. This is close to the goal. But according to charity organisation Oxfam, public climate financing in 2017-18 was $19- $22.5 billion, which was around one-third of the OECD's estimate, as revealed in a detailed analysis published in science magazine, *Nature* (see 'Inflated figures').

Oxfam published these estimates in its Climate Finance Shadow Report 2020. It also found that around $47 billion of the total climate financing of $59.5 billion pledged in 2017-2018 was forwarded as loans. In total, developed countries gave only $12.5 billion in the form of grants, $22 billion in loans with better-than-market rates and around $24 billion in loans with standard market rates. Providing climate financing in the form of loans and other non-grant instruments "risked contributing to the unsustainable debt burdens of many low-income countries", the document said. The fact that two-thirds of climate finance comes in the form of loans also creates a "climate debt trap" which is worsening the financial harm caused by COVID-19, as an unnamed COP negotiator mentioned in an article for *The Guardian*.

INFLATED FIGURES

Charities claim that climate aid is worth much less than what it seems, in part because a lot of it comes as loans, not grants



* Organisation for Economic Co-operation and Development

Source: Nature

It is also important to note that the NDCs of many countries are conditional—that is they will be made operational based on the finances that are made available as promised

Citing Oxfam researchers, *Nature* reported in its investigation, that "Japan, for instance, treats the full value of some aid projects as 'climate relevant' even when they don't exclusively target climate action." It also found that OECD included some road construction projects as climate aid.

Oxfam also found that only a fifth (20.5 per cent) of climate financing went to Least Developed Countries (LDCs) and just three per cent to Small Island Developing States (SIDS).

The Paris Agreement also requires that funding for mitigation and adaptation be balanced. But this is not the case. A bulk of climate finance flows to mitigation, Oxfam found. Only a quarter of funding was spent in helping countries adapt to the impacts of climate crises, while about 66 per cent of it was spent helping countries cut emissions or climate mitigation. The report did note that the amount of funding for climate adaptation had increased. It had risen to $15 billion per year in 2017-2018 from $9 billion per year in 2015-2016.

UK-based think tank Overseas Development Institute (ODI) has found that of the developed nations, only Germany, Norway and Sweden are paying their fair share of the $100 billion a year using public climate finance. Most other developed countries have no adequate plan in the pipeline to ensure that they would be able to fulfil their commitments. A report titled, Hollow Promises, by CARE, a development organisation, analysed 24 countries, of which only three—Luxembourg, New Zealand and the UK—have put forward a plan to increase their climate finance across multiple years.

The biggest shortfall comes from the US, which has provided less funding than France, Germany, Japan or the UK, even though its economy is larger than all of them combined, says ODI. The US transferred $1 billion during Barack Obama's second stint as president, but no funds were contributed during Donald Trump's presidency. In September 2021, at the UN General Assembly, US President Joe Biden announced that his government would double its climate finance contribution to $11.4 billion a year by 2024—double of the April 2021 pledge he had made of $5.7 billion. According to "Fair Shares Nationally Determined Contribution", a document endorsed by several prominent development groups including ActionAid, the US Climate Action Network, Friends of the Earth US and 350.org, the US should contribute $800 billion between 2021-2030.

ELEPHANT IN THE ROOM

Clearly, the question of finance, remains the biggest issue and hurdle in climate change talks. And this, when the need is massive—both to pay for the energy transformation in the still-not-polluting world and also to pay for adaptation costs as extreme events continue to rise and cripple the poor economies.

The climate convention's Standing Committee on Finance in October 2021 has said that developing countries need an upwards of $5.8 trillion by 2030, to finance less than half of the climate actions listed in their Nationally Determined Contributions (NDCs). It is also important to note that the NDCs of many countries are conditional—that is they will be made operational based on the finances that are made available as promised. UNEP estimates that annual adaptation costs in developing countries will reach $140 to 300 billion per year by 2030, which is perhaps an underestimate given the frequency and intensity of extreme weather-related disasters that are hitting these countries.

This then is the biggest issue on the table at COP26, fair and square.

Faculty Director, Environment Hub at Krea University

About the Environment Hub:
Krea University aims to establish, develop, and consolidate a centre/hub on the environment that is an umbrella body for research and outreach on the environment at the university.

The overall mission of the centre/hub is to enable cross-disciplinary and inter-disciplinary approaches to environmental challenges in a changing world. The environment centre/hub both in intellectual and conceptual terms requires engagement across the natural and humanistic sciences, and with theory as well as practice.

Among the main goals, the centre/hub shall:
(1) Foster a collaborative ecosystem across the university for scholarship within and importantly across disciplines. The hub on environment and the Director will foster dialogue as part of a broader canvas.
(2) Promote and engage in debate, dialogue and conversation in the university and beyond, making the centre a hub as well as a cross road for critical innovative and engaged ways of thinking about the environment.
(3) Foster research along identified key thematic areas and help develop and explore new curriculum/pedagogy across disciplines.
(4) Help develop the framework for a future PhD Programme on the Environment.
(5) Work with the university faculty to develop the one year Post graduate diploma programme of the School of Interwoven Arts and Sciences. Help explore and develop other programmes that the university can offer with a focus on capacity building on the environment and sustainable futures.
(6) Facilitate outreach to different sections of society such as the ongoing film on water and other such ways to engage civil society and the wider world.
(7) Take steps that seem relevant to make the Krea initiatives on the environment and its engagement with contemporary environmental challenges both vibrant and meaningful in the longer term.

Role & Responsibilities:
The Director of the Environment hub / centre shall lead the efforts to build a research centre of repute on the environment. The Director of the research centre shall also normally be a member of the Krea faculty.

The responsibilities of the Director shall include:
- Developing the strategic plan for the Environment hub / centre and its associated initiatives in alignment with the mission, research vision and goals of the university
- Establishing together with the university leadership the advisory and governance structure for the hub/centre and engaging effectively with such members to meet the objectives of the environment hub
- Promoting and facilitating inter-disciplinary research among faculty, postdoctoral fellows, and students in collaboration with research scholars and staff at the centre / hub
- Managing the research plan and ensure that the highest standards of research and ethical behaviour are defined and met
- Undertaking high quality research in the centre and disseminating the same to build the reputation of the centre and enable grants and collaborations.
- Developing local, national and international networks for collaborations with public and private research and advocacy institutions and for research collaborations with industry
- Representing the interests of the centre internally and externally
- Financial and administrative responsibility for the smooth operation of the centre/hub
- Supporting fundraising initiatives to meet the resources needed for the activities of the hub/centre

Desired Profile
We are looking for a leading scholar in the environmental sciences or environmental humanities who combines first rate scholarly credentials with a good teaching record and the ability to provide leadership as well as mentor younger scholars.
- A PhD with an extensive and outstanding research profile
- Sound experience at professor or senior or equivalent level in a university or a research institution is desirable. A sound research record with quality publications and proven teaching and organisational ability is essential. 10 years of experience at a professor level will help but is not a prerequisite.
- Proven track record of mentoring early career academics including PhD students.
- Proven leadership skills and the ability to inspire and promote a culture of critical thought, research and innovation.
- Ability to collaborate with internal and external stakeholders to develop research programs and initiatives and monitor their planning and implementation.
- Ability to develop and maintain relationships with external stake holders and to develop partnerships and collaborations.
- Understanding of the research funding ecosystem – government and private.
- Proven strategic and operations management capabilities in the administration of research centres and/or research initiatives and programs.

Important:
The position of Faculty Director - Environment Hub shall be held for a period of three years only, extendable by a maximum period of two years. The faculty position shall be with full tenure. There can be adjustment in regular course load for the time as Director.

Candidates are requested to send cv, names and details of three referees. They are encouraged to share a short statement on vision for the centre.

Please send all applications to **careers@krea.edu.in**

AGENDA 6: ADAPTATION GOAL

COST OF SURVIVAL

Given the frequency and severity of extreme weather events, the world needs to adapt to climate change

The cost of building resilience against weather-related devastation is massive

The ever-increasing adaptation cost has outpaced the flow of funds to developing countries

IT IS now clearer than ever that the world will have to adapt to changing climate. It is not enough to only talk about mitigation, because extreme weather events are happening with such rapidity and with such force that countries and people have to find ways of coping and managing the fallout of the calamities. But what must the world do together?

Article 7 of the Paris Agreement establishes a Global Goal on Adaptation of "enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change". The core components of the goal are interconnected and overlapping. Their progress will be assessed every five years under the Paris Agreement's Article 14, Global Stocktake.

Under the Global Goal on Adaptation, countries have to develop National Adaptation Plans (NAPS), which would identify activities that need support. These are then recorded in a public registry by the UN Framework Convention on Climate Change (UNFCCC).

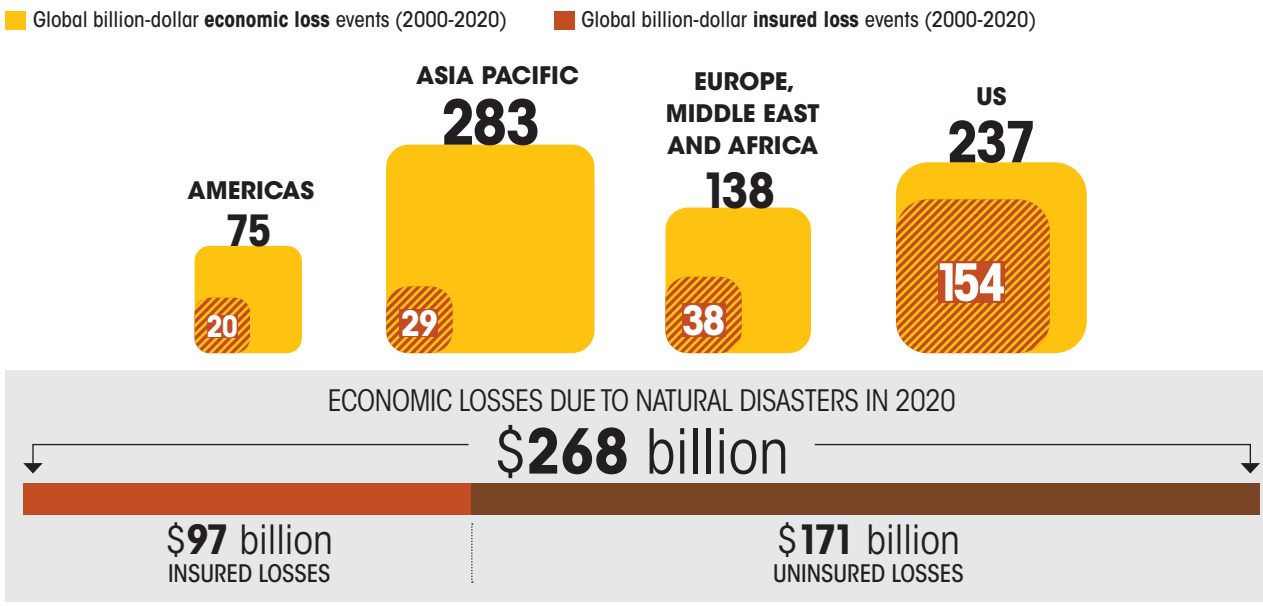
In April 2021, the Adaptation Committee, set up under UNFCCC, brought out a technical paper on how it would review the overall progress made in achieving the Global Goal on Adaptation. It details the many challenges of doing this at the global and national levels. The paper concluded that a collation of local efforts spread spatially, rather than just aggregating numbers from these locations to come up with a national total, is a far better approach for the assessment of adaptation activities. The paper defines collation as "to bring together different pieces of written information so that the similarities and differences can be seen". This would bring the necessary local context to the assessment of adaptation efforts and progress.

The fact is there is no clear definition of what the world means by "adaptation" and perhaps there can never be. This is why the work of the Adaptation Committee is becoming highly technical, so much so that it will be difficult for countries to apply this on the ground to measure, both impacts and monitor the programmes for implementation.

In the Pre-COP Chairs' Summary—a meeting held in Italy in late September with ministers and officials to discuss expectations from COP26—it was agreed that there must be a greater action on adapta-

COVERAGE COMFORT

The US had insurance cover for nearly 65 per cent of the billion-dollar economic loss events it faced in 2000-20



Source: Weather, Climate & Catastrophe Insight Report by AON, 2020

tion. Ministers wanted more discussions on the need to clarify the global goal on adaption; how progress could be assessed and the urgent need to address scaled-up finance for adaptation. This then will be the agenda for COP26.

But the real issue—the elephant in the room—is finance, or the lack of it. The cost of building resilience against weather related devastation is massive; it needs revamping of existing infrastructure to withstand storms and floods; building of advanced forecasting and early warning systems for cyclones and extreme weather events; and then, of course, development with speed to build resilience. This will need huge investment, not just in research but in supporting communities when disasters hit. We know that every disaster is not a single day event, but it cripples local economies and takes away the development dividend.

The Adaptation Gap Report 2020, released by the United Nations Environment Programme (UNEP) earlier this year, states that the adaptation finance gap is not closing—not by a long shot. The annual adaptation costs in developing countries alone are currently estimated to be in the range of US $70 billion and will reach $280-500 billion by 2030, the report says. This is possibly a gross underestimate of the costs which countries are already incurring with increased frequency of extreme weather events. Insurance broker, Aon, has estimated that in 2020, the world suffered economic losses of $268 billion from weather-related disasters, most of it uninsured and unprotected. Countries are paying the bill for this and it is costing them dearly (see 'Coverage comfort').

The Adaptation Fund, which was set up 2001, to fund projects in developing countries was financed with a share of the proceeds from the Clean Development Mechanism (CDM), established under the Kyoto Protocol. With CDM now dormant and defunct, the fund, though little, continues to be in operation under the Paris Agreement. It's a game of shells.

The issue of adaptation—the goal to make the world less vulnerable and more resilient—needs urgency and finance. This is the real agenda for the 2021 UN climate change conference (COP26).

AGENDA 7: LOSS AND DAMAGE

POLLUTER DOESN'T REALLY PAY

1970-2019 saw 11,000 climate-related disasters, with 2 million deaths and losses worth US $3.6 trillion

But the loss and damage faced by poor nations due to high emissions by rich ones is not a basis for compensation

CoP26 should make loss and damage a permanent agenda and compensate the victim nations

NEARLY 20 years after the Alliance of Small Island States demanded a mechanism within the global climate deal to compensate countries affected by sea level rise due to climate change, loss and damage has emerged as the "third pillar" of climate action after adaptation and mitigation. The 2021 UN climate change conference (COP26) should make loss and damage a permanent agenda for discussion and commit scaled-up resources to the victims as "compensation".

Article 8 of the Paris Agreement "recognises the importance of averting, minimising and addressing loss and damage associated with adverse effects of climate change, including extreme weather events and slow onset events".

It also says that countries should "enhance understanding, action and support to address loss and damage". But a fatal flaw creeps in when it goes on to say that "Parties agree that Article 8 of the Agreement does not involve or provide a basis for any liability or compensation". In other words, the huge losses and damages being inflicted on the poor because of the stock of emissions in the atmosphere—emitted by a handful of countries—cannot be the basis of seeking claims. It puts the polluter pays principle to shame.

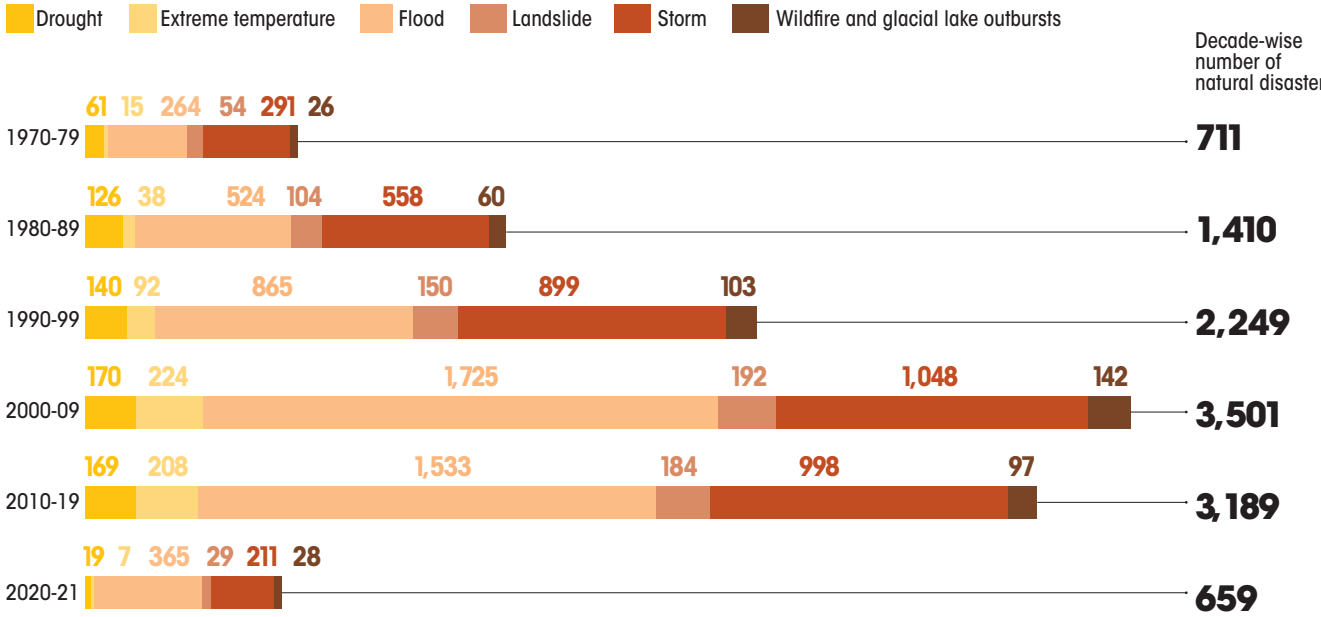
This is when losses are mounting because of extreme weather events (see 'Key threats'). According to the International Federation of Red Cross and Red Crescent Societies (IFRC), over the past decade, extreme weather and climate-related disasters have killed more than 410,000 people and affected 1.7 billion around the world. According to the World Meteorological Organization (WMO), between 1970 and 2019, there were more than 11,000 disasters attributed to weather, climate and water-related hazards, which accounted for just over 2 million deaths and US $3.64 trillion in losses. *Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes* by WMO says, "A disaster related to either a weather, climate or water hazard occurred every day on average over the 50 years, killing 115 people and causing $202 million in losses daily."

The discussions go back to 2010, when during COP16, a "loss and damage work programme" was started. This led to the creation of the Warsaw International Mechanism on Loss and Damage (WIM) in 2013 during COP19. In 2015, under the Paris Agreement, WIM was tasked with specific roles under Article 8. The key roles of WIM include enhancing action and support through finance for loss and damage, building the right technology regime to gauge climate change's impacts and also capacity-building of members.

The "enhanced action and support" is the WIM's fifth strategic role as mentioned in its five-

KEY THREATS

Floods and storms accounted for almost 80 per cent of the natural disasters between 1970 and 2021



Source: EM-DAT database, as on October 19, 2021

The discussions go back to 2010, when during CoP16, a "loss and damage work programme" was started. This led to the creation of the Warsaw International Mechanism on Loss and Damage in 2013

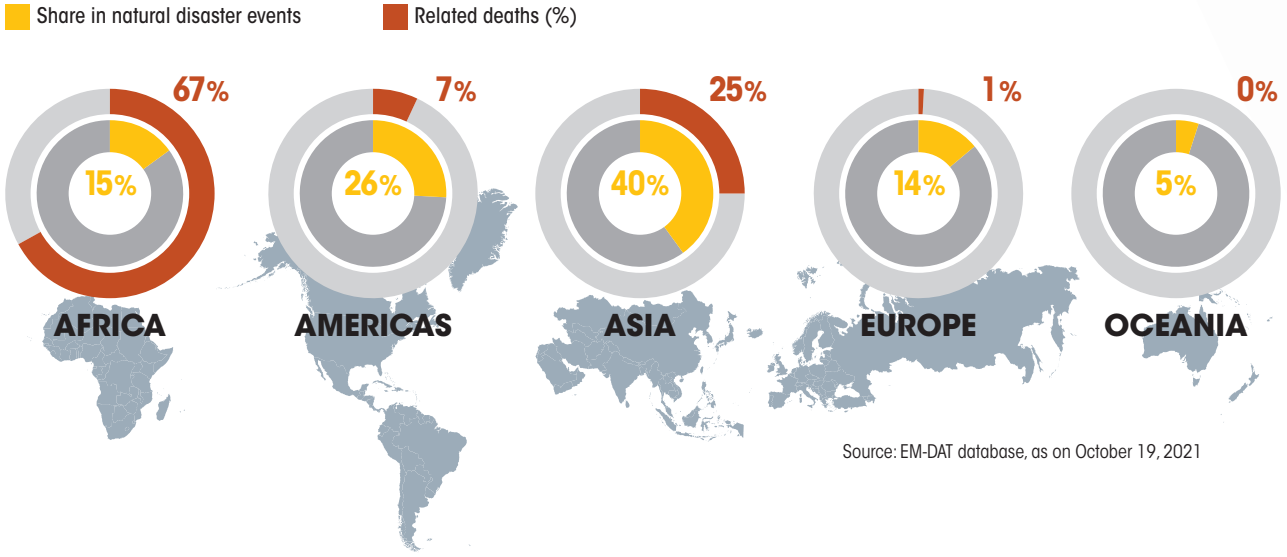
year rolling work plan. But as the working of the body shows, there is no progress at all in this role. What it has done instead in 2019 is create a network (called the Santiago Network on Loss and Damage) to facilitate interactions, technical assistance and resources. The network has so far only set up its website. UNFCCC has also set up the Fiji Clearing House for Risk Transfer—as a repository of information on what countries are doing on insurance.

Loss and damage is not even on the formal agenda for COP26. This when the Sixth Assessment Report of the IPCC, the first part of which was released in August 2021, says without hesitation that not only is the climate crisis caused by human activities, but that scientists can now "attribute" climate change to specific extreme weather impacts. This is important because till now we have only been able to understand climate change impacts in terms of the increased frequency of such events in the world. Now, we know with greater certainty the role of climate change in specific weather events. This should make it clear that extreme weather events, which cause losses and damages to the poorest in the world, destroy their economies and make them more vulnerable and insecure, are the direct outcome of climate change.

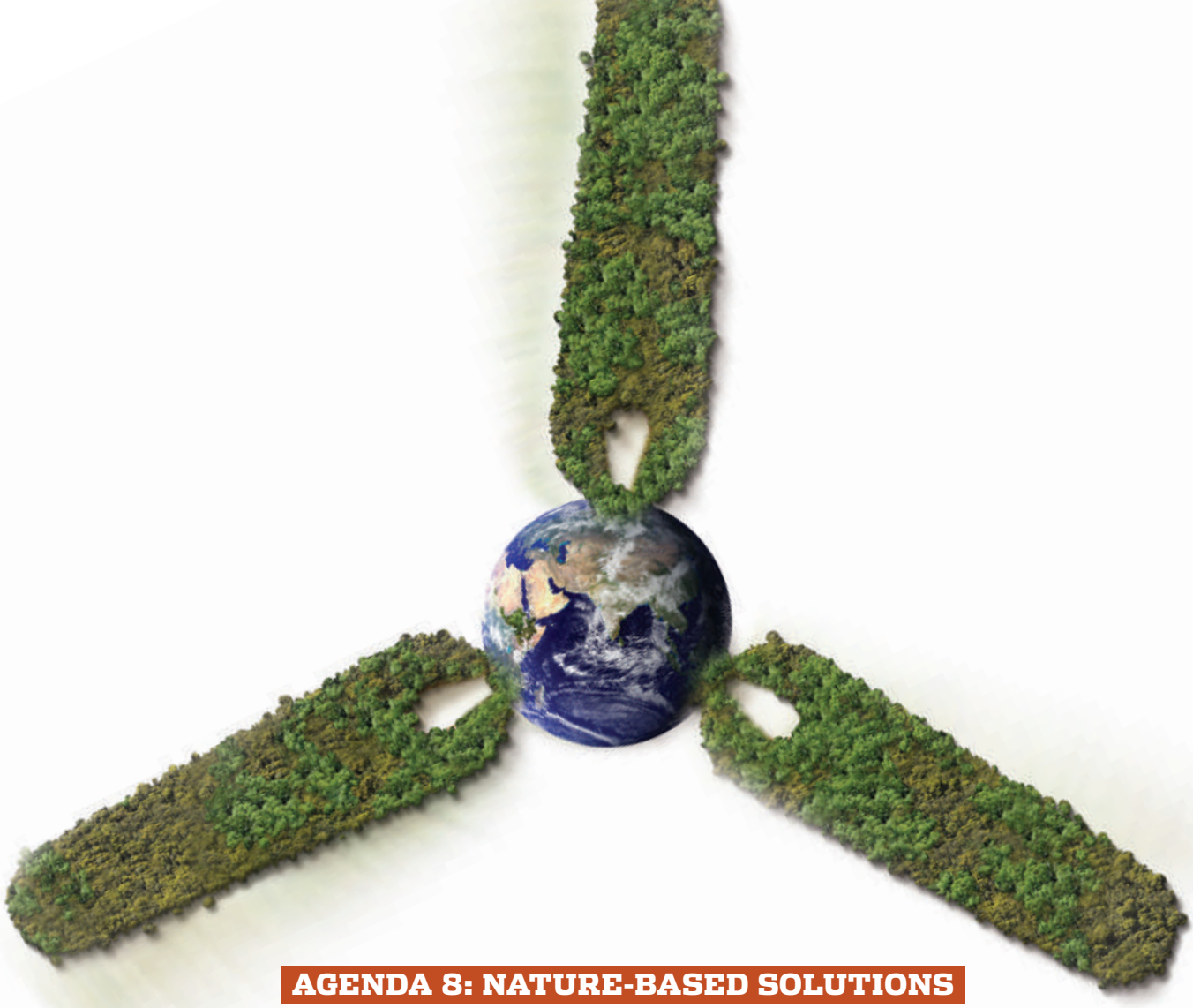
It's time the agenda of loss and damage was prioritised. Countries and communities need more than networks, information and knowledge. They need resources—human and financial—to cope with extreme weather events. Words will no longer be enough, not even close.

RICH AND RESILIENT

Even though the Americas experienced many more natural disasters than Africa, the region reported substantially lower deaths in 1970-2021



Source: EM-DAT database, as on October 19, 2021



AGENDA 8: NATURE-BASED SOLUTIONS

NATURE'S ARMY

With net zero, the call to use forests as carbon sinks is growing

Nature-based solutions can remove 7 $GtCO_2$ a year, enough to deliver a third of the 2050 emission-reduction target

Choice of trees and their management has to be for securing livelihoods, not just to fix carbon emissions

NOW THAT the world has jumped on the net-zero bandwagon, broadly seen as the way to keep emitting but to ensure that CO_2 can be sequestered or removed from the atmosphere, nature-based solutions have made a big splash in climate discussions. The term nature-based solutions may be new, but the role of forests both as a source, because of emissions from deforestation, and as a sink, because of their ability to sequester CO_2, has been long in discussion.

In climate change negotiations, Reducing Emissions from Deforestation and Forest Degradation (REDD) and its addition on conservation of forests stocks (REDD+) was originally the framework to implement nature-based solutions. At the 2013 UN climate change conference (COP19), the Warsaw Framework for REDD+ was adopted. In 2015, Paris Agreement recognised this and included it in Article 5; parties reiterated their commitment to implement REDD+.

Now with net zero, the call to use forests as "sinks" is growing. In May 2021, the Group of Seven countries (Canada, France, Germany, Italy, Japan, UK and US) pledged the goal of "conserving or protecting at least 30 per cent of global land and at least 30 per cent of the global ocean by 2030". The UN Environment Pro-

gramme (UNEP) estimates that if the world is to meet its climate change goals, it needs to close a US $4.1 trillion financing gap in nature by 2050. This could increase what the UNEP terms as "NBS assets" by 300 million hectares by 2050, relative to 2020.

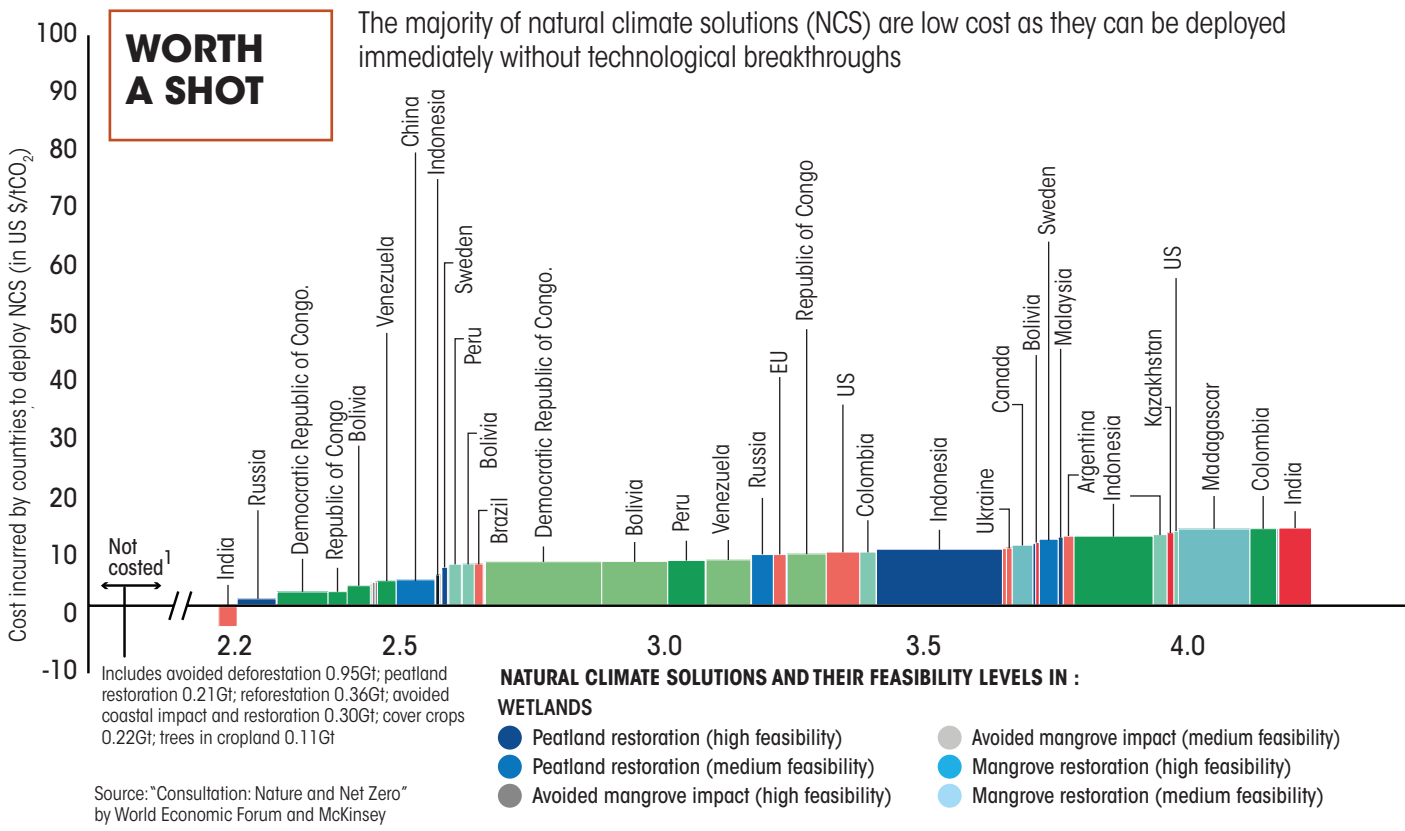
In May 2021, the World Economic Forum published in collaboration with McKinsey and Company a report, "Nature and Net Zero". According to this, nature-based solutions provide a "potential of [removing] close to 7 $GtCO_2$ per year, sufficient to deliver around one-third of the 2050 target [to cut emissions by 50 per cent over 2010 levels]" and this cost is lower than technological solutions (see 'Worth a shot'). The bulk of this will come from "avoided emissions, deforestation, peatland restoration, reforestation and cover crops". Cost is the key factor for this solution, says the business body. In most cases, costs are between $10 and $40 per tonne of CO_2 with variations between geographies and project types.

The report then says nature-based solutions will also generate a flow of funds to countries of the Global South as this is where the potential for reforestation really lies. But this means getting the market architecture right so that it will support tradable credits to buy and sell nature for climate mitigation. This then is where climate negotiations are now going—step by step.

FORESTS NOT JUST A SINK

The problem is not the idea of using forests as carbon sinks but the fact that what is being seen as a low-cost solution is in the lands of the poor and in forests of the developing world. They are the habitats of poor communities. So the choice of trees and their management has to be driven from the objective of securing livelihoods and not primarily for fixing emissions. For these co-benefits—reduced deforestation, reforestation and land management as a way of putting economic assets in hands of the poor—nature-based solutions require deliberate design and real intent.

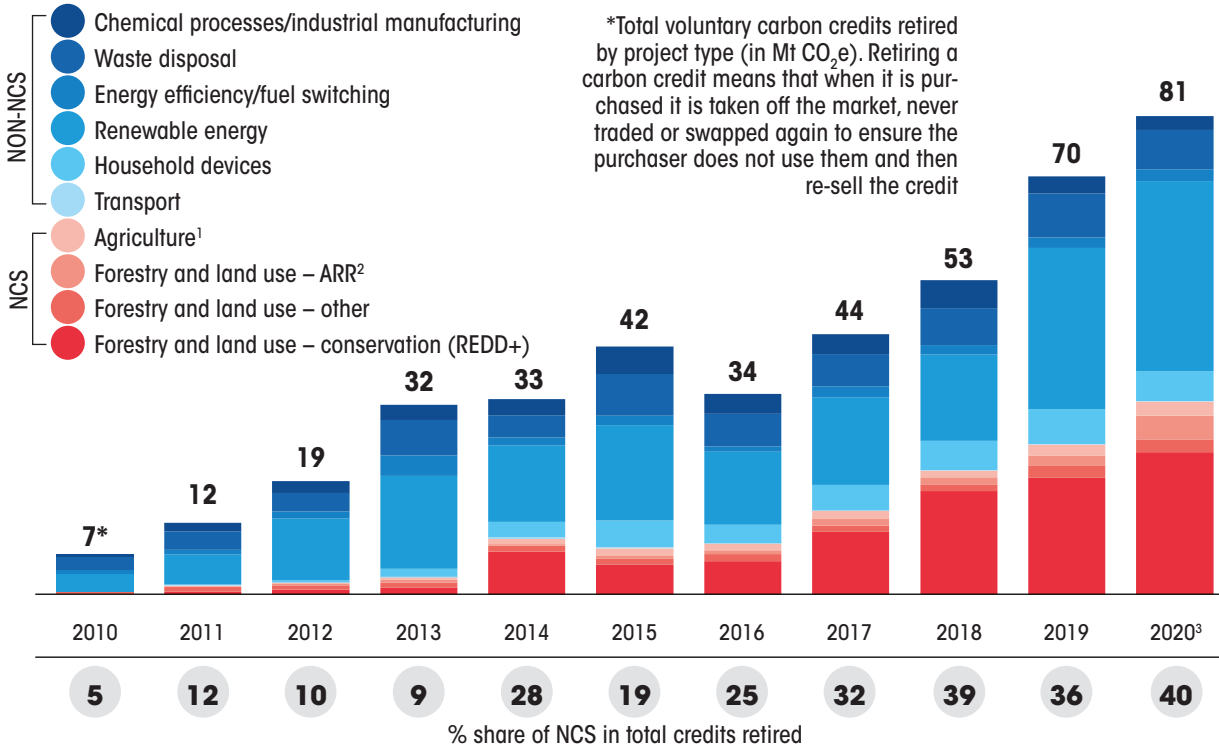
Currently, land—forests, grasslands and other biomes—absorb about 30 per cent of CO_2 emissions from human activity. However, estimates of its future potential vary greatly. This is because land sinks are under threat from fires and defor-



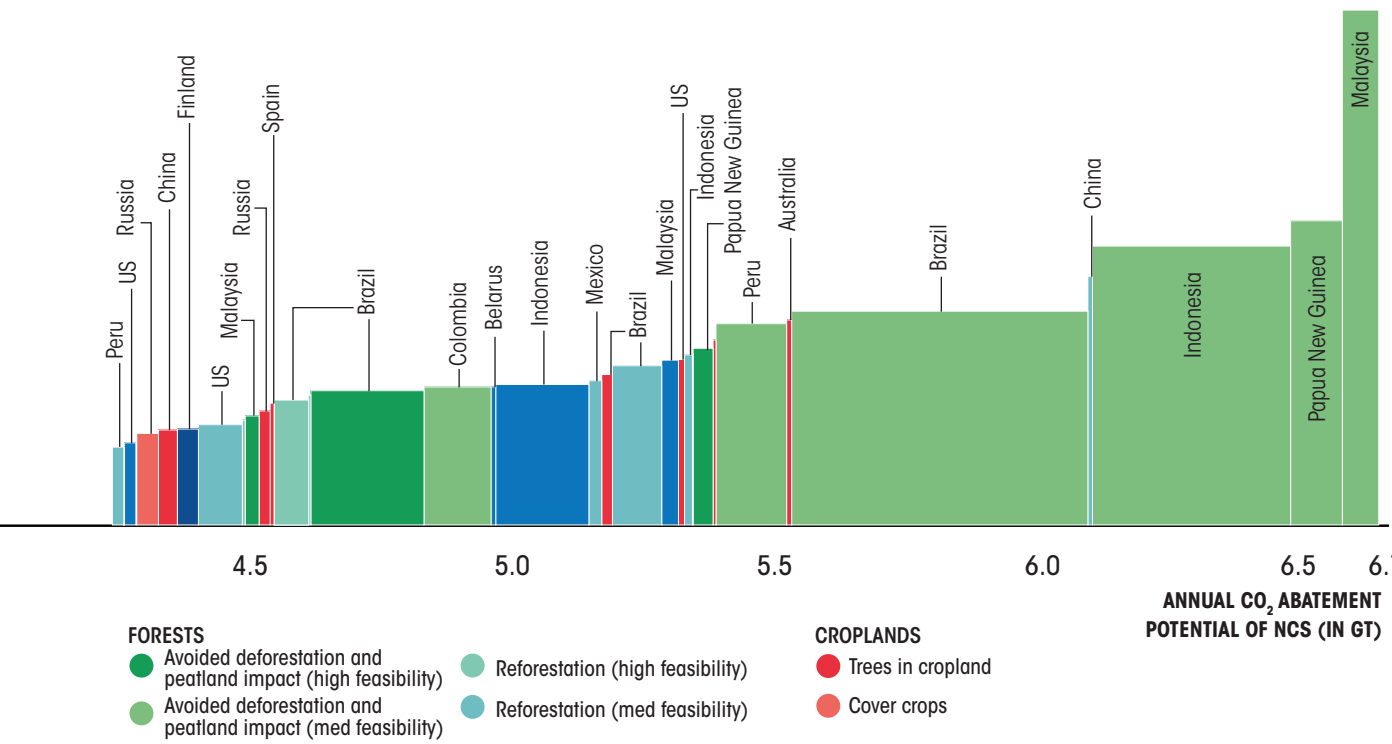
Source: "Consultation: Nature and Net Zero" by World Economic Forum and McKinsey

NATURAL HIGH

Demand for natural climate solutions (NCS) credits has increased in the past decade



Notes: 1 We include all projects listed as "Agriculture" as NCS here for simplicity. However, in practice; a portion of these projects are not NCS. For example, emissions reductions through anaerobic digesters; [2]afforestation, reforestation and revegetation; [3]data from January–November; does not include forecast to year end



What the world has seen so far is a scam of carbon offsets, where individuals, corporations and even countries, buy credits to mask their fossil fuel emissions

estation, which are being exacerbated by climate change. IPCC's Sixth Assessment Report, the first part of which was released in August 2021, underscores this by saying that the relative efficiency of sinks will go down in coming years as emissions continue to rise. This is already evident. Forest fires are blazing across the globe as temperatures soar. In this way, the stored carbon of forests is released and forests become a source of greenhouse gas emissions, not a sink.

It is now estimated that Amazon rainforests are emitting more carbon than they are absorbing—the key cause is large-scale deforestation to clear land for the production of beef and other commodities. Worse, the same international trading interest and large businesses that hail nature-based solutions are often complicit in the key drivers of tropical forest felling. It is estimated that one-third of the world's tropical deforestation is driven by international trade in food commodities.

So, it is important that the future negotiations on the role of forests and nature as the solution for climate change not only focuses on removing emissions but also for building resilient economic activities for communities. Till now, this has not happened.

CAUGHT IN CARBON SCAMS

Instead, what the world has seen is a scam of carbon offsets, where individuals, corporations and even countries, buy credits to mask their fossil fuel emissions. They do this by investing in growing forests or paying someone to grow forests somewhere. There is little accountability in terms of how this is done or if it actually works. A recent investigation by CarbonPlan, a US based non-profit, found that there was systematic over-crediting of forest offsets in California's programme. Nature Conservancy, a Washington DC-based group, was also compelled to start an internal review of its portfolio of carbon-offset projects after *Bloomberg Green*'s investigative journalists found that the group is facilitating the sale of meaningless forest credits to its corporate clients.

But the fact is nature-based solutions are too good for the countries to let go; they are using territorial sinks to mask their emissions from fossil fuels. Russia claims that its forests soak up 30 per cent of its CO_2 emissions, which means it needs to do little to cut back on emissions. As per a 2017 estimate by Giacomo Grassi, scientific officer at the Joint Research Center of the European Commission, published in *Nature Climate Change*, a quarter of the emissions reductions planned by countries in their nationally determined contributions (NDCs) came from forests as sinks. In 2019, researchers at the Potsdam Institute for Climate Impact Research in Germany found that of 167 NDCs, land sector is included in 121 of them but only 11 provide details that can be quantified.

Forest offsets as a way to buy carbon credits is also a growing business. According to the World Economic Forum-McKinsey report of 2021, nature climate solutions, as they call them, accounted for 5 per cent of carbon credits in 2010 and have increased to around 40 per cent by 2021 (see 'Natural high' on *p*51)

All this again points to the problem of lack of measurement, accounting tools and, most importantly, the question of the ownership of lands in which forests are being grown and carbon credits are being generated. So, even as nature-based solutions are critical for climate change mitigation, the world has not ensured that this win-win solution really works for people and forests. This should be the agenda for COP26, which at present seems to be missing the wood for the trees. DTE @down2earthindia

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(Clockwise from above) young climate leaders Neha Naikwad, Ganesh Kumar Subramanian, Sanju Soman, Hina Saifi, Aditya Mukarji, Archana Soreng and Sarath K R (centre)

YOUNG CLIMATE ACTIVISTS

INHERITANCE OF LOSS

The young are restless to conserve the world they know they will inherit

DAKSHIANI PALICHA NEW DELHI

AFTER SKIPPING a year due to COVID-19 disruptions, the 26th Conference of the Parties (COP26) to the UN Framework Convention on Climate Change (UNFCCC) is here. While the anticipation and run-up to this meeting has matched that of previous ones, or perhaps even surpassed them, the spotlight this time also shone on an event that has hitherto been all but relegated to the footnotes of the agenda—the 16th Global Conference of Youth.

Held as usual a few days before COP (October 28-31 this year), this youth conference is the biggest so far, with thousands of participants having registered from over 140 countries. This is leaps and bounds ahead of the few hundred participants that would attend the conference a decade ago. The sixth edition of the conference, for instance, held in Cancun, Mexico in 2010, saw just 500-odd attendees.

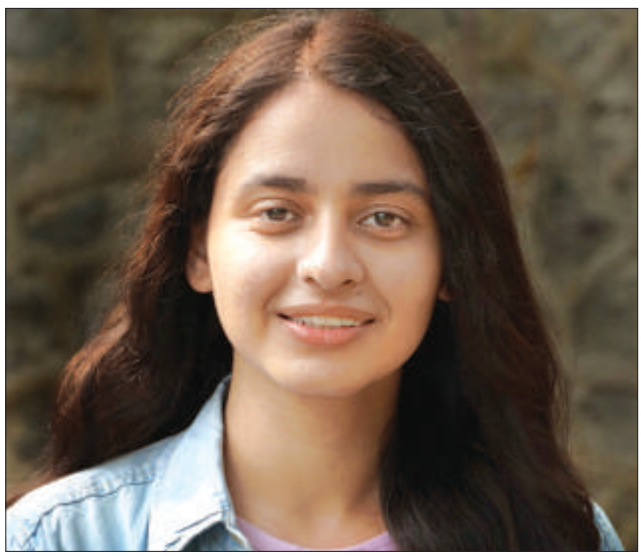
The main agenda of the youth conference this year, as per Heeta Lakhani, an elected Global Focal Point of the Youth Climate Movement or YOUNGO, a constituency of UNFCCC, was to share the views of young global leaders through a position paper that will be presented at the end of COP26. "Hopefully we can help countries build a consensus on how to move forward with the Paris Agreement, which they've been struggling with right now," she tells *Down To Earth* (DTE).

Such an expression of youth mobilisation was nowhere on the horizon three years ago, when then 15-year-old Greta Thunberg from Stockholm, Sweden, began skipping school to protest climate change inaction outside the Swedish parliament. Now, she serves as inspiration to millions of young people across the world to take to the streets to demand climate action from leaders. In September 2021, the UN recognised 17 such young climate leaders in India through its "We The Change" campaign. These leaders bring a plethora of ideas and ideals to deal with the global crisis. *Down To Earth* reached out to 10 of them to understand what made them aware of the climate crisis and what can be done to involve more youngsters in the movement.

UNITED BY FEAR

Most young climate activists say they fear losing the world they have grown up in. One such example is Archana Soreng, a research officer from Odisha's Sundargarh district and a member of the UN Secretary-General's Youth Climate Advisory Board. Belonging to the Khadia tribe of Odisha, 25-year-old Soreng is aware of the strong bond between indigenous people and nature. "My grandfather, known for community-led protection practices, believed in establishing a relationship with the environment. My father, an indigenous healthcare practitioner, gave me insights on transference of traditional knowledge from one generation to the next," she says. "After I began to pursue higher studies, I realised that everything taught about environment in books—sustainable livelihoods, organic farming—are concepts I've seen in action growing up," she adds. "It also made me see how communities often contribute the most towards climate action and yet are not involved in decision-making. This led me to research advocacy to protect the rights of communities like mine," she adds.

Similarly, for Sanju Soman of Thiruvananthapuram and Sarath K R of Arangottukara village in Kerala, climate action was a way to preserve the land their



(From top) young climate leaders Siddhartha Sharma, Sneha Shahi and Heeta Lakhani

communities call home. Having established Save A Rupee, Spread A Smile, a non-profit for social and environmental development while in college, Soman was inspired to take up the cause of wetlands destruction in his home state after a stint in Ladakh with another non-profit. “An initiative to provide solar power to households there was a turning point for me. I built enough social capital to want to start something of my own and returned to Kerala, where I began working on the Vembanad wetland conservation,” he says. “Communities here are the most vulnerable in the state, due to a recent surge in cyclonic storms and flooding in the last three years,” he says.

For 21-year-old Sarath, on the other hand, conservation of the Bharathapuzha river near his village was a matter of protecting his heritage. Years of ecological destruction had turned the river into a mere stream, much to the detriment of nearby communities that depended on the waters for irrigation and sand to make puppets. As member of Vayali Folklore Group, which works to preserve local culture and heritage, Sarath has started AlterSchool to promote collective action from governments and civil society to not just protect the local environment but also the legacy of the communities surrounding it, he says.

There are also those youngsters who are worried about an uncertain future if climate change continues unchecked. Eighteen-year-old Aditya Mukarji of Gurugram, Haryana, says he became aware of this possibility in 2018 when he saw a video of a veterinarian removing a plastic straw from a turtle’s nose. "It shook me. I began researching on plastic waste, and saw what an alarming situation the world is in.” He began a drive to eliminate plastic straws from hotels and restaurants in the National Capital Region and says that he has so far removed some 26 million straws from the ecosystem.

Then there is 19-year-old Hina Saifi from Sisosla village in Meerut district of Uttar Pradesh. “I gained climate awareness in class 8, when my teachers taught me about air pollution in my village due to crop burning and fossil fuel-based power,” she says. Along with other youths, and En Bloc, a Meerut-based social welfare organisation, she began to campaign for clean air

practices in the district and demanded that authorities facilitate solar power. “The emissions and climate change are our own doing, and it is our responsibility to act on it,” she says.

"Youth today is also more aware of climate change because the impacts are more visible now, as opposed to, say, 30 years ago," says 28-year-old Ganesh Kumar Subramanian, co-founder of Kabadiwalla Connect. The Chennai-based company offers smart waste management solutions, such as safe handling and better segregation of waste, to the informal sector.

AIDED BY INTERNET, SOCIAL MEDIA

While it may be a sense of fear that drives young people to act against the climate crisis, easier access to information compared to the previous generations is what equips them with the right tools. With Internet and social media, there is now a greater understanding of planet's climate perils and the ways to mitigate their impacts. However, building the bridge between scientific knowledge and implementing ground-level initiatives is not so easy.

Assam-based Siddhartha Sharma, the 27-year-old founding curator of the Guwahati Hub of Global Shapers Community, a "network of young people driving dialogue, action and change" in over 140 countries, tells DTE why this gap must be closed. “In India, especially the Northeast, there is a need for a behavioural shift among the people to mitigate impacts of climate change. We rehabilitate people here who face severe effects of the climate crisis, such as mass displacement due to floods, but they do not always take the right remedial steps,” he says.

Sneha Shahi, 23, a PhD student of conservation science and sustainability at Ashoka Trust for Research in Ecology and Environment (ATREE), Bengaluru, also noticed a lack of practicality in her approach. “In the initial years of my studies I undertook only research projects, rather than take social action. Ideally, there should be a balance between the scientific data that we collect and the way we disseminate it to people, because not everyone will easily perceive what a scientist is trying to say,” she says. One instance where she did strike this balance was during her graduate degree programme and MS University, Vadodara, Gujarat. With the help of other students, she was able to revive a rivulet, leading to a return of some native species.

For Lakhani, who currently works as a climate educator, the disparity came forth when she attended COP21 to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015 in Paris, France. “Despite a graduate degree in environmental studies [she was, however, working as a translator], I struggled to understand the negotiations. Even today, there are many who have no idea of how these international processes work or how the Paris agreement affects their lives. This was my motivation to get into climate education,” says 28-year-old Lakhani.

Acknowledging these gaps is important not just to facilitate greater awareness, but also to design appropriate solutions to catalyse the climate action process, says 27-year-old Neha Naikwade, who works with Visakhaptnam-based non-profit Climate Collective Foundation to provide financial and capacity support to climate startups.

FOCUS ON NEXT TWO YEARS

Given the urgency of the climate crisis, what should be the world's strategy? The youth's suggestion—inclusive approach and short-term targets. “Countries have been dreaming of meeting Sustainable Development Goals by 2030. But what about the next two years? We cannot expect to just begin working on emission reduction in 2025 and be done in five years; we need to start working now. This is where the youth need a voice; they need a bigger seat at the negotiating table because they will have to deal with the consequences,” says Shahi.

Mukarji agrees. “We do not want promises for 30-40 years. We want progressive change now along with actual dedication from our leaders. The transformation need not be 100 per cent; countries must commit to targets they can meet for inclusive development.” This also pertains to inclusion of vulnerable indigenous communities, say Soreng and Sarath.

Is the perceived success of this Conference of Youth, then a sign for a brighter, more inclusive future? It remains to be seen. DTE

@dakshipalicha

"Our leaders are lost, and our planet is damaged. Loss and damage used to be something people thought of as happening only in the Global South. As we have seen in the recent months with wildfires in California and Greece and floods in Germany and Belgium, loss and damage is now possible everywhere."

VANESSA NAKATE
Climate justice activist from Uganda

INTEGRATED ONLINE AND ONSITE TRAINING PROGRAMME ON

CONTINUOUS EMISSION AND EFFLUENT MONITORING SYSTEM

LAST DATE OF REGISTRATION 4 DECEMBER 2021

CSE has launched an integrated online and onsite training programme on CEEMS (Continuous emission and effluent monitoring system). The training programme will comprise of two parts: Basic learning (online platform) and Advanced learning (at our residential campus, AAETI). The course is designed to provide an overall understanding of the CEMS which includes theoretical knowledge via lectures from experts and firsthand experience through group exercises, discussions and case studies.

PROGRAM DESIGN

Part A: Basic learning (Online Platform), 7-15 December, 2021

• Includes session on CEMS and CEQMS introduction, pollution monitoring regulations in India and developed countries, PM CEMS- available technology options and correct selection of suitable technology, Gaseous CEMS- available technology options and correct selection of suitable technology and CEQMS available technologies and its assessment and CPCB guidelines for correct installation of CEMS and CEQMS.

• Conducted on Moodle Platform where participants will be provided with reading / audio-visual training material which they are expected to self-study. The course material will be for the duration of 2-3 hrs/day.

• Top performing participants (30 no) from online course will be invited for advanced course on scholarship.

Part B: Advanced learning (onsite), February 9-12, 2022

• Includes session on PM CEMS - correct installation, device operation and maintenance, calibration procedure, Gaseous CEMS- correct installation, device operation and maintenance, calibration procedure, CEQMS- correct installation, device operation and maintenance, calibration procedure, understanding of data acquisition and handling system, data interpretation and assessment, data tampering issue and how to check manipulation, CEMS guidelines and regulatory experience, CEMS certification status in India, CEMS audit methodology, field visit for hands on experience and various problem solving group exercises and discussions with experts.

• Conducted at CSE's residential campus, Anil Agarwal Environment Training Institute (AAETI) in Tijara, Alwar, Rajasthan

COURSE FEE

Part A (online): Rs 5000/-
(Indian participants)

$100/-
(Non-Indian participants)

Part B (Onsite): Full scholarship for selected participants. The scholarship covers boarding & lodging costs and training kit fees. It does not include to & fro Delhi travel (from your respective location) costs. Only shortlisted participant will be informed.

WHO CAN APPLY

Professionals from industries, Environment laboratories, Regulatory Body, Academic institutions, Consultants, Environment engineers, Researchers and Students and others interested participants.

PARTICIPANTS WILL BE AWARDED THE CERTIFICATE OF COMPLETION

For any query, kindly contact Training Coordinator:

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