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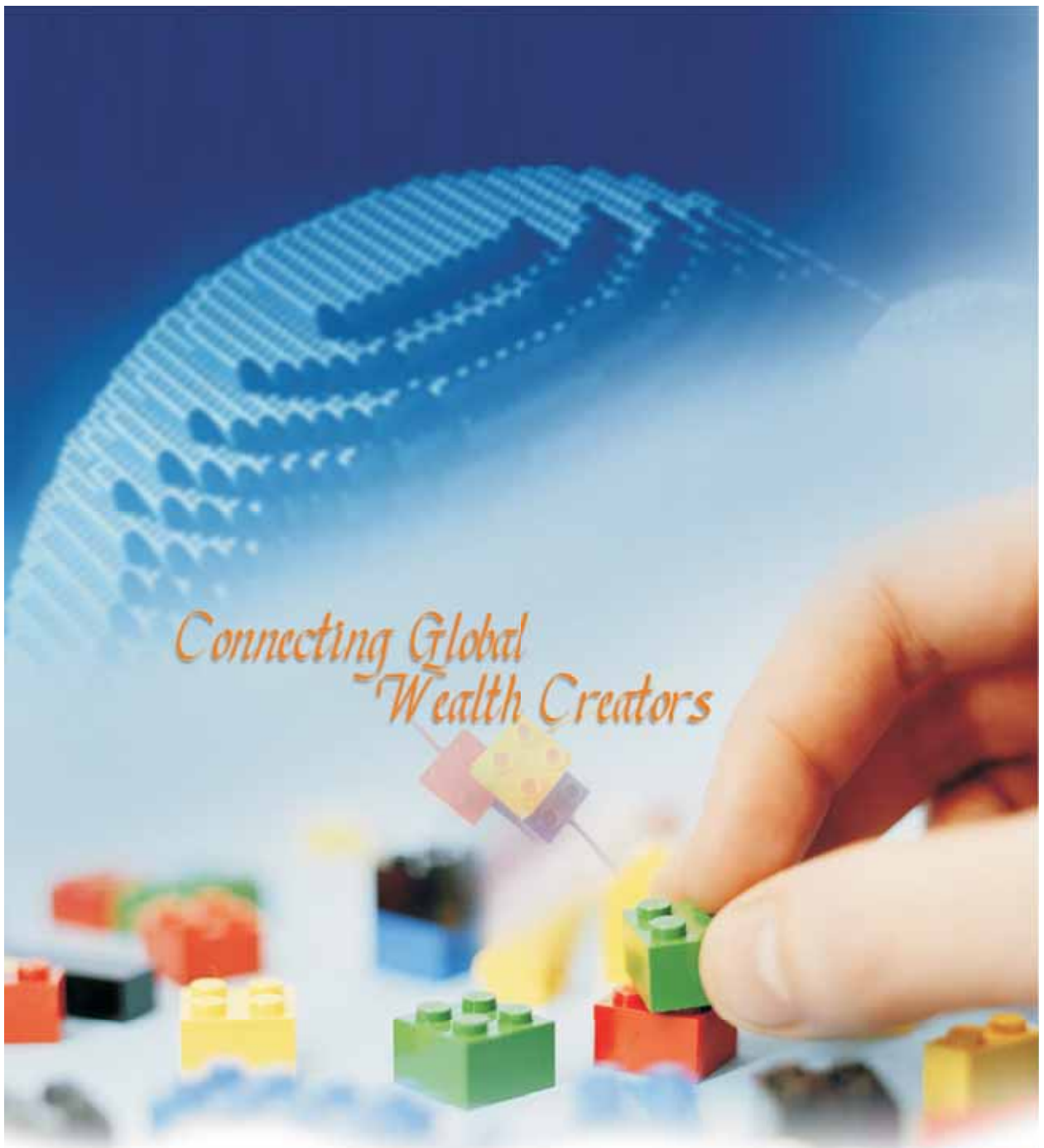
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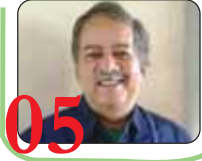
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New Media House, 1 Akbar Villa,
B.R. Sakpal Marg, Off Marol-Maroshi Road,
Andheri (E), Mumbai-400059 India.
Tel: +91-22-29250690, Fax: +91-22-29255279

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Founder Chairman
Late Shri R.K. Prasad

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Founder-Chairman: Late Shri R.K. Prasad

Managing Editor: Satya Swaroop

Directors: B.K. Sinha, Kamaljit Swaroop

Editor: Atula Imchen

Editor-in-Chief: Anil Kumar Sinha, IAS (Rtd.)

Executive Editor: Akanksha Pandey

Advisor to Editorial Team: Professor Sunita Reddy, Vandana Chauhan, Col Sanjay Srivastava, Dr Madhu Bala

Editorial Team: Dr. Anand Bijeta, Abhinav Walia, Majid Alam, Atul Tripathi, Suresh Vasudevan

Field Correspondents: Komal Priya Singh, AltamashKhan, Abhinav Kumar, Fariha Ali

Art Director: Santosh Nawar

Associate Art Director: Hemant Kolambe

Coordinator: Arvinder Kaur Sethi, Mohit Naik

Admin & Finance: Vrunda Gurav

Circulation: Jawaharlal, Santosh Gangurde, Vijay W.

Photographer: Kishen Singh

For Subscriptions Contact:
satya@newmediacomm.biz
knowdisastersmagazine@gmail.com

BRANCHES:

Kolkata:

Anurag Sinha, Regional Head
Mob: 09830043339 / 09051112019

Patna:

Rajesh Naraen, Vimmi
Mob: 09334390988

New Media Communication Pvt. Ltd.,

New Media House, 1 Akbar Villa,
Near Old SBI Bus Stop, Marol-Maroshi Road,
Andheri (E), Mumbai - 400 059
Tel: +91-22-2925 0690.

E-mail: satya@newmediacomm.biz
www.newmediacomm.com

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Dear Readers,

Greetings!

Six years ago, countries were asked to make changes to keep global warming well below 2°C and to try to aim for 1.5°C. COP26 Glasgow was the moment countries revisited climate pledges made under the 2015 Paris Agreement. Ahead of it, 200 countries were asked for their plans to cut emissions by 2030. A new global agreement - the Glasgow Climate Pact - was reached at the COP26 Summit. The Agreement - although not legally binding - will set the global agenda on climate change for the next decade as its goal is to keep cutting emissions until they reach net-zero by mid-century. COP stands for "Conference of the Parties", and the one in Glasgow was the 26th annual summit. This January issue of Know Disasters magazine is themed around the same.

Know Disasters is a humble yet challenging pioneering attempt to promote knowledge transfer and dissemination of information on all aspects of disasters, climate change and resilience building by demystifying and simplifying the DRR discourse to all the stakeholders, including the common man, citizens, and community (CCCs). This is also an attempt to awareness-raising and education, especially in bridging the gap between technical information available and information disseminated to the public in their language as far as possible. Our mission is committed to Building Disaster Resilience and Making Disasters 'Everyone's Business'.

This January issue brings you different articles from disaster management professionals, practitioners and academicians, including important news and interesting contributions from youth and children. Further, this also includes some information about recent books around the theme. You can read – 'COP26 - The Latest Event to Advance the Paris Agreement and Beyond', by Loy Rego; 'Is Climate Change a Real-Time Situation? Case Studies on Water Bodies in India', by Dr Shyamli Singh, Deepakshi Babbar and Prof. V.K. Sharma; 'Building Global Citizens to Balance Between Need and Greed', by Dr Saswati Paik; 'Embankments and Community Resilience in Indian Sundarbans', authored by Dr Jayanta Debnath; 'तटबन्ध अगर टूटता है तो बाढ़ नहीं आती प्रलय होता है', by Prof Dinesh Mishra Ji; 'कोविड-19 और हम', by डा. रजनी श्रीवास्तव; 'Disaster Resilient Education System - From Risk to Recovery', by a youngster - Neha Jain; 'The Indian Monsoon and Its Many Facets', by Paras Nath Rai, and, 'UNFCCC and its Role in Locating Displacement in Climate Action', by Sonu Tewari. I hope you will like these articles.

With this, I would like to thank all authors who have contributed their articles, and the readers for their encouraging responses. We always welcome your valuable comments and content contribution to the magazine.

Happy New Year!

Stay Informed, Safe and Healthy.

Anil Kumar Sinha, IAS (Retd.)

Hony. Editor-in-Chief, "Know Disasters"

Founder Vice Chairman, Bihar State Disaster Management Authority

Email: anilsinha.k@gmail.com

Contact No. +91- 9871616360

COP26 - The Latest Event to Advance the Paris Agreement and Beyond

Loy Rego is a Tech Advisor, MARS Practitioners Network (DPRR n SDGs) & VERVE Volunteers, Deputy Executive Director, ADPC, Bangkok (1996-2011) & Joint Director, NSC, India (1986-96).

The Paris Agreement was signed on December 12, 2015, in the Conference of Parties (COP21) in France. It charted a new course in the evolution of the UN under the Climate Change Convention. The Paris Agreement accelerates and intensifies actions and investment needed for a sustainable low carbon future by strengthening the global response to climate change, keeping global temperature rise this century well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase even further to 1.5°C, and aims to strengthen the ability of countries to deal with climate change impacts.

To reach these ambitious goals, appropriate financial flows, including by, before 2025, setting a new goal on the provision of finance from the USD 100 billion, and an enhanced capacity-building framework. A specific initiative was planned to be put in place through supporting action by developing countries and the most vulnerable countries, aligned to their national objectives. The Agreement emphasised enhanced transparency of action and support through a more robust transparency framework.



Loy Rego

COPs 22-25 and the SG's Summit Since

Five other COPs were held in the six years since, with Morocco (22), Fiji (23), Poland (24), Chile (25) and the UK (26) as Chairs, all slowly advancing and initiating special elements of the Paris Agreement, as summarised in Table 1. The Talanoa Dialogues at Fiji and Poland were innovative in their approach and objectives and brought forward valid bold perspectives and plans for action (BOX 1).

BOX 1

Talanoa Call for Action

A form of story sharing aimed at building empathy and trust leading to decisions for the collective good - a constructive, non-confrontational, and solutions-oriented, year-long process, during which parties and stakeholders can provide input through an online platform, and a political phase at COP24, where Ministers will engage in high-level roundtables.

December 2018 in Poland after COP23 and 24

In the Pacific tradition of Talanoa, the world came together to share experiences and help make wise decisions to inspire a global response to the threat of a changing climate. Climate action is on the rise, but not at the speed and scale we need. We need to do more and to do it now.

Key Messages:

We must fulfil the goals of the Paris Agreement, achieve a just transformation towards a better world, unlock the full potential of technology, demonstrate bold leadership, act together, maintain climate action at the top of the political agenda. We need to work closely with non-party stakeholders to enhance global ambition by 2020 and to develop long-term, low-emission development strategies; call upon governments and international agencies to step up financial, technical and technological cooperation; private sector leaders to be drivers of change, civil

society leaders to marshal the public and political will needed to drive action, spiritual leaders to unlock spiritual pathways for addressing climate change, the youth of the world to mobilise at a larger scale to ensure that their future is secure. We call upon everyone to take forward a clear signal from the Talanoa Dialogue.

The 2019 UN Climate Summit was convened by the UN Secretary-General in New York in September 2019. His call for action is reflected in his statement at COP25 (BOX 2).

BOX 2

UN Secretary-General Antonio Gutierrez's Statement at COP25

"We stand at a critical juncture in our collective efforts to limit dangerous global heating. By the end of the coming decade, we will be on one of two paths. One is the path of surrender, where we have sleepwalked past the point of no return, jeopardising the health and safety of everyone on this planet. Do we want to be remembered as the generation that buried its head in the sand; that fiddled while the planet burned? The other option is the path of hope - a path of resolve, of sustainable solutions, a path where more fossil fuels remain where they should be - in the ground - and where we are on the way to carbon neutrality by 2050. That is the only way to limit global temperature rise to the necessary 1.5°C by the end of this century."

Key Outcomes of COP26

COP 26 began in November 2021 with a World Leaders Summit of 120 leaders to kick start the decade of accelerated climate action. Leaders were joined by civil society, international organisations, businesses and youth meeting a year later than scheduled, due to the pandemic. Urgency in overcoming this collective challenge was the centre of discussions, emphasised by the prominence of the world's poorest and most climate-vulnerable countries. They came together in solidarity, keen that COP26 take ambitious action to tackle climate change and seize the opportunities for a clean and resilient transition through the critical decade ahead. Every country's unique circumstances and responsibilities were recognised but all regions were called to urgently address gaps in ambition - on mitigation, adaptation and finance, and their determination to do so at COP26 and beyond. The High Ambition Coalition and Climate Vulnerable Forum made strong calls for more ambitious targets.

Many called for a path to limiting global temperature rise to 1.5°C within reach; closing the gap between the current Nationally Determined Contributions (NDCs) to 2030 and requirements of science; updating targets as necessary, setting new quantifiable goals beyond 2025, calling to scale up climate finance from all sources, urgently delivering the \$100bn per year goal and working across the financial system to align financial flows with the Sustainable Development Goals (SDGs) and the Paris Agreement.

Key COP26 outcomes were the Glasgow Climate Pact (BOX 3), bold collective commitments to curb methane emissions, halt and reverse forest loss, align the finance sector with net-zero by 2050, ditch the internal combustion engine, accelerate the phase-out of coal, and end international financing for fossil fuels, to name a few; and a platform to launch innovative sectoral partnerships with new funding, to reshaping many economic sectors at scale needed to deliver a net-zero future.

BOX 3

The Glasgow Climate Pact - Outcome of COP26

Recognises the role of multilateralism and the Convention and international cooperation in addressing CC impacts in the context of sustainable development and eradicating poverty and, advances made through the UNFCCC multilateral process since 1994; including the Convention, the Kyoto Protocol and the Paris Agreement.

I. Adaptation

Emphasises urgency of scaling up action finance, capacity building and technology transfer to enhance adaptive capacity, strengthen resilience and reduce vulnerability.

Welcomes national adaptation plans submitted, which enhance implementation of adaptation actions and priorities.

II. Adaptation Finance

Notes with concern current provision of climate finance for adaptation remains insufficient and urges developed country parties to urgently scale up their provision and technology transfer and capacity-building for adaptation.

Recognises the importance of adequacy and predictability of adaptation finance, including the value of the Adaptation Fund in delivering dedicated support for adaptation.

III. Mitigation

Reaffirms the long-term global goal to hold the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels; recognising CC impacts will be much lower at the temperature increase of 1.5 °C compared with 2 °C, and this would significantly reduce the risks and impacts of climate change.

Recognises limiting global warming to 1.5 °C requires rapid, deep and sustained reductions in global greenhouse gas emissions, including reducing global carbon dioxide emissions by 45% by 2030 relative to the 2010 level and net-zero around mid-century, as well as deep reductions in other greenhouse gases and methane.

Calls upon parties to accelerate the development, deployment and dissemination of technologies, and the adoption of policies to transition towards low-emission energy systems, to support a just transition.

IV. Finance, Technology Transfer and Capacity-Building for Mitigation and Adaptation

Urges developed country Parties to provide enhanced financial and technology resources to assist developing country parties for mitigation and adaptation.

Emphasises mobilising climate finance from all sources to reach the level needed to achieve the goals of the Paris Agreement, including significantly increasing support for developing country parties beyond USD 100 billion per year.

Notes with deep regret that the goal of developed country parties to mobilise jointly USD 100 billion per year by 2020 in the context of meaningful mitigation actions and transparency on implementation has not yet been met, and welcomes increased pledges and the Climate Finance Delivery Plan: Meeting the US\$100 Billion Goal 4 and actions therein.

V. Loss and Damage

37. Acknowledges that climate change has already caused and will increasingly cause loss and damage and that as temperatures rise, impacts from climate and weather extremes, as well as slow-onset events, will pose an ever-greater social, economic and environmental threat.

Acknowledges the role of a broad range of stakeholders at local, national and regional levels in averting, minimising and addressing LnD associated with adverse CC effects.

Reiterates urgency scaling up action for implementing and averting, minimising and addressing LnD in developing countries particularly vulnerable to these effects.

VI. Implementation

Recalls parties and non-party stakeholders on pre-2020 implementation and ambition held in 2018, 2019 and 2020.

Welcomes action taken to unlock the potential for sectoral action to contribute to fulfilling and implementing national targets, particularly in emission-intensive sectors.

Recognises the importance of protecting, conserving and restoring ecosystems to deliver crucial services, acting as sinks and reservoirs of greenhouse gases; reducing vulnerability to CC impacts and supporting sustainable livelihoods, and taking an integrated approach to addressing national and local policy and planning decisions.

Leaders called to implement the Global Goal on Adaptation as a matter of survival. Many called on COP26 to achieve a step-change in finance for adaptation, some for at least doubling current funding, towards the collective agreement in Paris and stressed the reality of loss and damage from climate change, operationalising the Santiago Network, and ensuring international finance and technical assistance is scaled up.

One hundred and fifty-one parties submitted updated Nationally Determined Contributions (NDCs), with eight more to do so. The UNFCCC Summit report claimed that almost 90% of global emissions and over 90% of global GDP is now covered by mid-century net-zero or carbon neutrality commitments, rising from just 30% of global GDP at the end of 2019. Forty-two countries set coal phase-out dates and international public finance for coal is coming to an end.

Over 40 countries joined the Breakthrough Agenda, a 10-year plan to create green jobs and growth globally, making clean technologies and solutions affordable, accessible and attractive by 2030 – beginning with power, road transport, steel, hydrogen and agriculture.

One hundred and twenty countries covering over 90% of the world's forests endorsed the Glasgow Leaders' Declaration on Forests & Land Use committing to halt and reverse forest loss and land degradation by 2030,

committing public funds for forest conservation and a global roadmap to make 75% of forest commodity supply chains sustainable.

The Just Energy Transition Partnership was announced supporting South Africa's decarbonisation efforts, and the Global Methane Pledge by over 100 countries committed to reducing methane emissions by 30% globally by 2030.

Finance for low-carbon and resilient development continues to increase but remains short of levels needed to even meet the \$100 billion goals set for 2020, now expected to meet by 2023.

Many countries supported resilient and sustainable recovery from COVID-19 with increased investment and partnerships for clean, green infrastructure through Build Back Better World.

A Champions Group on Adaptation Finance committed to 50% adaptation finance, with support through African Adaptation Acceleration Programme and Infrastructure for Resilient Island States fund. 32 countries made Adaptation Communications or National Adaptation Plans, representing over 2 billion people, sharing good practice and mobilising action.

Participants from civil society, youth, indigenous peoples, businesses and international organisations contributed actively, demonstrating the role they play in raising ambition and building a net-zero, resilient future.

Despite significant headway on several fronts, national and international climate and financing commitments still fell far short of what is needed to come to grips with the climate challenge.

Strengths and Limitations of COPs and their Processes

It is important and useful to compare the UNFCCC and its intensely negotiated outcomes and processes of regular agenda elaboration with the outcomes of broader agendas like the SDGs and specific processes like Quito's New Urban Agenda and the Sendai Framework on DRR. These are finalised in intensely negotiated periodic processes but are non-binding and voluntary commitments, and while periodic progress is reviewed, it has no specific outcome.

Thus, while the negotiations are intense and periodic, the annual COPs advance the formal agenda much more, though progress is slow.

New Focus on Building Resilience and Adaptation

COP26 introduced a new link and emphasis on DRR and introduced the "Race to Resilience" - a bold new initiative to link work on DRR with the active push for building resilience. This is an effective and worthy effort to link the two agendas on adaptation and resilience and its progress will be actively anticipated and acted on. Led by global non-state actors from business, investors, civil society, academia, cities and regions, the Resilience Hub provided an immersion into urgent action while mobilising ambition to deliver a resilient world for all, never before experienced at any COP: "We won't stop until the job gets done".

The UN Global Compact's Business Ambition for 1.5°C is a coalition of 965 companies worth \$13 trillion that pledged to cut emissions and adapt their businesses to align with the Paris Climate Agreement. This is part of the "Race to Zero", a worldwide effort to bring net greenhouse emissions down to zero by 2050 hinges on two pillars: reducing greenhouse gas emissions and investing in nature-based solutions and other measures to remove carbon from the atmosphere.

The Global Commission on Adaptation (GCA) elevated the political visibility of climate adaptation and catalysed major actions and commitments. GCA's flagship report: Adapt Now: A Global Call for Leadership on Climate Resilience put forward a bold vision to transform key systems to be more resilient and productive.

India at COPs

Some important national initiatives reported by India in COPs 25 and 26 were Non-Fossil Fuel Electricity, Installation of Renewable Energy (solar, wind, bio and small hydro power and Biomass/Cogen; Affordable LEDs for All (UJALA), Street Lighting National Programme (SLNP) using LED lights, Deendayal Antyodaya Yojana of solar lamps by rural women Self-Help Groups (SHGs), Pradhan Mantri Ujjwala Yojana (PMUY), to reduce pressure on forests, Clean Coal Cess imposing a green tax on Coal, Seamless metro rail and other travel, National Electric Mobility Mission Plan (NEMMP) 2020 for faster adoptions and national manufacturing to achieve 30% electric vehicles by 2030 and 6-7 million sales of hybrid and electric vehicles by 2020; a National Biofuels Policy 2018: with a target of 20% blending of ethanol in petrol and 5% blending of

biodiesel in diesel by 2030, India's Forest Green cover increased; a Green Good Deeds Campaign movement to promote sustainable lifestyles, deployment of solar street lights, pumps and power packs to meet electricity and lighting needs of rural local communities/institutions/individuals, Urja Daata Rural renewable energy sources to transform farmers from anna daata (food provider) to urjadaata (energy giver) by installing solar panels, turbines, etc., to generate power on unproductive fields, six new Rules on Scientific Waste Management framed, Restoration of Degraded Land with targets for 2030.

At COP26, the Prime Minister of India announced his country's pledge of reaching net-zero emissions by 2070: "Today to save the world, we will just have to take big steps."

Union Environment Minister Bhupender Yadav, head of India's delegation to Glasgow, who maintained a blog 'COP26 Diary', said: "the current climate crisis has been precipitated by unsustainable lifestyles and wasteful consumption patterns in developed countries. India has proactively led in creating the International Solar Alliance, Coalition for Disaster Resilient Infrastructure (CDRI) and the One Sun, One World, One Sun Grid initiatives as international collaborations to combat climate change. Having done its part, India asked the developed world for concrete actions in this decisive decade and translation of commitments to actions." India has been criticised by several countries for the change it promoted to phase down, rather than phase out coal power, the single biggest source of greenhouse gas emissions.

Strongly Worded Views and Report Card by the Center for Science and Environment (CSE)

Sunita Narain, DG, CSE said, "COP26 acknowledged climate change is real, needs urgent actions for climate justice but did not raise the commitments to cut greenhouse gas emissions, highlighting deep distrust between the already rich and emerging world. COP26 did little to advance combating CC with cooperation at a scale never seen before". We cannot erase the fact that certain countries — the United States, European Union-27, the United Kingdom, Canada, Australia, Japan and Russia, joined now by China — have consumed roughly 70 per cent of the carbon

budget, the space in the atmosphere that is available to keep the world below the 1.5°C temperature rise. The world has run out of a carbon budget, but 70% of the world's people still need the right to development. The Glasgow Climate Pact's only achievement is that it reiterates the need for financial support for adaptation, but it does nothing more than this. The assessment of the 8 Agenda for Action should be considered by the countries and sectors."

Agenda 1: Climate Justice: FAILED: COP26 should have acknowledged historical emissions and not diluted them. About 70% of the world's population needs access to carbon space for development and cannot be told not to develop. CoP26 is needed to secure low-carbon pathways for the world.

Agenda 2: Dealing with China: STATUS QUO: China is the world's largest emitter with 33% of the remaining carbon budget for this decade, and no carbon dioxide (CO2) reduction targets. China will not be carbon-neutral unless it curbs its coal power production, and is silent about such plants at home. India needs to be de-hyphenated from China; China needs to be de-hyphenated from G-77 - the coalition of developing countries.

Agenda 3: Net Zero Targets: SOME PROGRESS: Emission cuts by 2030, and not Net Zero, needs to be the focus, with a front-loading emission reduction of 7+1 (US, UK, EU-27, Russia, Japan, Australia, Canada and China) as key, and space for the rest to grow.

Agenda 4: Climate Finance: SOME PROGRESS: The Paris Agreement calls on rich nations to transfer \$100 billion annually through 2025, to developing and poor countries, but the flow of real money is still illusionary; with only Germany, Norway and Sweden are paying their share.

Agenda 5: Market Mechanisms and Nature-Based Solutions: STATUS QUO: This must be transformational action, not for cheap credits.

Agenda 6: Loss and Damage: STATUS QUO: The Paris Agreement is flawed as LnD cannot be taken as compensation or liability, and needs reworking. COP26 should have made LnD a permanent agenda to compensate the victim nations.

Agenda 7: The Adaptation Goal: STATUS QUO: The ever-increasing cost of adaptation has outpaced

fund flow to developing countries. The Global Goal on Adaptation needs more than networking and information; it needs finance.

Agenda 8: The Question of Coal: FAILED: Coal has fuelled developed nations’ prosperity. Developing nations still need it for their economic growth.

Towards COP27 in Egypt in 2022

Egypt will host the COP27 UNFCCC in the Red Sea resort of Sharm El-Sheikh. Egypt’s proposal was “Road to COP27 - A United Africa for a Resilient Future.” Egypt’s Minister of Environment Yasmine Fouad, announced on January 1, 2022, its four-axis plan for hosting the upcoming COP27 in November during a meeting with the Minister of Local Development Mahmoud Shaarawy, at the Ministry of Local Development, and discussed projects for converting

waste into energy, besides draft contract between the investors and the governorates through the Waste Management Regulatory Agency.

These axis include:

- 1) raising the efficiency of hotels, diving centres, and hotel rooms in Sharm El-Sheikh, in cooperation with the Ministry of Tourism.
- 2) providing eco - friendly transportation.
- 3) raising the electrical capacity of the conference hall.
- 4) raising the efficiency of the city’s waste system in terms of collection, transportation, treatment and recycling.

Egypt is working closely with UNFCCC in setting the agenda and identifying global actions to be taken under the themes.

Table 1: The Last 6 COPs and the One Forthcoming

COP, Year and Dates, Location	Declaration	Special Reports
COP21, 2015 – November 30 - December 12, Paris, France.	The Paris Agreement, the threshold for entry into force – formal acceptance by 55 countries accounting for at least 55% of global emissions.	‘Hybrid’ approach that lets countries define their NDCs while binding them to procedural obligations aimed at promoting transparency, accountability and rising ambition.
COP22, 2016 - November 7-18, Marrakech, Morocco.	Marrakech Action Proclamation. By the end of COP22, ratified by 111 countries representing more than three-fourths of global emissions.	Adaptation Fund continues to serve Paris Agreement; 2050 Pathway Platform launched; Roadmap for mobilising \$100 billion a year for developing countries by 2020; first review of the Warsaw International Mechanism for Loss and Damage; Powering Past Coal Alliance.
COP23, 2017 - November 6-18, Bonn, Germany.	Fijian Presidency convened Talanoa “Facilitative Dialogue” in 2018 to inform the next round of NDCs due in 2020.	IPCC’s Special Report on Global Warming of 1.5°C; renewed push by developing countries for stronger developed country action by 2020; for entry into force of Doha Amendment setting; 2020 emission targets under Kyoto Protocol.

COP24, 2018 – December 2-15, Katowice, Poland.	Katowice Rulebook to implement the Paris Agreement and provide information about their Nationally Determined Contributions (NDCs) on domestic climate actions, mitigation and adaptation measures; report on emission cutting efforts; Talanoa Call for Action - We call upon everyone to take forward a clear signal from the Talanoa Dialogue; achieving climate neutrality in the second half of the century was a game-changer that requires action in all sectors of the economy and society. We had Ministerial Declarations on energy, forests and electro-mobility.	Special Report on Global Warming of 1.5°C; Just transition Silesia Declaration signed by 50 countries; launch of Forests for Climate initiative, High Ambition Coalition, “information necessary for clarity, transparency, and understanding” (ICTU) Guidance adopted; account for emissions and removals corresponding to their NDCs; to promote environmental integrity; to promote transparency, accuracy, completeness, comparability, and consistency (TACCC); voluntary cooperation among parties in implementing their NDCs, including through the use of market-based approaches (Art 6); an “adaptation communication,” guidance adopted at Katowice information on their national circumstances, impacts and vulnerabilities, adaptation priorities, plans and actions, and support needed and provided; biennial transparency reports (BTRs), and, as appropriate, additional information, including on implementation.
UN Climate Action Summit 2019 - September 25, New York, UN General Assembly Summit at HQ.		The purpose is encouraging. Small island nations (SIDS) and least developed countries (LDCs), major cities and regional economies came with initiatives, as did the private and financial sectors. 70 countries announced the intention to submit enhanced national contributions in 2020; 65 countries and major subnational economies committed to working for net-zero emissions by 2050.
COP25, 2019 - December 2-13, Madrid, Spain.	NDCs must have the necessary ambition to defeat the climate emergency.	Advance work on capacity-building, deforestation, indigenous peoples, cities, finance, technology, complete technical matters for the full operationalisation of transparency framework under the Paris Agreement; Gender Action Plan adopted; Climate Ambition Alliance Expanded; UN Global Climate Action Awards to 15 most practical, scalable and replicable game-changing initiatives; 150 members World Travel and Tourism Council (WTTC), Global Covenant of Mayors for Climate and Energy convened.
COP26, 2021 - November 1-12, Glasgow, Scotland, UK.	Glasgow Climate Pact	
COP27, 2022 -November December, Sharm El-Shaikh, Egypt.		



Building Global Citizens to Balance Between Need and Greed

Dr Saswati Paik is a Faculty at the School of Education, Azim Premji University, Bengaluru.

Imagine a child, during her young age, is introduced to the concept of the supercontinent 'Pangaea' and the concept of 'Continental Drift' as described by Alfred Wegener. She will probably start imagining herself on a floating boat equivalent to the supercontinent on a huge ocean called 'Panthalassa' and the entire event is happening on a huge planet called Earth. What an excitement it could be for her to know the planet in this way!

Usually, a child in India is never introduced to such a concept while studying Geography in school. Disciplinary subjects in India remain isolated islands to generate good results for the sake of examination. This is probably not just a reality in the Indian education system but in many other countries. Due to this, despite the development of formal education across the globe, we have pushed our environment and even the entire planet into danger. We kept on running on our rat race while mother earth started suffering because of our mere negligence.

Long back, Nelson Mandela rightly stated, "Education is the most powerful weapon which you can use to change the world." Perhaps, education could not be utilised as the most powerful weapon by us. We do educate our children with the help of the formal education system, but this education, unfortunately, remains confined only to standardised tests, marks, higher educational opportunities, and finally, a white-collar job as the ultimate destination. It is high time to ask ourselves as responsible adults and parents or guardians of our future generation in many ways, the following two questions:

1. Are we educating our future generation to be responsible global citizens who can think globally but act locally?
2. Are we unnecessarily trying to maintain the traditional disciplinary divide between various disciplines which need to be effectively bridged during times of crisis?

At this point of time, when the



Dr Saswati Paik

pandemic is bringing so many challenges in front of us, we must recognise how effective research could be if a climatologist works with an epidemiologist to understand the distribution, and possible control of diseases, illnesses and other factors related to health, or a social geographer works with a psychologist to understand the pattern of human trauma and behaviour. To ensure such practices, we need to plan for a different approach to prepare our future generation to be global citizens who can be "active promoters of

more peaceful, tolerant, inclusive, secure and sustainable societies" as mentioned by UNESCO (en.unesco.org). We failed to make it happen. Therefore, in this 21st century, we need to take a pledge to save our own home - our planet Earth.

Human Beings as Global Citizens

Since 2019, a prolonged pandemic has reminded us repeatedly what struggle for existence means and how survival of the fittest is still meaningful to all of us. The human-environment interaction, which remains as an eternal truth, has exploited nature for thousands of years, more because of greed rather than the need. As a result, the entire human species is now struggling for its survival sustainably. The COVID-19 pandemic has added another layer to it. Our planet is not keeping well because man-environment interactions have neglected the importance of maintaining an ecological balance. Since the beginning of civilisation, human beings have stretched their power on various lands, established geopolitical identities, and explored resources across the planet, wherever they could reach. The addiction to exploration and exploitation of earth's resources hypnotised us so much that at one point in time, we started ignoring our common identity as global citizens, which is the foremost identity to respect our planet earth.

Later, Newton's Third Law started acting with a visible impact on us and our surroundings. Some indicators are very much evident in the recent past. Let us first look at some information provided by the National Aeronautics and Space Administration (NASA). "Carbon dioxide levels in the air are at their highest in 650,000 years", "Nineteen of the warmest years have occurred since 2000",

"Satellite data show that Earth's polar ice sheets are losing mass". The average surface temperature of the earth has risen about 1.18°C since the late 19th century. The increased heat has been absorbed by the oceans, and as a result, the top 100 metres of the oceans show an increase of temperature by 0.33°C since 1969 (climate.nasa.gov).

Some of the coldest regions of the world have been on fire in 2021 even through the winter months, indicating a changing climate. During 2020-21, the forest ecosystem was disturbed by multiple wildfires around the world which emitted massive carbon. The wildfires mostly occurred in Siberia, North America, North Africa and the Mediterranean. States in India with huge losses due to forest fires included Odisha, Madhya Pradesh, Chhattisgarh, Maharashtra, Jharkhand, Uttarakhand, Andhra Pradesh, Telangana, Mizoram, Assam and Manipur. A forest fire destroyed the mountainous State of Uttarakhand, in the early part of 2021 when the fires had been going on continuously for six months. The India Meteorological Department (IMD) predicted an average temperature in this State to be higher than normal (Sangomla, 2021).

In this crucial era, environmental pacts are certainly most essential. There are many conversations around climate change in the past few decades because of the high risk of the natural ecosystem across the world. The United Kingdom hosted the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow from October 31 to November 13, 2021. "The Parties" refers to all 197 nations which agreed to a new environmental pact, the UN Framework Convention on Climate Change (UNFCCC).

Precursor to COP26

Let us quickly have a look at the initiatives taken so far at the international level to save the planet and its ecosystem from the danger of climate change. As World War II was about to end in 1945, nations were in ruins, and the world wanted peace. The representatives of 50 countries gathered at the United Nations Conference on International Organisation in San Francisco, California from April 25 to June 26, 1945. For the next two months, they proceeded to draft and then sign the UN Charter, which created a new international organisation - the United Nations. It was hoped that the UN would prevent another world war like the one they had just lived through. The World Meteorological Organisation (WMO) was established in 1950. Figure 1 provides an overview of some major milestones of international initiatives for protecting the planet and its ecosystem.

WMO and UNEP established Intergovernmental Panel on Climate Change (IPCC) in 1988. On December 11, 1987, at its 42nd session, the General Assembly of the United Nations designated the 1990s as the International Decade for Natural Disaster Reduction (IDNDR). In 1990, the IPCC released its first assessment report that spoke about Greenhouse Gases (GHG). It stated that the temperature increased by 0.3-0.60C over the last century. The United Nations Framework Convention on Climatic Change (UNFCCC) signed in 1992 at the UN Conference on Environment and Development constituted the Foundational Climate Agreement. This Agreement provided the platform for most international climate agreements that appeared later (Kuh, 2018). If all the nations in the world follow the norms mentioned in the Agreements, there is the possibility of maintaining the

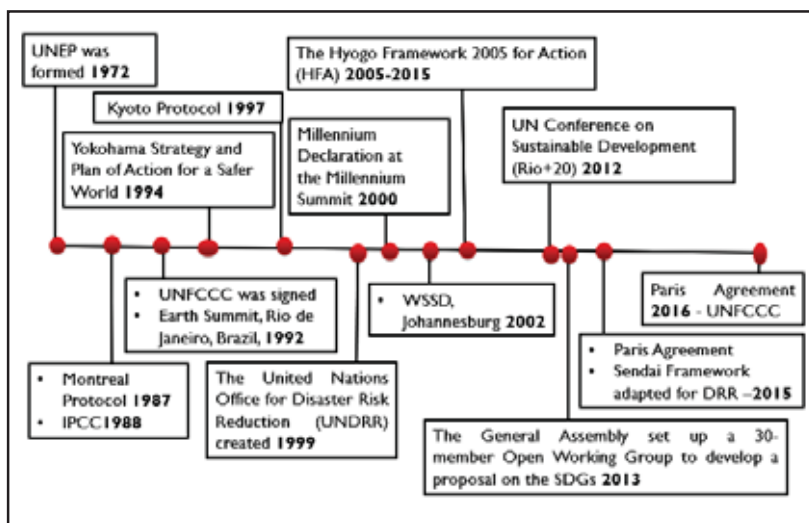


Figure 1: A few major milestones of international initiatives for protecting planet earth.

balance for a few more decades. However, mere agreements and conversations will not be effective until and unless actions are taken sustainably.

Impact of Climate Change on Pandemic and COP26 Promise

Since the pandemic, triggered by Covid-19, numerous research-based studies were conducted to understand the causes of the pandemic and its consequences on the larger ecosystem. According to research conducted by the Center for Climate, Health, and the Global Environment (C-CHANGE), there is a need to take climate action to prevent the next pandemic. The research says that deforestation is a root cause of climate change because animal migration happens due to deforestation, and such migration further increases the risk of infectious disease spread. The Ebola epidemic in West Africa probably occurred in part because bats, which carried the disease, had been forced to move into new habitats because the forests they used to live in had been cut down to grow palm oil trees. Therefore,

preventing deforestation can reduce biodiversity loss leading to a reduction of animal migrations and infectious disease spread (www.hsph.harvard.edu).

During the COP26 Climate Summit, more than 100 world leaders promised to end and reverse deforestation by 2030. The countries that have signed the pledge cover around 85% of the world’s forests. Some of the funding will be provided to developing countries to restore damaged land, tackle wildfires and support indigenous communities (Rannard and Gillett, 2021).

Impact of Pandemic on Climate

The pandemic caused restrictions on travel, trade, etc., causing an economic impact for sure but, those restrictions led to some improvement in air quality in many places especially in the urban, industrialised areas across the world. However, the same pandemic triggered another threat to our environment. The pandemic led to an increased demand for single-use plastics. The use of plastic increased because of mainly three reasons: (i)

requirements in the health sectors, especially in the forms of PPE kits, Covid testing instruments, masks, goggles, gloves, sanitisers, etc., (ii) requirements of the public for increased online shopping in the form of plastic carrier bags, packaging materials, garbage bags, etc., (iii) requirements of the public’s personal care in the forms of masks, sanitiser, gloves, etc (Parashar and Hait, 2020).

A major part of these plastics is disposable but not biodegradable. The use of such plastics intensifies pressure on an already out-of-control global plastic waste problem. “While it is suspected to be large, the magnitude and fate of this pandemic-associated mismanaged plastic waste are unknown” (Penga et al, 2021). According to research conducted in the School of Atmospheric Sciences, Nanjing University State, China, “The Arctic ecosystem is considered to be particularly vulnerable due to the harsh environment and high sensitivity to climate change”. There are chances of rising riverbed and seabed. The released plastics after being transported over long distances in the ocean may encounter marine wildlife and potentially lead to injury or even death (Penga et al, 2021). Although COP26 has recognised the importance of the health of oceans, there is no specific recommendation to manage the emerging situation due to the pandemic. More immediate thoughts are needed for this aspect. Such thoughts must emerge based on research in the disciplines of oceanography, ecology and climatology supported by chemical and medical sciences.

Interdisciplinary Approach Leading to Global Citizens

“Charity begins at home”. Let us think of a way of bringing up our

future generation as global citizens. Here is an illustration of thought for redesigning our educational approach for children at the elementary level (till Grade VIII) in schools in India. The disciplines introduced in elementary grades include Science, Social Science, Mathematics, and a few Languages.

Figure 2 below shows a canvas full of themes which a child glances under different disciplines named as various subjects during her elementary education. If we imagine the blue background as the languages the child learns, she gets exposure to various broader themes through subject-specific disciplines like Science, Social Sciences (often referred to as Social Studies in school that include Civics, History and Geography) and Mathematics. If we introduce her to her huge home - planet earth - at the beginning, then she can always discover her location and immediate surroundings, marked by a political boundary within the huge home. She can play around with all information available in multiple disciplines, but we need to help her connect the dots of all disciplines adequately to make those meaningful for her own life, immediate surroundings as well as her bigger home, and think of herself as a global citizen. In this way, a child will not travel on various discipline-based isolated islands just to ensure a brilliant academic result followed by a white-collar job. Rather, she will get a holistic understanding of all disciplines connected and their interlinkages that will surely enhance her understanding of both macro and micro-level changes. Such a holistic development may ensure a better future for our younger generation. Such a child will organically construct responsible behaviour, will showcase her civic sense and responsibility to keep peace and harmony sustainably.

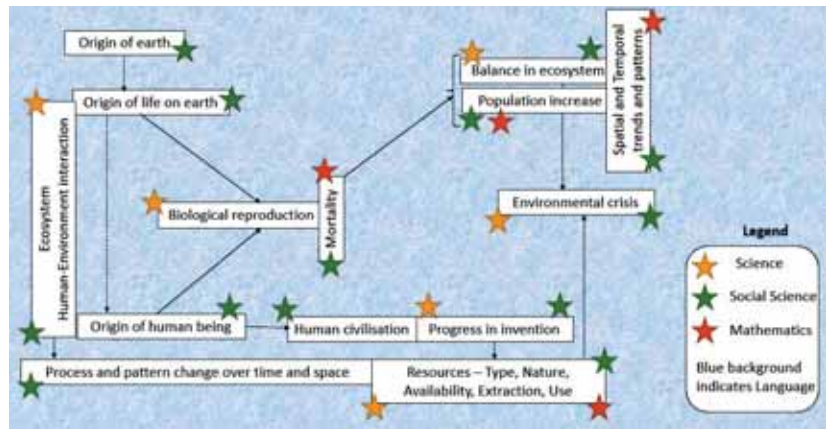


Figure 2: Interlinkages of themes often introduced through various disciplines at the elementary level of formal education in India.

Other materialistic needs of life will automatically get fulfilled over time.

Dream for a Better Tomorrow

“Don’t limit a child to your learning, for he was born in another time.” Rabindranath Tagore stated this almost 100 years ago, but we still could not establish a strong and visible interdisciplinary approach in school education. Most of the disciplines and standardised processes of evaluation remained confined within mere factual understanding, and disciplines remained as isolated islands for children. Our future generation gets into the world of formal education in an extremely mechanical manner. A few Agreements with limited nations of the world will not be able to solve the problems highlighted by COP26. This COP26 is not an isolated event. It is rather a warning for all of us across the world. Let us start thinking of bringing our future generation in such a manner that our children start thinking logically and rationally to save available resources shared by all creatures in this larger ecosystem, to reuse resources, to conserve planet earth sustainably. Interpretations may hinge on any subject-specific discipline such as Physical Science,

Social Science or Mathematics in any language but the goal and response should remain the same – making a sustainable world as a gratitude to our mother earth. ■

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The Indian Monsoon and Its Many Facets

Paras Nath Rai IPS (Retd.) is a Member of the Bihar State Disaster Management Authority, Bihar.

The article explains the need to mainstream DRR in the day-to-day development practices, rather than having a response-based approach to disasters.

Perhaps no other climate-related phenomenon in the world has been as romanticised in folklore and high literature as the Southwest Monsoon - popularly referred to as the Indian Monsoon. After the sweltering summer across the Indian subcontinent, and when the Indian monsoon hits the shores of Kerala in early June, it brings a sense of relief and joy. Thereafter, the progress of the monsoon is followed closely for weeks and months by the common man, farmers, traders, and even policymakers. With a large proportion of the Indian population dependent on agriculture, it is no surprise that the country eagerly looks forward to monsoons. However, the implications of the monsoon's performance are not limited to agriculture. They ripple across the entire economy. The country's economic growth or its downturn is often linked to the timing and the quantum of rain each year.

Increasingly, however, this happy tide is often mixed with grief due to frequent disasters witnessed during the monsoon. The purpose of this paper is to talk about the many negative impacts that occur in both a 'good' or 'bad' monsoon year. All of these impacts can be significantly reduced with some forethought, systematic approach and planning.

The most common and visible impact in a good monsoon year is in terms of large scale riverine floods.

Floods cause damage to property, crops and livestock resulting in immense misery to large sections of the population in several States. Much has been said and written about riverine floods in India. Flood commissions for the country as a whole as well as those focused on specific river basins have studied the problem of floods in great depth and recommended both structural measures (e.g. embankments and dams) and non-structural measures (e.g. land use planning, local level flood preparedness) to alleviate the impacts of floods. Many of these measures have been implemented across the country. This article goes beyond riverine floods to look at other disasters that accompany monsoons. These disasters are less visible perhaps because the impacts



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are diffused and are stretched across several weeks during or just after the monsoons. The following paragraphs discuss the problem of five such disasters: urban floods, lightning strikes, drowning, snakebites, infectious diseases (water-borne and vector-borne).



People throw tyre tubes to save a man being carried away by gushing waters in the Falaknuma area of Hyderabad, Hyderabad Flood, 2020.



Patna Flood 2019

(Source - <https://www.theguardian.com/world/2020/oct/03/floods-france-italy-record-rain>)

The problem of urban flooding has assumed alarming proportions all over the world. The primary reasons are the absence or inadequate systems for drainage of water, indiscriminate disappearance of water bodies, insensitive urban planning and, of course, extreme weather. We have to look at climate and water sensitive urban planning.

2. Lightning Strikes: As per National Crime Record Bureau (NCRB), over 2000 are killed by lightning every year since 2005. 2300 died in 2018. Bihar lost over 400 lives in 2020 alone.

Lightning is a major natural disaster in India where most of the deaths occur in rural areas, with low levels of awareness and absence of lightning protection. It comes with the onset of monsoons when farmers and their workers rush to the fields as rains arrive. Lightning does occur in the US too, but the average number of deaths per year is just 49. (Source - <https://www.weather.gov/safety/lightning-victims>). Even though lightning is the biggest contributor to accidental deaths due to natural causes, it remains among the least studied atmospheric phenomena in the country. Occurrences of lightning are not tracked in India, and there is simply not enough data for scientists to work with. Often, safety measures and precautions against lightning strikes do not receive as much publicity as other natural disasters such as earthquakes and floods. Its relationship with monsoons is exhibited by what happened in Bihar this year. Close to 450 lives were lost. June 25, 2020, was an extremely sad day as no less than 100 people falling prey to this natural phenomenon. The week - June 24 to July 4 - saw a maximum number of deaths.

1. Urban Floods: In the recent past, the intensity of extreme precipitation events has become a norm rather than an exception. Smaller cities and many large cities like Hyderabad, Mumbai, Chandigarh, Patna, Gurgaon and Bengaluru have been brought to their knees. Mumbai 2005, Chennai, 2015, Hyderabad in 2020, etc., were watershed in this aspect. These floods resulted in the loss of life and property and disrupted normal life for several days for a large population trapped in water-logged areas. Response agencies had great difficulty in rescue and relief operations.

1.1: Look at what happened in Hyderabad and the surrounding areas on October 13 and 14, 2020. The city recorded the highest-ever rainfall in October since 1891 - 32 cm in 24 hours. Videos circulating showed as if a river was flowing through the city. The extreme rainfall killed more than 60 people.

1.2: Patna experienced one of the worst urban floods in 2019. It did not cause any death worth mentioning but brought much misery to the residents. Commercial/clinical establishments suffered heavily as insurance does not cover floods in cities. There was a tremendous loss of livelihood for thousands, if not lakhs.

1.3: Outside our country, the city of New York faced an extreme weather emergency for the first time in September 2021, when unprecedented rains caused a large number of deaths. The then New York City Mayor Bill de Blasio described the flooding as a "historic weather event". The city experienced rainfall in a day which was many times more than the average rainfall. It was up to 3 to 4 inches per hour, due to cyclone Ida, whereas, New York City's sewer system was only designed to handle 1.75 inches of rain in an hour. Very heavy rain in August had left waterways already near capacity. For example, New York City received over 10 inches of rain in August, its fourth-highest amount on record during the month.

1.4: On July 12, 2021, nearly 76mm of rain fell in 90 minutes in parts of London (The Guardian). Europe, too, had its share of extreme weather when as recently as October 13-14, 2020, unrelenting rainfall hit levels not seen since 1958 in northern Italy's Piedmont region where 630 millimetres of rain fell in 24 hours. (Source - <https://indianexpress.com/article/world/one-killed-25-missing-in-severe-floods-in-italy-and-france-6688055/>). On the other side of the border, in Nice, France, almost a year's average rainfall fell in less than 12 hours.

There is a clear connection between weather conditions and lightning deaths. Monsoon rains that have been both deficient and delayed in most of the recent years have been rather bountiful this year as Bihar received 66% excess rains from June 1 to July 2 and 77% excess in the week of June 24 to July 1. East Uttar Pradesh received 72% excess rains in the same period with 79% excess only from June 24 to July 1 week. Therefore, when timely monsoons arrived this year, farmers moved to their fields quickly to take advantage of the rain but fell prey to lightning strikes. (Source - Bihar Monsoon 2020: Lightning death - an analysis, Bihar State Disaster Management Authority).

3. **Drowning:** Thousands die from drowning during the monsoon months. July, August and September are the worst. Unfortunately, a majority of them are young children who drowned in process of enjoying the rainy season, or those performing daily chores such as bathing, washing clothes, etc. Drowning is the third leading cause of death worldwide for children aged 5-14 years. It caused 30,187 deaths in India in 2018 as per NCRB. (Source - <https://ncrb.gov.in/sites/default/files/ADSI-2018>) 2020 has been particularly bad as children remained at home due to COVID-19. The situation could be worse as many of the cases are not reported because not every State has declared it a local disaster, providing for ex-gratia payment for deaths. The States most affected are Madhya Pradesh, Karnataka and Tamil Nadu.

The primary reasons for such a large number of deaths are:

1. Absence of basic safety measures
2. Lack of swimming and rescue skills

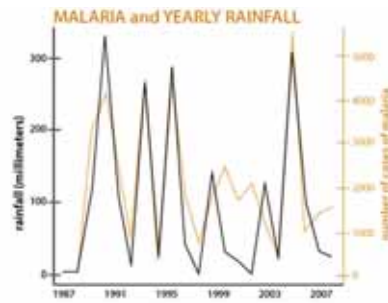
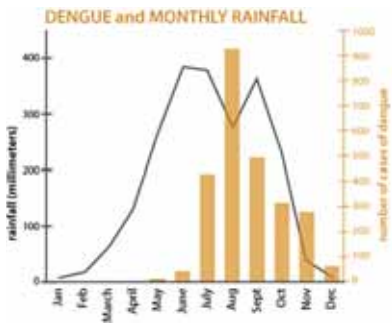
There is serious deficit of awareness among villagers regarding basic



preventive action/precautions against drowning i.e., not going to dangerous water bodies. Such places are neither identified nor earmarked. Therefore, the foremost prevention is creating awareness among villagers not to venture out in water bodies during the monsoon and especially not allowing children to venture out alone. Traditionally, rivers and ponds were training grounds for the villagers for swimming, bathing and washing clothes. However, with disappearing village ponds and with most households having a separate bathing area, the most vulnerable - the children - do not know swimming.

4. **Snakebites:** Snakebite, also frequently witnessed during the rainy season, is a dreadful disaster even though its seriousness is not appreciated. Again, as per the NCRB, around 9000 deaths occurred in 2018. (Source - <https://ncrb.gov.in/sites/default/files/ADSI-2018>) Unfortunately, such deaths are not documented as they are taken as normal events. States like Bihar, Jharkhand, Madhya Pradesh and Odisha accounted for 70% of deaths during the period 2001-14. The number could be much higher as not all deaths are reported to police or government agencies for various reasons, including non-provision of ex-gratia





payment. Even though most snakes in India are non-poisonous, we witness an unusually large number of deaths. Water-logging during monsoons disturb the habitation of the snakes, forcing them to seek shelter in homes, etc.

The main reason for many deaths is dependence on traditional treatment in villages than on allopathic medicines. Governments are, therefore, focused on educating the people to seek immediate medical assistance as against resorting to local methods of treatment. This is a big challenge for community leaders, including the public representatives, teachers, Self Help workers and semi-government functionaries working at the village level, Asha workers, Anganbari Sevika, Kisan Mitra, etc.

5. Infectious Diseases: It is a well-known fact that doctors and hospitals get extra busy during

monsoons due to the onslaught of several diseases such as dengue, chikungunya, malaria, etc. Increased incidence of infectious diseases is observed from the graphics below.

Dengue is one of the most fatal of these diseases. The problem of contaminated drinking water causing many problems is directly linked to monsoons.

The Way Forward

What should worry us is that models have predicted that this is likely to get worse as temperatures rise. Climate change has added to the caprices of the monsoon by shifting the seasons as well as providing excess or deficient monsoon rains. As it is, India has become hotter since the middle of the 20th century with more droughts, lightning, floods, and stronger cyclones. This has made monsoons and related

disasters the top priority of disaster management policymakers and managers in the country. It has affected hitherto unknown areas.

Therefore, in the absence of risk-informed mitigation and adaptation measures, climate change is likely to pose profound challenges to achieving the Sustainable Development Goals (SDGs) adopted by the UN Member States in 2015.

As most natural disasters happen in villages and large spaces and times, we do not appreciate their enormity. Our response, therefore, is mostly reactive while we need to prioritise and promote prevention and mitigation activities. Nations and communities need to do much more than what is being done currently. Some key interventions could be engaging the community, adoption of technology, and mainstreaming disaster reduction, which is still a non-issue in all activities. Bihar's climate change adaptation programme - Jal Jeevan Hariyali - could be a game-changer. Its main pillars are - increasing green cover, rejuvenation of water bodies and, management of groundwater. ■

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UNFCCC and Its Role in Locating Displacement in Climate Action

Sonu Tewari is pursuing PhD from the Jamsetji Tata School of Disaster Studies at the Tata Institute of Social Sciences. Her PhD research is on understanding women’s lived experiences of forced displacement due to coastal erosion in the Sundarbans.

Forced Displacement due to disasters and climate change has become a reality for many who live in fragile and vulnerable locations across the globe. Displacement can take many forms; however, if it is left unaddressed with the disaster risk and climate change adaptation framework, it can become prolonged and protracted and can cause complex survival challenges associated with the lives, health and livelihood of those affected. This article posits displacement within the decisions and agreements of United Nations Framework Convention on Climate Change (UNFCCC) through the Conference of Parties. It argues that though there is recognition of the people who are displaced due to climate change and disasters and a commitment to work towards their protection and wellbeing within the UNFCCC, there is a long way to go to realise the commitments into concrete actionable steps in the area of forced displacement.



Sonu Tewari

Forced displacement is one of the inevitable consequences of climate-related disasters. There is a growing recognition that climate change is one of the influencers of disaster-led displacement around the world, coupled with social, economic, environmental, cultural, and political factors. Many who are struggling with their lives, health, and livelihoods in areas

experiencing disasters are forced to move to a new location for survival and the well-being of their family members. Some among them are those who have lost their lands and homes to the approaching sea, some whose land does not yield crops for subsistence, and others whose lands are being charred by a forest fire or inundated by floods. Those who displace from

disasters are the ones who are most vulnerable, poor, and have limited choices but to flee for their safety and survival.

According to Internal Displacement Monitoring Committee (IDMC), out of 40.5 million people who were internally displaced in the year 2020, around 30.7 million people were displaced due to disasters. More than 98% were displaced as a result of weather-related hazards such as storms and floods (Refer to Fig 1). Accordingly, IDMC calculates the economic burden of internal displacement for individuals, communities, and economies as nearly \$20.5 billion in 2020, it accounts for IDP’s housing, education, health, security needs and, loss of income.

Displacement associated with both slow-onset environmental change and rapid onset weather-related disasters cause complex

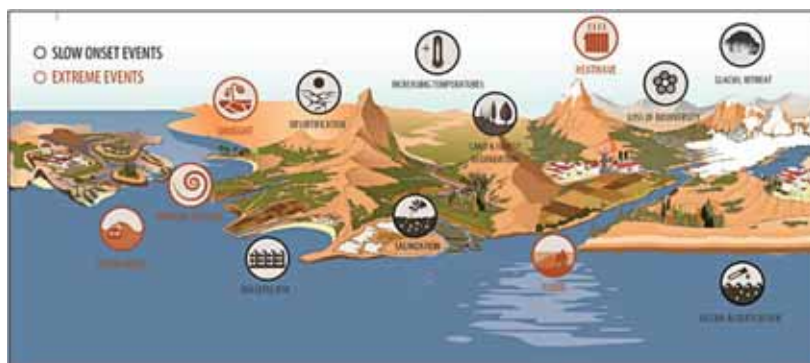


Figure 1: Slow Onset and Extreme Events. Source: UNFCCC

survival challenges for displaced people. It is also varied in nature depending on the context in which the displacement takes place. For the sake of explanation, this article divides displacement broadly into four types based on the nature of displacement that takes place. However, the categories of displacement are not rigid, and often the boundaries between them are blurred.

Types of Displacement

1. Temporary Displacement:

People who are affected by rapid-onset events like hurricane, flood, storm surge, tsunami or tropical cyclones have limited options but to displace them to a safe location for survival during disasters. Displacement in such situations is generally for a short period and is often considered as temporary where the people go back to their original habitat after the situation returns to normal.

2. Permanent Internal Displacement:

People dealing

with slow irreversible environmental changes like sea-level rise and coastal erosion are forced to displace due to loss of habitat, productive land, and vital ecosystem services. Other slow onset events like drought, desertification, and salinity intrusion cause acute food insecurity as they impact the environmentally-based livelihoods including agriculture, fisheries, aquaculture, and horticulture. Displacement is used as a survival strategy to cope with this loss of homes, land, and livelihoods. People in such cases, move from one region to another within the border of their country, far enough away from their places of original residence that makes their return unlikely or impossible. For example, people move from a drought-affected region to an inland town or city.

3. Permanent Local Displacement:

In cases, where the two types of events, viz., slow and rapid onset disasters intertwine. For example, in the Sundarbans Delta which experiences both sea-

level rise and coastal erosion along with floods and tropical cyclones, people are displaced locally but permanently due to irreversible changes to their living environment. They are the small-scale and localised movement of people within their place of residence. When rehabilitation is incomplete after a disaster, either induced by slow or rapid onset events, subsequent events, severe or non-severe, push people over the edge. They turn temporary local displacements into permanent ones, resulting in a vicious cycle.

4. Cross Border Displacement:

People who do not find solutions to displacement within their own countries, displace to other countries that are willing to offer permanent protection. For example, the case of small islands that are submerging due to sea level rise, like, a Kiribati displacing permanently to New Zealand.

Each of these displacement types is unique and requires different policy and legal conceptual frameworks to address the plight of those who are displaced. In recent years, the United Nations Framework Convention on Climate Change (UNFCCC), which is the primary international instrument dealing with climate change has brought climate displacement within its discourse. The decisions and agreements of the Convention provide hope for mitigating the rise in emission level and provide States with an opportunity to adapt to climate change.

UNFCCC began introducing the human face of climate change from the Cancun Adaptation Framework (CAF) in COP16 in 2010. Decision 14f in the CAF invites parties to undertake measures to enhance understanding, coordination, and cooperation concerning climate change-induced displacement, migration, and planned relocation

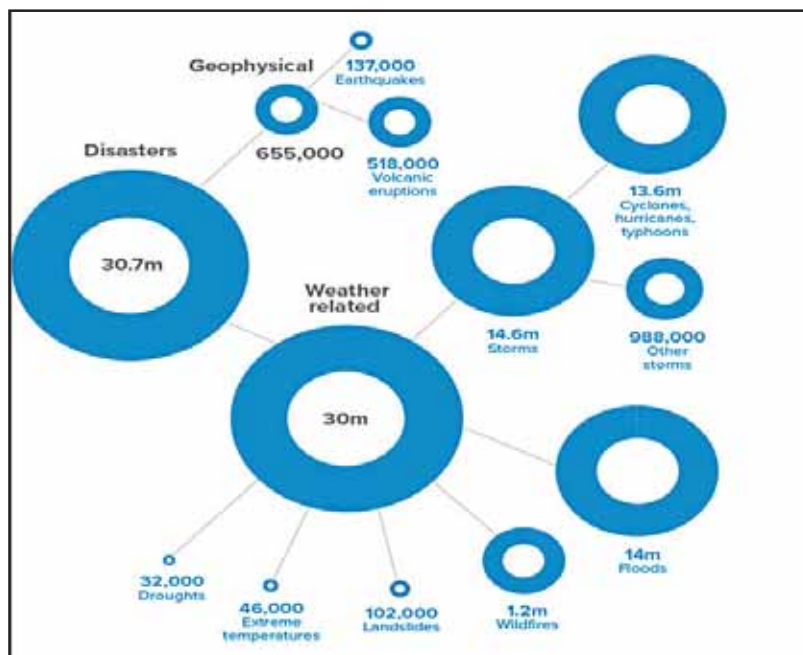


Figure 2: New displacements by disasters in 2020.

Source: IDMC

at the national, regional, and international levels. This was the first time the global community agreed that climate change-induced mobility takes on different forms and needs diverse policy approaches. However, it did not oblige the signatory States to take action or does not specify any measures for the implementation of this decision.

A significant development that took place within the adaptation framework was the establishment of the Warsaw International Mechanism for Loss and Damage (WIM) by the parties at COP19 in Warsaw, Poland, to examine compensation for damages caused by climate change. Till 2015, WIM treated loss and damage as an aspect of adaptation and did not provide a mechanism to provide compensation for both slow-onset and rapid-onset harms that cannot be avoided through adaptation, including climate displacement.

Climate displacement found a place in the Paris Agreement which was adopted in December 2015 as a protocol to the United Nations Framework Convention on Climate Change (UNFCCC) which seeks to hold global temperature increases to no more than 2°C above pre-industrial levels. It was a major historic agreement that not only calls

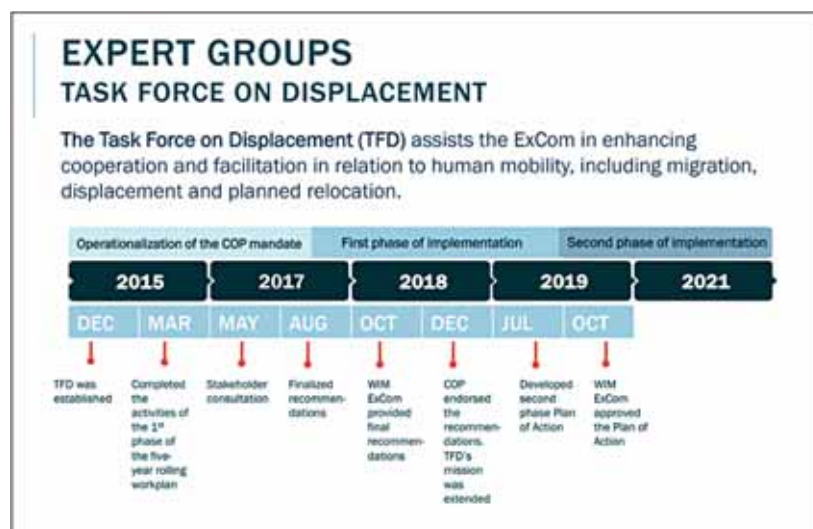


Figure 4: Task Force on Displacement. Source: UNFCCC

for mitigation of climate change and promotion of sustainable development but also linked climate change and migration beyond adaptation. It contains a loss and damage provision which is designed to avert and address displacement. It also advised the Warsaw Mechanism's Executive Committee to establish a task force to "develop recommendations for integrated approaches to avert, minimise, and address displacement related to the adverse impacts of climate change. The preamble of the Paris Agreement talks about human rights, particularly the right

to health, the rights of indigenous peoples, migrants, children, persons with disabilities, and people in vulnerable situations. The explicit references to human rights and climate justice in the Paris Agreement is an important step that may provide a foundation for those seeking redress for human rights violations caused by climate change.

Under the Paris Agreement, the Executive Committee (Excom) of the WIM established the cross-institutional Task Force on Displacement to formulate integrated approaches to avert, minimise and address displacement related to the adverse impacts of climate change by their mandate outlined by the Paris Agreement. The recommendations given by the task force were endorsed by UNFCCC in 2018 and its mandate was extended till 2021. Some of the important recommendations include formulation of national and subnational legislation, policies, and strategies to avert, minimise and address displacement, improved institutional coordination and coherence, and broader public participation. It also identified



Figure 3: Milestone on loss and damage. Source: UNFCCC



a finance gap when it comes to climate-related migration since most UNFCCC funds do not address them at all. Dealing with the protection issues of migrants and refugees involves a significant allocation of resources which includes the provision of public services, humanitarian assistance as well as the protection of rights to shelter, education, health, etc.

In recent years, within the UNFCCC, there is a growing recognition of the people who are displaced due to disasters and climate change, and therefore, a commitment to work towards their protection and well-being. However, the recommendations of the Task Force on displacement are yet to be developed into guidelines and the steps that will be taken by the Signatory States are still to

be formulated. COP26 has not outlined concrete actions to realise the commitment in the area of forced displacement which will be essential to protect vulnerable communities and avoid or minimise the devastating consequences for millions of people who are displaced due to climate change.

Unfortunately, adaptation can only be possible along with mitigation of climate change. COP26 in Glasgow, revealed that the Nationally Determined Contributions or NDCs i.e. the plan of reducing emissions laid down by countries will exceed those committed during the Paris Agreement in 2015. Crossing the 2°C will have devastating consequences on people's lives and livelihoods in vulnerable areas whereby some of the effects of climate change will not be possible

to control; one among them is displacement. One last hope is the Glasgow Climate Pact. Theoretically, it is an attempt to keep the targets of the Paris Agreement alive by requesting countries "revisit and strengthen" their climate pledges by the end of 2022. Ideally, if the Glasgow Climate pact works, it will effectively mitigate climate change, thereby minimising displacement considerably. ■

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Is Climate Change a Real-Time Situation?

Case Studies on Water Bodies in India

Dr Shyamli Singh, Deepakshi Babbar and Prof. V.K. Sharma are faculty at the Indian Institute of Public Administration (IIPA), New Delhi.

Climate change is no longer a prediction, rather, it is real. As a result of climate change, the temperature of the earth is increasing, and rainfall is declining. Water bodies are a perfect feature to understand the impact of climate change in reality. Three study areas have been taken to understand the climate change impact. Three areas belong to the different ecosystems i.e. forest ecosystem, urban ecosystem and wetland ecosystem. The study area has been chosen accordingly that anthropogenic pressure does not affect our results so that a clear picture of climate change can be shown. The results show that there are considerable changes in the extent of the water and surface water bodies are drying. Therefore, we should stop saying that climate change is not real, rather our focus should be on the rejuvenation and conservation of these water bodies. Use of the GIS and remote sensing is suggested to develop climate change models and appropriate plans for water management.



Dr Shyamli Singh

Ancient Global Scenario of Climate Change

It has always been a topic of debate whether climate change is real or not. Climate change is believed to be a big challenge of the 21st century for water bodies. Waterbodies are a significant component to understanding climate change and its impact on any ecosystem. They are important as they serve various functions to get rid of the destructive effects of climate change, serve as a perennial source for groundwater recharge at times of drought, act as a sponge at the time of floods, act as a carbon sink for greenhouse gases, act as a heat sink for deducing the urban heat island effects, act as a better cooling agent than green spaces in any ecosystem (Rao, 2021). According to the IPCC (2007), the world has been experiencing a deteriorating impact on water resources. To manage the water resource, we need to understand the enhanced societal demand and be aware of the climate change effect on various components of the water cycle (Abbaspour et al., 2009). According to IPCC (AR5, 2014), the global temperature is expected to rise to 4°C and will heavily influence water resources and their demand across the world. The reason for this change

is the alteration in precipitation, evapotranspiration and Spatio-temporal distribution of water resources (Kumar et al., 2017). Climate change creates flood or drought conditions in any area. These are a result of alterations in precipitation, temperature and evapotranspiration normal values. Higher precipitation will cause more surface runoff which leads to flood conditions and lesser groundwater recharge. The escalation of the temperature causes evapotranspiration which leads to drought conditions. Moreover, global warming creates other disastrous conditions like forest fires, and this warming of the atmosphere makes the air hold moisture which results in heavier and more frequent precipitation (Rao, 2021). To achieve water management objectives to overcome future challenges, the impact of climate change on the water balance needs to be checked from regional to larger scales (Kumar et al., 2017). India has different geographies at different places which pose difficulty in generalisation of the impact of climate change on water bodies, and it is still a matter of research (Goyal et. al., 2018). To understand the fact that climate change is real and that it also poses an impact on water bodies, three study areas have

been taken which belong to the different geographic locations and different ecosystems in India. To check the impact of climate change on water bodies, a large temporal gap is needed here. We have taken a time gap of a minimum of 20 years and a maximum of 30 years to find significant spatial differences.

Trends of Precipitation and Temperature in India

Rainfall: Our study area covers North Eastern (Manipur), North Western (Rajasthan) and North India (Delhi). In India, the majority of the monsoon is a result of the southwestern winds or monsoon, while a minor decrease in rainfall is observed all over India. In the North Eastern States of India, no particular trend of rainfall is observed but this region receives heavy rainfall (Jain et al., 2013; Goyal et al., 2018) while a minor increasing trend is observed in the North-Western region, which is again unusual for an area like Rajasthan. On comparing the 20th and 21st-century rainfall data, 21st century has experienced dry years. Based on the predictive analysis, 7-18.7% of rainfall is expected to increase by the year 2099 (Chaturvedi et al., 2012; Goyal et al., 2018).

Temperature: IMD has reported a warming trend over the years since the 20th century. Based on the analysis of the temperature data from 1881-1997, a rise of 0.57°C per hundreds of years has been observed (Pant & Kumar, 1997). Western India showed an increase in annual mean temperature (Arora et al., 2005). Also, a temperature rise is observed in northern and North-Eastern India (Goyal et al., 2018).

Study Area:

The three areas covered for the study are (i) Sariska Tiger Reserve, Alwar, Rajasthan (Northwestern area), (ii) New Delhi, Delhi (Northern area), and (iii) Loktak Lake, Manipur (Northeastern area). The study area has been chosen to check the impact of climate change in different ecosystems i.e. Sariska Tiger Reserve (Forest Ecosystem), Urban Ecosystem (New Delhi), Loktak Lake (Wetland Ecosystem). The STR region is of major importance as it is a reserved area and anthropogenic pressure is negligible, So the changes measured will be because of the climatic variation. The Loktak Lake is also a wetland of international importance and is marked as a Ramsar site (A Ramsar Site is a wetland site designated to be of international importance. The Ramsar Convention on Wetlands, also known as the Convention on Wetlands, is an intergovernmental treaty for the conservation and wise use of wetlands) of India. A special and unique feature of this wetland is the presence of floating islands called

‘phumdis’ which also supports the rich biodiversity of the region.

Methodology:

The Landsat and Sentinel Satellite data has been used to extract water bodies. Detailed methodology is given in Figure 1.

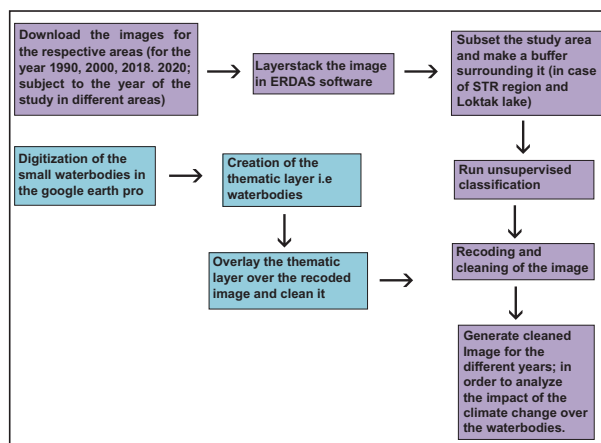


Figure 1: Methodology adopted for the extraction of water bodies in the study areas (i.e. STR, Delhi, Loktak Lake)

Data Used for the Study

The detailed spatial and temporal information for the different study sites is shown in Table 1.

Table 1: Data Type Used for the Study

S. No.	Satellite Used	Data Type	Date
Sariska Tiger Reserve			
1	LANDSAT 7 ETM+	Spatial data (30m)	January 2000
2	LANDSAT 8 OLI/TIRS	Spatial data (30m)	February 2018
Delhi			
1	Landsat 5 (Thematic Mapper)	Spatial data (30m)	February 2000
2	Sentinel-2A	Spatial data (10m)	October 2020, December 2020
Loktak Lake			
1	Landsat 5 (TM)	Spatial data (30m)	March 1990
2	Landsat 8 OLI/TIRS	Spatial data (30m)	March 2018

Results:

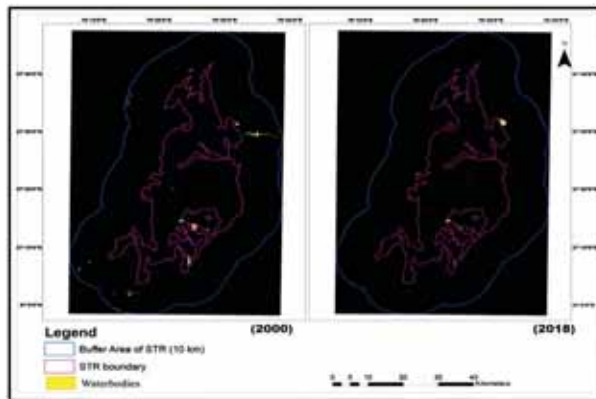
Case Study 1: Forest Ecosystem: Sariska Tiger Reserve

The STR is comprised of the Sariska Wildlife Sanctuary and adjoining areas in the Alwar District of Rajasthan. The Reserve lies within the Aravallis Mountain Range with altitudes ranging from 270 to 360 m. The Reserve's core geographical extent is 27° 5' to 27° 33' N latitude and 76° 17' to 76° 34' E longitude. The total area of 881.11 km² is notified as CTH (Critical Tiger Habitat) by the Government of Rajasthan (GOR) in 2007. This includes the Reserved Forest (604.97 km²) and the Protected Forest (276.14 km²) in STR. (GOR, 2004). The study area covers the STR region and its 10 km buffer.

Table 2: Results for the Change in Water Bodies of the STR Region

Year of Study	Area	% of the Whole Area
2000	869.32 ha	0.003
2018	334.19 ha	0.001
Net change in the area of the water bodies	535.13 ha	0.002

Figure 2: Spatial Results for the Water Bodies of the STR Region for 2000 and 2018



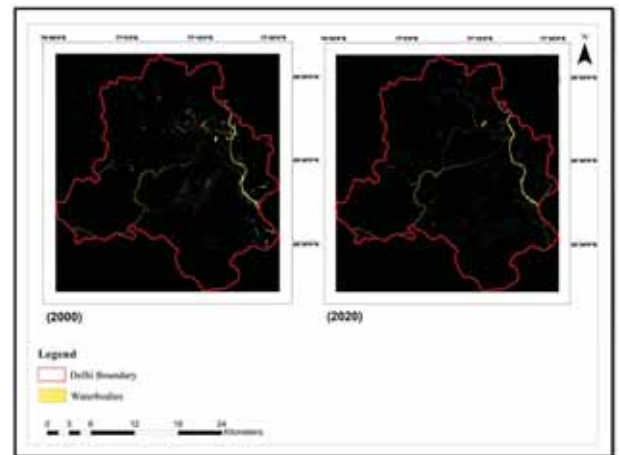
Case Study 2: Urban Ecosystem

The urban ecosystem must include a metropolitan city. We are taking Delhi as our representative of the urban ecosystem as it is the largest metropolitan city in India. Delhi has the coordinates of latitude 28.7041° N and longitude 77.1025° E. The city experience a high rate of industrialisation, urbanisation and it is a habitat of a large population; therefore; it has a high anthropogenic constraint.

Table 3: Results for the Change in Water Bodies of the Delhi Region

Year of Study	Area	% of the Whole Area
2000	2370.15 ha	0.015
2020	1754.78 ha	0.011
Net change in the area of the water bodies	615.37 ha	0.004

Figure 3: Spatial Results for the Water Bodies of the Delhi Region for 2000 and 2020



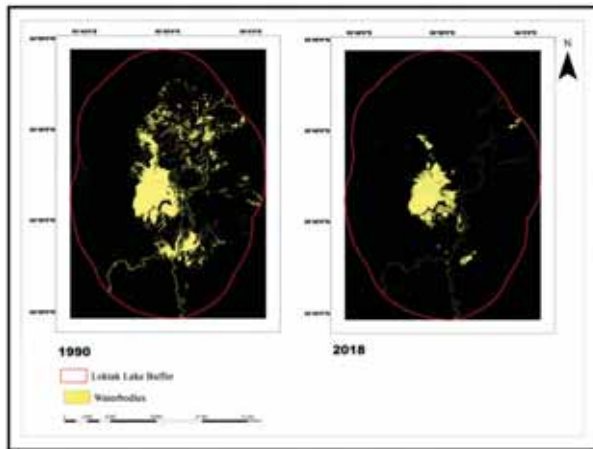
Case Study 3: Wetland Ecosystem

The study covers a wetland of international importance i.e. Loktak Lake. This area is of significance as it is an ecotone between terrestrial and aquatic ecosystems. This area is a part of the Indo-Burma biodiversity hotspot. This lake lies at 24° 38' 24.0792'' N and 93° 52' 11.7624'' E. The southern area of the lake is a part of the world's only floating national park i.e. Keibul Lamjao National Park and a natural habitat for the highly endangered Sangai deer. The area has a lesser anthropogenic constraint as compared to the city of Delhi.

Table 4: Results for the Change in Water Bodies of the Loktak Lake Region

Year of Study	Area	% of the Whole Area
1990	16,014.2 ha	0.09
2018	7707.81 ha	0.04
Net change in the area of the water bodies	615.37 ha	0.05

Figure 4: Spatial Results for the Water Bodies of the Loktak Lake Region for 1990 and 2018



Conclusion:

The last few decades have shown that the environmental status has been altering alarmingly. Forest cover decrease, soil erosion, siltation, drying up of lakes, dams, rivers or any other surface water resource are a few examples of this alteration in the environment. Fossil fuel burning and the rising of GHGs also adds to global warming. The high rate of urbanisation, economic development, and degraded ecosystems has left the world vulnerable to the impacts of climate change. Floods and drought conditions are the result of climate change. The negative impact of these natural or man-made situations has compromised the ability of water bodies to deliver ecosystem services. Most of the water bodies in the country are experiencing water quality issues like toxicity, cyanobacterial blooms, eutrophication, etc., and these unfavourable ecological conditions are not only affecting the aquatic flora and fauna rather it is deadly to human health also.

The Sariska Tiger Reserve is a conserved area and, therefore, negligible anthropogenic pressure would be there. The 10km buffer of the STR has been taken to conduct our study. The spatial results clearly show that water bodies are declining whether we look into buffer areas or the STR area. The study site belongs to North-Western India and hence, experiences high temperature and lower rainfall, while an unusual little hike trend of rainfall is observed during monsoon time in NW areas which is also a result of climate change. The challenge of the drying up of the water bodies in the STR Region is a result of climate change and no anthropogenic pressure is involved in it. A total spatial loss of 535.13 ha is observed. Water pollution from the tourism industry is the only anthropogenic

pressure waterbodies facing there, e.g. Pandupol area (Shahabuddin et al., 2004).

Records from 1970 to 2008 of Delhi have shown a 21% decline in water bodies. There are records of the vanishing of dry water bodies. According to a study by Singh et al. (2013), there is a decline in the number of water bodies as well as their quality. A similar kind of results has been observed in our study in the temporal gap of 20 years (2000-2020), the water bodies have shown fall off in the area of 615.37 ha. The city experiences semi-arid type of climatic conditions as the temperature has been rising and the rainfall has declined with time, and therefore, the natural or climatic constraint is there. While if we look into the anthropogenic constraint, high water pollution is being faced by the water bodies, and one of the examples is the Yamuna Action Plan. Increasing industrialisation and population in the megacities are a threat to the water bodies. The Government is spending crores to rejuvenate the dying lakes (Kumar, 2019).

Loktak Lake is found to be shrinking along with the water bodies in the buffer area. The impact of climate change is seen there as the temperature rise is an important parameter for this decline and, the rainfall is found to be a 20-30% deficit in Manipur in the last few years (Devi, 2021). As the situation of the lake is deteriorating, climate change is not the only parameter affecting the scenario, while anthropogenic pressure is also a major influencer. The construction of the Ithai Barrage altered the hydrology of the lake and affected the socio-economic living conditions of the locals of Manipur (Bhanduri, 2019). The challenge posed by this natural or anthropogenic pressure is that the migratory route of the fishes has been blocked. The lake is experiencing siltation issues because of the constant water level resulting from barrage construction causing the thinning of the phumdis. The absence of an outlet for the water is also adding to water pollution.

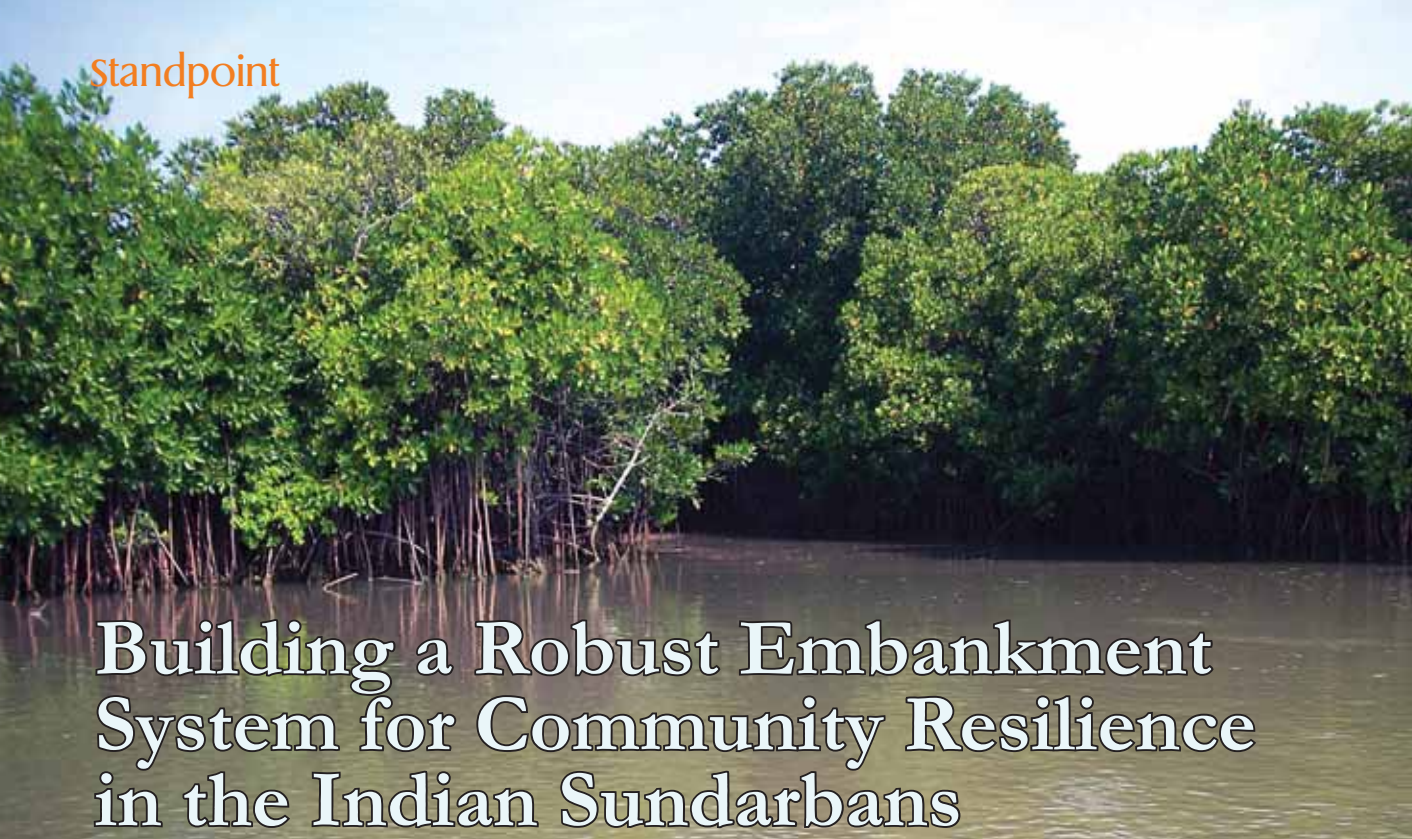
Based on the results derived from the above-mentioned case studies, we can say that climate change is real. We have taken study areas where no anthropogenic (STR)/less anthropogenic (Loktak Lake) and high anthropogenic pressure (Delhi) are there, but all the results have shown that there is a considerable change in the extent of the water bodies. Therefore, one should stop saying that climate change is not real and start taking measures to conserve and rejuvenate the degraded water bodies to make the country climate-change resilient. Strategy-making should be based on the identification of key climatic zones where the impact is going to be severe, the use of remote sensing and GIS to develop climate change models and appropriate plans for water management.

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Building a Robust Embankment System for Community Resilience in the Indian Sundarbans

Dr. Jayanta Debnath is Assistant Professor, Department of Political Science, Mrinalini Datta Mahavidyalaya, Birati, Kolkata.

Embankments have greater efficacy for community resilience and flood management, especially in coastal regions like the Sundarbans. Though a concrete river embankment is a long-persist demand of the people living here, it was never constructed due to mere party politics, negligence of policymakers at both the local and State level, and difficulties in land acquisition. As a result, they suffer year after year from the ill consequences of disasters. In this circumstance, this article examines the impact of embankments on the livelihoods of the islanders. Many issues around land acquisition are explicitly discussed in the article. It also attempts to understand how the politics of embankments influences their way of living.



Dr. Jayanta Debnath

Sundarbans, the largest delta in the world, consists of 10,200 sq km of mangrove forest, spread over India (4200 sq km of reserved forest) and Bangladesh (6000 sq km approx of reserved forest). It is also the largest mangrove forest in the world. Inhabited region in India, along the north and north-western fringe of the mangrove forest, is also known as the Sundarbans region in India. Hence, the total area of the Sundarbans region in India is 9600 sq km, which constitutes the Sundarban Biosphere Reserve (SAD, 2021). The region is

surrounded by plenty of rivers, creeks and the Bay of Bengal. The Sundarbans, a wonderland, is blessed with diverse fauna and flora. However, nowadays, it has come to our attention for recurring disasters. Four mega-disasters have hit the Sundarbans region in the last thirteen years, and small and moderate natural catastrophes are perhaps weekly phenomena across these islands. Cyclonic storms, tidal surges, floods are very common for the islanders.

Though natural catastrophes have

been frequent in the Sundarbans region, yet governmental apathy is seen in effective disaster management for many decades. However, the cyclone-induced flood Aila that struck in May 2009 gave policymakers some lessons to be prepared for disaster risk reduction (DRR). Then, in November 2019, another lethal cyclonic storm Bulbul hit the region. Fani, a cyclonic storm, had also moderately affected the Sundarbans the same year. As the islanders were still to recover from the adverse effects of these

natural catastrophes fully, Amphan hit the Sundarbans in May 2020. The latest loss and damage caused by a natural catastrophe is a severe cyclonic storm Yaas that hit the coastal districts of Odisha and West Bengal. Thus, in the last few years, the frequencies and magnitudes of natural catastrophes in the Sundarbans region are increasing fast.

The cyclonic storm Bulbul had devastated the Sundarbans, while Aila, Amphan and Yaas not only ravaged but submerged the entire region. In between these events, many incidents of embankment breaching occurred, causing enormous damage to the lives and livelihoods of the hapless islanders. When Aila struck the Sunderbans, the State Government had approached the Water Resources Section of the Civil Engineering Department of IIT, Kharagpur, for suggestions to resolve the problem permanently. It was recommended to replace all earthen river bunds with breach-resistant, concrete-reinforced earthen embankments (Choudhury, 2020).

With rising sea levels, coastal areas face the threat of more severe and frequent floods, erratic rainfall and cyclones (Centre for Science and Environment, 2012). The entire delta of the Sundarbans will continue to remain at the forefront of climate and disaster risks. Regional consequences of tropical cyclones, surge flooding and coastal erosion may continue to rise under the influence of global climate change (Shaw and DasGupta, 2015). In this circumstance, building robust embankments across the islands and constructing sea walls would certainly reduce large-scale life threats and economic loss.

Building Robust Embankments for Safer Livelihoods

The Sundarbans is recognised as



one of the backward regions of the globe, and its backwardness has been increasing for frequent natural catastrophes. Although cyclones and floods are annual phenomena in this coastal region, cyclone-induced flood brings about casualties and destruction that are more widespread. Most of the islanders who now live in the Sundarbans came as refugees from Bangladesh or landless people from neighbouring districts of the State in search of livelihood. The Scheduled Caste and Tribes are the dominant communities among them. Before the British came to Bengal, the Sundarbans was a deep and extended forest zone. For revenue generation, they had encouraged agricultural activities in the region by clearing forests. It encouraged landless people to inhabit and engage in agricultural activities. This was how people there were able to possess land.

A majority of the islanders are engaged in agriculture, especially paddy cultivation, betel cultivation, fishing, catching crabs, honey collection, and other agricultural allied activities for their livelihood. To earn a pittance of Rs 100 a day, islanders travel for miles and sometimes enter into protected forest zones that are prohibited by environmental laws. Therefore,

tiger attacks are almost a daily phenomenon leading to increasing widows in villages across the region. They know that every time they go out into the water for some earnings, the distance between life and death is not too far away. Despite such awareness, islanders, especially fishermen, are forced to do this daredevil job for their family members. Their livelihoods revolve around a popular maxim, 'crocodiles in water and tigers ashore', hinting at a two-way crisis for them. The recurring natural catastrophes and strict restrictions under the environmental laws have put their livelihoods in a quandary. Given this uncomfortable situation, thousands of islanders have migrated to different States and Union Territories in search of jobs.

People in the Sundarbans live in a perpetual state of vulnerability as breaches occur in earthen embankments that protect the inhabited islands. The development of the people is considered a low priority in here. A wonderland that is essentially unsuitable for humans, the Sundarbans had been deployed historically by governmental rationality during the colonial and post-colonial era (Mukhopadhyay, 2009). It presents us with a grand vision of conservation whose centre stage is occupied by wildlife;



particularly the Bengal tiger, and people are the obvious obstacles to this process of conservation (Mukhopadhyay, 2011). However, for most islanders, even after seven decades of independence, a wide pucca road, safe drinking water, safe bridges, electricity, and telecommunication are still distant dreams, though the situation has improved to a certain extent in the last few years.

When saline water ingresses into agricultural land after the embankment collapse, islanders face difficulties ploughing their lands for a few consecutive years. It is observed that more or less, up to three to four years, no crop grows in this land. Such situations have arisen after Aila and Amphan. This year, after Yaas, islanders faced a similar experience as there was a breach in the embankments at several places across the coastal districts. Why does embankment breaching occur every year in the region? Why does the government not solve the embankment problem in the Sundarbans by making a permanent or strong embankment system? It is assumed that perhaps there is a nexus among local politicians, contractors, and bureaucrats resulting in artifice in mud pelting works, brick abduction, and using sub-standard materials for construction. Not solving

the embankment problem is an intended business of the corrupt politicians and officials.

However, the embankment building process in the Sundarbans was an attempt at revenue generation by the colonial power. In the 1790s, Tillman Henkel, a magistrate appointed by the newly-arrived British, was assigned the task of developing an administrative block in the Sundarbans. He was supervising the processes of clearing mangrove forests and transporting soil to 'create' land. The vision of Henkel and the British administration was to make these mostly uninhabited lands a centre for paddy cultivation. For this, he continued to reclaim land in the Sundarbans, a process that carried on into the 1870s. To make agriculture profitable in the delta subjected to frequent saline water ingression, the British administration built embankments that prevented the saline water from inundating the agricultural land. It was Sir Daniel Hamilton, a Scottish businessman, who had put forward the idea of constructing embankments to block the tidal waters. This was how the embankment system was built up in the Sundarbans. A major part was erected between 1873 and 1939.

Although scholars have heavily criticised the structural measures

of building embankments on the banks of the rivers, it is an absolute necessity for a safer livelihood for the islanders in the Sundarbans. Some feel embankments bring more troubles than solutions. It may be for some regions, but the physical characteristics of the Sundarbans and people's vulnerability are very different from any other coastal belt on earth. However, the Sundarbans was made habitable initially by building earthen embankments to block the ingress of saline water. These earthen embankments run for about 3,500 km in this region. In Aila, earthen embankments across the islands were extensively damaged and had collapsed in several places. Cyclonic storms Amphan and Yaas further made these embankments immensely vulnerable to frequent breaching, therefore, putting islanders' lives at tremendous risk.

Land Acquisition and Compensation

The management of the embankment is vital for the protection of agrarian land and human habitation. It has been seen across islands in the Sundarbans that over generations, people have lost lands to the sea and rivers. Sea erosion and river erosion have been a worry for the community. There are some islands in the Indian

Sundarbans like Ghoramara that are assumed to disappear in future due to continuous soil erosion and the non-existence of a strong embankment system. If someone goes back to the colonial period, it will be seen that the Bengal Embankment Act, 1882, governed embankment management. This Act was last amended in 1967, and there is considerable scope to update and improve both the management arrangements and legislation that currently oversees the Indian Sundarbans Delta (ISD) embankment system (WWF, 2011). Initially, preventing saline water around islands was entrusted to local zamindars. After India's independence, when the Zamindari System was abolished, the task of maintaining the erstwhile zamindari embankments devolved upon the State Government. It then transferred this responsibility to the Irrigation and Waterways Department (I&WD) in 1960. Nowadays, the local government deals with minor repairing of embankments while large repairing works and new construction works are carried out by I&WD. The I&WD maintains around 10,400 km of flood protective embankments throughout the State, including sea walls and coastal embankments (Annual Report, 2018-19).



After every deadly cyclone and high tidal wave, embankments become moribund and therefore, breaching is a recurring incident across the Indian Sundarbans region. For example, according to the Irrigation Department, within 24 hours after super cyclone Amphan hit last year, 71 breaches were reported from North and South 24 Parganas districts. This year too, after Yaas, 135 breaches occur in the coastal belt of the State. This is a serious matter of concern that needs to be looked at by the administrative level. Embankment rebuilding is of crucial importance in post-Aila Sundarbans, and there is no denying the fact that land acquisition is necessary to facilitate embankment rebuilding. But islanders' past experiences of

land acquisition have made them suspicious about the Government's intentions. The Government's compensation package did not include the landless agricultural labourers (Mukhopadhyay, 2009). This process of rebuilding involves the acquisition of land which contributes to further displacement of the islanders, and rarely, if ever, are people compensated against their lost land (Mukhopadhyay, 2011).

The colonial laws vest full power in the State bureaucracy and the Irrigation & Waterways Department (I&WD). Under the law, embankments are government property. The Department is the ultimate arbiter of where, when and how embankments are built and maintained. These decisions are life-and-death issues for the people who live in the Sundarbans (Ohdedar, 2020). The acquisition of land in an agricultural economy is difficult for any government in India, especially in the North and North Eastern States, given the nature of party politics and bargaining factors. However, land acquisition has been an underlying issue of conflict between the Government and landowners in contemporary West Bengal politics, especially since 2007, when the erstwhile Left Front government attempted to acquire some agricultural lands for the industry. The opposition political party tried to exploit the event





and politicised it to a certain level that ultimately brought a political change in the State. Though the situation of the Sundarbans is not like Nandigram or Singur, people here may be willing to give their lands to the government if adequate compensation is given or it is as per present market value. However, such conflict is seen more in the Sundarbans when the Irrigation Department attempts to acquire land for building a ring embankment when the main embankment collapses.

‘Politics of Embankments’ Weakens Community Resilience

One has to understand the politics of ex-ante and ex-post disaster management activities of the Government to comprehend the concept ‘politics of embankments’ in the Indian Sundarbans. The political rewards from ex-ante and ex-post disaster management policies are very different. First, the electoral impact of expenditures in ex-post disaster management is higher than the electoral benefit of investing in ex-ante disaster preparation. Investments in ex-ante preparation reduce the risk and magnitude of damage from disasters. But the results are relatively more uncertain and less tangible than expenditures in ex-post relief (Depoorter, 2006). For

this reason, policymakers perhaps, are not keen on an effective solution to river embankments across islands in the Sundarbans. For building a reputation and an image, they extend their hands in relief material distribution only and exploit the political opportunity.

The islanders started to demand permanent and concrete river embankments by making an appropriate plan at the governmental level and providing adequate compensation to the land loser since 1985, but the government never heard their cry. However, it is already said that after a massive cyclone-induced flood (Aila) in 2009, the State Government has shown some readiness to build embankments as the entire Sundarbans was devastated and submerged. To redress people’s growing anger who lost everything to Aila, the State Government promised and announced building a 3500 km long permanent embankment in the Sundarbans; 778 km at the first stage, and in the next five years, the entire Sundarbans would be protected from recurring floods. It is surprising to know that in a government notification for land acquisition, mention was made that land will be acquired following the 1894 Act, a 126-year-old Act. Such a move has certainly no

link with today’s material world. However, the erstwhile Left Front government could not do much of the sanctioned project claiming that land acquisition is a major barrier before the Government as the then main opposition – the Trinamool Congress - mobilised islanders against the move of the government.

However, using the disaster as an opportunity, TMC successfully penetrated red strongholds and won South 24 Parganas Zila Parishad after Aila. When the State Assembly election was held in 2011, the CPI (M)-led Left Front government was replaced by the Trinamool Congress. The new Government, returned the Aila fund (Rs 5032 Crores) that was meant for building embankments, to the Central Ministry as it was not being utilised. A decade after Aila hit the region, Bulbul, Amphan and Yaas struck within just one and a half year, increasing the islander’s marginality to a great extent. Year after year, parliamentary, assembly, and even panchayat elections come and go, but the promises made by the politicians are forgotten immediately after each election. It has been a bitter experience for the islanders in Wonderland. Even after a few weeks of Amphan, a Master Plan for the Sundarbans was proposed in an all-party meeting held at State Secretariat. It was said the State Government would approach the central policy think tank, NITI Aayog, to get its nod, but surprisingly, this said plan did not reflect in the manifesto of the incumbent party. It is important to note here that the 17th Assembly Election was held in West Bengal a few months back. Thus, the much-needed demand of the marginal islanders in the Indian Sundarbans remained unheeded in the manifesto.

The government authority is empowered to acquire the required land if there is a public purpose. It

is also reflected in The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, [RFCTLARRA] 2013. Sub-section (1) of Section 2 under Chapter I of the Act says, “The provisions of this Act relating to land acquisition, compensation, rehabilitation and resettlement, shall apply when the appropriate government acquires land for its use, hold and control, including for public sector undertakings and for public purpose, and shall include a project for water harvesting and water conservation structures, sanitation; project for residential purposes to the poor or landless or to persons residing in areas affected by natural calamities, or to persons displaced or affected because of the implementation of any scheme undertaken by the Government, any local authority or a corporation owned or controlled by the State (RFCTLARRA 2013, 2021).

In this Act, some terms are defined for more clarification. Here, an “affected family” is signified as a family whose land or other immovable property has been acquired. On the other, “displaced family” means any family, who on account of the acquisition of land has to be relocated and resettled from the affected area to the resettlement area. A “resettlement area” means an area where the affected families, who have been displaced as a result of land acquisition are resettled by the appropriate Government. There is also a provision of additional compensation in case of multiple displacements. It reads, “The Collector shall, as far as possible, not displace any family which has already been displaced by the appropriate government for acquisition under the provisions of this Act, and if so displaced, shall pay an additional compensation equivalent to that of the compensation determined under this Act for the second or successive displacements (Section 39).



On the other hand, Disaster Management Act 2005 in Clause 61 under Chapter XI confirms, “While providing compensation and relief to the victims of disaster, there shall be no discrimination on the ground of sex, caste, community, descent or religion (The Disaster Management Act 2005, 2019). So these provisions under the above said Acts make it very clear that fair compensation is to be given to the land losers due to disaster or the Government’s efforts towards land acquisition for building embankments. It is essential to mention here that land acquisition in Sundarbans for embankments had started in 2012. Unfortunately, in 2014, just within two years, the Government’s declared scheme was obstructed. Furthermore, there has been no explanation from the government agency why this scheme was terminated just after completing 10% building of embankments at the initial stage. Land acquisition to rebuild embankments can be justified only when it is accompanied by a definite policy of relocation with compensation (Mukhopadhyay, 2011).

Civil Society Response and Political Will

A committee Nadi bandh o Jibon-Jibika Raksha Committee

(Sundarbans River Embankments & Life-Livelihood Protection Committee) [SRELPC] was formed recently by the islanders. An online convention was held on 4th October 2020 to demand permanent concrete river embankments and just compensation for land acquisition. Throughout the discussion, the consensus was that the islanders are ready to fight for justice. They even intended for a movement to achieve their demand. Moreover, it is important to mention here that people from different blocs of the Sundarbans are demanding permanent river embankments and ensure land acquisition with just compensation for the last three decades, but there was no response from the Government until the 2009 disaster. In addition, from 2009 onwards, the political actors script an avoidable history of politics of embankments.

However, a few months later, on 4th February 2021, a River Embankment Parade was performed under the guidance of SRELPC in the coastal areas in support of concrete river embankments. The committee demanded that river embankments be constructed across the islands only during the dry season. On 5th June 2021, a massive protest movement spread across the islands in the Indian Sundarbans to demand river embankments. Their

slogan was, “we don’t want relief, but want permanent concrete river embankments”. The islanders have experienced three mega-disasters in the last three consecutive years – Bulbul (2019), Amphan (2020) and Yaas (2021). Nobody knows how many disasters are waiting for them as they live in one of the world’s most hazard-prone regions. In such circumstances, what can save them? Only a strong embankment system. Building robust embankments would make the community more resilient and help the administration in dealing with frequent natural catastrophes that might decrease annual government expenditure on flood relief and reconstruction works.

For this, civil society response is crucial. It is apparent that only SUCI (C), a marginal political party in the Indian Sundarbans region, is concerned about people’s sufferings like relief, river embankment, compensation, tiger attacks, and widow allowance. It raises these burning issues quite often, and sometimes, to meet their demands, assembled for protest movements in front of block offices with a few people. More importantly, it is not an issue of SUCI (C), Trinamool Congress, CPI (M) or BJP, but involves the greater interest of the islanders and the Sundarbans. Therefore, irrespective of political colours, people need to be united to consolidate their just demands and spread protest movements across the islands.



Conclusion

Living with natural catastrophes is an enormous challenge anywhere in the world, especially for people in an economically backward and hazard-prone region like the Sundarbans. To reduce disaster risk in the region, a robust embankment is the most conducive solution. Although people often talk about permanent embankments for the Sundarbans, there is no permanent thing in the universe; therefore, I consciously have preferred using the words ‘strong’ or ‘robust embankments’ throughout the paper. If a strong embankment system is ensured across the islands, the poor islanders would be protected from recurring floods. However, it is seen that government efforts of land acquisition sometimes fail due to opposition politics. Therefore, it must be avoided for the sake of a secure livelihood for islanders. To

come out of the land acquisition problem, both ruling and opposition political parties have significant roles at the local level because the lives of the islanders revolve around destruction and construction. They need to unite for the public good and play an important role in forming a positive and constructive public opinion across the Indian Sundarbans favouring a strong embankment. In addition, government agencies need to execute a rational policy of compensation. It must consider the current market value where the land is located while compensating land losers whose land is taken for building embankments. Besides, adequate compensation to those who are to be resettled in a different place is required as the full market value of the land cannot be justified as the government also has financial constraints. Islanders must also not be reluctant to give their lands for public purpose, especially in the Indian Sundarbans as they would not survive without a strong embankment. Last but not least, a balanced-rational approach from both sides is the need of the hour so that the long persisting embankments problem in the Indian Sundarbans is resolved thereby, ensuring safer livelihoods and making communities resilient to deal with frequent saline water ingress and floods. ■





Vector Management: Road Traffic Accidents

Devashish De is an alumnus of the prestigious Jamsetji Tata School of Disaster Studies, TISS, Mumbai. His initial studies were in Mechanical Engineering from the University of Pune. He is currently serving with DGQA at Pune.

India fares the worst in road traffic accidents. The issue is more live with urban settlements where the centres of economy, business and attractions of a modern life pivot. The government has come out with the amended Motor Vehicle Act with punitive measures that are not very popular. The paper looks at the issues on a road ecosystem in India and judges the very many other factors which govern vehicle-based commuters. It advocates animated punishment methods, which may actually, bring in the desired change. It also addresses the hazards induced by mobile phones and suggests ways based on people's perceptions.



Devashish De

When one talks of Road Traffic Accidents (RTA), the discussion peters out to poor road manners in most circumstances. Many cite the bulk of two-wheeler drivers who pass by car owners in swift manoeuvres, which makes larger vehicle drivers induce in him or her unnerving caution. More often than not in a road traffic accident site involving pedestrians and car owners, the latter is thronged by masses with mob mentality[1] to break open a car. This gush of anger is more to

do with the disparity in social strata where the less blessed find it an apt opportunity to relinquish the weight of their pain to have not made it in the elite strata. To counter poor traffic sense and failed prospects of micromanagement, the Road and Surface Transport Ministry came out with a revised Motor Vehicle Act with draconian punitive punishments[2]. But rather than being reformatory, people started dumping their two wheelers[3]. The Ministry however is clueless on the

secondary cascading hazards of emanating law and order issues of which RTA incidents just serve as the initiator. The compensation is not suitably worded for victims who are a result of the cascading effect of the first. This is a vulnerability for the concept of 'Good Samaritan' espoused by the Honourable Apex Court. WhatsApp jokes are on

conspicuous gaps wherein one anecdote suggests to the public that they should escape the cops if they are drunk since it would fetch them a penalty of Rs2000/- only as against drunk driving for which the penalty is Rs10,000/-.

Methodology

The article has been framed on the Research Gap which becomes evident against the people's perception versus the attitude of the State to handle the issue. The paper presents the views of the State against the results of a people's perception prepared on Google Forms and lays bare the fact that while State policymakers are seized of the issue, their mathematics is on a wrong premise. In the ibid case, putting a clause of only published material, the Ministry has withdrawn itself from the scope of citizen inputs in an independent capacity. It is a well-known fact that publications are a matter of multiple peer reviews which tends to abrogate the harsher part of the concept in many instances.

Literature Review

The primary perception of the State concerning the RTA culture in India is reflected in the formal video documentaries of State-run television shows on Rajya Sabha TV and Sansad TV[4]. It provides many inputs, like the third day of November in a calendar year is observed as a day for solidarity towards Road Traffic Accidents. The documentaries have a few pointers towards the extent of the problem. It says that the age bracket of the victims is from 5-29 years and that the primary victims have constituted those of pedestrians, cyclists and motorcyclists. The UN Resolution for Reduction in RTA is spaced from 2021-30. Deaths on Indian Roads constitute 11% of global deaths. 61% of the incidents have been

on State and National Highway wherein 35% of the victims were two-wheeler drivers. Over speeding, rash-driving[5], non-usage of helmets, post-crash response, drunken driving and black spot identification have been the key to the issue aggravation. 50% of the deaths have been at T Junctions and Y junctions. States with the highest RTA as Maharashtra, West Bengal and Tamil Nadu have yet not adopted the Motor Vehicle Act 2019. This sums up the colossal issue of RTA. One of the innovations relating to practical urbanism where poorly designed joints and corners are redesigned with the help of cones, paints and barriers, was found less in references. Practical urbanism also ensures pedestrians are not mixed up with the loose cognitive application of speeding drivers. Very few vehicle manufacturers in India have had a five-star safety rating on wheels that they have been rolling out. Most of the vehicles instead are being exported from India with seven-star safety features. The literature review also collated facts as 53 road crashes in India happens every hour[6]. In addition, India has only 1% of global vehicles, yet it accounts for 11% of the RTA as per the World Bank. 76.2% of the

people affected have been in the working-age of 18-45 years. The Rajya Sabha/Sansad TV episodes, though are there in profusion, did not discuss a single road layout or indulge in accident track analysis. This was the research gap on which this paper has been framed. Aply, the paper has been titled as one on Vector Management.

In Qatar, in the recent past, there was a webinar on Road Safety Audit[7] where certain excerpts of which may be relevant. 'Complying with Standards does not Guarantee Road Safety'- was one of the key statements flashed during that webinar. It meant that tabletop efforts were not good enough to reduce the menace of the issue. In the ibid case, it is the article writing competition at the MyGov portal. However, if the deliberations are made with circular roads with abrupt T junctions, then, a lot more could be perceived. It is the behaviour of errant drivers that will give all the clues. Terms like Practical Urbanism are technically the solution initiator. So when an uncontrolled driver gets his SUV up the pavement[8] and crushes unsuspecting humans, using it, in an overpopulated country, raising the heights of such pavements can



Image 1: Suggested methods to prevent vehicle tyre getting over footpaths in urban areas.

give the solution at first level in all probability. So, can there be a system where a rain/storm drain could double up as a tyre plugger? Footpaths in high pedestrian use zones could use additional road barriers to avoid power vehicles marauding fragile lives. As per the Indian adage to the thoughts in continuation, the corner plot is the most beneficial for a business reflection. However, it is also the one that is the most sensitive point for a driver to lose control[9]. It is in these corner plots[10] that encroachments have happened and pedestrian assembly points for road crossings have diminished in space[11] due to the footfalls theory of business gains.

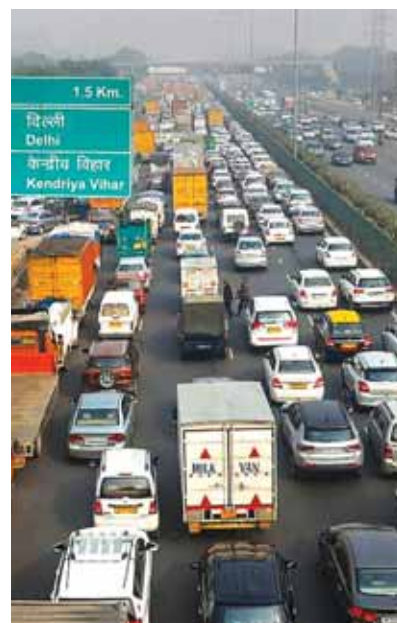
Findings and Analysis

A survey was conducted with a set of a section of educated office goers for whom meeting the reality of Indian road conditions had remained a reality. Of these, 61.5% of respondents were males. Women were encouraged to respond as they also constituted a major portion of the commuter strength on Indian roads.

At the outset, they chose to blame the bulk of the youngest commuters for whom speeding was a deadly thrill (46.2%). This was followed by the uncontrolled vector tracks adopted by two-wheeler owners (30.8%) who were indicated as the issue creators. Pedestrians were not cited at this stage. Car owners were apportioned little to blame, in the wake of stray cattle and dog menace which seems to have aggravated. However, all were in unison for creating records of aberrations digitally so that heightened mounds of sin could be shown to the sinner to enable him to adopt reformation in utter shame.

The third question was more elaborate. It sought suggestions on listing major road irritants.

Green Signal at road junctions means - Who goes first?	It was agreed by respondents that that was the primary gut feeling. However, some confided that the sight of a policeman walking in from the opposite end was a deterrent. So could roadblock lines be supported by a speed breaker at the opposite end was an afterthought.
Honking as a coercive noise pushing method was the second road irritant was suggested.	Women thought it to be an unnerving agent. Since most of the women are shorter in height, it was felt that their feet barely reached the road surfaces. Profusion of honking disbalanced them. An engine stopped due to idle running differentials were seen as an invitation for heightened coercive honking. Then there were engine sounds of racing bikes which during the idling period raised a sense of premonition of their nasty intent to pass by with the possibility of a concurrent harm such as chain snatching or a more inappropriate act.
Speeding induces because the second signal has to be crossed before it turns red - is the general mental state when one sees the second signal crossing at sight.	Vector mismanagement sets in. This is one instance where car owners reflect the superiority of their machines. Cars follow the lane with an intent to reduce the space of a motorcyclist creeping in between. There is felt intolerance on inter-lane transfers. Cars try to push out an intruder in their lane during this spell.
Over speeding also happens as everyone attempts to escape the crossing collectors	There was an affirmation. It was felt that these children attempted to touch the riders and drivers inappropriately almost in a poking fashion. This induced a fear of items being flicked from dashboards and open dickeys, which could mean loss of wallet, lunch or even files and documents.
Due to proximity, women felt that there continued to remain an uneasy gaze on them	Women and men affirmed.
Bullying trucks also try to make way.	The respondents affirmed that due to lesser police control, this was a new trend.
The luxury bus creeps up from behind like a giant because it's so silent?	Two-wheeler commuters felt that noise elimination was not a convenient option all the time. Many times, such a feeling of a giant ghost could misbalance weak drivers, and despite helmets, they felt that the possibility of a crash happening at the last moment was high.
The sight of policemen in blind corners is unnerving?	Respondents affirmed but didn't attribute it as a major issue in effecting RTA except that there was a mass slowdown concurrently and these could lead to traffic jams.



The queries were:

Apart from the road irritants, the respondents were explained that there could be distractions that induced deviations and overspeeding. To this, most of them stated that WhatsApp pings during office hours were a cause for alarm. They cited public misbehaviour as the second distraction. The issues aggravated if unplanned roadblocks and jams happened as bosses were unrelenting and the modern-day automated biometric attendance system waived off conveniences that could be bought with the word 'Sorry', earlier. Ambulance parleys and new vehicles revving up were distractions but didn't merit attention.

The next question was on the remedy. It was cited that car-pooling was not evolving in India. Respondents said that instacarpooling by Google could be a remedy or even something as WhatsApp car-pooling. The driver and the co-passenger have no scope to plan except getting on to their destinations. So, Google carpooling would get activated if somebody started a car. The Car

App on the mobile could ask the comfort of a driver to take on a road passenger as a landmark indicator or guide. He or she could also do a benevolent pick up for the elderly or children or a paid pick-up for sharing fuel bills. This App could be approved for drivers with good character records and a temporary video of the travel could be made available to all stakeholders.

The deterrent was also limited to a policeman and an errant interaction, where the latter claimed to be a victim. To this, the author suggested a method of calling bosses, employers, wives, relatives, landlords and neighbours/society members for rescue which gained appeal. It was an emulation of practice set in school days by teachers, which was suggested as a social experiment for take-off. It was felt that a limited-time experiment could structure the discipline for days. So, if an errant boy was a road rage monger, then his suspected girlfriend and the boy's parents could be confronted. The fear of a chain reaction could serve as an inhibitor. Some even suggested that the media would get relishing news for their columns

at the cost of improving road discipline. Truck drivers could face their employers who could be forced to come to Pune from their homes in Punjab. A practice was assured to reduce the menace of urban road indiscipline. Serial road honkers could have their wives being called for their rescue until honking would finally be relegated to use as an emergency brake. Similarly, the author suggested that trigger-happy volunteer cops could be called upon to bubble paper-wrap the head of an errant two-wheeler driver, and this could happen to anybody not carrying a valid doctor's prescription citing reduced cognitive capabilities with the use of a helmet. These were considered positive deviations to which respondents agreed.

As a remedy, people erring could also face the loss of internet for five days to start with. More or less, the respondents agreed that, rather than punitive punishments, more deterrents was expected in animated punishments - the old classroom way.

The next query was related to the absence of Good Samaritans on



the road. The deterrents were the perceived callous attitude of the police. Women said that blood and broken bones was an abominable proposition. Other than serving a glass of water, nothing much could be expected. Then people rescinded that the Good Samaritan tag did not come with good prizes such as, income tax exemption for one year, or free lunch passes for self and family or even internet top-up; the last being beneficial to students. Some suggestions made by the author also included a URL copy-paste solution for a tagline on Facebook, Amazon, LinkedIn, Instagram and so on, with the provision of recovery by the government at will and replacing it with something nastier. People were not very convinced at the tag of Been There Done That - beyond once until it served to ease their lifestyles and compulsive requirements to a certain extent.

The next query pertained to clogged up mohalla and service lanes. Some said that weaning away a car was not a popular decision as many acquire it after years in their lifetime. Commercial and very cheap multi-floor car parking was considered as the appropriate response to the growing strength of cars. People wanted electric cars, automated cars and rent-an-electric-car solutions at cheaper rates.

Towards the end, the recurring link of pedestrian sensitivity was again

put up for discussion. 58.8% of the respondents agreed that they served to be impediments to free traffic movements in some way. 61.5% agreed that pedestrians were worse if they were also on the mobile at the same time. To this, the respondents were asked if AI-based face recognition cameras loaded on smart drones could be placed on Indian roads to identify errant members of the public. 76.9% of the respondents said in unison that this will create panic. More people would attempt to hide their faces and other identification features. They will be shot and scooted by nuisance mongers and people could catapult the device even to see it crash with intent to crush it under their tyres. So, the use of this device as a hidden instrument is suggested.

Lastly, respondents were indecisive on the query if mobile call spaces

could be earmarked for the public just like close door smoking zones.

Discussion

Possibly the activities on the road are not being differentiated between rowdy mess makers and encroaching vehicle parks or street vendors et al. Amid street vendors, sizable new identities relate to Bangladeshi refugees who have their community issues and the subject diversion is on a different level.

Education and awareness are lacking. While schools in Japan have an education, Indian schools still do not have a clear debate and analysis. Appealing WhatsApp forwards could be a start to the project per se. Even NDMA could do that rather than restricting the mandate to Twitter and Facebook only.

The readability of road accidents annual report of 2019 is far from acceptable. It is a voluminous 233-page report on many vital scores. But just like most of the IAS officers would like to have a problem statement and proposed solution written to them in an A4 size sheet, such voluminous ensembles remained a delight for the researcher only. It was not thought of as a feedback format in which the routine gentry could be educated on the problem statement



and solution innovations. These reports did not seem to come out with poster ideas although many of these could have a vital exposure, such as the time of the day when accidents happens the most, etc.

Did these reports do the following?

Gives a ready reckoner on the death/injury settlement of insurance claims which could indicate the most people-friendly insurance in terms of time and amount in every State? Could it also give a cost imposed to the victim or his family in getting a claim since people could lose their jobs due to an accident? Whatever the UN bodies or international forums continue to advocate for India, the end statement of Chanakya remains the truth for citizens, which says - Disaster is the loss of a breadwinner.

Did these statistics also reflect on the cognitive capacity of the deceased?

Did these statistics deal with commuting conveniences for the elderly and the infant, considering the evolution of such thought limited to washroom fittings only by companies such as Kohler and Grohe, till date? Maybe, no.

Did these statistics equate the reformatory practice of punitive punishments to paying capacity of offenders? If done, then it could be of consequence for the masses.

Did these reports ever take feedback on the fear of women drivers, considering their differently wired motor systems?

Were the statistics of motor practice grounds earmarked for learners or weak drivers or their skill augmentation were only pivoted to the display of the letter 'L' and not more? What was the provision for simulator rooms for rowdy and rash drivers or weak drivers?

What could be the roadmap for road rage or mob mentality? Why did the police continue to be the primary data creator when this task could have been outsourced? Police are already stressed and police reforms seem to be a faraway dream still for which the current economy probably did not have the captive money for effecting a transformation.

Conclusion

Vector management in an overpopulated country is the key to the reduction of road traffic accidents. Somewhere, there has to be a full stop to the Saturday or Sunday night beeline outside petrol pumps, usurping the routine flow of life contrary to the process as seen on other days. Somewhere, the free mobility of two-wheelers to change lanes at will and to be overcrowded on footpaths or in front of four-wheelers needs to change. During road construction or partial excavations, it is the two-wheelers who have a free-go as against others also attempting the same concurrently. Road clogs from 5 pm to 7 pm every evening or the flow of traffic to accessible twin cities is an understood unspoken contest to concurrently attempt undeclared human competitions on road. Many times, large vehicle drivers tend to compete on highways, and machines go out of control. Thus, finer vector management of the profusion of the Indian public trying to make it through the only orifice called roads needs to be controlled or streamlined. These may include serrated road spaces akin to fairs where crowd management reigns supreme. ■

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their invoice to the structured survey laid out to them.

(Disclaimer: This work is a citizen perception only and does not relate to government identities of people or persons involved)

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तटबन्ध अगर टूटता है तो बाढ़ नहीं आती प्रलय होता है

डॉ. दिनेश कुमार मिश्र,

श्री दिनेश कुमार मिश्र ने आई.आई.टी खड़गपुर से सिविल इंजीनियरिंग (1968) तथा एम. टेक (1970) की डिग्री प्राप्त की. दक्षिण गुजरात यूनिवर्सिटी से पीएचडी के आलावा वे निरंतर 3 वर्ष अशोका फेलो भी रहे हैं. नदी कार्यकर्ता के रूप में विख्यात मिश्र जी अपने प्रभावी लेखन कार्य, रोचक व्याख्याओं व जन जागरण के माध्यम से सारिता संरक्षण को प्रमुखता दे रहे हैं. उन्होंने बिहार की लगभग सभी प्रमुख नदियों पर गहन शोध किया है, जिसके आधार पर तटीय जीवन से जुड़े तमाम पहलुओं को उन्होंने दृष्टिगोचर किया..

नदियों की बाढ़ से बचने के लिये जो सबसे आसान तरीका मालूम होता है वह यह है कि रिहाइशी इलाकों, जिसमें खेती की जमीन भी शामिल है, की रक्षा करने के लिये नदी के किनारे मिट्टी की एक दीवार खड़ी कर दी जाये जिसे हम बोल-चाल की भाषा में बाँध, बन्धा या तटबन्ध कहते हैं। ऐसा करने के समय हम यह भूल जाते हैं कि तटबन्धों के निर्माण के बाद जो पानी सहज भाव से नदी में चला जाता था वह इन तटबन्धों के कारण बाहर अटकता है और कभी-कभी परिस्थितियाँ ऐसी बनती हैं कि बाहर जलजमाव का लेवल बरसात के मौसम में इतना बढ़ जाता है कि तथाकथित सुरक्षित क्षेत्र के लोग जो पहले नदी के पानी से परेशान रहते थे वह अब जल-जमाव में फँसते हैं। तटबन्धों से होकर नदी के पानी का रिसाव इस समस्या को और भी ज्यादा दुष्कर बनाता है।

प्रकृति द्वारा नदियों को कुछ काम सौंपे गये हैं जिनमें भूमि का निर्माण, भूमिगत जल की सतह को बनाये रखना तथा उनके पानी के साथ आयी गाद को विस्तीर्ण क्षेत्र पर फैला कर जमीन

की उर्वरा शक्ति कायम रखना और इन सब के अतिरिक्त वर्षा के बचे हुए पानी को किसी बड़ी नदी या समुद्र तक पहुँचा देना। जल-चक्र इसी तरह से पूरा होता है।

नदियों के किनारे बने तटबन्धों से वर्षा के पानी का तो ठहराव स्पष्ट है पर अगर कोई उसकी सहायक धारा मिलने के लिये आ जाये तो तटबन्ध उसका मुहाना बन्द कर देते हैं और सहायक धारा अपना पानी मुख्य धारा में नहीं ढाल पाती है। इसके लिये स्लुइस फाटक बना कर व्यवस्था की जा सकती है ताकि इन फाटकों को उठा कर बाहर के पानी को मुख्य नदी में डाल दिया जाये। दिक्कत यह है कि बरसात के मौसम में अगर फाटक खुले रह गये तो मुमकिन है कि मुख्य नदी का पानी ही सहायक धारा में चला जाये। इसलिये इन फाटकों को बरसात में बन्द ही रखना पड़ता है। फाटक अगर बन्द ही करने पड़ें तो उनके होने या न होने से कोई फर्क नहीं पड़ता है। तब तथाकथित बाढ़ से सुरक्षित क्षेत्र जो पहले बड़ी नदी से परेशान रहता था, अब जल-जमाव और सहायक धारा के पानी से परेशान रहेगा। इस



दिनेश कुमार मिश्र

दुःस्थिति से बचने का एक ही उपाय है कि सहायक धारा पर भी तटबन्ध बना दिये जायें। यह अगर कर दिया जाये तो फिर मुख्य नदी और सहायक धारा के तटबन्धों के बीच के क्षेत्र का क्या होगा? वहाँ तो वर्षा के पानी की निकासी का कोई रास्ता ही नहीं बचता है।

फिर, आजतक कहीं भी कोई ऐसा तटबन्ध नहीं





बना है जो टूटता न हो। तटबन्ध अगर टूटता है तो बाढ़ नहीं आती प्रलय होता है। नदियों के किनारे बसे लोग नदियों के स्वाभाविक तौर पर किनारों के ऊपर से बह कर आने वाले पानी से निपटना तो जानते हैं और वह इसका स्वागत भी करते हैं मगर तटबन्ध तोड़ कर आने वाली बाढ़ का मुकाबला करना बहुत मुश्किल होता है। बाढ़ जो पहले बिल्ली की तरह आती थी वह अब बाघ बन कर आती है। बिल्ली के साथ क्या करना है यह वह लोग अच्छी तरह जानते हैं पर बाघ के सामने पड़ने पर तो जान की अमान ही माँगनी पड़ती है। नदी के किनारे बने तटबन्धों के साथ एक और भी समस्या है और वह बाढ़ वाले क्षेत्रों में तटबन्धों के बीच रहने वाले लोगों के पुनर्वास की। होना तो यह चाहिये कि उनका पुनर्वास पूर्ण हो जिसमें घर-द्वार और जीविका के साधनों को पूर्ववत् बनाये रखा जाय। सीधे

शब्दों में इसे जमीन के बदले जमीन और घर के बदले घर कहते हैं। यह जमीन बाढ़ वाले क्षेत्रों में जमीन की उर्वर होने के कारण बहुत कम ही उपलब्ध होती है। ऐसी स्थिति में घर बसाने के लिये जमीन तो मिल जाती है पर खेती की जमीन के बदले जमीन नहीं मिल पाती है और विस्थापितों से यह उम्मीद की जाती है कि वह लोग रहें पुनर्वास में रहें और खेती के लिये अपनी पुश्तैनी जमीन को ही उपयोग में लायें।

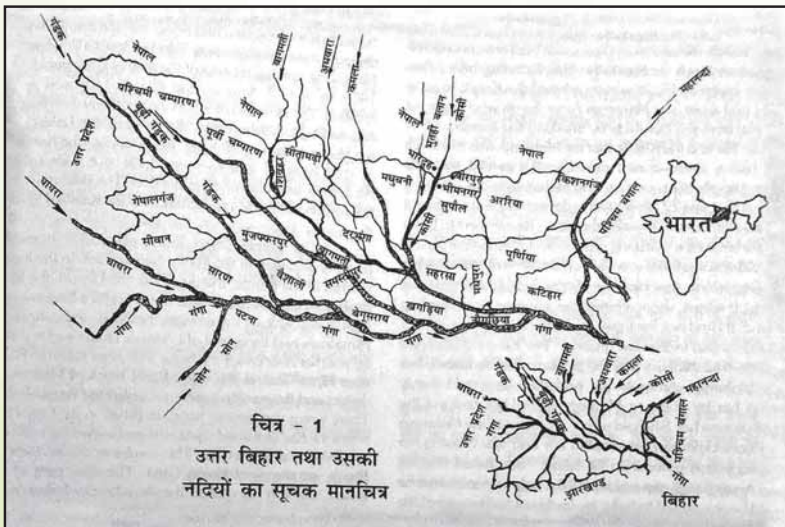
खेतों से दूर रह कर खेती करना एक व्यावहारिक समाधान नहीं है। तब होता यह है कि कुछ दिन पुनर्वास में रह लेने के बाद लोग अपने पूर्वजों के गाँव-घर में वापस लौट आते हैं। बिहार की नदियों के किनारे पर बने तटबन्धों के विस्थापित इसी त्रासदी से गुजरे हैं। यह समझौता बरसात के दिनों में होने वाले कष्टों को

भोगने के विनिमय में ही होता है। सरकार यह टलील देती हैं लोग अपने पूर्वजों की थाती को लेकर इतने आग्रही होते हैं कि वह अपने पुराने गाँव में वापस चले जाते हैं।

ऐसी स्थिति में तटबन्धों के अन्दर (रिवर साइड) रहने वालों और तथाकथित रूप से तटबन्धों के बाहर (कंट्री साइड) में रहने वालों के हितों में टकराव होता है। बरसात आने पर रिवर साइड में नदी का जलस्तर बढ़ता है और वहाँ रहने वालों का जीवन दूभर हो जाता है। घरों में पानी भर जाता है, तब यह लोग मचान बना कर रहते हैं या तटबंध पर ही आकर रहने लगते हैं। जानवर लम्बे समय तक पानी में खड़े रहने के कारण बीमार पड़ते हैं। खाना-पीना, आना-जाना, दावा-दारू सभी कुछ अव्यवस्थित हो जाता है। यह लोग सुरक्षित जगहों की तलाश में भटकते हैं और जब पानी सिर से ऊपर जाने लगता है तो चाहते हैं कि किसी तरह अगर तटबन्ध टूट जाता तो उनकी जान बचती। नदी कभी-कभी यह काम कर भी देती है पर कभी-कभी कुछ जाबॉज खतरा उठा कर तटबन्ध को काट देते हैं। इससे उनकी रक्षा हो जाती है पर वह लोग जो अपने को सुरक्षित मानते थे उनके जान पर बन आती है। भुक्तभोगी क्षेत्रों के लिये ऐसा होना कोई नयी बात नहीं है। कभी-कभी यह भी होता है कि जल-जमाव से बचने के लिये और बाढ़ के पानी का लेवल बढ़ जाने पर कंट्री साइड के लोग भी तटबन्ध को काट देते हैं। ऐसा खतराग पूरी वर्षा भर चलता रहता है। इन दोनों के बीच तटबन्ध सीमारेखा का काम करते हैं। सौ-डेढ़ फुट के फासले पर हित विपरीत हो जाते हैं।

बिहार की कमला-बलान नदी के तटबन्ध को ग्रामीणों ने काटा

इसी तरह की एक घटना का जिक्र बिहार (चित्र-1) की कमला-बलान नदी के साथ 1963 में हुआ था। नदी के दोनों किनारों पर इस तटबन्धों के निर्माण का काम 1962 में पूरा कर लिया गया था और एक साल के अन्दर ही यह घटना हुई जब इस नदी के किनारे जल-जमाव और स्लूइस फाटकों के नाकारेपन से परेशान ग्रामीणों ने तटबन्ध को काट कर अपनी जान और खेती को बचा लिया था।



कमला-बलान नदी

यह नदी (चित्र-2) नेपाल में हिमालय में महाभारत शृंखला से सिंधुलिया गढ़ी के पास 1200 मीटर की उंचाई से निकलती हुई शीसापानी के पास तराई में उतरती है जहाँ इसका जलग्रहण क्षेत्र 1409 वर्ग किलोमीटर होता है। भारत में यह नदी मधुबनी जिले के जयनगर से साढ़े तीन किलोमीटर उत्तर में प्रवेश करती है। भारत में धौरी, सोनी, बलान, गोबरजई, गेहुमां इसकी मुख्य सहायक धारायें हैं। 1954 में बिहार में एक भयंकर बाढ़ आयी थी जब कमला नदी ने पूरब की ओर बढ़ कर बलान नाम की एक धारा को आत्मसात कर लिया था। तभी से इस नदी का नाम कमला-बलान हो गया था। यह नदी खगड़िया जिले में बदलाघाट के पास कोसी से संगम करती है। इसकी पूरी लम्बाई 328 किलोमीटर है जिसमें 208 किलोमीटर नेपाल में तथा शेष 120 किलोमीटर बिहार में पड़ता है। शीसापानी, जहाँ यह नदी पहाड़ों से उतरती है, जयनगर से 48 किलोमीटर उत्तर में स्थित है। 1953 दिसम्बर में कोसी नदी पर तटबन्ध बनाने का निर्णय लिया जा चुका था और कमला-बलान पर तटबन्ध बनाने का निर्णय 1955 में लिया गया। 1956 में कमला तटबन्धों का निर्माण शुरू कर दिया गया था जिसे 1962 में पूरा कर लिया गया। इस योजना से 1.92 लाख हेक्टेयर जमीन को बाढ़ से सुरक्षा मिलनी थी।

ग्रामीणों ने कमला-बलान का तटबन्ध काटा

अगस्त, 1963 का पहला सप्ताह समाप्त होने के पहले कमला नदी के पूर्वी तटबन्ध को झंझारपुर के दक्षिण प्रसाद पंचायत के फैटकी गाँव में ग्रामीणों ने काट दिया था। यहाँ गेहुमां नदी कमला से संगम करती थी मगर कमला का पूर्वी तटबन्ध बन जाने के बाद गेहुमां का मुँहाना बन्द हो गया और उसके पानी की कमला-बलान में निकासी बन्द हो गयी। अब गेहुमां का पानी पीछे की ओर फैल कर बहुत से गाँवों की खेती को नुकसान पहुँचाने लगा। पानी की निकासी और अपनी खेती की जमीन को जल-जमाव से मुक्त करने के लिये किसानों ने बाध्य होकर यह कदम उठाया था। पानी की निकासी के लिये इस तरह के काम की देखा-देखी दूसरे



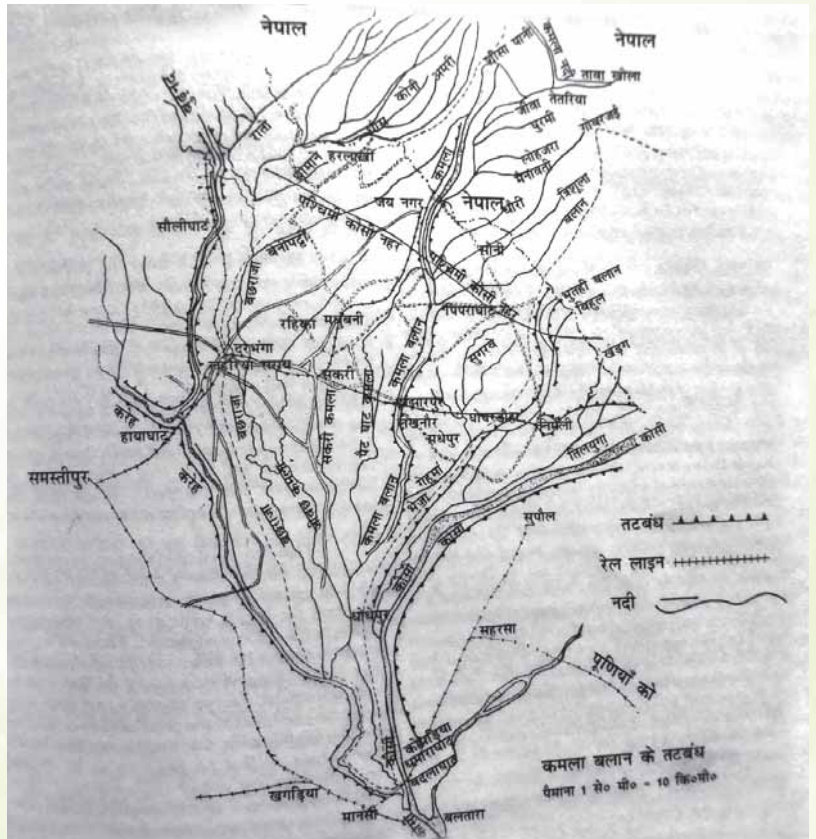
राम खेलावन

गाँव के किसान भी तटबन्ध न काटने लगे इसलिये तटबन्ध पर ग्रामीणों का आना-जाना वर्जित कर दिया गया था और उसके लिये वहाँ धारा 144 लागू कर दी गयी थी। काटने के फलस्वरूप तटबन्ध में पड़ी दरार को बन्द करने के लिये सरकार को यह कदम उठाना

जरूरी था। वहाँ मजदूरों और कर्मचारियों के अलावा किसी को भी जाने की इजाजत नहीं थी। गाँव वाले ऐसा न करते तो उनकी खरीफ की फसल बरबाद हो जाती।

हमने इस घटना की जानकारी एक प्रत्यक्षदर्शी श्री राम खेलावन मण्डल (आयु 73 वर्ष), ग्राम प्रसाद टोले खैरी, प्रखंड मधेपुर, (तब जिला दरभंगा) से ली। उन्होंने जो कुछ हमें बताया उसे हम नीचे उद्धृत कर रहे हैं।

'1963 में कमला का बाँध जो यहाँ काटा गया था उस समय में 11वीं कक्षा में जवाहर उच्च विद्यालय, मधेपुर में पढ़ता था। हमारा स्कूल हमारे गाँव से कोई चार-पाँच किलोमीटर होगा। हमारे स्कूल में भी उस साल तीन फुट पानी भर गया था। हुआ यह था कि कमला नदी पर तटबन्ध बन जाने से गेहुमां नदी, जो कमला में आकर मिलती थी, का मुहाना बन्द हो गया था और उसका पानी अगल-बगल और पीछे की ओर फैलने लगा था जिसकी चपेट में बहुत से



चित्र - 2

गाँव आ गये थे और वहाँ भीषण जल-जमाव हो गया था। हमारे स्कूल का परिसर इसी पानी में कमर भर से ज्यादा पानी में डूबा था। धान की फसल भी डूब गयी थी। तब आसपास के पचही, प्रसाद, खजुरा, खैरी, फैटकी, उमरी और बलिया गाँव के लोगों ने आपस में मिल कर तय किया कि कमला के तटबन्ध को काट दिया जाये तो यह पानी निकल जायेगा और इन गाँवों के लोगों के सहयोग से इस बाँध को काटा गया था।

जब यह तटबन्ध बन रहा था तभी यहाँ के चार्ज में जो इंजीनियर था वह यहाँ के गाँव के लोगों से कहता था कि आप लोग इस बाँध के निर्माण का विरोध कीजिये। यह बाँध नहीं होना चाहिये। बाँध बनने के बाद कमला नदी की पेटी ऊपर उठेगी, पानी का लेवल बढ़ जायेगा और आपकी जमीन नदी के मुकाबले नीचे चली जायेगी। कमला यहाँ देने के लिये आयी है, लेने के लिये नहीं आयी। उस समय आप लोग परेशान हो जाइयेगा। उस समय तो उनकी सलाह किसी ने नहीं मानी मगर यह परेशानी 1963 में सचमुच हुई और बाँध को पानी की निकासी के लिये काटना ही पड़ा।

'बाद में प्रशासन ने उस इलाके को घेर कर पुलिस लगा कर कमला-बलान में पड़ी दरार को बन्द करवा दिया था। तब इसका विरोध गाँव वाले नहीं कर पाये क्योंकि प्रशासन और पुलिस से तो सब डरते ही थे। उस समय तटबन्ध में फाटक नहीं बना था, वह बाद में बना। बाँध काटने का नेतृत्व हमारे ही गाँव के श्यामानन्द झा कर रहे थे और इसके पीछे उनके चाचा हक्कर झा लगे हुए थे। बाँध जब काट दिया गया तो 50-60 लोगों के खिलाफ नामजद एफ.आई.आर. थाने में की गयी और हजार-पाँच सौ अज्ञात लोगों का हवाला भी इस रिपोर्ट में दिया गया था। उस समय हमारे यहाँ के मुखिया जमील अहमद कुरेशी हुआ करते थे। वह एकदम ठोस आदमी थे और उन्होंने बाँध काटने वालों की जमानत अपने प्रभाव से करवा ली थी। थाना-पुलिस सब हुआ था लेकिन कोई जेल नहीं गया। हमारे गाँव प्रसाद के ही जानकी नन्दन सिंह स्वतंत्रता सेनानी थे जो बाद में विधायक और मंत्री भी बने। वह भी बहुत प्रभावशाली थे और उनकी वजह से हम लोगों को थोड़ी सहूलियत हो गयी थी। उसके बाद



अगर कभी बाँध कहीं टूट जाये तो यहाँ विभाग अपनी जान बचाने के लिये कुछ लोगों पर एहतियातन एफ.आई.आर. करवा दिया करता था कि बाँध टूटा नहीं है, लोगों ने काट दिया है।

'बाँध जब काट दिया तो गेहुमां का पानी कमला में होता हुआ आगे कोसी से मिलने के लिये चला गया। हम लोगों की धान की फसल का उस साल नुकसान हो गया था क्योंकि गेहुमां के पानी के लम्बे समय तक बाहर रह जाने के कारण फसल डूब गयी थी मगर उसके पानी के साथ खेतों में जो नयी मिट्टी पड़ गयी थी तो रब्बी की बहुत अच्छी खेती उस साल बिना खाद पानी के हुई थी और बाँध काट देने के बाद पानी भी सूख गया था। रब्बी की सफलता से बहुत से लोग, जो खेती नहीं करते थे, वह भी किसान बन गये थे। हमारे यहाँ से तो बाँध काट देने के बाद जल-जमाव घट गया लेकिन वह बगल के भगवानपुर पर चोट करने लगा। वहाँ के लोगों ने भी कई साल तक इसे बर्दाश्त किया पर बाद में उन लोगों ने भी बाँध को काटा।

'नवटोल, झंझारपुर, गंगापुर, बेलही, गुणाकरपुर, खैरी, फैटकी, भगवानपुर आदि में यह बाँध टूट चुका है या काटा जा चुका है। बाँध जब टूट जाता है तो बाहर की कंट्रीसाइड की जमीन को नदी की मिट्टी/बालू से पाट देता है और वह ऊँची हो जाती है। तब बाढ़ का पानी दूसरे गाँव का रास्ता पकड़ता है। पानी रास्ता तो खोज ही लेता है पर उसका इलाका बदल जाता है। अभी हालत यह है कि बाँध अगर टूटेगा तो नदी का पानी हमारे गाँव में आयेगा लेकिन यहाँ

मिट्टी भर जाने से दूसरी ओर चला जायेगा। साथ ही बाहर का पानी अब कमला में नहीं जायेगा क्योंकि उसकी पेटी ऊपर उठ गयी है। अनिश्चितता का यह दौर अब हमारी आदत बन चुकी है। यह तटबन्ध उस साल पास के दइया खरवारि गाँव में भी टूटा था जिसके चलते वहाँ काफी परेशानी हुई थी।'

गेहुमां से होने वाले जल-जमाव और तथा अन्य समस्याओं के निदान के लिये 1963 में ही एक योजना (प्राक्कलित राशि 14,95,493 रुपये) मधुबनी लघु सिंचाई विभाग द्वारा तैयार कर के सरकार को भेजी गयी थी जिस पर मधेपुर और फुलपरास के प्रखंड विकास अधिकारियों की सिफारिश लगी हुई थी। राज्य सरकार ने इसके क्रियान्वयन के लिये विधानसभा में आश्वासन भी दिया था मगर कोई काम नहीं हुआ। इस योजना में गेहुमां के पानी को कोसी के पश्चिमी तटबन्ध को पार करके कोसी में गिराने की बात थी मगर नहर के इस मार्ग पर स्थानीय लोगों को ऐतराज था क्योंकि नदी को रास्ता देने के लिये बनाये जाने वाले तटबन्धों से जल-जमाव बढ़ने का खतरा था। और वहाँ लोगों की जोत का आकार छोटा था अतः जो कुछ भी जमीन बची थी वह इन निर्माण कार्यों में ही खप जाने का अंदेश था। यह योजना तभी से अब तक लटकी हुई है।

कमला-बलान के तटबंध 1965 में 21 जगहों पर और 1987 में 24 जगहों पर टूटे थे। इनकी उपयोगिता इन दो उदाहरणों से ही स्थापित हो जाती है।

कोविड-19 और हम

डा. रजनी श्रीवास्तव,

डयरेक्टर आपदा प्रबंधन सोसाइटी (नॉन गवर्नमेंटल ऑर्गेनाइजेशन), एवं हिटायई प्रधान-अध्यापक, दीन दयाल उपाध्याय गवर्नमेंट पी जी कॉलेज, सरईदाबाद, प्रयागराज।

साल 2020 में चीन के वुहान से निकला कोविड-19 वायरस वैश्विक महामारी बनकर अपनी जहरीली जकड़न में हमें लेने के लिए मायावी कोशिशें कर रहा है। मार्च 2020 के तीसरे सप्ताह से हमारे देश में कोविड-19 वायरस का तांडव शुरू हुआ। एक अनबूझ पहली की तरह इसने हम सभी को अपने रंग रूप से बुरी तरह झकझोर कर रख दिया। इस वायरस के जानलेवा संक्रमण को रोकने हेतु 21 मार्च 2020 से पूरे भारतवर्ष में विश्व के अन्य देशों की तरह लॉकडाउन लागू हो गया। ऐसा लगने लगा जैसे हम पिंजड़े में कैद हो गए हों। सर्वाधिक ध्यान केंद्रित करने वाला तथ्य यह है कि पर्यावरण का प्रदूषण-स्तर स्वतः ही आश्चर्यचकित ढंग से घटने लगा, जिससे आस-पास में वृक्षों की हरियाली दिखने लगी और पक्षियों की चहचहाहट सुनाई पड़ने लगी। इसने हमें एक बड़ा संदेश यह दिया कि यदि पृथ्वी पर हमें हंसी-खुशी के साथ जीना है, तो जीव-जन्तु, पेड़-पौधों आदि को उचित सम्मान देने को अपनी आदत बनाना होगा। हमें पर्यावरण संरक्षण को प्रमुख आधार बनाते हुए ही अपनी परम्पराओं, रीति-रिवाजों या त्योहारों को मनाना

होगा।

लाकडाउन के दौरान अपने घरों को लौटने के लिए प्रवासियों की बेतहाशा उमड़ी भीड़ और उससे जनित अनेक दुष्परिणामों और आफतों ने जनमानस को एक बड़ा संदेश दे दिया कि हम यथासम्भव अपने घर-परिवार के साथ रहकर ही अपने जीवन यापन का माध्यम सुदृढ़ करें। इससे हमारे स्थानीय संसाधन जहां हमें सरल ढंग से उपलब्ध हो जाएंगे, वहीं वित्तीय वहन भी हमारी सीमाओं में बना रहेगा। हम अपने क्षेत्र में अपने आपको सुरक्षित महसूस करेंगे और हमारा पुश्तैनी कारोबार, कला शैली, शिल्प कौशल, दस्तकारी व अन्य सभी प्रकार की कारीगरी निखर कर जीवन को सहज बनाने लगेगी।

समाज में पूर्ण लाकडाउन, अर्ध लाकडाउन और शर्तगत लाकडाउन के कारण जो रोमांचकारी परिवर्तन देखने को मिला वह है 'डिजिटलाइज' होने की जनमानस की आकांक्षा। बच्चों से बड़े तक मोबाइल, कम्प्यूटर, लैपटॉप में अपनी पैठ बनाने लगे। इससे ई-कामर्स भी अप्रत्याशित सफलता के शिखर छूने लगा।

वर्ष २०२१ तो कोरोना के खतरों के बीच ही शुरू हुआ, मगर यह टीके के रूप में एक

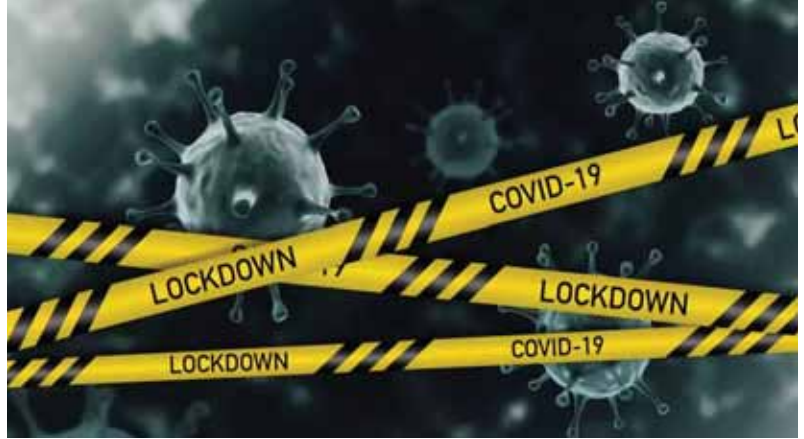


डा. रजनी श्रीवास्तव

उम्मीद भी लेकर आया। जनवरी 2021 माह से देश में चरणबद्ध तरीके से वैक्सीन लगनी शुरू हो गई। कोविड-19 संक्रमण भी काफी हद तक सीमित दिखने लगा था कि तभी फागुन का रंग लोगों पर ऐसा चढ़ा कि वे कोविड अनुकूल व्यवहार भूल गये। लगभग इसी समय देश की चुनावी रैलियों में भी आम जनता अति उत्साह से शामिल होने लगी। परिदृश्य बदलते वक़्त नहीं लगा जिससे अप्रैल और मई में मानव तबाही के सर्वाधिक दर्दनाक मंजर हमें देखने पड़े। लगभग हर घर बुरी तरह पीड़ित हुआ। यदि किसी ने अपना खोया, तो अगलों ने अपनों के अपनों का दर्द सहा। इस बार डेल्टा वैरियंट की लहर ऐसी विशाक्त हुई कि हम सब किंकर्तव्यविमूढ़ हो गए। अपनों को बचाने की चिंता में हम अपनों से ही बचने लगे। इस समय डेल्टा पीड़ित लोगों की सेवा करने वाले, मृतोगियों की लाश ले जाने वाले या उनका दाह संस्कार करने वाले लोग दुर्लभ ही थे। बढ़ते मरीजों के कारण अस्पतालों में बिस्तरों की कमी, आक्सीजन की कमी, प्रशिक्षित नर्सों व डॉक्टरों का अभाव आदि के अलावा दवाइयों की मारामारी और उनकी कालाबाजारी से हमारे देश की बुनियादी "चिकित्सा व्यवस्था" - 'ढांचा'



और 'योजना' दोनों मोर्चों पर लड़खड़ा गई। कितने ही बेबस परिवारों ने अपनी आँखों के सामने अपने परिवार जनों को दम तोड़ते देखा। 1.2 गुना चिकित्सा आक्सीजन की मांग से हमारा देश सांसों का संकट झेल रहा था। 'मौत की दहशत' सर्वत्र महसूस होने लगी थी। इस तरह वर्ष 2021 के मध्य में 'चिकित्सा आपातकाल' जैसी स्थिति प्रतीत होती रही। भारत सरकार के साथ राज्य सरकारों ने भी कोविड-19 रोकथाम की नीतियों के अन्तर्गत सभी स्वास्थ्य सुविधाओं को कोरोना संक्रमितों की देखभाल में झोंक दिया। इससे बच्चों की डिलेवरी, प्रसव-पूर्व या प्रसव बाद महिला की निगरानी और टीकाकरण सहित मातृ एवं शिशु स्वास्थ्य तथा अन्य गम्भीर मरीजों की सेवाएं प्रायः बाधित रहीं। भविष्य में ऐसी परिस्थितियों से निपटने के लिए भारत सरकार ने पूरे देश के लिए "पीएम आयुष्मान भारत हेल्थ इन्फ्रास्ट्रक्चर मिशन" की शुरुआत भी कर दी। परिणामस्वरूप राज्य स्तर पर 15 हेल्थ इमरजेंसी सेंटर, 17,788 ग्रामीण हेल्थ एंड वेलनेस सेंटर और 11024 शहरी केंद्र बनाने के सफल प्रयास प्रारम्भ हो गये हैं। कोरोना काल की दूसरी लहर डेल्टा वैरियंट ने मानव संवेदनाओं की अनूठी मिसाल भी पेश की। सेवा-भाव को हमारे समाज के एक बड़े हिस्से में ठीक से समझा गया।



सेवा और परमार्थ कार्यों में संलग्न कुशल संस्थाओं एवं संस्थानों ने पीड़ित परिवारों को आवश्यक राहत सामग्री की आपूर्ति करके मानवीय सेवा का बेजोड़ उदाहरण प्रस्तुत किया। यही नहीं बल्कि उद्योग, व्यापार तथा सिने जगत से जुड़े अनेक लोगों ने अपने अपने तरीकों से पीड़ितों को आर्थिक, चिकित्सीय, मनोवैज्ञानिक और जीविकोपार्जन से संबंधित सुविधाओं, साधन और अवसर प्रदान करने में विशेष योगदान दिया है।

वर्तमान में कोविड-19 की तीसरी लहर ओमीक्रोन वैरियंट ने भारत में दस्तक दे दी है। हो सकता है फरवरी 2022 में यह अपने चरम पर हो। हमें बार बार आगाह किया जा रहा है कि हम विषम परिस्थितियों से निपटने के लिए पूरी तरह

तैयार रहें। भारत में आज लगभग सभी राज्यों और केंद्र शासित प्रदेशों में ओमीक्रोन से संक्रमित मरीज पाए जाने लगे हैं। चिंतनीय पहलू यह है कि ओमीक्रोन से संक्रमित मरीजों की संख्या तेज रफ्तार से बढ़ रही है, किंतु सुखद बात यह भी है कि देश में शीघ्र ही बूस्टर टीका आने वाला है। चिकित्सीय आक्सीजन के सन्दर्भ में हम आत्मनिर्भर हो रहे हैं। किशोरों को टीकाकरण की परिधि में ले लेने की युद्ध स्तर पर व्यवस्था की जा रही है। इसका शुभारंभ दिनांक 3 जनवरी 2022 से हो चुका है। 2 साल से 14 साल तक के बच्चों के टीकाकरण के प्रबंधन के लिए भी पुरजोर कोशिश की जा रही है। तीव्र गति से पैर पसारते ओमीक्रोन के डरावने साये में हम नए वर्ष 2022 में प्रवेश कर चुके हैं। ऑस्ट्रेलियाई गणितज्ञ मेट पार्कर ने कहा है कि महज़ 8 मिलीलीटर सार्स-कोव-2 वायरस पूरी दुनिया में कहर बरपा रहा है। इस जीव ने अर्थव्यवस्था से लेकर राज व्यवस्था तक सभी को हिला कर रख दिया। किंतु आज की तिथि में हम आत्मविश्वास के साथ मजबूती से खड़े होना भी सीख चुके हैं। आवश्यकता बस इतनी है कि हम 'मास्क' को ही अपना 'जीवनरक्षा कवच' मानें, भीड़-भाड़ से दूरी बनाएँ, सफाई के नियमों का पालन करें और हरियाली संरक्षण को बढ़ाने वाले ठोस उपायों का 'अनुकूलन' करें।



Bihar Mausam Seva Kendra - A Step Towards Climate Adaptation

Altamash Khan is a Program Coordinator, Collaborative Advocacy at SPHERE India, and a Field Correspondent for Know Disasters magazine.

The Planning and Development Department, Government of Bihar, set up a Bihar Mausam Seva Kendra (Bihar Weather Service Centre) in 2020. It is an ambitious step by the State Government towards achieving one of the common goals of several international agreements like the Paris Agreement and COP26 to achieve climate adaptation. With this step, Bihar joins the 93 select few countries or territorial bodies under the World Meteorological Organization (WMO) members to have state-of-the-art early warning services vital to support adaptation in climate-sensitive sectors like health, water and agriculture. The WMO Secretary-General, Petteri Taalas, must be happy to learn about this development from India.



Altamash Khan

What is BMSK?

Bihar is a flood-prone State. Every year, natural calamities like drought, cold waves, thunderstorms, torrential rain and cyclonic storm keep hitting the State, causing immense loss of life and property. There was a need to establish a strong system to minimise the loss of public money by disseminating information related to these natural calamities, especially floods, drought, heavy rains and

earthquakes, etc. A systematic approach to risk management through the established Early Warning System (EWS) can reduce the loss of life and the negative impact on the economy. An EWS based on effective institutional plans can predict risks in a timely and effective manner, thus empowering decision-makers and communities at risk.

In 2020, the Department of Planning and Development (Government of

Bihar) approved the establishment and operation of Bihar Mausam Seva Kendra (BMSK) at the State level. The Centre will be responsible for consolidation, integration and forecasting of data received from the Automatic Weather Station (AWS) and Automatic Rain Gauge (ARG) installed in all Block Headquarters and Gram Panchayats respectively. Setting up of Automatic Weather Stations (AWS) and Automatic Rain Gauges (ARGs) are underway in all administrative Blocks and Panchayats of the State. This would help in forecasts on crop damage, drought and flood.

Karnataka Connection

According to a press release from the Asian Disaster Preparedness Centre (ADPC) on March 21, 2021, there was a high-level meeting between officials from the Department of Planning and Development, Government of Bihar (GoB) and the Karnataka State Natural Disaster Monitoring Centre (KSNDMC). The



Photo: www.adpc.net/igo/contents/Media/media



Photo: www.adpc.net/igo/contents/Media/media

event brought together government officials, technical officials from KSNDMC, and the Asian Disaster Preparedness Centre (ADPC). The ADPC has had a close working relationship with the Government of Bihar in India since 2015 to support its capacity-building needs in the recently adopted Bihar Roadmap for Disaster Risk Reduction (2015–2030). With the support and guidance of the Bill & Melinda Gates Foundation, ADPC supports Bihar Government officials to implement disaster risk reduction programmes in development programmes.

The meeting was organised to advance technical cooperation between KSNDMC and GoB to establish a hydro-meteorological network - Bihar Mausam Sewa Kendra (BMSK).

ADPC has submitted a detailed project report to the Department of Planning and Development to establish a similar network. It aims to provide practical scientific and technological ideas in the field of disaster management promptly. BMSK will be the central facility to produce information, reports and advice for the public, research organisations and the GoB to support improved and timely decision-making on their part.

The network has shown promising results while being successfully implemented during Phase I (2016

- 2018) of the project. ADPC has facilitated scheme design on the Agricultural Early Warning System in five Bihar districts. Part of this project involves the development of a high-resolution telemetry-based hydro-meteorological network in the districts that will provide improved weather-based advisory services in agriculture and related sectors. The programme also facilitated the signing of a Memorandum of Understanding (MoU) between KSNDMC and the Department of Agriculture to provide technical support for the successful implementation of the pilot project.

Based on the success of the pilot project, GoB has decided to expand the network to 33 other districts through the Department of Planning and Development, GoB. In addition, the Centre is being established and will be known as BMSK. It will provide meteorological and other disaster risk information services to various government departments and the general public.

KSNDMC has agreed to extend technical support and capacity building for BMSK. It will support capacity building by providing guidance and exposure visits to selected staff from the Planning Department. Development works best when partners with the same motivation work together.

Challenges Before BMSK

A source working closely on the installation of instruments in the field shared some of the following challenges in this early phase of establishment:

Land Acquisition: BMSK is not getting the desired land for installing the instruments in village Panchayats. It is mostly getting farmlands exposed to thefts or those difficult to look after.

Theft of Instruments: The ARG's battery is being stolen as the instruments are installed on the open ground. Due to this, the data of that Panchayat is not received and the vendor has to install the instruments or tools again. One way to prevent this problem is to install equipment on the rooftops of government schools or Panchayat buildings.

Efficiency of Dissemination Process

BMSK would need to ensure their mass-messaging systems do not create panic or havoc among district or block level functionaries and the general public. At the same time, it must reach the right people at the right time.

Effective Partnerships to Improve Service Delivery

Partnership with other government institutions, the private sector, academia, international NGOs, and climate and development finance partners is crucial. Such partnerships help foster joint research and innovation, develop new or enhanced products and services, and improve service reach. ■

References:

https://www.adpc.net/igo/contents/Media/media-news.asp?pid=1694&topic=https://ndmindia.mha.gov.in/images/pdf/01_ComprehensiveReportfor7citiesEWSReview.pdf

Disaster Resilient Education System - From Risk to Recovery

Neha Jain is a 17-year-old passionate social activist, content creator and civil service aspirant who envisions a safe, empowered and inclusive society. She is pursuing a Bachelor of Arts Honours in Applied Psychology at Gargi College, Delhi University. She currently works as the Youth Co-Content Creator at UNICEF INDIA. She has been associated with many organisations including NINE IS MINE, CRY and GOONJ, amongst others, while advocating for child rights and empowerment, climate action, health. From teaching the last child and coming on the ground for COVID relief to raising funds, participating in awareness campaigns/conferences and leading social projects in partnership with government stakeholders and civil society, she continues to leave no stone unturned to bring a positive change in society.

Human-induced disasters like COVID-19 have been like this sudden, unsafe and unexpected dive in the sky full of uncertainties, uncontrollable chaos and an adrenaline overload. Such calamities have a massive impact on children, youth and the education system. While the education system has been disrupted by disasters, it is also a crucial part of the solution. It acts as our parachute, a lifesaver, as we prepare for a smooth landing in the post-pandemic world.



Neha Jain

Let us begin unlocking some answers as we strive to reimagine, recreate and restore a bright future.

Why do we need a disaster-resilient

education system for the post-pandemic world?

It is imperative to understand that quality education can provide life-saving information and practical skills that protect children and youth,

in, during, and after emergencies.

Disasters are rapidly producing further disasters to become more complex and deadly, but amidst these, a strong education system has the potential to become that ray of hope which helps us move from darkness to possibility, from pandemic to panacea and from risk to recovery.

Therefore, the inclusion of disaster risk reduction component in the education system is necessary not only to increase the level of preparedness and protection of students and their communities but to allow the learners affected by it to continue their education, and out





of school children, who are perhaps marginalised, also get access to learning both during and after emergencies.

Who plays an important role in making education disaster-resilient?

Each of us has a unique role to play, while the following form the core pillars of change as we reimagine

school education in the post-COVID-19 world.

- Government
- Educators
- Civil Society
- Youth
- Media (considering the present times)
- Parents

How could each of these stakeholders implement effective solutions to bridge existing learning crises and inculcate disaster preparedness via education?

Is re-envisioning of education viable without the capacity building of the actors and institutions involved?

How can we build disaster-resilient education?

At one level, primarily, we need to cope with disruption in the education system caused in context to COVID-19.

At another level, we need to discuss how to strengthen our education system to prevent such disasters in future.

From the management of schools including school buildings, grounds and policies to framing an effective curriculum covering content, learning and teaching, it is essential to infuse disaster-risk reduction practices. A practical, experiential framework must be crafted in such





a way that it empowers all people and especially motivates the youth to take action.

What should be the outcome of a disaster risk reduction included curriculum?

To reimagine an education framework:

- where we understand that our simple lifestyle choices like a cycle over a car, coolers over ACs, reusing electronic waste and upcycling our clothes make a difference to a world struck by hazards like climate change, global warming and ozone depletion.
- where we know how to question government and hold it accountable for making more investments, effective policies and stronger infrastructure, while we may stay in a country like India exposed to disasters ranging from terrorism to malnutrition.
- where we are aware of things from local drainage channels, backup food and water supplies, components of emergency kits and first-aid to government relief schemes as we deal with State-specific disasters like Assam Floods, Gujarat Drought, Uttarakhand

Landslides or the Bhopal Gas Tragedy.

- where we know when to stop burning crackers and how to burn the stubble to counter pollution in a city like Delhi
- where we know simple preventive measures like switching off the cylinder knob to learning how to use fire extinguishers and knowing important helpline numbers, while we try to prevent a cylinder explosion or a fire accident at our schools and homes.
- where we do not feel helpless but know simple life-saving techniques like CPR (Cardiopulmonary Resuscitation) and prone position when individuals have low-flow oxygen, especially during the second disastrous wave of the pandemic.

It is true that from individual to community, city, State, national and global level, we are at risk of being surrounded by disasters of varying degrees. Hence, Max Mayfield, former Director of the National Hurricane Center, USA, very rightly said, "Preparation through education is far better than learning through tragedy."

I have also learnt these things in many practical ways when I went on-ground in an attempt to, reduce, if not end, the suffering of those who faced joblessness, food scarcity and even oxygen, and when I worked to manage COVID-19 risks by being a Vaccine Buddy and empowering people who were working as domestic help, or those working in several construction sites and the slums.

It is high time that we lead the world towards a transformed education system that would not only ensure that education and awareness sustain us in times of disaster but its wholesomeness would also ensure that we prevent and overcome any such fatal disaster in future.

Here is a call to action to make the world safer, healthier and happier for every human being, and the time to act is now or never! ■

- To know more about Neha and the work she has been engaged in so far, please check:

<https://www.linkedin.com/in/nehajain-7a54ba156>

Alok Sharma Addresses Media as COP26 Concludes

As COP26 concluded in November 2021 and reflected on the task ahead, COP26 President Alok Sharma said:

We can now say with credibility that we have kept 1.5 degrees alive. But, its pulse is weak, and it will only survive if we keep our promises and translate commitments into rapid action. I am grateful to the UNFCCC for working with us to deliver a successful COP26.

From here, we must now move forward together and deliver on the expectations set out in the Glasgow Climate Pact and close the vast gap which remains. Because as Prime Minister Mia Mottley told us at the start of this Conference, for Barbados and the other Small



Island States, '2 degrees is a death sentence'.

It is up to all of us to sustain our lodestar of keeping 1.5 degrees within reach and to continue our efforts to get finance flowing and

boost adaptation. After the collective dedication which has delivered the Glasgow Climate Pact, our work here cannot be wasted. ■

Source:
ukcop26.org

Thailand's New Early Warning Technology to Protect 70 million from Disasters

A new early warning and hazard monitoring system, ThaiAWARE, will provide advanced decision support capabilities to Thailand's disaster managers, protecting the country's 70 million residents from natural disasters.

The Thailand Government and

Pacific Disaster Center (PDC) have operationalised this system, launched in a virtual ceremony on December 15, 2021. It was the Pacific Disaster Center's first customised, remote deployment of DisasterAWARE in Asia and only the second worldwide.

Thailand is prone to natural disasters, such as floods, droughts and tropical storms. The country suffered an economic loss of \$46,055,161 due to natural disasters from 2009 to 2018.

The National Disaster Relief Centre has indicated that flood disasters in Thailand between 1989 and 2018 caused more than B160.8 billion (\$5.1 billion) damage to the economy. The 2011 floods accrued economic damage of more than B23 billion (\$0.7 billion) alone.

Thailand's Disaster Prevention and Mitigation Department (DDPM) reported that flooding affected 229,220 households across 6,827 villages in 193 districts of 31 provinces as of September 30, 2021. ■

Source:
downtoearth.org



Tsunami from Tonga Volcano Eruption Leaves Trail of Flood Damage



with water, and scientists warn the main island could be blanketed in volcanic ash.

Videos shared on social media after the eruption showed people running for higher ground as the one-metre-high floods hit coastal areas and made their way farther inland while the sky darkened with ash.

There were no official reports of injuries or deaths by Monday (January 17, 2022) morning, with communications limited. ■

Tsunami waves caused by an undersea volcano have flooded the Pacific Island country of Tonga, where entire towns are inundated

Source: [theguardian.com](https://www.theguardian.com)

Sixth Mass Extinction of Wildlife Accelerating

According to a recent analysis, the sixth mass extinction of wildlife on Earth is accelerating. More than 500 species of land animals are on the brink of extinction and are likely to be lost within 20 years; the same number were lost over the last century. Scientists say that without human destruction of nature, this rate of loss would have taken thousands of years, and they warn that this may be a tipping point for the collapse of civilisation.

The analysis, published in the journal -*Proceedings of the National Academy of Sciences* -looked at data on 29,000 land vertebrate species compiled by the International Union for Conservation of Nature (IUCN) Red List of Threatened Species and BirdLife International. Scientists identified 515 species with populations below 1,000 and about half of these had fewer than 250 individuals remaining.



Mass extinction is usually defined as a loss of about three-quarters of all species in existence across the entire Earth over a “short” geological period. Given the vast amount of time since life first

evolved on the planet, “short” is defined as anything less than 2.8 million years. ■

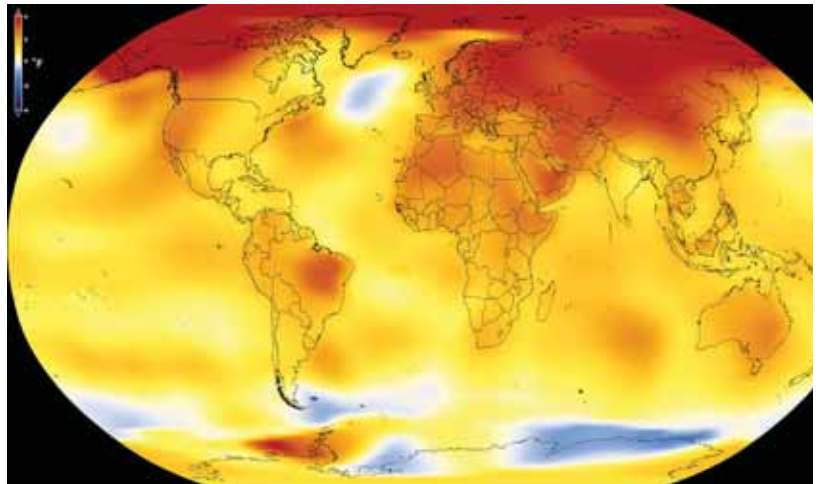
Source: [earth.org](https://www.earth.org)

2021 Tied for Sixth Warmest Year in Continued Trend, NASA Analysis Shows

Earth's global average surface temperature in 2021 tied with 2018 as the sixth warmest on record, according to independent analyses done by NASA and the National Oceanic and Atmospheric Administration (NOAA).

Continuing the planet's long-term warming trend, global temperatures in 2021 were 1.5°F (0.8°C) above the average for NASA's baseline period, according to scientists at NASA's Goddard Institute for Space Studies (GISS) in New York. NASA uses the period from 1951 to 1980 as a baseline to see how global temperature changes over time.

Collectively, the past eight years are the warmest since modern recordkeeping began in 1880. This



annual temperature data makes up the global temperature record – which tells scientists the planet is warming. ■

Source:
climate.nasa.gov

Global Warming 'Could Reach 4°C by the End of this Century' after COP26 Fell Short of its Aims, Say Experts

Researchers from the University of Exeter and the Met Office analysed worldwide policies and found that on the "current trajectory" the Paris Agreement's aim of limiting warming to 1.5°C above pre-industrial levels is slipping out of reach.

There could be global warming of 4°C by the end of this century despite pledges made at the COP26 Climate Summit, according to a new report.

Professor Richard Betts, who led the research, said the agreements made at COP26 in Glasgow "have reduced the likelihood" of warming reaching 4°C, "but it remains possible". If this happens, heat-related deaths in the UK is projected to increase from 2,000 a year at the moment to 7,200 by the 2050s, and 12,800 by the 2080s.

The report, which informed the government's Third UK Climate Change Risk Assessment, concluded that climate change is already bringing substantial



risks to Britain's natural environment, infrastructure, human health, communities and businesses. The UK also faces concerns relating to security, migration and supply chains. All these risks would increase if warming reaches 2°C and even more so at 4°C. ■

Source:
news.sky.com

Cyclonic Storm 'Jawad' Shows Mercy, Sparing India's East Coast Havoc

India's east coast is unlikely to face the fury of cyclonic storm Jawad which has weakened into a deep depression before reaching the Odisha-Andhra Pradesh coast, but thousands of people living along the sea have been evacuated as a precautionary measure, officials said on Saturday - December 4, 2021.

However, a teenager was killed in the Srikakulam district of Andhra Pradesh after a tree came crashing down on him in heavy rain under the influence of the tempest.

People of Odisha, already battered by cyclone 'Gulab' and 'Yaas' in the last year, heaved a sigh of relief as the storm began ebbing away while still rolling over the sea.

There was no rain in the Odisha



capital, Bhubaneswar, and coastal districts since noon, prompting the authorities to stop the evacuation.

"About 1,500 people have been evacuated, including 300 pregnant

women. We have stopped evacuation now," an official said. ■

Source:
[business-standard.com](https://www.business-standard.com)

As Told to Parliament on December 16, 2021: Cyclones, Floods Increased in Last Two Decades

Natural disasters such as cyclones and floods have increased in the country in the last few years, Dr Jitendra Singh, Union Minister of State, Science and Technology, told the Rajya Sabha on December 16, 2021.

There was a significant rise [0.86 per decade] in the frequency of post-monsoon (October-December) very severe cyclonic storms in the northern Indian Ocean during the past two decades (2000-2018).

The frequency of extremely severe cyclonic storms over the Arabian Sea increased during the same period. There was also an increased frequency of localised heavy rainfall on sub-daily and daily timescales that has enhanced the flood risk over India, contributing to an increased frequency and impacts of floods in urban areas, Singh added. ■



Source:
[downtoearth.org](https://www.downtoearth.org)

India's Old Dams: Gandhi Sagar in MP Needs Immediate Repair, Says CAG Report

Gandhi Sagar Dam on Chambal River in Madhya Pradesh requires an immediate repair, warned a new report. It is one of the five water reservoirs of national importance. The absence of regular checks, non-functional instruments and choked drains are the major problems plaguing the dam for years, stated the report by the Comptroller and Auditor General of India (CAG) released on December 23, 2021.

Gandhi Sagar Dam was constructed in 1960 to provide drinking water to several districts of Rajasthan and generate 115 megawatts of electricity. It has been breached several times in recent years, causing flooding in downstream areas, showed reports. Three districts in the State — Sheopur, Morena and Bhind, with an approximate collective population of 4.35 million (as per the 2011 Census) — lie downstream the dam.

Gandhi Sagar was put in Category II of the dam inspection report. Dams



with major deficiencies, which may lead to complete failure/partial failure and need attention at once, fall under Category I. Those with minor to medium deficiencies that are rectifiable but need immediate attention falls under Category II. The CAG report mentioned a dam in Category I but did not name it. As many as 27 other smaller dams of MP were in Category II, according to the analysis.

The State Dam Safety Organisation (SDSO), the Department responsible for its maintenance, did not comply with recommendations by the Central Water Commission (CWC) and Dam Safety Inspection Pane (DSIP) on remedial measures, according to the paper. ■

Source:
downtoearth.org

India Needs Two-Pronged Strategy to Deal With Future Pandemic Exigencies

The efficacy of the COVID-19 vaccine will always be challenged and compromised as the Coronavirus keeps evolving with immune escape capabilities. The vaccine platform will require constant modifications if it must provide immunity against new variants.

Currently, the Omicron variant is found to escape all vaccine-induced immunity and pharma companies are reformulating vaccines to make it effective against Omicron and other variants, points out Dr Satish Ranjan, a leading Germany-based immunologist.

Since vaccine development would be expensive and its efficacy likely short-lived, India should bring big-bang reforms in healthcare and evolve a two-pronged strategy that addresses a potential future pandemic and gives allowance to other infectious and non-infectious diseases as well.

The country needs to develop a structured, integrated, preventive and responsive healthcare system wherein



all private and public healthcare infrastructure are governed by a unified law. ■

Source:
thehindubusinessline.com

Centre Lists Districts Vulnerable to Climate Crisis in India's First Weather Hazard Atlas

The Sunderbans in West Bengal, neighbouring districts of Odisha, and Ramanathapuram, Pudukkottai and Thanjavur in Tamil Nadu are the most vulnerable to high storm surges of as much as 8.5 to 13.7 metres that are induced by cyclones, according to the Climate Hazards and Vulnerability Atlas of India released by the Ministry of Earth Sciences.

The Atlas, the first of its kind, will aid in disaster preparedness as extreme weather events rise in the wake of the climate crisis, scientists said. The maximum heights of storm surges in the Atlas provides data for all coastal districts in India.

The Atlas is expected to mitigate the effects of the 13 most hazardous meteorological events – cold waves, heat waves, thunderstorms, flood, drought, fog, wind hazard, dust storm, snowfall, hailstorm,



lightning, extreme rainfall and cyclone – that can cause extensive damage. There are 640 climate vulnerability maps in the Atlas.

For a visual display of the climate vulnerability maps, the Weather

Bureau has used geographic information system tools at the Office of Climate Research and Services office in Pune.

Source: [hindustantimes.com/](https://www.hindustantimes.com/)

Subhash Chandra Bose Aapda Prabandhan Puraskar 2022

To recognise and honour the invaluable contribution and selfless service rendered by individuals and organisations in India in disaster management, the Government of India has instituted an annual award known as Subhash Chandra Bose Aapda Prabandhan Puraskar. The award is announced every year on January 23 - the birth anniversary of Netaji Subhash Chandra Bose. The award carries a cash prize of Rs 51 Lakh and a certificate in the case of an institution, and Rs.5 Lakh and a certificate in the case of an individual.

For the award this year, nominations were solicited from July 1, 2021, onwards. The award for 2022 has gone to (i) Gujarat Institute of Disaster Management (Institutional



Category) and (ii) Professor Vinod Sharma (Individual Category) for the Subhash Chandra Bose Aapda Prabandhan Puraskar for their excellent work in Disaster Management.

They were conferred with the award along with the awardees of the year

2019, 2020 and 2021, by Prime Minister Shri Narendra Modi, at the investiture ceremony held on January 23, 2022, to commemorate the 125th birth anniversary of Netaji Subhash Chandra Bose.

Source: www.pib.gov.in

Children are our future. It is, therefore, crucial that they are included in decision-making, designing and implementing policies, plans, and standards, as emphasised by the Sendai Framework for Disaster Risk Reduction 2015-2030. We dedicate this page to them to express creatively regarding issues related to disasters and ways to mitigate their impact.

Noopur Urvash

Grade 8

Aspire International School, Nagpur



Saumya Singh

Grade 4

St. Teresa's School, Bhagalapur



Soubhagya Fulkar

Grade 3

Aspire International School, Nagpur



Reader's Response

We are delighted to share a few insightful views received as feedback about the previous issues from different sections of society. We take note of these suggestions and will try to ensure that they are incorporated in the forthcoming issues.



In my eyes, KNOW DISASTERS is the first magazine I have studied related to disasters. I have learned a lot about disasters, such as how disasters and development are interlinked and how SDGs, climate change and disasters are interconnected. Satendra Singh's article on forest fires and climate change and their impact on each other gave me great insight into this area; so is Ahmad Rashiq's article on groundwater crisis and the traditional and modern methods of water conservation like johads (khadin), bhungroos or holiyas, baolis, kunds or kundis, naulas and rainwater harvesting. Komal Priya Singh's article conveyed the need for equality even during disasters. Persons with disabilities are a crucial section of our society and, we have to include them in development processes. The article on the 15th Finance Commission – A Game-Changer for Disaster Finances in India, takes a very holistic and comprehensive approach to the financial structure for disaster management in India.



Mithun Kumar
Programmer
District Emergency Operations Centre
(DEOC),
Lakhisarai, Bihar.



Dr Satyendra Kishore

*Adjunct Professor - IUJ Ranchi,
Former Executive Director, Indian
Institute of Coal Management,
Ranchi, Jharkhand.*

Know Disasters is just superb! The magazine has reputed authors and writers who cover many aspects of disaster management. The news and book review sections are very informative. The motivational article by a TISS faculty is also quite interesting. Above all, your short article explaining the greater cyclonic vulnerability of the Bay of Bengal is the icing on the cake.

The magazine has all the attributes of an internationally-acclaimed magazine.

Terminology

Contingency Planning

A management process that analyses disaster risks and establishes arrangements in advance to enable timely, effective and appropriate responses.

Building Code

A set of ordinances or regulations and associated standards intended to regulate aspects of the design, construction, materials, alteration and occupancy of structures that are necessary to ensure human safety and welfare, including resistance to collapse and damage.

Environmental Hazards

They may include chemical, natural and biological hazards. They can be created by environmental degradation, physical or chemical pollution in the air, water and soil.

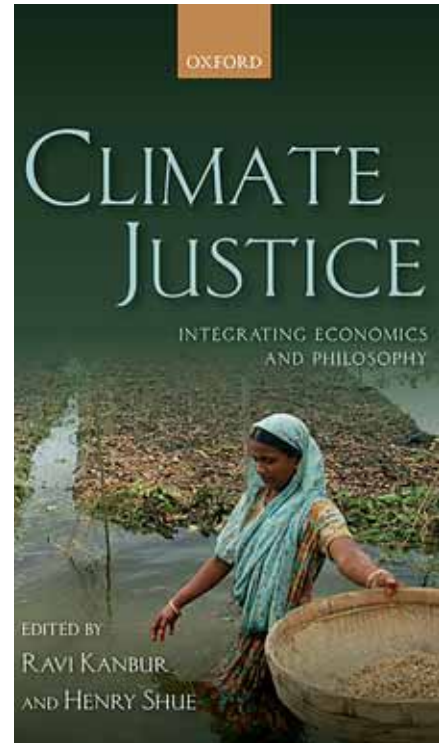
Source:

www.undrr.org

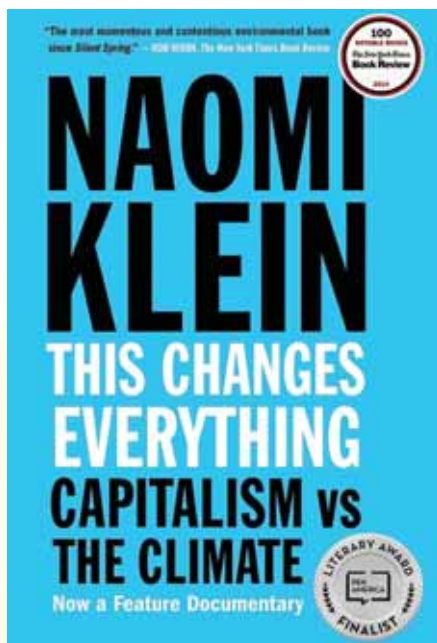
Climate Justice: Integrating Economics and Philosophy

Edited by Ravi Kanbur and Henry Shue

Climate justice requires sharing the burdens and benefits of climate change and its resolution equitably and fairly. It brings together justice between generations and justice within generations. In particular, it requires that attempts to address justice between generations through various interventions designed to curb greenhouse emissions today do not end up creating injustice in our time by hurting the currently poor and vulnerable. The United Nations Sustainable Development Goals (SDGs) Summit in September 2015, and the Conference of Parties (COP) to the Framework Convention on Climate Change in Paris in December 2015, brought climate change and its development impact centre stage in global discussions. In the run-up to Paris, Mary Robinson, former President of Ireland and the UN Secretary-General's Special Envoy for Climate Change, instituted the Climate Justice Dialogue "to mobilise political will and creative thinking to shape an ambitious and just international climate agreement in 2015". The editors of this volume, an economist and a philosopher, served on the High-Level Advisory Committee of the Climate Justice Dialogue. They noted the overlap and mutual enforcement between the economic and philosophical discourses on climate justice. But they also noted the great need for these strands to come together to support public and policy discourse. Climate Justice: Integrating Economics and Philosophy is the result. Bringing together contributions from economists and philosophers, Climate Justice illustrates the different approaches, how they overlap and interact, and what they have already learned from each other and might still have to learn.



You can purchase this book at Flipkart.com



This Changes Everything: Capitalism vs. The Climate

By Naomi Klein

In *This Changes Everything*, Naomi Klein argues that climate change is not just another issue to be neatly filed between taxes and healthcare. It is an alarm that calls us to fix an economic system that is already failing us in many ways. Klein meticulously builds the case for how massively reducing our greenhouse emissions is our best chance to simultaneously reduce gaping inequalities, re-imagine our broken democracies, and rebuild our gutted local economies. She exposes the ideological desperation of climate-change deniers, the messianic delusions of the would-be geoengineers, and the tragic defeatism of too many mainstream green initiatives. She demonstrates precisely why the market has not—and cannot—fix the climate crisis but will instead make things worse, with ever more extreme and ecologically damaging extraction methods, accompanied by rampant disaster capitalism.

This book is available at amazon.com



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GFDR Secretariat: 1-Akbar Villa, Near Old State Bank, Marol Maroshi Road, Andheri (E),
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