

# POWER OF EVIDENCE

**India is transitioning to a robust tool to assess the loss and damage caused by extreme weather events**

**SEEMA PRASAD**

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**R**ain conjures hope in Maharashtra's Marathwada region. Its eight districts are predominantly rainfed and are among the most drought-prone areas in the country. Monsoon failures and chronic farmer suicides bring the region national notoriety. This year, the monsoon season was different. The region received bountiful rains, and yet farmers lost their crops; scores of them even took their lives.

Between July and September, 4.5 million farmers in Marathwada saw rain wash away their standing crops from 0.38 million hectares (ha), an area more than double the size of Delhi, informs the office of divisional commissioner at Aurangabad, Maharashtra. Even before the news of crop loss could spread, in June, 108 farmers in Marathwada died by suicide. July saw 83 suicides, while August reported the highest 114 suicides and September 90 such incidences. This means three farmers from the region died by suicide every day during this monsoon season.

The situation was particularly acute in Maharashtra's Nanded district, which saw a two-fold rise in farmer suicides during the monsoon season—eight farmers died by

suicide in July, 26 in August and 22 in September. This was the highest spike in farmers' suicides in the region, which coincided with the monsoon's erratic progress that oscillated between dry and wet spells.

According to the India Meteorological Department (IMD), Nanded received 135 per cent and 501 per cent excess rainfall in the fourth week of June and first week of July, respectively. The trend continued in the second (210 per cent excess) and third weeks (67 per cent excess) of July. Farmers usually sow seeds in early June, and excess rain destroyed most of the saplings. Since seeds account for 40 per cent of crop input costs, most small and marginal farmers could not resow their fields. Only the ones with money, or access to credit, went in for late sowing. Even that did not help. Rainfall stopped abruptly in the last week of July, ushering in an unexpected month-long dry spell that continued till the first week of September. And then, in the next week, the district received 247 per cent excess rainfall. Kiran Gade of Himayatnagar village in Nanded says the September rains eroded the soil to the extent that farmers in his village might not be able to grow crops in the next few seasons.

## Extreme swings

On September 30, IMD announced the monsoon report card, claiming that the season was normal for the country, with 6 per cent excess rainfall. The reality is most parts of the country have experienced extremes like Marathwada. At the end of the season, 188 districts, or 27 per cent of the country, reported deficit rainfall (20-59 per cent less than normal), and seven received large deficient rainfall (60-99 per cent less than normal). The states that received deficit rainfall include Jharkhand, Bihar, Uttar Pradesh, Uttarakhand, Assam, Haryana, Delhi and Punjab.

The case of Uttar Pradesh was

department submitted a document to the chief minister's office urging it to consider declaring a mid-season drought, which is extremely rare. While the state took some immediate measures such as waiving off electricity costs for borewells, it never announced a drought. The discussion fizzled out after the rains.

## Year-round damages

The monsoon was not the only erratic season this year. Weather vagaries were visible in the winter and pre-monsoon seasons as well. In the first 273 days of this year (January-September), India experienced extreme weather events on 242 days, according to an

# IN THE FIRST 273 DAYS OF THIS YEAR (JANUARY-SEPTEMBER), INDIA EXPERIENCED EXTREME WEATHER EVENTS ON 242 DAYS

particularly unusual. The overall monsoon in the country's most populous state remained deficient even after receiving 193 per cent excess rainfall in the last week of September. Shortly after, the state got flooded. On October 5, three of its districts received 10,000 per cent excess rainfall. Shravasti district received 176.8 mm rains, against the normal of 2.4 mm. On October 11, IMD released data that suggests that in the first 10 days of the month, the country received 80 per cent excess rainfall; Uttar Pradesh reported 689 per cent excess rain.

Apart from damaging crops, the unexpected rains in October also dashed farmers' hopes of receiving compensation for the crops lost due to deficit rainfall during the season. On August 20, the relief commissioner of the Uttar Pradesh revenue

analysis by *Down To Earth* Data Centre (see 'Disaster a day', p16).

What India has witnessed so far in 2022 is the new normal in a warming world. A 2020 report by the UN Office for Disaster Risk Reduction says globally, there has been "a sharp increase [in disasters] over the previous twenty years". India reported the third highest number of natural disasters during this period.

Between 1995 and 2020 (till October), India recorded 1,058 climatic disaster events (floods, cyclones, droughts, cold waves and heat-waves), says a September 2021 report by National Institute of Disaster Management (NIDM). It says the country has seen an "increasing pattern for both hydro-meteorological [floods, droughts and others] and biological disasters [disease outbreak]."

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# DISASTER A DAY

India experienced extreme weather events\* on 242 of the 273 days from January 1 to September 30, which claimed 2,755 lives and damaged 1.9 million hectares (ha) crop area

**KIRAN PANDEY AND RAJIT SENGUPTA**

## Extreme weather event type\*

- Heatwave ■ Cyclone ■ Snowfall ■ Cloudburst
- Lightning and storm ■ Cold wave/cold days
- Heavy rain, flood and landslide

### WINTER

**22** | **33,184 ha**  
Human deaths | Crop area affected

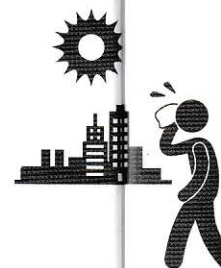
**39 of the 59 days in January and February** saw extreme weather events, spread across 21 states and Union Territories (UTs). Uttar Pradesh saw extreme events on 25 days, followed by Madhya Pradesh (24 days) and Punjab (15 days). The country experienced its third wettest January since 1951. Yet, most of **Maharashtra, Karnataka and Kerala recorded deficit rainfall**. This is surprising because central and southern regions were wetter than normal.



### PRE-MONSOON

**302** | **83,256 ha**  
Human deaths | Crop area affected

**81 of the 92 days between March and May** saw extreme weather events, spread across 3 states and UTs. **Rajasthan and Assam saw extreme events on 36 days, followed by Himachal Pradesh (33 days)**. Unusually hot March and April led to the early onset of heatwaves this year. The country reported heatwaves on 51 days. While the temperature was largely normal in May, the month saw heavy rainfall.



## REGION-WISE EXTREME WEATHER EVENTS

**Central region** recorded extreme weather events on **198 of the 273 days**. Madhya Pradesh was the worst hit, with events on 140 days.

### States in the region

Gujarat,  
Madhya Pradesh,  
Goa, Maharashtra,  
Chhattisgarh  
and Odisha



Deaths

**887**

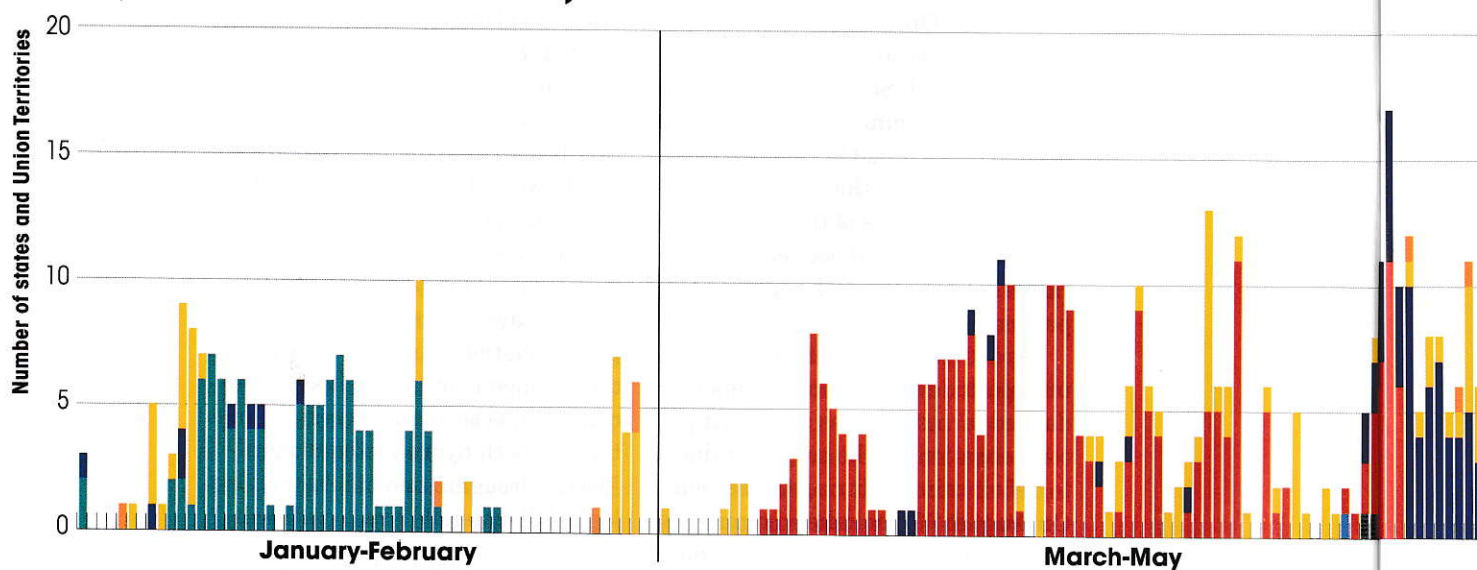
Crop area affected

**136,781 ha**

**East and northeast region** recorded extreme weather events on **171 of the 273 days**.



## SEASON-WISE DAILY EXTREME WEATHER EVENTS IN INDIA (JANUARY 1 - SEPTEMBER 30, 2022)





## EVENTS (JANUARY 1- SEPTEMBER 30, 2022)

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Assam was the worst hit, with events on 131 days.

### States in the region

Bihar, Jharkhand, Sikkim, West Bengal, Assam, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Meghalaya

Deaths

**783**

Crop area affected  
**256,517** ha

Northwest region recorded extreme weather events on **198 of the 273 days**. Uttar Pradesh was the worst hit, with events on 104 days.

### States in the region

Jammu and Kashmir, Punjab, Himachal Pradesh, Uttarakhand, Haryana, Delhi, Uttar Pradesh and Rajasthan

Deaths

**735**

Crop area affected  
**393,726** ha

South peninsula region recorded extreme weather events on **124 of the 273 days**. Karnataka was the worst hit, with events on 82 days.

### States in the region

Telangana, Andhra Pradesh, Tamil Nadu, Kerala and Karnataka

Deaths

**350**

Crop area affected  
**1,126,607** ha

## MONSOON

**2,431** | **1,797,190 ha**

Human deaths | Crop area affected

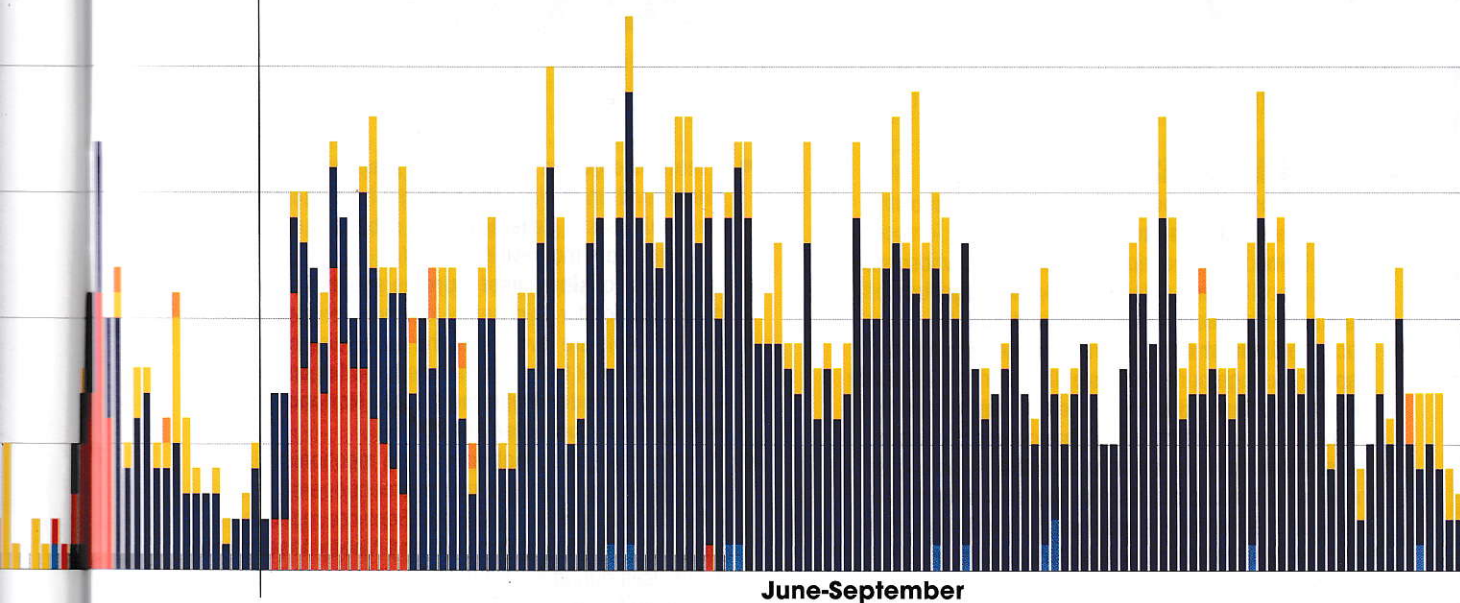
All the 122 days between June and September saw extreme weather events, spread across 34 states and UTs. **Assam saw extreme events on 95 days, followed by Madhya Pradesh (84 days) and Maharashtra (80 days).**

While the overall monsoon was normal, rainfall fluctuated between deficit and excess throughout the season. At the end of the season, 188 districts (27% of districts in the country) received deficient rainfall, while seven districts received large deficient rainfall (60-99% less than normal).



\*India Meteorological Department's "Statement on Climate of India during 2021" lists the given events (except cloudburst) as extreme weather events

SOURCE: Based on India's database on weather disasters dashboard by CSE-DTE Data Centre; Data sourced from the Disaster Management Division of Union Ministry of Home Affairs, India Meteorological Department and media reports



INFOGRAPHICS: SANJIT / CSE



The disasters result in huge economic losses. The World Meteorological Organization, in its "State of the Climate in Asia" report, says that in 2020 India lost US \$87 billion due to disasters. The UN's Economic and Social Commission for Asia and the Pacific projects that for 2020-59 "India is set to record an average annual loss of \$225 billion". But for those affected by these disasters, the future only brings increased vulnerability due to inadequate assessment of loss and damage.

The United Nations Framework Convention on Climate Change (UNFCCC) in its working definition of loss and damage says that it is "negative effects of climate variability and climate change that people have not been able to cope with or adapt to".

This is the situation of most farmers in Maharashtra and Uttar Pradesh who do not have the capacity to "cope or adapt to" extreme weather events. A farmer

household in Maharashtra has more outstanding loan than their annual income. Over 54 per cent of the farmer households in Maharashtra are indebted and the average outstanding loan per household is ₹82,085, as per the National Statistical Office 2019 survey on "Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households". With each crop failure, the debt burden increases. As per the "Farmers Suicides in Marathwada Region of India: A Causative Analysis", a research published in the *International Journal of Current Microbiology and Applied Sciences*, 2019, out of the 320 farmer suicides studied between 2010 and 2017, about 76 per cent of the farmers died by suicide due to increased indebtedness. Crop failure amounted to over 87 per cent of the suicide cases in the Marathwada region. The average per capita annual income of these observed cases was about ₹74,576.

## HOW TO COUNT THE COST

While the actual process of loss and damage assessment for a disaster in India varies from state to state, the procedure broadly remains the same

### ASSESS LOSSES, DAMAGES

- Once a disaster is announced, the **first step** is to coordinate **rescue and relief operations**.
- **At the same time**, the team on the ground, whose size and composition are determined by the magnitude of the disaster, **collects damage-related data**.
- Once the **disaster ends**, the revenue department and disaster management officials at the district level **verify the information and upload it to the centralised National Disaster Information Management System**.
- The **state disaster management authority** re-verifies the information and **calculates the economic value** based on the Norms of Assistance, a Central document which assigns values to different losses, to avail of funding from the state disaster relief fund and the state government's budget.
- If there is a gap in funding, they prepare a **memorandum** to close the gap with funding from the National Disaster Relief Fund. It is subject to approval by a central team that revisits the data.
- In the case of **slow-onset extreme events** like drought, agencies monitor its onset by looking at precipitation and soil moisture levels. After the onset, district and panchayat level teams create **seed, fodder banks and create jobs under Mahatma Gandhi National Rural Employment Guarantee Act 2005**.
- When state decides that the existing mechanism is unable to handle disaster management operations, international agencies like World Bank are roped in to carry out **Joint Rapid Damage and Needs Assessment**. It was used during the Uttarakhand floods of 2013 and the Kerala floods of 2018 and 2021.



## Lost in assessment

India has a mechanism for assessing disaster damages, which is, in simple terms, the immediate cost of a disaster. However, it lacks a robust infrastructure to assess the more holistic losses that arise from it. The existing system is centred around relief and offers little to rebuild an area and its economy post-disaster. The focus is changing, but the transition is likely to take a while.

The process of assessing damages varies from state to state, though the broad principles remain the same (see 'How to count the cost'). The district administration is the nodal agency that ropes in other departments such as health, revenue, agriculture, and agencies such as the national and state disaster response forces and the Army, says Manoj Ranjan, commissioner, Karnataka State Disaster Management Authority. The ground team does the initial assessment while carrying out relief work. Post disaster, the information is verified

and uploaded into the National Disaster Information Management System. The numbers are re-verified, and the compensation is released. "The first round of assessment is of houses, cattle, agriculture and crops. Our priority is to give some ex-gratia amount to the people affected. The exercise is completed a month after a disaster ends," says G D Tripathi, secretary of the Assam State Disaster Management Authority. Then, the damage to schools, hospitals and government buildings is assessed.

There are three major problems with the system: it does not cover all the affected sectors that are crucial for quick recovery; the compensation is seldom enough; and it gives the ideas of recovery and resilience a miss. The Norms of Assistance, a document that is used to calculate the economic cost of a disaster, was last revised in 2015. This is the reason state governments announce additional compensation packages in

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## USE ROBUST TOOL

- In 2018, India for the first time, used the **post-disaster needs assessment** tool for the Kerala floods, which had already been used across the world since 2008. In 2019, cyclone Fani in Odisha was the second disaster that used this tool. Currently, a post-disaster needs assessment is underway for the Assam flood.
- It **replaces** an internationally accepted tool called **damage, loss and needs assessment**, which focuses on physical infrastructure and not on social sectors. In India, the Bhuj Earthquake of 2001 and tsunami of 2004, used damage, loss and needs assessment for funding from the World Bank.
- Besides **analysing immediate damage**, a post-disaster needs assessment, carried out along with international agencies such as World Bank, looks at macro-economic costs such as the **impact of the disaster on the local economy**. It has a third component that looks at **improving the resilience of the region**.
- In 2019, India released a **manual for this assessment**, and this year at least **eight states are using it for floods**. The country **plans to migrate to this tool** for all kinds of disasters over the next three years.

## FUND COMPENSATION

- While the disaster is underway, only relief is provided. All **compensation occurs post-disaster**.
- **Each state has a disaster relief fund**, which is financed by the Union Ministry of Home Affairs, and the respective state/UT budget. The **amount and the Centre-state share is decided by the Finance Commission**.
- **State relief funds are allocated** money based on **a combination of capacity** (as reflected through expenditure), **risk exposure** (area and population) and **hazard and vulnerability** (risk index).
- In the 15<sup>th</sup> Finance Commission (2021-26), the corpus for the entire period is ₹160,153 crore. The Centre's share is ₹1,22,601 crore. The amount is broken down into six installments and released annually to state funds.
- Finance Commission **allocates additional funds** for urban floods, landslide-prone states and others.
- State governments, at times, announce additional compensation to either augment the existing amount or cover a bigger population. Maharashtra this year has announced compensation for farmer suicides.

SOURCE: Based on interactions with state disaster management officials of Odisha, Kerala, Karnataka, Assam and Haryana, and government documents



times of a disaster. "As per the current compensation rate, a farmer gets only ₹100 per coconut tree, which takes 15-20 years to mature," says Sekhar Lukose Kuriakose, member secretary, Kerala State Disaster Management Authority. The state government, as a result, pays an additional ₹600 per coconut tree damaged at the time of a disaster.

Overall, the existing mechanism leaves recovery and resilience almost exclusively to the initiative and capacity of each affected person. As a result, people resort to rebuilding their homes and other assets applying lower standards of quality and using inadequate construction materials. In the end, disaster risk, rather than being reduced, increases.

## Relief to resilience

The country has realised the limitations of the existing system, and is slowly transitioning to a more robust assessment tool called post-disaster needs assessment. The idea of the internationally accepted assessment tool is to build back better after every disaster. This is achieved by following four distinct steps. Creating a baseline of all the regions of the country, at least till the district level, to help the assessors know what kind of socio-economic system existed before the disaster. Next comes assessment of the immediate loss and damage, which India is already doing with reasonable success.

Third is assessment of the broader impact of the disaster on the macroeconomy (such as the impact of the state GDP and tax receipts) and on households and communities (such as the loss of household income due to the closing down of factories). And finally, a needs assessment is carried out to identify a full-fledged development

plan that goes beyond the disaster and makes the region resilient.

Post-disaster needs assessments have been around globally since 2008 and India used it for the first time during the Kerala floods of 2018. The state government took the help of four international agencies—Asian Development Bank, World Bank, EU Civil and Humanitarian Aid, and the UN—to carry out the assessment. The final report, accessed by DTE, shows that the damages caused by the floods was worth ₹10,577 crore, but the amount needed for the total recovery from the disaster was three times more at ₹30,715 crore. "We started the Rebuild Kerala Development Programme on the basis of the post-disaster needs assessment and got funding from the international agencies," says Kuriakose. The methodology was again used in 2019 during cyclone Fani in Odisha. The final report shows that while the damages from the event was ₹16,465 crore, the total cost was ₹29,315 crore. "With the help of the post-disaster needs assessment, we formulated the Odisha Disaster Recovery Project," says Gyana Das, executive director, Odisha State Disaster Management Authority.

The tool is currently being used only for major disasters, but India plans to make it an integral part of all disasters. "This year, it has been adopted by eight states—Assam, Himachal Pradesh, Gujarat, Karnataka, Jharkhand, Maharashtra, Odisha and Meghalaya—to assess floods. In another three years, we will see this being used for all disasters in the country," says Kumar Vatsa, member of the National Disaster Management Authority. In 2019, NIDM released a two-volume post-disaster needs assessment manual, which has altered the global best practices to suit the country.

While there is a consensus among state officials that the tool should be embraced, they say the transition will be challenging. The country's administrative setup, for example, is not in line with the tool's guidelines, a point clearly mentioned in the manual. All post-disaster needs assessments must be carried out across nine sectors as pre-defined under the globally-accepted System of National Accounts. This is crucial to make the assessments comparable. The problem for India is that multiple government departments are responsible for each of the sectors. The activities mentioned under the agriculture, forestry and fisheries sector are carried out by five ministries and departments.

onset disasters like droughts that affect a large area and cause massive losses, but little structural damage. India is yet to use it for a drought and even globally, of the 55 post-disaster needs assessments conducted since 2008, only two were on droughts, suggests a 2018 World Bank report.

But the most important question is: Will this assessment tool translate into more funds for loss and damage—either from the Centre or international agencies such as the World Bank? India is trying to achieve this ideal. In February 2021, the 15<sup>th</sup> Finance Commission for the first time, made a provision for recovery and reconstruction in the national disaster management budget.

## **INDIA'S EXISTING MECHANISM OF LOSS AND DAMAGE ASSESSMENT IS RELIEF-CENTRIC AND DOES LITTLE TO BUILD RESILIENCE**

This overlapping of departments can cause problems in data collection and baseline creation.

India will also struggle with creating baselines, which require historical data for the disaster-affected region and the most recent forecasts available on the same variables for the current and subsequent years of the disaster. Shairi Mathur of UNDP, who was part of the assessment conducted on the 2018 Kerala floods, recalls that baseline gaps were rampant in remote villages, particularly in the worst-affected districts of Wayanad, Idukki, Alappuzha, and Pathanamthitta. "It was difficult to find documentation for *pucca* households at the rural level and determine their worth," she says.

There are concerns over the efficacy of the tool in assessing slow-

"This new addition increased the disaster management budget by 100 per cent from the 14<sup>th</sup> Finance Commission; It grew from ₹62,000 crore then to ₹1,60,153 crore now," says Vatsa. It has also introduced a new state disaster mitigation fund and bifurcated the existing state disaster relief fund for three functions: response and relief, recovery and reconstruction, and preparedness and capacity-building.

The country has also been vocal in its support for a global mechanism for transferring loss and damage funds from the developed world to developing countries. This is expected to be one of the core discussions at the upcoming 27<sup>th</sup> Conference of Parties to UNFCCC in Sharm el-Shaikh, Egypt. **DTE**

*(With inputs from Himanshu N, Raju Sajwan and Vivek Mishra)*