



## Five feared dead in J&K as cloudbursts wreak havoc

### DISASTER MANAGEMENT

Jammu and Kashmir faced severe destruction from cloudbursts and flash floods over the weekend, leaving at least five people feared dead and many stranded with over 100 people rescued. Chief Minister Omar Abdullah expressed grief over the loss of life and property, as the region experienced extreme weather, including lightning, hailstorms, and snowfall over 48 hours.



particular in the Pir Panjal Range, Jammu Division, and higher areas of Kashmir, advising people to stay away from water bodies.

Landslides triggered by sudden weather changes blocked five locations along the Srinagar-Jammu National Highway in Ramban, damaging homes, shops, and the road itself. Many commuters were left stranded. Chief Minister Omar Abdullah stated that rescue efforts are ongoing and urged citizens to avoid non-essential travel. Union Minister Jitendra Singh confirmed heavy hailstorms, strong winds, and landslides in the region, reporting three casualties and property damage. The India Meteorological Department issued a new advisory warning of another Western Disturbance expected from April 20, with weather improvement likely by April 22.

The India Meteorological Department warned of thunderstorms, lightning, hailstorms, and gusty winds,

## All eyes on a likely policy statement as Vance arrives today on 'rare' U.S. V-P visit

### INTERNATIONAL RELATIONS

U.S. Vice-President J.D. Vance will visit India on a rare four-day trip starting Monday, accompanied by his family and a delegation of officials. The visit includes stops in Delhi, Agra, and Jaipur. Vance will receive a ceremonial welcome and meet Prime Minister Narendra Modi at a dinner with Cabinet members. This marks the first visit by a U.S. Vice-President to India in 12 years, following Joe Biden's trip in 2013.

External Affairs Minister S. Jaishankar may meet U.S. Vice-President J.D. Vance during his visit, though most of



Monday is expected to involve private engagements. On Tuesday, Vance will speak at the Rajasthan International Centre in Jaipur, where he is expected to make a significant policy statement on India-U.S. relations. His address is highly anticipated, given his assertive remarks during previous international visits, including criticism of Europe over Ukraine and strong U.S. claims on Greenland.

The Ministry of External Affairs (MEA) did not confirm whether specific issues—such as U.S. tariffs, the upcoming Bilateral Trade Agreement talks, the Quad Summit, student visa restrictions, or deportations of Indi-

ans—are on the agenda for Vice-President J.D. Vance's visit, stating only that "all relevant issues" will be discussed during his meeting with Prime Minister Modi. The U.S. has yet to appoint an ambassador to India, with Deputy Chief of Mission Jorgan Andrews currently filling the role. Vance is not scheduled to meet Indian Vice-President Jagdeep Dhankar, due to differences in the two countries' governmental structures.

Officials are hopeful that key announcements, including the launch of the renamed TRUST (Transforming Relationship Utilizing Strategic Technology) partnership—formerly iCET under the Biden administration—will follow Vice-President J.D. Vance's meeting with Prime Minister Modi. Former Ambassador Navtej Sarna noted that Vance's personal connection to India through his wife, Usha Chilukuri, could positively influence India-U.S. relations during the visit.

## Vande Bharat has weak defences against even cows: safety report

### POLITY & GOVERNANCE

A railway safety report prepared by the Commissioner of Railway Safety has raised concerns about the Vande Bharat Express, stating that its lighter front coach makes it vulnerable to serious accidents, even from cattle run-overs, especially at high speeds. The report recommends that the Railways install strong fencing to prevent human and animal trespassing and eliminate level crossing gates on routes where trains run at 160 kmph to enhance safety.

Shubhranshu, former Principal Chief Mechanical Engineer at the Integral Coach Factory, defended the safety of the Vande Bharat Express, explaining that the front nose cone is designed to absorb impact and the cattle guard deflects obstructions. He clarified that while the leading coaches are lighter than locomotives, this is a standard design for modern train sets, and does not compromise safety. The safety report also recommended that the Railways address trespassing issues and cattle ingress by deploying Railway Protection Force personnel, regular patrolling, and providing subways for



farmers and their cattle. Shubhranshu previously led the team that developed the first Train18 rake.

Vande Bharat trains, India's first semi-high-speed trains, are being manufactured at multiple factories across the country, including in Chennai, Kapurthala, and Rae Bareilly. As of December 26, 2024, 136 Vande Bharat services are operating, with 62 introduced in 2024 alone. Hundreds of new rakes, including Sleeper Class trains for long-distance travel, are being produced. However, the safety report has raised concerns about the risk of serious accidents from cattle hits at higher speeds, especially as the Railways plans to operate trains at 160 kmph on several routes.

## India, EU can collaborate on space policy, says envoy

### INTERNATIONAL RELATIONS

Marjolijn van Deelen, European Union Special Envoy for Space flagged debris from Anti-Satellite (ASAT) weapon testing and Rendezvous and Proximity Operations (RPO) that threaten satellites as major concerns. She expressed confidence that India can be a very active player in developing an international framework for responsible behaviour in space.

As India and the EU seek to strengthen strategic cooperation, they are planning to initiate a "space dialogue" as the first step toward collaboration in the space sector. The EU envoy emphasized the importance of jointly developing international agreements to regulate Rendezvous Proximity Operations (RPOs), ensuring they do not pose security threats. While RPOs themselves are not inherently problematic, the goal is to establish norms and principles that allow for safe and responsible use of space, without jeopardizing civilian space programs and benefits.

The EU envoy expressed concern about the creation of debris from India's ASAT (Anti-Satellite) test, highlighting that destructive ASAT testing is a global issue and the EU supports a UN ban on such testing. While there have been no discussions yet regarding India's ASAT program, the envoy emphasized that her visit would focus on cooperation. India's successful ASAT test in March 2019 destroyed a live satellite using a three-stage interceptor missile. The envoy also mentioned other space security concerns, including cyber jamming, spoofing, and Rendezvous Proximity Operations (RPOs), where



satellites approach closely, potentially posing risks to sensitive satellites, especially if conducted by unfriendly actors.

The EU is set to bring in a Space Act in the next few months, which the envoy termed is an instrument designed for European competitiveness. While reiterating that it does not regulate third parties, she said the Act tries to ensure EU companies cooperate more closely so that the bloc does not “get 27 individual space programmes, but do that more jointly”.

## Tackle heatwaves with short- and long-term measures

### DISASTER MANAGEMENT

India experienced its first severe heatwaves of 2025 on March 15, 20 days earlier than in 2024. Over the past decade, the frequency and intensity of heatwaves have been increasing. 2024 was the warmest year on record, about 1.55°C above pre-industrial levels, and December 2022 was the hottest December since temperature monitoring began in India. Rising temperatures, combined with humidity and wind speed, lead to heat stress, which occurs when external temperatures near the body's normal temperature of 37°C, impairing the body's ability to release internal heat. Heat stress can damage organs like the kidneys, liver, and brain, and can cause illness or death.

#### Socio-economic impact and equity issue

Heatwaves in India have significant socio-economic and non-health impacts, particularly in the agriculture and construction sectors, which are labour-intensive. Rising temperatures reduce farm productivity, harm livestock, and decrease outdoor workers' ability to work, leading to a loss of income and job opportunities. Approximately 75% of India's workforce, or 380 million people, rely on heat-exposed labour. Heat stress results in economic losses of 3% to 5% of GDP in many countries, including India, with an estimated 6% of work hours lost in 2023. Additionally, rising temperatures increase electricity demand, causing power cuts that affect industrial production, ultimately slowing economic growth.

Heat stress disproportionately affects vulnerable groups such as the poor, marginalized, migrants, subsistence workers, women, and the elderly. Women, in particular, face additional challenges due to social norms and cultural practices. Historically, urban areas have been hotter than rural areas, with human activity contributing significantly to this rise. While the first heat and health action plans (HHAP) were developed in non-tropical European countries between 2003 and 2008, Ahmedabad, Gujarat, became the first city in Asia to create a heat action plan (HAP) in 2013. Since then, over 23 Indian states and around 140 cities have developed HAPs, and India's National Programme on Climate Change and Human Health (NPCCHH) offers heat advisories through the National Disaster Management Authority (NDMA).

#### Heat action plans need nuances

Heat Action Plans (HAPs) typically include four to five key components: early prediction of heatwaves to issue alerts, raising community awareness on necessary actions, preparing the health system to manage heat-related conditions, and implementing long-term measures to reduce heat, such as increasing green spaces and planting trees. Additionally, painting rooftops white to reflect heat has been used in some cities. The fifth component focuses on collecting and analysing heat stress, morbidity, and mortality data. While many Indian states and cities have HAPs, their implementation requires more attention. These plans have had partial success, particularly in areas where local authorities collaborate with the state government, public health institutions, experts, NGOs, and community organizations.

As India might be heading into another warm year, there are some learning and action points which should be considered.

States should develop or update their Heat Action Plans (HAPs) by incorporating lessons learned and best practices from existing plans. These plans should account for both temperature and humidity, and be based on local vulnerability assessments. They should clearly define the responsibilities of various stakeholders and be activated at the start of March.

A review article in the journal *Preventive Medicine: Research & Reviews* highlighted that most Indian cities experience excess mortality due to heat stress, stressing the need for better data collection on heat stress. It also pointed out that when such data is incomplete or underestimated, analysing existing information can help identify the individuals most affected by heat strokes and the areas they live in, offering valuable and potentially lifesaving insights.

Some countries, like the United Kingdom, have implemented Heat Health Alert (HHA) systems that monitor both daytime and nighttime maximum temperatures. Similarly, India's Heat Action Plans (HAPs) should also include day and nighttime temperature monitoring. Additionally, there is a need for more advanced warning systems that can predict thermal comfort and identify times during the day when temperatures are lower, helping to protect health and ensure the continuation of activities like school and work.

Long-term preventive measures in Heat Action Plans (HAPs) should be strengthened by promoting better building and urban infrastructure, as well as improved building materials. Heatwaves disproportionately affect the poor, and during such times, governments should consider providing financial support to informal sector workers who may experience wage losses.

A 2022 study from India, Pakistan, and Bangladesh found that the universal "stay indoors" advisory during certain hours may not be effective for all families. In poorer neighbourhoods with confined spaces and high-rise buildings, people may experience higher temperatures both indoors and outdoors. Therefore, heat advisories should be tailored to specific geographical and social contexts within cities.

### Need for a people-centric approach

Indian cities should consider implementing "summer or cold shelters" similar to winter shelters, and some states are already developing a "cool roof policy" to use materials that reflect sunlight and keep buildings cool. Preventing heatwaves requires more science-based innovations. During heatwaves, local authorities typically implement short-term measures like advisories to drink water. To support this, municipalities should ensure easy access to drinking water and electrolyte solutions. Additionally, offices and workplaces should allow staggered work hours and consider shutting down during the hottest parts of the day, especially for workers in the informal sector and outdoor environments.

Investing in heat-related actions and adaptation is cost-effective and should focus on reducing the economic burden of heat stress on hospitals and emergency services, as well as its broader social and economic costs. As temperatures rise annually, both short-term measures and long-term strategies are needed, including better coordination among agencies and initiatives like insurance coverage for lost workdays. If policymakers approach heatwaves as an equity issue and prioritize people-centric strategies, significant progress can be made.

## Calling out American trade illegality

### INTERNATIONAL RELATIONS

The world is shaken by the reckless decision of the United States to impose reciprocal tariffs, which were announced on April 2, 2025, though it has been paused for 90 days, barring the tariff rates on China. The illegality of these tariffs under international trade law, as defined by the World Trade Organization (WTO), makes little difference to U.S. President Donald Trump, who treats international norms with derision. Since the announcement of the tariffs, countries have responded in various ways, with some openly criticising the U.S. while others have chosen to remain silent.

### Criticising the U.S.

Several countries, including Singapore, Brazil, China, Japan, and Canada, have condemned the U.S. for imposing illegal tariffs, arguing that these actions violate WTO rules and undermine the principles of international trade. China has initiated a dispute within the WTO and imposed retaliatory tariffs, while Canada has filed a legal claim regarding U.S. tariffs on Canadian automobiles. These nations stress the importance of a rule-based trading system and believe that powerful countries must be held accountable for disregarding these rules.

Some countries, such as Fiji and Italy, have expressed dissatisfaction with the U.S.'s tariff hikes, calling them "unfair" and a "mistake." However, other nations, including India, have remained silent or issued neutral statements, neither criticizing the U.S. nor expressing formal discontent with its actions. These countries are merely examining the U.S.'s decision without taking a clear stance.

### Reasons behind India's silence

India's silence on the U.S. tariffs is often justified by the ongoing bilateral trade agreement (BTA) negotiations with the U.S., with the argument that criticizing the U.S. publicly could harm negotiations. However, this reasoning is questionable, as the U.S. has openly criticized India's legal tariffs without it affecting their negotiations. Other countries in similar situations have publicly condemned the U.S. for its unilateral actions. India could express its discontent without hindering negotiations, reinforcing its commitment to a rule-based trading system while privately addressing the issue with the U.S.

The second reason for India's silence on the U.S. tariffs is the dysfunctionality of the WTO's dispute settlement body, which makes filing a legal claim seem ineffective. However, this transactional view is flawed, as international law serves not only to enforce compliance but also to challenge the legitimacy of actions. Despite the WTO's dysfunction, countries like China and Canada have still filed legal claims against the U.S., using international law to assert the legitimacy of their positions.

### Respect for trade rules

Recently, around 40 WTO member countries, including many developing nations, supported trade multilateralism and WTO rules in response to U.S. tariffs. However, India, which often advocates for a rule-based trading system, did not join this statement. This presents a critical opportunity for India to lead the Global South by promoting trade multilateralism and opposing unilateral actions, positioning itself as a defender of both national interests and a fair global trading order.

### Law of the land

The Supreme Court of India recently focused on controversial provisions of the Waqf (Amendment) Act, 2025, which increases government control over waqf properties, potentially limiting the Muslim community's autonomy in managing

them. On April 17, the Centre assured the Court that waqf properties would not be de-notified, and no appointments would be made to the Central Waqf Council or State Waqf Boards under the new law until the next hearing on May 5. The Court raised concerns over provisions that discontinued the "waqf by user" category, allowed non-Muslims to be appointed to waqf boards, and gave the state unilateral control over waqf properties in disputes. The new law could challenge the legal status of many Muslim sites that lack documentation, as they predate modern land registration laws.

The passage discusses a legal case involving around 100 petitions concerning amendments to waqf law, which governs Islamic charitable trusts. The Court will decide on several key issues, such as whether a provision requiring waqf creators to be practicing Muslims for five years violates freedom of religion, whether excluding "waqf by user" is discriminatory, and whether allowing non-Muslim members on waqf boards violates Article 26 of the Indian Constitution, which guarantees religious freedom. While the amendments aim to promote inclusivity, transparency, and accountability, there are concerns that they could alter the religious nature of waqfs. Despite extensive consultations and debates, the Muslim community was not adequately involved, and the Court's ruling will have broader implications for India's secular and pluralist identity.

### Enabling legislation

The passage highlights Tamil Nadu's recent effort to address discrimination against persons with disabilities through affirmative action. Chief Minister M.K. Stalin introduced two Bills in the Assembly to increase the representation of persons with disabilities in local bodies across the state. One Bill proposes nominating individuals with disabilities to urban local bodies, while the other aims to include them in rural panchayats and district panchayats. If enacted, these Bills would create guaranteed positions for over 13,000 persons with disabilities in various local bodies. This move seeks to enhance dignity, reduce stigma, and empower the community by involving them in decision-making at the grassroots level.

The passage emphasizes the government's responsibility to ensure equal opportunities for all citizens, especially those facing obstacles, such as persons with disabilities. It references the historical context of reservation policies, starting with the 73rd and 74th Constitutional Amendments, which reserved seats for women in local bodies, and the passage of the Women's Reservation Act for 33% reservation in the Lok Sabha and State Assemblies in 2023. Tamil Nadu's initiative to appoint persons with disabilities to local bodies is the first of its kind in India, aiming to empower this marginalized community and increase their societal acceptance. However, it cautions that, based on past experiences with women's reservations, the government must ensure that persons with disabilities are genuinely empowered and not sidelined by others, such as family members.



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# U.S. visas issued to Indian students decline by 30%

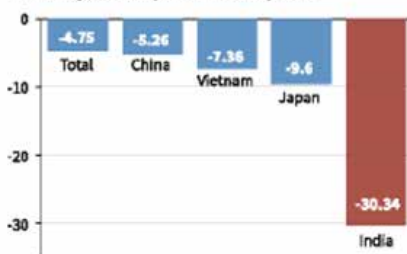
## INTERNATIONAL RELATIONS

### Indian students bear the brunt

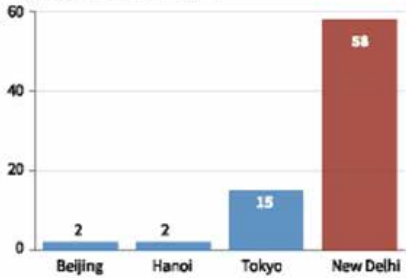
The data for the charts were sourced from Travel.State.Gov (U.S. Department of State: Bureau of Consular Affairs)



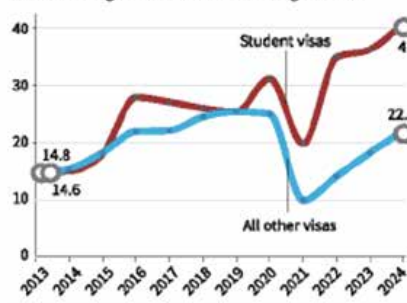
**Chart 1:** Percentage drop in F-1 visas (student visas) issued in February 2025 compared to February 2024



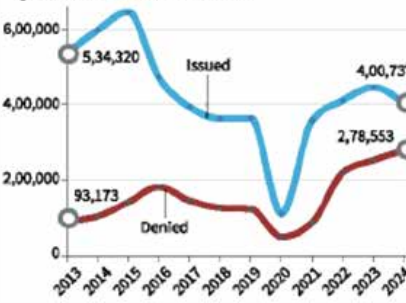
**Chart 2:** Student visa wait times (in days) for the capitals of countries mentioned in Chart 1



**Chart 3:** Denial rates of F-1 visas (student visas) and all other visa categories from 2013 to 2024. Figures in %



**Chart 4:** Absolute number of F-1 visas issued and denied by the U.S. between 2013 and 2024



the denial rates for both categories remained relatively similar, but a sharp divergence emerged in the post-pandemic years. In 2024, 41% of student visa applications were denied, compared to the 22.1% of all other types of visa applications that were denied — a gap of nearly 19 percentage points. Before the pandemic, the largest difference was just 6 points (in 2016). In fact, in 2023 and 2024, over half a million students were denied visas. Chart 4 shows the absolute number of F-1 visas issued and denied by the U.S. between 2013 and 2024.

## Diving into SC's verdict on Governors

### POLITY & GOVERNANCE

There was dispute between the Tamil Nadu Governor and the State government over delayed action on Bills passed by the Legislative Assembly. The Governor had stalled the Bills without approving, rejecting, or referring them, effectively using a "pocket veto." Following the Supreme Court's intervention on April 8, 2025, the Bills were returned to the Assembly and then resent to the Governor, who referred them to the President. As of the Court's ruling, the President had approved one Bill, rejected seven, and not acted on two. The case highlights growing tensions between centrally-appointed Governors and opposition-led State governments, reflecting broader challenges in India's federal structure.

### Going above and beyond

A landmark Supreme Court judgment addressing the prolonged delay by the Tamil Nadu Governor in acting on Bills passed by the State Assembly. The Court ruled that the Governor's inaction was unconstitutional, stating that Governors cannot exercise a veto or pocket veto, and must either assent to a Bill, return it, or refer it to the President—each under spe-

cific conditions. Similarly, the President cannot withhold assent without valid constitutional grounds. To uphold federalism and the democratic will of the State's people, the Court not only clarified these legal principles but also controversially set specific timelines for Governors and the President to act on Bills—despite no such timelines existing in the Constitution. Invoking its powers under Article 142, the Court declared the delayed Bills as law, prompting immediate implementation by the Tamil Nadu government. While critics argue that the Court overstepped its role, supporters view its actions as necessary to prevent constitutional paralysis caused by the Governor's unjustified delay. The case raises broader questions about the balance of power within India's constitutional framework.

### Problem of constitutional design

The inherent tensions in the Indian Constitution, shaped by its historical context. While the framers aimed to establish a federal and parliamentary democracy, key figures like Nehru, Ambedkar, and Patel also favored strong central control. To balance these goals, they drew from colonial constitutional models that prioritized executive supremacy. Under British rule, representative institutions were allowed only to a limited extent, with real power retained by British-appointed executives. One key tool of this control was the colonial governor, whose role was to restrain provincial legislatures and nationalist aspirations—an influence that carried over into independent India's constitutional design.

The Indian Constitution retained the form of the colonial Governor, it introduced a dual authority at the State level—between the centrally-appointed Governor and the elected State Legislature—leading to inevitable tensions. Unlike other areas of the Constitution where powers are clearly codified, the roles and limits of the Governor were left to be guided by unwritten constitutional conventions. This lack of explicit checks created critical gaps, making the system vulnerable to misuse by those disregarding these conventions. The Supreme Court's recent case thus highlighted a flaw in constitutional design: the absence of safeguards against Governors misusing their position, such as through pocket vetoes, threatens the integrity of India's federal structure.

### Time for course correction

The Supreme Court's recent judgment should be seen as a necessary response to flaws in the Constitution's design, particularly regarding federalism and democratic governance. With no clear limits on the Governor's powers, and no other authority to intervene, the Court stepped in to prevent the erosion of democratic principles. However, the ruling also expanded judicial power, raising concerns about long-term sustainability and balance. The real solution, the passage suggests, lies in rethinking the Constitution's centralising tendencies—starting with questioning the relevance of the Governor's role in 2025. For now, the Court's action is seen as a temporary fix for a deeper constitutional problem.

## What is U.S. Federal Trade Commission's antitrust case against Meta?

### INTERNATIONAL RELATIONS

Nearly five years after the U.S. Federal Trade Commission (FTC) sued Facebook over its alleged monopoly status and for preying on smaller firms it considered threats, CEO Mark Zuckerberg took the stand on Monday to defend the company's acquisitions of WhatsApp and Instagram more than a decade ago.

### What is Meta's antitrust case about?

An ongoing antitrust case in which the U.S. Federal Trade Commission (FTC) accuses Meta of maintaining an illegal monopoly in the personal social networking (PSN) market. The FTC claims Meta engaged in anti-competitive practices, including acquiring rivals like Instagram (2012) and WhatsApp (2014), and placing restrictive conditions on software developers. If the FTC wins, Meta may be forced to divest these key platforms. The case, initiated during Donald Trump's presidency and continued under Joe Biden and current FTC Chair Andrew Ferguson, has gained rare bipartisan support among U.S. lawmakers and officials.

### What are Meta's key arguments against the FTC?

The Meta's defense in an antitrust case filed by the FTC, which accuses the company of maintaining an illegal monopoly in the personal social networking (PSN) market. Meta, which acquired Instagram in 2012 for \$1 billion and WhatsApp in 2014 for \$19 billion,





challenges the FTC's market definition as too narrow, excluding key competitors. In a statement on April 13, Meta argued that Instagram competes not just with Snapchat and MeWe, as the FTC claims, but also with TikTok, YouTube, X, and other platforms. Meta criticized the FTC for targeting a successful American company while the U.S. government attempts to regulate TikTok, a Chinese-owned app.

During the trial, Meta argued that it is not a monopolist, presenting slides showing similarities between Instagram Reels, TikTok, and YouTube Shorts to demonstrate strong market competition. The slides also showed how users frequently switch between Meta's platforms and rival apps like Snapchat, TikTok, Twitter, and various messaging services. Meta claimed its acquisitions of Instagram and WhatsApp were pro-competitive, leading to significant improvements and efficiencies. It highlighted the substantial investments—billions of dollars and millions of work hours—made to enhance these apps and expand free access for users.

### What role did Mark Zuckerberg's political affiliations play in the trial?

Zuckerberg had to appear in court, where he was grilled about his early-stage plans for Instagram and asked to comment on past correspondences about the app, in which he expressed concerns about its popularity and even considered strategies to defeat Instagram.

### Has the FTC sued Meta before?

Meta and the U.S. FTC have a thorny history. In 2019, the FTC hit Facebook with a "record-breaking" penalty of \$5 billion over charges that it violated a 2012 FTC order and misled its users about their data privacy. In 2023, Meta sued the FTC over the regulator's proposed changes to the way it handles users' data, including personal information belonging to children.

### Could Meta be forced to divest Instagram and WhatsApp?

It is hard to tell at this point as the FTC has struggled to bring the case to where it stands now. The original 2020 complaint was dismissed in 2021 by U.S. District Judge James Boasberg, who was not convinced by the FTC's allegations. Though the complaint was amended, re-submitted with more details, and then cleared during former Chair Khan's term, Boasberg warned that the agency may still find it tough to prove its allegations. Ferguson, current FTC Chair thought of Meta as a monopoly and would try to prove it in court. On the flip side, he also said he would help implement Trump's "deregulatory" agenda when it came to mergers. While the outcome of the Meta antitrust case is unknown, it is clear that fears about Meta's tremendous influence over the digital landscape are uniting U.S. enforcers regardless of their party loyalties.

## ISRO satellites forecast wheat production, assess crop condition

### SCIENCE & TECHNOLOGY

ISRO has estimated wheat production from eight major Indian states to be 122.724 million tonnes as of March 31, 2025, using satellite data. This assessment was done through CROP, a semi-automated, scalable framework developed by ISRO's National Remote Sensing Centre (NRSC), which allows near real-time monitoring of crop sowing and harvesting during the Rabi season across India.

### Systematic assessment



ISRO reported that it used satellite data to monitor wheat crop progress and conditions during the 2024–25 Rabi season across eight major wheat-growing states: Uttar Pradesh, Madhya Pradesh, Rajasthan, Punjab, Haryana, Bihar, Gujarat, and Maharashtra. Using Optical and Synthetic Aperture Radar (SAR) data from satellites EOS-04, EOS-06, and Resourcesat-2A, ISRO estimated the wheat sown area to be 330.8 lakh hectares as of March 31, 2025—closely aligning with the Agriculture Ministry's figure of 324.38 lakh hectares as of February 4, 2025.

### Parameters

ISRO explained that it uses a process-based crop growth simulation model at a 5×5 km spatial resolution to estimate wheat production at a national level. This model integrates satellite-derived data on crop area, sowing dates, and in-season crop conditions. The use of multi-source data



enhances the accuracy of production estimates at a finer spatial level. As of March 31, 2025, the total wheat production from eight major wheat-growing states in India is estimated to be 122.724 million tonnes.

## Two cheetahs move to new home in Madhya Pradesh

### ECOLOGY & ENVIRONMENT

Two cheetahs, Prabhas and Pawak, were released into the Gandhi Sagar Wildlife Sanctuary in Madhya Pradesh by Chief Minister Mohan Yadav. The six-year-old males are part of the batch brought from South Africa to the Kuno National Park in February 2023. They will now roam a 64-sq. km enclosure in Gandhi Sagar, located between Mandsaur and Neemuch districts. The Cheetah Project, aimed at increasing the cheetah population in India, is considered a success, with the Gandhi Sagar Sanctuary becoming the second site in the state to reintroduce cheetahs. Efforts are underway to bring more cheetahs from South Africa, Kenya, and Botswana.



### Four to arrive

Four cheetahs are set to be translocated from Botswana to Gandhi Sagar in May, with another four arriving in a second phase, as announced by the Madhya Pradesh government. Chief Minister Mohan Yadav highlighted that Kuno National Park has recorded the highest number of cheetah births globally after the intercontinental translocation. On April 18, a 20-member team led by Kuno's Chief Conservator of Forest transported two cheetahs to Gandhi Sagar, over 250 km away. The team will stay for seven days to train Gandhi Sagar staff, who have been trained at Kuno, in handling the big cats. With this movement, Kuno now has 24 cheetahs, 14 in the wild and 10 in enclosures. Additionally, wildlife authorities have been working to increase the sanctuary's prey base.

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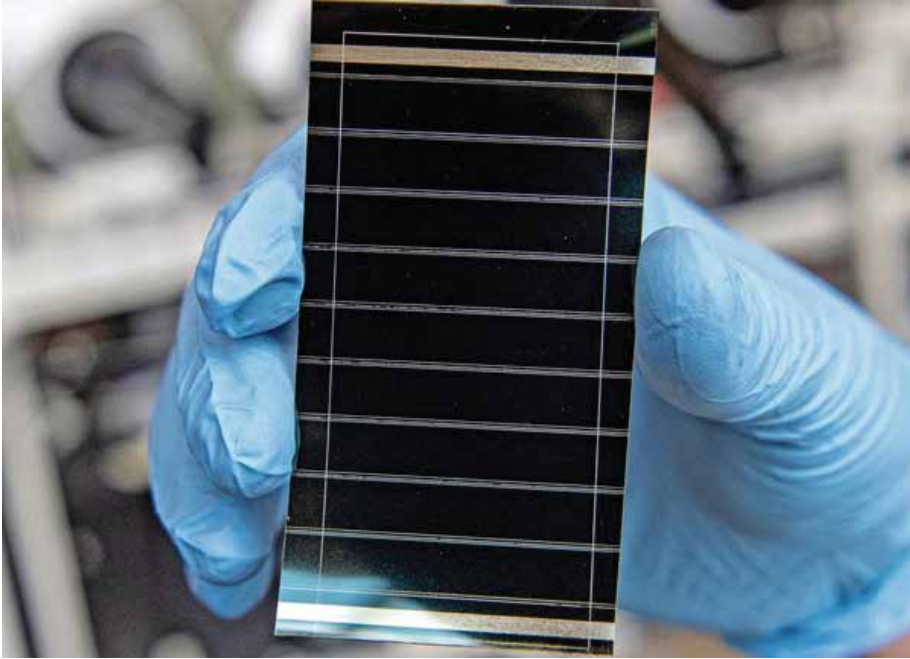
# Scientists find green way to recycle toxic perovskite solar cells

## SCIENCE & TECHNOLOGY

While solar energy is more environmentally friendly than fossil fuels, the production of silicon-based solar panels is energy-intensive, and their disposal remains a challenge. An alternative is perovskite solar panels, which are cheaper to make but contain toxic elements like lead, requiring careful processing at the end of their lifespan. Currently, recycling perovskite panels involves using toxic organic solvents like dimethylformamide.

### A yummy sandwich

In a paper published in Nature, scientists have found a potentially greener method to recycle perovskite solar panels



using a water-based solution, eliminating the need for toxic organic solvents. This process not only degrades the used perovskite but also recovers high-quality crystals for reuse in new solar cells. While perovskite solar cells are praised for their high efficiency, their shorter lifespan and stability remain challenges for the technology.

### Improving solar energy

Early recycling efforts for perovskite solar cells focused on capturing lead, but now there is a broader focus on a circular economy approach. The goal is to keep the components of the solar cells in use for as long as possible to minimize waste. By recycling materials, perovskite solar cells could be made with lower environmental impact, reducing emissions and costs. Currently, toxic organic solvents are still required for recycling these materials.

### Acids and salts

Scientists overcame the challenge of dissolving and recycling lead-containing perovskite by adding three key salts to the water solution. Sodium acetate binds with lead ions to form soluble lead acetate, while sodium iodide helps regenerate pure perovskite crystals, and hypophosphorous acid stabilizes the solution for reuse. This process enables high-quality, recycled perovskite crystals and supports a circular economy for perovskite solar cells. Experts, like Matthew Davies, see this as a promising step toward making perovskite solar technology low-cost, high-efficiency, and environmentally sustainable.

Scientists developed ethanol and ethyl acetate solutions to dissolve and recycle components of perovskite solar cells, allowing them to reuse the perovskite crystals and other layers. After recycling up to five times, the reassembled cells showed nearly the same efficiency as new ones, with 99% of the layers recovered. Experts like Rhys Charles praised this breakthrough for potentially overcoming major barriers to commercializing perovskites and addressing environmental concerns. Charles also emphasized the importance of life cycle assessments to ensure the technology's sustainability and minimize unintended environmental impacts.



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