

**The Hindu Important News Articles & Editorial For UPSC CSE**

**Monday, 21 April, 2025**

**Edition: International Table of Contents**

<p><b>Page 01</b> <b>Syllabus : GS 1&amp; 3 : Geography and Disaster Management</b></p>	<p><b>Five feared dead in J&amp;K in cloudburst havoc</b></p>
<p><b>Page 03</b> <b>Syllabus : GS 3 : Science and Technology</b></p>	<p><b>Six-member panel to revise Kerala's Intellectual Property Rights policy after a gap of 17 years</b></p>
<p><b>Page 07</b> <b>Syllabus : GS 3 : Science and Technology</b></p>	<p><b>Scientists find green way to recycle toxic perovskite solar cells</b></p>
<p><b>Page 09</b> <b>Syllabus : GS 2 : Indian Polity</b></p>	<p><b>Ensuring a fair federal balance</b></p>
<p><b>In News</b></p>	<p><b>INS Chennai and INS Kesari</b></p>
<p><b>Page 08 : Editorial Analysis: Syllabus : GS 3 : Environment</b></p>	<p><b>Tackle heatwaves with short- and long-term measures</b></p>

Over the weekend, Jammu & Kashmir witnessed a severe natural calamity triggered by cloudbursts and flash floods. Ramban district was the worst hit, where multiple landslides and heavy rainfall caused significant destruction. At least five people are feared dead, more than 100 were rescued, and many remain stranded as parts of the Srinagar-Jammu National Highway were blocked.

## Five feared dead in J&K in cloudburst havoc

Govt. yet to issue official number of people dead or injured; more than 100 rescued in Ramban after landslips, flash floods leave people stranded; IMD forecasts inclement weather till Tuesday; five places along the Srinagar-Jammu National Highway at Ramban were blocked; CM Omar Abdullah says the focus now is on managing situation

**Peerzada Ashiq**  
SRINAGAR

Jammu and Kashmir grappled with the trail of destruction left behind by cloudbursts and flash floods over the weekend, with at least five people feared dead and hundreds more left stranded and needing rescue. Scores of vehicles were either pushed into deep gorges or buried under unprecedented landslips in Ramban district.

Three people, two children among them, were killed when a house collapsed in Bagna in Ramban, officials said. However, the J&K government has not issued any official death toll or the number of the injured.

Gujjar community leader Talib Hussain said two people were killed after lightning struck Jamedi village in Arnas, Reasi, on Sunday. He added that



**Swept away:** Vehicles stuck in debris after heavy rain and flash floods in Ramban, J&K, on Sunday. PTI

around 40 cattle were killed in the lightning.

Senior Superintendent of Police (SSP), Ramban, Kulbir Singh told presspersons that more than 100 people had been rescued in the district.

Chief Minister Omar Abdullah said he was extremely anguished by the

tragic events, "which have caused considerable damage to life and property".

### Freaky weather

Parts of the Union Territory witnessed freaky weather over a 48-hour-period, marked by lightning, gusty winds, hailstorms, and snowfall.

Five places along the Srinagar-Jammu National Highway at Ramban were blocked following the sudden change in weather. Debris from the landslide-damaged houses and shops along the highway and parts of the highway itself. Dozens of commuters also remained stranded on

the highway that connects the Kashmir Valley with the Jammu division.

### Rescue and relief

"We are in touch with the local administration to ensure immediate rescue efforts wherever needed. Later today, I will be reviewing restoration, relief, and repair plans. For now, the focus remains on managing the situation on the ground. Citizens are advised to follow travel advisories and avoid non-essential movement in vulnerable areas," Mr. Abdullah said.

Union Minister and BJP MP for Udhampur Jitendra Singh posted on X: "There was a heavy hailstorm, multiple landslides and fast winds throughout the night in the Ramban region, including the areas surrounding the Ramban town. The National Highway stands blocked and unfortunately there have

been three casualties and loss of property for a couple of families."

The MP said he was in "constant touch with Deputy Commissioner Baseer-ul-Haq Chaudhary".

The district administration deserves appreciation for timely and prompt action, which helped save several precious lives, he said, adding that every kind of relief, both financial and otherwise, is being provided. The DC has been told that whatever more is required can be provided from the MP's personal resources as well. "The request is not to panic. We shall all together overcome this natural calamity," Mr. Singh said.

### Bad weather forecast

The India Meteorological Department's centre in Srinagar issued a fresh weather advisory regarding an active Western Disturbance expected to affect

J&K from April 20, with improvement expected from April 22. It warned of thunderstorms, lightning, hailstorm and gusty winds, especially across the Pir Panjal Range, Jammu Division, and the middle and higher reaches of Kashmir Division.

It urged the public to avoid visiting riverbanks, streams, and other water bodies. "Do not travel to higher reaches unless absolutely necessary. Secure loose items and avoid taking shelter under trees during thunderstorms. Farmers are advised to take necessary precautions to protect crops and livestock," it added.

In view of the inclement weather and heavy rain, causing flash floods, all government and private schools, colleges and technical education institutions in Ramban district will remain closed on April 21, officials said.

### Causes of the Disaster:

The primary cause of this disaster was an active Western Disturbance that led to intense rainfall, hailstorms, lightning, and gusty winds. These weather patterns are increasingly linked to climate change and variability in monsoon behaviour. Unplanned human activities like deforestation, construction on unstable slopes, and inadequate drainage systems have further aggravated the natural vulnerability of the region.

### Impact:

The calamity had multi-dimensional impacts:

- **Human casualties** included the death of three individuals in a house collapse in Bagna, and two others struck by lightning in Reasi district. Around 40 cattle were also killed.
- **Infrastructure damage** was severe. Several houses and shops were damaged or swept away. The Srinagar-Jammu highway was blocked at multiple points, leaving commuters stranded.
- **Educational disruptions** occurred as all schools, colleges, and technical institutions in Ramban were ordered closed on April 21.
- **Emotional and economic loss** to affected families was significant, compounded by the lack of timely official figures on injuries and deaths.

### Government and Administrative Response:

Chief Minister Omar Abdullah expressed anguish and assured immediate rescue and relief. He highlighted the government's focus on managing the situation and emphasized following safety advisories. Union Minister Jitendra Singh also acknowledged the tragedy and praised the prompt action by the district administration, stating that all possible support, including from personal resources, would be provided.

### Weather Forecast and IMD Advisory:

The Indian Meteorological Department has issued warnings of continued bad weather until April 22, including thunderstorms, hailstorms, and strong winds across Jammu and Kashmir, especially in the Pir Panjal range and higher altitudes of the Kashmir Valley. The public was advised to avoid riverbanks, high terrains, and unnecessary travel. Farmers were told to take precautions to protect their crops and livestock.

### Critical Analysis:

This event highlights the increasing frequency and severity of extreme weather events in India's Himalayan region, in line with global climate change trends. Despite previous incidents, disaster preparedness remains weak in many areas. There is a need for better early warning systems, stricter regulation of construction in ecologically sensitive zones, and integration of climate adaptation into regional planning.

### Way Forward:

1. Strengthening local disaster management infrastructure, including rapid response teams and rescue equipment.
2. Implementing strict land-use regulations to prevent construction in vulnerable zones.
3. Enhancing forecasting and real-time communication systems for hill districts.
4. Conducting public awareness campaigns and community-based disaster preparedness drills.
5. Ensuring quick compensation and long-term rehabilitation for affected families.

**UPSC Mains Practice Question**

**Ques :**The Ramban disaster in Jammu & Kashmir highlights the gaps in local disaster preparedness in ecologically sensitive zones. Examine the challenges in disaster risk reduction and suggest measures for strengthening local resilience. **(250 Words)**



Kerala is set to revise its Intellectual Property Rights (IPR) Policy for the first time since 2008. A six-member committee, headed by N. Anilkumar (Chairman, Kerala State Biodiversity Board), has been constituted by the Kerala State Council for Science, Technology and Environment (KSCSTE) to draft the new policy. The revision is aligned with the National IPR Policy (2016) and recent central directives.

## Six-member panel to revise Kerala's Intellectual Property Rights policy after a gap of 17 years

**Tiki Rajwi**

THIRUVANANTHAPURAM

The Intellectual Property Rights (IPR) Policy of Kerala is set to undergo a thorough overhaul after a gap of 17 years.

The Kerala State Council for Science, Technology and Environment (KSCSTE) has constituted a six-member drafting committee headed by N. Anilkumar, Chairman, Kerala State Biodiversity Board, for preparing the revised policy. Kerala had first formulated an IPR policy in 2008, which will now undergo comprehensive revision in line with the new and emerging demands in this crucial area.



**Legal literacy:** Proposed draft policy recommends inclusion of IPR in school and university curricula as a mandatory subject. M. VEDHAN

The terms of reference of the panel include identifying focus areas to be included in the revised policy and working on a draft IPR and Traditional Knowledge Policy proposed by R.S. Praveen Raj, senior principal scientist with the

CSIR-National Institute of Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, and one of the panel members, and refining the document, an April 9 order issued by the KSCSTE said.

Dr. Anilkumar told *The Hindu* that the panel was required to submit the revised policy within three months. The National IPR Policy released by the Centre in 2016, and an August 2024 direction by the Centre's Department of Science and Technology to the States to prepare State-level policies in line with the national policy has necessitated the revision.

KSCSTE Executive Vice-President K.P. Sudheer said the draft would undergo a long and gruelling process before the Law Department issued it as a policy. "The KSCSTE has an IPR Rights Information Centre (IPRIC-K) which is the State nodal agency for

IPR-related matters. Once the draft is ready, it will be submitted to the State government. The government will convene a stakeholders meeting," Dr. Sudheer said.

### Draft policy

The draft policy proposed by Mr. Raj recommends, among other things, inclusion of IPR in school and university curricula as a mandatory subject. Establishment of an IPR Academy and a Kerala Traditional Knowledge Authority, creation of a Traditional Knowledge Docketing System and a 'Mission IPR' for the IP administration of the State are other highlights of this draft.

### Key Developments:

- IPR Policy (2008) is being overhauled after a 17-year gap.
- Panel to submit the revised draft within three months.
- The move follows an August 2024 advisory by the Department of Science and Technology asking States to update IPR policies in line with national goals.
- Draft prepared by R.S. Praveen Raj (CSIR-NIIST) is the foundation for the policy revision.

### Major Recommendations in the Draft Policy:

1. **Mandatory IPR Education:** Introduction of IPR as a compulsory subject in school and university curricula to increase legal and innovation literacy.
2. **Establishment of an IPR Academy:** A dedicated academy for training, research, and capacity building in intellectual property.
3. **Kerala Traditional Knowledge Authority:** A statutory body to protect and document Kerala's indigenous and traditional knowledge systems.
4. **Traditional Knowledge Docketing System:** Mechanism for systematic recording of traditional medicinal practices, folklore, and native biodiversity knowledge.
5. **Mission** IPR:  
An overarching program to streamline IPR generation, protection, enforcement, and commercialization in the State.

### Why is this Significant?

1. **Outdated IPR Ecosystem:** The 2008 policy is no longer equipped to deal with emerging challenges like digital innovation, AI, and traditional knowledge piracy.
2. **Need for Legal Empowerment:** Educating students on IPR promotes legal literacy, crucial for safeguarding innovation and preventing bio-piracy.
3. **Boost to Innovation Ecosystem:** A strong IPR framework supports startups, research institutions, and local industries in monetizing their innovations.
4. **Traditional Knowledge Protection:** India has faced repeated challenges internationally in cases like turmeric and neem patents—highlighting the need for systematic protection.

### Governance & Policy Implications:

- Reflects a decentralized approach to IPR by enabling States to tailor policies to local needs.
- Encourages public-private-academic collaboration in IPR awareness and innovation.
- Aligns with Atmanirbhar Bharat and Digital India goals by encouraging grassroots innovation.

### Critical Analysis :

- **Strength:** Kerala's move shows proactive state-level initiative in a domain often dominated by national policy.
- **Challenges:** Implementation will require cross-sector coordination, legal clarity, and trained personnel.
- **Way Forward:** Need for replication in other states, integration with Digital IPR filing systems, and incentives for patent filing from rural and tribal innovators.

**UPSC Mains Practice Question**

**Ques :**“Intellectual Property Rights are crucial to India's innovation ecosystem.” In the light of Kerala’s new IPR policy draft, examine the role of States in strengthening IPR regimes. **(250 words)**



Scientists have developed a green, water-based method to recycle perovskite solar cells (PSCs), making it possible to reuse almost 99% of their layers without toxic solvents. This innovation addresses key environmental and sustainability challenges in the lifecycle of next-generation solar technologies.

# Scientists find green way to recycle toxic perovskite solar cells

Scientists have developed a way to process perovskite solar cells – which are more efficient but have shorter lifespans – such that the efficiency is almost the same as using fresh materials, even after being recycled up to five times; they were also able to re-obtain about 99% of the cells' layers after multiple rounds

**Rohini Subrahmanyan**  
BENGALURU

Using solar energy may be better for the environment than burning through fossil fuels, but the process still isn't exactly perfect. Making silicon-based solar panels is energetically expensive and we still don't know what to do with the silicon once the panels are done being used. There is a cheaper way to make solar panels, also called photovoltaics (PVs), using crystal structures called perovskites. However, perovskite crystals contain toxic elements like lead, which needs to be processed carefully once these solar panels reach the end of their lifespan. And so far, researchers have had to use toxic organic solvents like dimethylformamide to recycle such solar panels.

**A yummy sandwich**  
Now, in a paper published in *Nature*, scientists have described another, potentially greener way of dealing with the problem. Using a water-based recycling solution, they have reported a way to degrade and recycle used perovskite. They were also able to get back high-quality perovskite crystals, which can potentially be used again for making new solar cells.

"It's kind of a complex chemistry to make the water solution usable and very stable for perovskite recycling, to fully remove the [the use of] organic solvents," Xun Xiao, a postdoctoral researcher at Linköping University in Sweden and lead author of the paper, said.

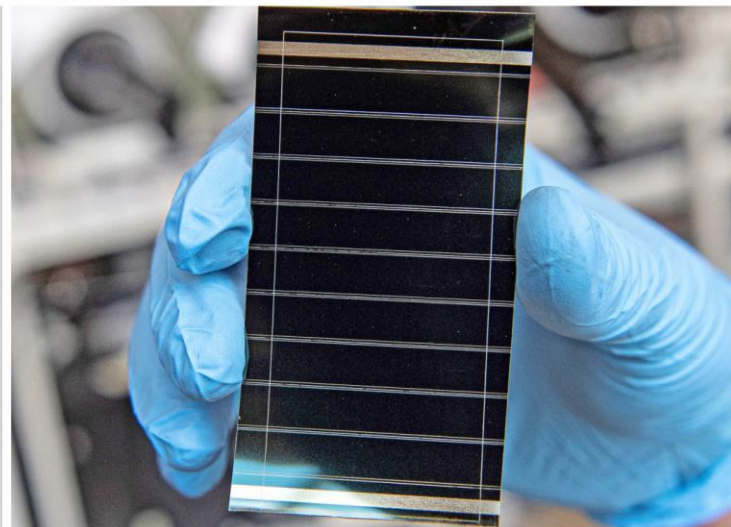
Perovskite solar cells are made up of multiple layers. The perovskite layer is sandwiched between materials that can conduct and transport charges, in this case metal electrodes and glass sheets.

"People have been very excited about [perovskite PVs] for a decade or more now because very quickly they have been able to achieve very high power conversion efficiencies," Rhys Charles, a researcher in the chemical engineering department at Swansea University in the U.K. explained. "So you could deliver an extremely cheap solar energy technology, but there are some things that have been holding the field back."

Stability is one of them: perovskite solar cells have a shorter lifespan.

**Improving solar energy**  
"Early attempts to recycle these devices have all focused on capturing lead. Now, people are taking a little bit more of a holistic view of it," Charles continued. "From a circular economy point of view, recycling is also important because they want to capture the major impact materials [that] they use again."

For a circular economy, the aim is to keep the product – in this case the components of a perovskite solar cell – in use for as long as possible, to minimise



A researcher holds up a PET perovskite solar module. DENNIS SCHROEDER / NREL

waste. This way, if the cells are made again with recycled components, they would have a much lower environmental impact, which means lower emissions and lower cost associated with solar energy generation.

Thus far, the only way to recycle these important materials has been to use toxic organic solvents.

### Acids and salts

Dissolving and recycling the lead-containing perovskite layer in water was a major challenge to overcome. For this, the scientists added three key salts to help in the recycling process.

The first salt they added was sodium acetate. The acetate ions bound with the lead ions in the perovskite, making a highly soluble lead acetate that dissolved well in water.

They then added sodium iodide and hypophosphorous acid to help regenerate pure perovskite crystals in their water solution. Sodium iodide contains iodide ions that help repair and restore the degraded perovskite, such that when the solution is cooled, high-quality, pure perovskite crystals re-emerge from the solution.

The acid acts as a long-term stabiliser, ensuring the water solution can be reused and that the quality of the recycled crystals remains high.

"I'm pleased to see this focus on



Early attempts to recycle these devices have all focused on capturing lead. Now, people are taking a little bit more of a holistic view of it

**RHYS CHARLES**  
Researcher at chemical engineering department, Swansea University

recycling, remanufacturing, and green chemistry," said Matthew Davies, a professor of chemical engineering at Swansea University. "It lays the foundation for perovskite PVs to deliver on their promise as a low-cost, high-efficiency solar technology within a circular economy, avoiding the large-scale waste challenges faced by earlier PV technologies."

The scientists also developed solutions made of ethanol and ethyl acetate to dissolve other components of the perovskite solar cell, after which they were able to recycle each component to reuse along with the perovskite crystals. Then they reassembled the solar cell layer by layer and found that the efficiency was almost the same as using fresh materials, even after being recycled up to five times. They were also able to re-obtain about 99% of the different layers even after multiple rounds of recycling.

"These guys seem to have solved the problem; they seem to be able to use this aqueous system to recycle the cells and make them again with high efficiency," Charles said. "If it can be scaled [up] and if it works as well as the paper claims, it could potentially overcome some of the most significant barriers to commercialising perovskites and solve some of the key environmental concerns about the technologies as well."

Charles also stressed the need to underpin scientific and industrial progress, especially when it came to environmental technologies, with life cycle assessments. Life cycle assessment, he explained, is an approach to quantify all the impacts of a technology across its entire life cycle, from the start to when one has the final product. "But you can go further," he said. "Then you can look at the use phase of the technology and the end-of-life phase as well."

"I always enjoy it when I see these things underpinned by life cycle assessment, to make sure there aren't unintended consequences and to make sure the research really is targeting the key environmental problems for the technology," Charles added. "I'd like to see more of that as well, as just standard practice."

(Rohini Subrahmanyan is a freelance journalist in Bengaluru. roh.subb@gmail.com)

### THE GIST

Perovskite crystals used in making solar panels contain toxic elements like lead. And so far, researchers have had to use toxic organic solvents like dimethylformamide to recycle such solar panels

Dissolving and recycling the lead-containing perovskite layer in water was a major challenge to overcome. Now, using a water-based recycling solution, scientists have reported a way to degrade and recycle used perovskite. They were also able to get back high-quality perovskite crystals, which can potentially be used again for making new solar cells.

For this, the scientists added three key salts to help in the recycling process – sodium acetate, sodium iodide and hypophosphorous acid. Then they reassembled the solar cell layer by layer and found that the efficiency was almost the same as using fresh materials, even after being recycled up to five times

## What are Perovskite Solar Cells (PSCs)?



- PSCs are a type of photovoltaic (PV) cell made using perovskite-structured compounds, typically containing lead and halides.
- They are low-cost and highly efficient compared to traditional silicon-based solar panels.
- However, they suffer from:
  - Low stability and shorter lifespans
  - Use of toxic materials like lead
  - Hazardous recycling processes using organic solvents

### The Innovation: Green Recycling Method

- Researchers replaced toxic organic solvents with a water-based solution.
- Key chemical inputs:
  - Sodium acetate: Binds with lead to form water-soluble lead acetate.
  - Sodium iodide & hypophosphorous acid: Help regenerate and stabilize pure perovskite crystals.
- Complementary solvents like ethanol and ethyl acetate used to recycle other layers like electrodes and glass sheets.
- Result: Recycled PSCs show efficiency close to new cells, even after five reuse cycles.

### Relevance to Circular Economy:

- Follows the principles of "reuse, recycle, remanufacture"
- Reduces e-waste and toxic discharge from used solar panels
- Extends material lifecycle, leading to lower emissions and cost savings

### Environmental & Policy Implications:

1. Sustainability Boost:
  - Reduction in toxic waste from lead-based perovskites
  - Lower energy input compared to silicon PV manufacturing
2. Supports India's Green Energy Goals:
  - Aligned with India's Net Zero 2070 commitment and National Solar Mission
  - Can help scale renewable energy without worsening the environmental footprint
3. Policy Gaps Remain:
  - E-waste rules in India do not adequately address solar panel disposal
  - Life Cycle Assessment (LCA) not mandatory for PV technologies

### Challenges Ahead:

- Scalability: Lab success must translate to industrial-scale application.

- Regulatory Support: Need for dedicated recycling policy for solar waste.
- Toxicity Concerns: Even with water-based recycling, lead content in PSCs remains a long-term risk.
- Cost Efficiency: Green recycling must remain economically viable.

### Critical Analysis :

This innovation represents a shift from a linear model of energy production to a sustainable circular economy approach in renewable technology. However, the lack of clear environmental regulations and recycling frameworks for solar PV waste may hinder widespread adoption in countries like India.

The development underlines the importance of coupling technological innovation with systemic regulatory frameworks and life cycle-based environmental monitoring.

### UPSC Mains Practice Question

**Ques :** "Scientific advances in renewable energy must align with principles of circular economy to ensure long-term sustainability." Critically examine in light of recent innovations in perovskite solar cell recycling. (250 words)



Tamil Nadu Chief Minister M.K. Stalin has announced the formation of a three-member high-level committee to review the Constitutional, legal, and policy frameworks of Centre-State relations. The objective is to strengthen State autonomy and reassert the federal structure as envisioned in the Constitution.

## *Ensuring a fair federal balance*

**F**or nearly a century, the Dravidian movement has been strongly advocating the need for de-centralisation of powers to accelerate growth and implement a development model that benefits everyone. Hence, my announcement in the Legislative Assembly – on constituting a three-member high-level committee to review the provisions of the Constitution, laws and policies regarding Centre-State relations, and recommend appropriate steps to strengthen the States' autonomy and ensure a fair federal balance – was the next logical step in our quest to push back the ever-increasing intrusiveness of the Union into State domains.

The Constitution of India clearly states that India is a 'Union of States'. This preamble exemplifies the inherent powers that are vested with the States. Our party's founder, C.N. Annadurai, in his Rajya Sabha speeches, had repeatedly highlighted the need for the Union government to devolve adequate powers to the States. The fundamental principle of the Dravida Munnetra Kazhagam (DMK) is 'Self-rule in the States; collective rule at the Union'. In this regard, our leader Kalaignar (former Chief Minister M. Karunanidhi) formed a three-member commission headed by Justice P.V. Rajamannar to realise this goal.

### **Trampling on rights**

Today, we witness a scenario that is much worse than what it was when Kalaignar raised his voice for fair distribution of power. In those days, some powers were grabbed from States. However, today, under the hyper-centralising Bharatiya Janata Party (BJP) at power in the Union, there is a clear attempt to immobilise the States and make them dysfunctional by trampling on their rights. The Union government intends to curtail the legislative power of the States and



**M.K. Stalin**  
Chief Minister,  
Government of  
Tamil Nadu

reduce the States to being subservient to the Union. Attempts are also being made to eradicate the States' unique linguistic and cultural heritage.

The Constitution has a clear demarcation of powers through three vital lists: the Union List, the State List, and the Concurrent List. But in the last decade, many subjects listed under the Concurrent List, by default and practice, have been functionally moved to the Union List. There is also little regard for the items listed in the State List. The BJP-led Union government has been brazenly enacting laws in subjects which are clearly under the State List. Compounding the issue further, the Union is also creating steep stumbling blocks against States' legislative powers on State List subjects, by misusing the constitutional offices of Governors and President. We have successfully removed these blocks by securing the recent historic judgment at the Supreme Court.

It is imperative now that States reclaim their guaranteed rights and secure autonomy

### **A contemptuous attitude**

The Tamil Nadu government's State Education Policy is based on social justice, inclusiveness, and access to all, in contrast to the Union's elitist National Education

Policy (NEP). The NEP also has a hidden agenda of the three-language formula, which indirectly pushes Hindi as a mandatory language. We have rightly rejected this dubious design. Hence, the Union government has kept Tamil Nadu's share of ₹2,500 crore in abeyance, with scant regard for the welfare of nearly 42 lakh students. This same ruthless behaviour was displayed by the Union recently when it withheld presidential assent for our NEET exemption Bill. The Union's deeds on these two vital issues exemplifies its contemptuous attitude.

### **A struggle for rights**

We have also listed out the harms that will befall India if any unfair delimitation exercise is carried out by the Union government, penalising performing States and incentivising non-performing States. We are building a coalition of like-minded States to counter any such lopsided move and to ensure that the idea of a progressive and prosperous India continues to thrive. Tamil Nadu will never allow the concept of cooperative federalism to be replaced through aggrandisement and centralised decision-making at Delhi. Our struggle against this new norm of BJP governance is not only to fulfil Tamil Nadu's demands, but also to secure due powers for all the States. Hence, we are confident that other States will also join us in this just struggle for our legitimate rights.

We are firm in our understanding that only strong States can create a strong India, while at the same time protecting the plurality of the country. The time has come to reset the balance in Centre-State relations. Structuring a robust mechanism will ensure that the inherent rights of the States cannot be trampled on by the Union. At this critical juncture, Tamil Nadu will once again rise to fulfil its historic duty, as it has always done in the past. Tamil Nadu will fight and Tamil Nadu will win.



LOTHI RAMANINGAM B.

## **Core Issues Raised:**

### 1. Hyper-centralisation of Powers:

- Allegation that the Union government is increasingly encroaching upon State List subjects.
- Subjects from the Concurrent List are being interpreted or implemented in favor of the Centre.
- The Centre's control over the Governor's office and Presidential assent is being used to block legislation passed by State Assemblies.

### 2. Financial and Policy Discrimination:

- Withholding of ₹2,500 crore in school education funds over Tamil Nadu's rejection of the National Education Policy (NEP).
- Rejection of Tamil Nadu's NEET Exemption Bill, showcasing selective and partisan federal behaviour.

### 3. Linguistic and Cultural Assertion:

- Concerns raised about the three-language formula in the NEP being used to impose Hindi.
- Assertion that Tamil Nadu will protect its linguistic and cultural autonomy.

### 4. Delimitation and Demographic Penalization:

- Tamil Nadu warns against future delimitation exercises that may reward States with higher fertility and penalize performing States with lower population growth.

### Constitutional Angle:

- India is a "Union of States" (Article 1), implying a cooperative but not hierarchical structure.
- The Seventh Schedule clearly delineates power between:
  - Union List
  - State List
  - Concurrent List

However, practices and legislative trends in recent years have blurred this distinction, causing friction between the Centre and States.

### Historical Parallel:

- Reference to the Rajamannar Committee (1969) formed by former CM M. Karunanidhi, which was one of the earliest efforts to systematically demand greater State autonomy.

### Critical Issues :

Pros of Tamil Nadu's Stand:

## Daily News Analysis

- Promotes true cooperative federalism and strengthens democracy at the grassroots.
- Respects regional diversity, which is a cornerstone of Indian unity.
- Brings attention to the misuse of institutional mechanisms (e.g., Office of Governor).

### Concerns and Challenges:

- Risks being viewed as political posturing or anti-nationalism in some quarters.
- Excessive regionalism could undermine national unity if not balanced carefully.
- Fiscal federalism remains a sore point — Finance Commission recommendations, GST compensation delays, and central allocation biases continue to deepen mistrust.

### Policy Implications:

- Need for permanent institutional mechanisms (like Inter-State Council, Zonal Councils) to resolve Centre-State disputes.
- Reinforcing the principles of subsidiarity – powers should be devolved to the lowest effective level.
- Re-examining the role of Governors, making them accountable to State Assemblies.
- Ensuring delimitation is not used to penalize States that have implemented population control policies.

### Conclusion:

This article highlights the increasing demand from States for greater autonomy and respect for federal principles. As India aspires to be a \$5 trillion economy, it needs empowered States with policy flexibility and equitable representation. The reset in Centre-State relations must be based on cooperation, dialogue, and mutual respect.

### UPSC Mains Practice Question

**Ques :** *"Federalism in India is a dynamic equilibrium between the Centre and the States." In the light of recent debates on State autonomy, critically examine this statement. (250 words)*

### In News : INS Chennai and INS Kesari

- Indian Navy ships INS Chennai and INS Kesari successfully carried out manoeuvring exercises and Visit, Board, Search & Seizure (VBSS) drills during the sea phase of Africa India Key Maritime Engagement (AIKEYME) 2025.

#### About INS Chennai

- It is the third and last ship of the Kolkata-class stealth-guided missile destroyers (Project 15A) of the Indian Navy.
- The first two ships to be manufactured under Project 15A were INS Kolkata and INS Kochi.
- INS Chennai was constructed by the Mazagon Dock Limited (MDL) at Mumbai.
- It was commissioned into the Indian Navy on November 21, 2016.
- It is placed under the operational and administrative control of the Western Naval Command.

#### INS Chennai Features

- It is 164 metres long and weighs over 7,500 tonnes.
- It sails at a top speed of over 30 knots (around 55 km) per hour.
- It is powered by four reversible gas turbine engines.
- It can carry 350 to 400 people.
- It is armed with supersonic surface-to-surface BrahMos missiles and Barak-8 Long Rang Surface-to-Air missiles.
- It is fitted with the chaff decoy system 'Kavach' for defence against enemy missiles.
- For protection from enemy torpedoes, the ship has been equipped with the torpedo decoy system 'Mareech'.
- Both 'Kavach' and 'Mareech' have been developed in India.
- The ship is designed to carry and operate up to two multi-role combat helicopters.
- The multi-mission ship is highly suited for expeditionary and surface strikes.
- The ship is equipped to fight under nuclear, biological and chemical (NBC) warfare conditions.
- It is fitted with a modern Surveillance Radar, which provides target data to the gunnery weapon systems of the ship.

#### About INS Kesari

- INS Kesari (L15) is a Shardul Class Landing Ship Tank (LST) of the Indian Navy.
- The ship was built by Garden Reach Shipbuilders and Engineers (GRSE), Kolkata.
- It was commissioned into the Indian Navy on 5 April 2008.
- The ship is capable of carrying troops, tanks, armored vehicles, and other military equipment.

- It is designed to support amphibious operations and humanitarian assistance and disaster relief (HADR) missions.

**UPSC Prelims Practice Question**

**Ques : Consider the following statements about INS Chennai:**

1. It is the second ship under Project 15A of the Indian Navy.
2. It is equipped with BrahMos and Barak-8 missile systems.
3. It has the indigenous chaff and torpedo decoy systems named 'Kavach' and 'Mareech'.
- 4. It can carry up to four multi-role helicopters.**

**Which of the above statements are correct?**

- (A) 2 and 3 only  
(B) 1, 2 and 4 only  
(C) 2, 3 and 4 only  
(D) 1, 3 and 4 only

**Ans : A)**



**Classes**  
Quality education

# Tackle heatwaves with short- and long-term measures

**O**n March 15, some States and cities in India experienced the first of severe heatwaves for the year 2025. This was 20 days earlier than the first severe heatwave in 2024. In the last decade, the number of severe heat days and the severity/intensity of heatwaves have been rising. The year 2024 was the warmest year on record at about 1.55°C above pre-industrial level, according to the World Meteorological Organization. In India, December 2022 was the hottest December since temperature monitoring in the country started in 1901. The frequency of heatwaves in India has increased in the last two decades, in comparison to the previous two decades.

The impact of rising external temperature and heatwaves along with humidity and wind speed, is reflected in the form of heat stress. When the outside temperature reaches close to our body temperature of 37° Celsius, the body fails to release the internal heat which is generated as a part of the basal metabolic rate. Thus, one starts to feel heat-stressed. Heat stress can affect multiple organs including the kidneys, the liver and the brain, and may cause sickness and even death.

### Socio-economic impact and equity issue

However, heatwaves have many non-health and socio-economic impacts. Climate change, specifically rising temperature, is one of the causes of farming sector stress in India. With rising temperatures, it becomes difficult for farmers to work in the field and harvest comes down. Livestock can die, further impacting the poor and farmers. Heat stress can reduce livestock production, food production, farm productivity and the ability of outdoor workers/workforce productivity. As India is a labour-intensive country, especially in the agriculture and construction sector, heatwaves result in an individual's reduced working ability. Thus, loss of work hours and loss of job reduce personal and family income. In India, up to 75% of the workforce, or 380 million people are dependent on heat-exposed labour. There are estimates that heat stress results in an economic loss of 3% to 5% of GDP in many countries including India. There are estimates that in 2023, nearly 6% of work hours in India were lost due to heat stress. As temperature rises, electricity demand and power cuts affect industrial production. Heatwaves and heat stress impact personal income and may slow down a nation's economic growth.

Heat-related data indicate that the impact of heat stress is worst on the poor, the marginalised, migrants, subsistence workers, women, and the elderly. Women are additionally impacted due to social norms such as working in the kitchen, the need to wear clothing due to cultural requirements, or space allocated for sleeping. From every angle, it is a matter of inequity.

As early as the middle of the 19th century, researchers and scientists made observations that urban areas have a higher temperature than rural areas, arriving at the inference that much of the rise in temperature is human made. Yet, it took



**Dr. Chandrakant Lahariya**

is a practising physician and expert in global health, with nearly 17 years of professional work experience with the United Nations system including the World Health Organization and UNICEF

As India might be heading into another warm year, there is a need for people-centric and multi-sectoral interventions, along with science-based innovations

another 150 years for the first heat and health action plans (HHAP) to be prepared in the European countries; ironically, the first such efforts were from the non-tropical regions, between 2003 to 2008.

In 2013, Ahmedabad, Gujarat, became the first municipal corporation in Asia to develop a heat action plan (HAP). Since then, and in the last decade, more than 23 Indian States and around 140 cities across India have State- and city-level HAPs. India's National Programme on Climate Change and Human Health (NPCCHH) also provides heat advisories and other health-related information through the National Disaster Management Authority (NDMA).

### Heat action plans need nuances

Most HAPs have four to five components, i.e., early prediction of heatwaves to raise alerts; increasing awareness among the communities/people on actions to be taken; and preparing and getting the health system ready to manage health conditions. The fourth component of such plans focuses on ensuring long-term measures to reduce heat, government initiatives to increase the number of trees and parks and keeping gardens open for public use. There is experience, from various cities, about painting rooftops white to reflect heat. The fifth component of HAP must be collecting, analysing and interpreting heat stress, and also morbidity and mortality data. Though many Indian States and cities have HAPs, their implementation demands more attention. These HAPs have shown partial success and only in some settings where city authorities work with the State government, engage local public health institutions, subject experts, non-governmental organisations and community-based organisations.

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

First, every State should consider developing and/or updating its HAP, informed and guided by the learnings and best practices from the existing plans. The HAP should factor in humidity and not just temperature. The HAPs should be developed based on a local vulnerability assessment. Plans should ensure the clear accountability and the responsibility of various identified stakeholders. These should be activated from the beginning of March.

Second, a review article published in the medical journal, *Preventive Medicine: Research & Reviews*, noted that most Indian cities have excess mortality due to heat stress, which demands better heat stress-related data collection. Besides, when heat-stress related data is not comprehensive and an under-estimation, it is worthwhile interpreting available data to review who the people who suffer a heat stroke are and which part of the city they live in, which, in turn, would provide useful, actionable and potentially lifesaving information.

Third, a few countries such as the United Kingdom have started Heat Health Alert (HHA) systems which use both daytime and nighttime

maximum temperatures. The HAPs in India also need to factor in the day and nighttime temperature monitoring. There is also a need for more sophisticated and specific warning systems which can predict thermal comfort and the timings during the day when temperatures are likely to be low. This can ensure health as well as continuity of work such as school and office functioning.

Fourth, the long-term preventive measures of HAPs need to be strengthened. Better building and urban infrastructure and building material need to be promoted. Heatwaves impact the poor the most, and it is during these periods that governments should also consider financial support for informal sector workers who may suffer wage losses.

Fifth, a 2022 study from three Asian countries (India, Pakistan and Bangladesh) suggested that the universal 'stay indoors' advisory during specific hours may not be helpful for all families. People in a poor neighbourhood and in a confined space that is surrounded by high-rise buildings may experience higher temperatures in their homes and outside, in comparison to the rest of the city. Even within cities, there is a need for geography and social context-specific heat advisories.

### Need for a people-centric approach

Sixth, it is time that more Indian cities start 'summer or cold shelters' similar to winter shelters. There are already some States that are developing a 'cool roof policy' to promote the use of material in building roofs which will keep houses cool by reflecting sunlight. Prevention of heatwaves needs more practicable and science-based innovations.

Seventh, during heatwaves, local authorities carry out a lot of short-term measures such as advisories to drink a lot of water. However, to make that happen, municipalities and city authorities need to ensure the easy availability of drinking water points, and the availability of electrolyte solution/ORS powder. Offices and workplaces (both formal and informal) should allow staggered work times and also early morning and late evening work. Work can be closed during the day, especially for those who work in the informal sector and open spaces.

The evidence is that investments in heat-related actions and adaptation are highly cost effective. Therefore, every effort should be made to reduce the economic burden of heat stress in hospitals and emergency rooms and its indirect social and economic costs. With every passing year, in India and globally, the average temperature is rising. Therefore, the actions should be focused not just on short-term measures but also on long-term strategies to address the challenge of rising temperatures and steps such as enhanced coordination between multiple agencies, with *inter alia* initiatives such as provision of insurance coverage for lost work days. If policymakers and planners remember that a heatwave is an equity issue and that the approach has to be people-centric, half of the task will be done.

## Paper 03: Environment

**UPSC Mains Practice Question:** Heatwaves in India are not only an environmental hazard but a major public health and equity challenge. Discuss with reference to recent trends and government responses. (250 words)



## Context :

India, in recent years, has faced severe heatwaves earlier than in previous years, with rising temperatures and increasing frequency of heat-related stress. The year 2024 was recorded as the warmest year, highlighting the growing intensity of heatwaves in the country. In this context, Dr. Chandrakant Lahariya discusses the impacts of heatwaves and suggests both short- and long-term measures to combat this rising issue.

## Key Points of the Article:

1. Impact of Heatwaves:
  - Health Effects: Rising temperatures and heat stress can cause significant health issues such as heatstroke, dehydration, kidney failure, and other severe conditions. The intensity and frequency of heat stress are rising, causing serious impacts on the human body, especially in the hot summer months.
  - Economic Impact: Heatwaves cause a direct loss in productivity, especially in labor-intensive sectors like agriculture and construction. With up to 75% of the workforce exposed to heat stress, India suffers an economic loss of 3-5% of its GDP annually. In 2023 alone, an estimated 6% of work hours were lost due to heat stress.
  - Social Impact: The poor, marginalized groups, women, and the elderly are most vulnerable to heatwaves. Heat stress exacerbates social inequities, particularly in low-income communities where access to cooling mechanisms like air conditioning is limited.
2. Need for Heat Action Plans (HAPs):
  - State-Level Initiatives: Indian cities and states have developed heat action plans (HAPs) over the past decade. These plans are designed to mitigate the health impacts of heatwaves through early warnings, community awareness, and strengthening the healthcare system.
  - Four Key Components of HAPs:
    - Early prediction and alert systems
    - Community awareness programs
    - Health system preparedness
    - Long-term measures to reduce heat, such as increasing tree coverage, urban parks, and reflecting heat from rooftops.
3. Challenges in Implementation:
  - While the plans exist, their implementation has been inconsistent. Only cities where local authorities actively collaborate with state governments and community organizations have seen partial success in mitigating the effects of heat stress.
  - Data collection related to heat-related morbidity and mortality is often incomplete, leading to underestimations of the true impact.
4. Suggestions for Improvement:

## Daily News Analysis

- State-Level Review: Every state should update or develop its HAPs, incorporating lessons from existing plans. This includes considering both temperature and humidity, conducting local vulnerability assessments, and clearly assigning accountability to relevant stakeholders.
  - Sophisticated Warning Systems: India should adopt advanced systems similar to those used in the UK, considering both daytime and nighttime temperatures to provide more accurate predictions of heat stress.
  - Urban Infrastructure Improvements: Long-term solutions include promoting better urban infrastructure and building materials that are heat resistant. Local governments should consider financial support for informal workers affected by heat stress.
  - People-Centric Approaches: Recognizing that heatwaves are a social equity issue, advisories must be tailored to specific geographic and social contexts. For example, individuals in poor neighborhoods with less access to cooling systems need different guidance compared to others.
5. Long-Term Strategies:
- 'Cool Roof' Policies: Promoting the use of materials that reflect sunlight and keep buildings cool is an essential long-term strategy.
  - Shelter Systems: Cities should implement "summer shelters" similar to winter shelters to provide refuge from extreme heat for vulnerable populations.
  - Workplace Flexibility: Employers should allow staggered work timings, especially in the informal sector, to ensure workers are not exposed to extreme heat during peak hours.
  - Health and Adaptation Investments: Investing in heat-related adaptations, such as better healthcare facilities and emergency preparedness, is highly cost-effective in the long run.