UnderStand UPSC
What we UnderStand, We Conquer

Currently – 1 July 2026

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Indian and foreign

Forcing students to learn at least two Indian languages is not ideal

The controversy over introducing a third language from Class 6 stems from an unresolved contradiction in the National Education Policy (NEP) 2020. At several places, the NEP, rightly, extols the special importance of English, especially in mathematics, science and even legal education, and does not club it with other "foreign" languages such as French or Spanish. At the same time, it advocates the three-language formula, with two languages required to be native to India, one of them ideally the mother tongue, in effect relegating English to the status of a foreign language. The Central Board of Secondary Education (CBSE) has implemented this aspect of the NEP, ignoring other welcome observations that the policy makes on language learning. While introducing three languages from Class 6, it said students in Classes 7, 8 and 9 should also study three languages, of which two should be "Bharatiya". Thus, if a student had taken French as a second language along with English, they would have had to forego French and switch to two Bharatiya languages, one of which would be entirely new to them. This could adversely affect their Class 10 Board examination performance, and render redundant the teaching capacity and resources schools had built in those languages. Following backlash, the CBSE has said that students in Classes 7, 8 and 9 need take only one additional Bharatiya language if they had taken English and, say, Spanish. The third language, moreover, will not be tested in the Class 10 examinations. These are, however, temporary arrangements and the CBSE is going ahead with the three language policy with two Bharatiya languages from Class 6.

Prudence demands that if the NEP is to guide the Union government's decisions, it should ensure language learning that serves the best interests of students. The policy speaks of the need for "high-quality bilingual textbooks and teaching-learning materials for science and mathematics, so that students are enabled to think and speak about the two subjects both in their home language/mother tongue and in English". Here, the NEP places the mother tongue and English on an equal footing if STEM is to be central to India's progress. In the same breath, it speaks of the importance of learning languages such as Japanese and German at the secondary level to enhance students' "mobility". The government's vision is to skill Indians for cutting-edge jobs worldwide, building the human capital needed to drive India's development. Instead of atavistic relapses, education initiatives should look ahead to serve at least this vision, even if that model is open to question. Given that the CBSE often becomes the template for much of India, the better course would be to teach the mother tongue and English and, where resources permit and students desire, offer a third language of their choice.

Three-Language Formula under NEP 2020:
Promoting Multilingualism, Ensuring Choice and Global Readiness

CONTEXT

The **National Education Policy (NEP), 2020** prescribes the **Three-Language Formula** from Class VI, wherein students must study three languages and at least two of them must be Indian (Bharatiya) languages, one preferably the mother tongue/home language/local language. After concerns over mid-session disruptions, the **Central Board of Secondary Education (CBSE)** has issued relaxations: Class X is fully exempt (old two-language system continues); Classes VII–IX may continue two foreign/non-native languages (e.g., English + French/German/Spanish) by only adding one Indian language as third choice (with internal assessment, no Board exam for these batches); CBSE schools abroad, returning foreign students and Children with Special Needs (CwSN) are fully exempt. For future batches entering Class VI and onwards, the strict NEP rule will apply—three languages with at least two Indian languages, and the third as a formal Board-exam subject in Class X.

WHY FOREIGN LANGUAGE MATTERS

- Enhances global employability and mobility in an interconnected world.
- Opens doors to higher education, research, trade, diplomacy and cultural understanding.
- Improves cognitive skills, communication ability and cross-cultural sensitivity.
- Critical for STEM collaboration, technology, tourism, aviation and global business.

BENEFITS OF THE THREE-LANGUAGE FORMULA

Cognitive Advantage
Learning multiple languages improves memory, creativity and problem-solving skills.

Cultural & National Integration
Promotes respect for diverse Indian languages and strengthens national unity in diversity.

Better Learning Outcomes
Mother tongue-based education in early years improves foundational literacy and numeracy.

Academic & Career Benefits
English and foreign languages expand access to higher education, research and global opportunities.

Preservation of Linguistic Heritage
Supports survival and development of Indian languages and literature.

CHALLENGES & ISSUES

Academic Burden on Students
Learning an additional language may increase pressure, reduce focus on core subjects and affect Board performance.

Reduced Flexibility & Student Choice
Students interested in foreign languages may be forced to switch to another Indian language, limiting career-oriented choices.

Resource & Implementation Gaps
Shortage of qualified language teachers, lack of quality bilingual textbooks and uneven availability across States and schools.

Contradiction in Policy Interpretation
NEP recognises importance of English for STEM and higher education, yet implementation treats it as a foreign language.

Regional & Linguistic Diversity
One-size-fits-all approach may not suit all regions with distinct linguistic realities.

THE WAY FORWARD: A BALANCED APPROACH

- Retain the spirit of multilingualism with flexibility in implementation, respecting regional contexts and student aspirations.
- Strengthen mother tongue-based education in foundational years and ensure strong English proficiency for higher education and global competitiveness.
- Allow choice in the third language—Indian or foreign—based on aptitude, interest and future goals.
- Invest in teacher training, multilingual learning resources and bilingual materials, especially in STEM subjects.
- Ensure gradual and consultative implementation without disrupting ongoing batches.

UPSC VALUE addition

Constitutional Provisions
- **Article 29** – Protection of interests of minorities (language and culture).
- **Article 30** – Right of minorities to establish and administer educational institutions.
- **Article 350A** – Instruction in mother tongue at primary stage.
- **Article 351** – Development and promotion of Hindi.

NEP 2020 Vision
To build a linguistically rooted yet globally competent citizenry, promoting inclusive education, cognitive development and India's linguistic diversity.

KEY TAKEAWAY

The Three-Language Formula should strengthen India's linguistic heritage while keeping students future-ready. A balanced approach—mother tongue + English + choice-based third language—can best serve learning outcomes, national integration and global readiness.

KEYWORDS
Three-Language Formula | NEP 2020 | Multilingualism | Mother Tongue | Linguistic Diversity | Student Choice | Global Competitiveness | CBSE | STEM Education | Human Capital

By Rahul Sir, Faculty at Understand UPSC

The fiscal tightrope for State govts.

Most State government expenditure is on social sectors, such as health and education, and economic sectors, such as agriculture and irrigation. In Kerala, such spending has driven social progress since the 1960s. The gap between expenditure and receipts is usually financed through market borrowings.

ECONOMIC NOTES

Jayan Jose Thomas

Kerala and Tamil Nadu are among the most socially and economically advanced States in India. Yet, the finances of both governments, like those of most other States, are under stress. The White Papers recently released by the two governments described their outstanding debt as alarming. State government debt is often vilified as the result of fiscal mismanagement. But it may, in fact, reflect a mismatch between development aspirations and the limited fiscal capacity of State governments.

The fiscal dilemma

Debts build up over the years with deficits, which arise when the government's expenditure overshoots its tax and other receipts. In India, while the power to raise taxes rests largely with the Union government, a larger share of overall government spending is borne by the State governments. A majority of the State government expenditure is on social sectors, such as health and education, and economic sectors, such as agriculture and irrigation, all of which have a direct impact on people's lives and livelihoods. In Kerala, the high levels of State government spending on social sectors since the 1960s have been a central constituent of the public action driving social progress. Compared with the corresponding average for all Indian States, per capita State government social expenditure was higher in Kerala and Tamil Nadu (by 30% and 20%, respectively). In contrast, it was markedly lower in Bihar and Uttar Pradesh (by 35% and 40%) (for the period 2020-23, according to an analysis based on State Finances: A Study of Budgets, Reserve Bank of India).

States meet their expenditures partly through their own revenues – which mainly include State Goods and Services Tax (SGST) and sales tax – and through fiscal transfers, grants, and loans from the Union government. Kerala has a sufficiently good record of mobilising own-tax revenues, which, on a per capita basis, are 1.5 times the average for all Indian States and Union Territories. However, its share in the Union government's tax devolution to States was 1.92%, lower than its 2.6% share of India's population in 2023-24.

The excess of expenditures over receipts has been met through market borrowings by the States, on which the States pay interest **(Charts 1 and 2)**.

Of the limited financial resources at its disposal, Kerala has been able to direct only 10% towards capital expenditure to enhance future production capabilities. The rest was spent on revenue, or day-to-day expenditure. Approximately a fifth of the State's budget expenditure was on the salaries of government employees, mainly teachers, nurses, doctors, and police personnel. Pensions accounted for 15.3%, while interest on market borrowings accounted for 16.5% of the total budget expenditure **(Chart 2)**.

The investment challenge faced by Kerala

Kerala is thus caught in a fiscal dilemma. If it tries to create more fiscal space by reducing revenue expenditures – cutting pensions, retrenching employees – it risks eroding its strengths in the social sector. At the same time, Kerala urgently requires large-scale, State-directed investments in infrastructure, higher education and research, and public transport, if it is to realise its potential in modern, knowledge-intensive economic sectors. Educated young people are leaving Kerala in large numbers because the State is unable to create educational and employment opportunities that meet their aspirations.

In Kerala, the government's weak fiscal capacity contrasts with unmistakable signs of private affluence (lavishly built houses, expensive cars, and a high density of gold shops), threatening to exacerbate inequalities.

The ratio of credit to deposits of scheduled commercial banks in Kerala is only around 66%, compared with the national average of 76% and ratios exceeding 100% in Maharashtra and Tamil Nadu (2023). The excess of bank deposits over bank credit is one indicator of the volume of unutilised savings in Kerala. Between 2016 and 2026, the State government's capital expenditure could have been at least doubled if Kerala had been able to channel at least part of its surplus savings into investment **(Charts 3 and 4)**.

The borrowing opportunity for China's local governments

In China, the bigger chunk of the massive investments that have boosted economic growth has been undertaken by provinces and lower-level local governments. Local governments borrow heavily to finance these investments, drawing on the large pool of domestic savings held by Chinese banks, while their efforts are coordinated through central government planning. China's local governments raise resources through the sale of local government bonds (LGBs), land sales, and off-budget borrowing via local government financing vehicles (LGFVs), supplementing fiscal transfers by the central government.

In India, not only have there been limits on borrowing by State governments, but the cost of their debt has also been markedly high. State governments pay interest of 6.5% to 7.5% on the securities they issue, known as State Development Loans (SDLs), to borrow from the market. This is 0.25 to 0.75 percentage points higher than the rate at which the Union government borrows and significantly more expensive than the cost of borrowing by Chinese local governments from their banking system (around 2%).

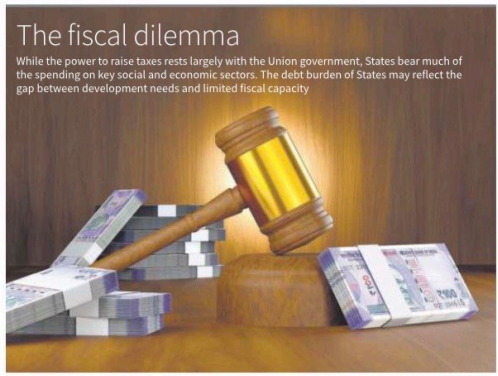
The high interest burden further tightens the debt noose around State governments.

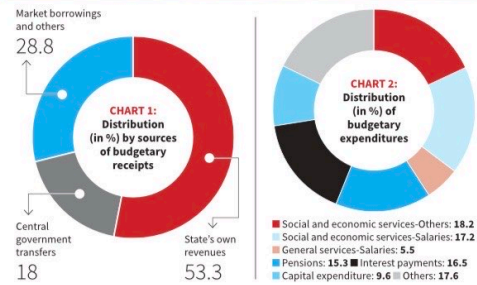
The State and Union government bonds issued in India are largely purchased by domestic financial institutions, including commercial banks and insurance companies, which deploy the savings they mobilise from the public to support government finances. In effect, the debt the government owes is a debt to its own people. A government that borrows to fund projects that expand welfare and opportunities is serving a far greater cause than a tight-fisted government.

A family would prefer that its savings, rather than being wiped out to send their child to study in a distant land, be used to establish a public university in their district.

We need fiscal structures that enable State governments to access domestic savings more easily and at a lower cost to fund meticulously planned development projects.

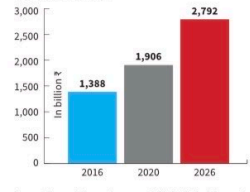
(Jayan Jose Thomas is a Professor of Economics at the Indian Institute of Technology (IIT) Delhi and a visiting researcher at the South Asia Institute of the Heidelberg University.)

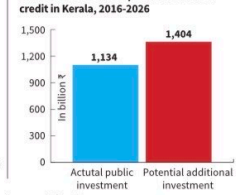




Note: Kerala's total budgetary receipts = total budgetary expenditures = ₹1,924.6 billion. That amount was 13.5% of Kerala's Gross State Domestic Product of ₹14,271.5 billion.

Source: *Revised Budget in Brief 2026-27, Finance Department, Government of Kerala*





Sources: *Economic Survey, Government of India; Budget documents, Government of Kerala*

THE GIST

State government debt builds up over the years when expenditure exceeds tax and other receipts. While the Union government raises most taxes, States bear a large share of public spending.

States meet their expenditures partly through their own revenues, including State Goods and Services Tax (SGST) and sales tax, and through fiscal transfers, grants, and loans from the Union government.

The excess of expenditures over receipts has been met through market borrowings by the States, on which the States pay interest.

CURRENTLY

Source: The Hindu (1 July 2026)

FISCAL FEDERALISM: THE FISCAL TIGHTROPE FOR STATE GOVERNMENTS

GS-2 Centre–State Relations – Federalism, Devolution of Powers & Finances | **GS-3** Indian Economy – Government Budgeting & Public Finance

1 CONTEXT

Kerala and Tamil Nadu's White Papers on rising State debt highlight a critical issue in India's **fiscal federalism**—States have greater developmental responsibilities but comparatively limited fiscal resources.

2 WHAT IS FISCAL FEDERALISM?

Fiscal Federalism is the constitutional arrangement for the distribution of **taxation powers**, expenditure responsibilities and **financial transfers** between the Union and the States to ensure **efficient governance, equity and balanced development.**

- **Taxation Powers**
- **Expenditure Responsibilities**
- **Financial Transfers (Grants, Tax Devolution)**

3 CONSTITUTIONAL & INSTITUTIONAL FRAMEWORK

Constitutional Provisions

- **Articles 268–281** – Distribution of taxes and revenues
- **Article 275** – Grants-in-Aid
- **Article 280** – Finance Commission
- **Article 279A** – GST Council
- **Article 293** – Borrowing by States

Key Institutions

Finance Commission
Recommends sharing of taxes between Union and States and grants-in-aid.

GST Council
Brings Centre and States together for cooperative decision-making on GST.

4 WHY ARE STATES UNDER FISCAL STRESS?

1. **Vertical Fiscal Imbalance**
   Union mobilises a larger share of tax revenue, while States bear most expenditure on health, education, agriculture, irrigation, welfare etc.
2. **Limited Fiscal Space**
   A large part of State budgets is committed to salaries, pensions and interest payments, leaving little for new investments.
3. **Low Capital Expenditure**
   Insufficient investment in infrastructure, research, and public services affects long-term growth and job creation.
4. **Dependence on Central Transfers**
   Heavy reliance on tax devolution and grants reduces fiscal autonomy and creates uncertainty in planning.
5. **High Cost of Borrowing**
   States borrow mainly through State Development Loans (SDLs) at higher interest rates (**around 6.5%–7.5%**), **higher than the** Union government's cost of borrowing.

5 HOW DO STATES FINANCE THEIR EXPENDITURE?

- **Own Tax Revenue** (SGST, Excise, Stamp Duty, etc.)
- **Share in Central Taxes** (Tax Devolution by Finance Commission)
- **Grants-in-Aid from Union Government** (Article 275)
- **Centrally Sponsored Scheme Transfers**
- **Market Borrowings** (State Development Loans – SDLs)

6 REVENUE vs CAPITAL EXPENDITURE

REVENUE EXPENDITURE	CAPITAL EXPENDITURE
Incurs day-to-day expenses of the government.	Creates assets and infrastructure for future benefits.
Examples: Salaries, Pensions, Subsidies, Interest payments, Maintenance.	Examples: Roads, Irrigation projects, Schools, Hospitals, Public transport, Research institutions.
No asset creation.	**Generates long-term growth.**

7 COMMITTEE RECOMMENDATIONS

SARKARIA COMMISSION (1988)	• Strengthen cooperative federalism. • Ensure predictable and fair fiscal transfers. • Increase Centre–State consultation in financial matters.
PUNCHHI COMMISSION (2010)	• Provide greater fiscal autonomy to States. • Reduce discretionary grants from Centre. • Institutionalise mechanisms for fiscal coordination.
15th FINANCE COMMISSION (2021–26)	• Strengthen fiscal responsibility and debt management. • Promote performance-based grants. • Enhance local body financing and State capacity.

8 WAY FORWARD

- ✅ Ensure predictable and transparent tax devolution.
- ✅ Increase untied grants to enhance States' spending flexibility.
- ✅ Strengthen cooperative fiscal federalism through regular Centre–State consultation.
- ✅ Improve States' own tax mobilisation and public financial management.
- ✅ Reduce borrowing costs and promote prudent debt management.
- ✅ Prioritise capital expenditure and improve quality of spending.

9 WHY FISCAL FEDERALISM MATTERS?

- Ensures equitable regional development
- Enables efficient delivery of public services
- Strengthens cooperative federalism
- Promotes fiscal accountability
- Supports inclusive and sustainable economic growth

10 UPSC MAINS LINKAGE

GS-2
- Functions & responsibilities of Union and States
- Issues & challenges pertaining to the federal structure
- Devolution of powers & finances
- Cooperative federalism

GS-3
- Government Budgeting
- Public Finance
- Indian Economy & issues relating to planning
- Inclusive growth & regional development

KEY TAKEAWAY: True fiscal federalism requires not only devolution of functions but also adequate devolution of finances, enabling States to meet their constitutional responsibilities while maintaining fiscal sustainability.

Criminal justice system's digital push aims for a full roll-out by next year

However, data maintained by the NCRB shows only 46% of FIRs were digitally transmitted to courts; out of 36 States, U.T.s, Haryana, Goa, Assam, Punjab, and Chandigarh have implemented all parameters, while 23 States are above national average

Vijaita Singh
NEW DELHI

From January 1, 2027, procedures related to all investigations and trials under the new criminal laws will be recorded digitally, a senior Home Ministry official said on Tuesday.

The official said the nationwide rollout of the Interoperable Criminal Justice System (ICJS) - which integrates police, courts, prisons, forensics, and prosecution on a single platform - is expected to be completed soon, with emphasis on end-to-end digital workflow.

The data will be stored in the government-owned cloud platform MeghRaj.

However, data maintained by the National Crime Records Bureau (NCRB) showed that the first information report (FIR) consumption by courts, the process through which cases are electronically transmitted to and received by court systems, was at 46%, less than half of the cases registered.

The three new criminal laws, Bharatiya Nyaya Sanhita (BNS), Bharatiya Sakshya Sanhita (BSS), and Bharatiya Nagarik Suraksha Sanhita (BNSS), replaced the Indian Penal Code (1860), Indian Evidence Act (1872), and the Code of Criminal Procedure (1898), respectively.

These came into effect on July 1, 2024, and in the past two years, 74.66 lakh FIRs have been filed under BNS. Since these laws require upgraded infrastructure and forensic capabilities, States and Union Territories have been given five years to implement all the pillars of criminal justice system.

As many as 63,572 zero-FIRs, those which can be filed irrespective of jurisdiction, have been registered under the BNSS. Though the provision existed earlier, the BNSS gave it a statutory backing. The official said that around 13,000 zero-FIRs were filed in different districts of the same State and fell under the category of "intra-State transfers".

The Crime and Criminal Tracking and Network Systems, the platform which is used to file FIRs across 16,000 police stations in the country, has an option to register cases in 23 languages and the *Bhashini App* can translate the zero-FIR to the language used in the jurisdiction concerned, the official said.

"A police person cannot turn away a complainant from filing a zero-FIR. Once registered, the case is transferred to the police station concerned and they can decide further upon inquiry, if they want to close the case or pursue the investigation," said the official. Out of 36 States and Union Territories, Haryana, Goa, Assam, Punjab, and Chandigarh have implemented all the parameters of the justice system, while 23 States and U.T.s, including Delhi, are above the national average. The official said due to connectivity issues, some of the northeastern States were lagging behind.

More forensic labs

As the new laws make forensic examination of crime scenes mandatory in cases punishable by seven years or more, as many as 25 new forensic laboratories (FSL) were added in the past two years, taking the total number of laboratories from 129 in 2023 to 154 in 2025.

While in 2023, the forensic labs received 8,44,589 cases for examination, out of which 4,64,879 were pending, in 2025, the cases received were 11,11,798 with 3,90,786 pending. More than 700 mobile forensic units have been deployed so far.

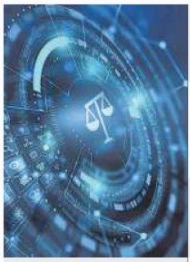
After the new laws came into effect, the national implementation score increased from 46.47% (January 2025) to 70.06% (June 2026). The 60-day chargesheet compliance rose from about 51% to 67%, and the 90-day compliance rose from about 40% to 61%. Additionally, 46.5 lakh digital evidence (Sakshya) IDs were generated, and 56.74 lakh e-summons were served.

As on May 31, 2026, there are 37.68 crore police records, which include 9.9 crore FIRs and 7.64 crore chargesheets in the database, which can be accessed by police and investigating agencies.

The Ministry official said that improving Internet connectivity, especially in remote and northeastern parts of the country, standardising processes across States and U.T.s, ensuring full interoperability among all criminal justice platforms and training of personnel were some of the challenges ahead.

Digital drive

The digitisation aims to make way for faster, more transparent, and integrated justice delivery nationwide



- All investigations and trials under BNS, BSS, and BNSS will be digitally recorded and stored on the **MeghRaj** government cloud platform
- The **Interoperable Criminal Justice System** (ICJS) connects police, courts, prisons, prosecution, and forensic laboratories on a single platform
- Over **63,500** zero-FIRs have been registered, allowing complaints to be filed regardless of jurisdiction and transferred electronically
- 25 new **forensic laboratories** have been added in two years to support mandatory forensic investigations
- Implementation has risen from 46.47% to 70.06% since January 2025, with improved **chargesheet compliance** and millions of digital evidence IDs and e-summons generated

I. Context (GS-II: Governance | GS-III: Internal Security | ICJS: Police, Courts, Prisons, Prosecution & Forensic Science Laboratories) : The Union Home Ministry will roll out the Interoperable Criminal Justice System (ICJS) nationwide from 1 January 2027, enabling end-to-end digital investigation and trial under the new criminal laws.

II. Key Highlights

* Integrates Police, Courts, Prisons, Prosecution & FSLs on a single digital platform.
* Digital FIRs, chargesheets, case diaries, evidence (Sakshya ID) and e-Summons; records stored on MeghRaj Cloud.
* Zero FIR and Bhashini (23 Indian languages) support citizen-friendly access.
* Implementation increased from 46.47% (Jan 2025) to 70.06% (June 2026).
* 37.68 crore police records, 9.9 crore FIRs and 7.64 crore chargesheets digitised.

III. Significance & Challenges

Significance: Faster, paperless and transparent justice delivery; better coordination among agencies; promotes forensic-led investigation.

Challenges: Digital infrastructure gaps, cybersecurity, capacity building and uniform implementation across States.

• POLICY

Why more medicines will now have QR codes on their packets

Anonna Dutt
New Delhi, June 29

THE CENTRE has recently mandated that all vaccines, antimicrobials, narcotics and addictive drugs, and anti-cancer drugs carry a bar code or QR code, to enable tracking of each vial or blister pack of the medicine. This track-and-trace mechanism allows regulators as well as manufacturers to follow the entire journey of every unit of the product, from the manufacturing plant to the retail store.

This is already applicable for 300 top brands of drugs, such as the gastric reflux tablet Aciloc and fever medicines like Calpol.

The mechanism will be implemented for the new categories over the next two years — by July 2027 for vaccines, narcotics, and anticancer drugs and by July 2028 for antimicrobials, according to the recent gazette notification.

How does the tracking system work?

In addition to the unique identification number for the particular blister pack or vial, the QR code or bar code also has to carry the brand name and generic name of the drug, name and address of the manufacturer, batch number, date of manufacturing, date of expiry, and manufacturing licence number.

While most drugs in the market already carry this information on their pack, the QR code-based tracking system requires the manufacturers, wholesalers, distributors, and retailers to log these products on specialised track and trace platforms.

"This mechanism makes counterfeiting difficult. Some may still use AI to generate codes similar to the original product, but with each unit carrying a unique code, that becomes difficult," said an industry expert, adding, "Even using the original packaging to refill and sell counterfeit drug is not likely to work because once the drug has been registered on the platform, the same number cannot be re-registered."

"The enhanced traceability mechanism will facilitate authentication of medicines at various stages of the supply chain and enable improved tracking and verification of drug products. The measure is expected to strengthen regulatory oversight and support efforts to curb the distribution of spurious medicines in the market," said the Union Health Ministry in a statement.

Past cases

- The use of this mechanism to track expensive cancer drugs is specially significant, considering there have been instances where used vials have been filled with other medicines and sold to desperate patients.
- A recent investigation by 'The Indian Express' had tracked one such ring that counterfeited the cancer immunotherapy drug Keytruda.

Why is it needed?

The main aim is to prevent counterfeiting. A drug can be counterfeited by either releasing products with no active ingredient into the market or diluting a drug to increase quantities for sale.

The track and trace mechanism can help regulators identify whether a product was contaminated at the source — at the manufacturing plant of a company — or was tampered with.

The possibility of tracking every single unit also means that regulators and companies know exactly where to find their products in case there is a recall.

What are the challenges?

One of the challenges, an industry expert said, is that if there is a delay in logging the genuine product and a counterfeit gets logged into the system, the genuine drug might come across as counterfeit.

Second is the challenge of cost. Companies will have to put in place mechanisms to generate the unique codes and the tracking platforms, incurring significant expense.

The expert said: "While it may be feasible for companies selling expensive cancer drugs, smaller companies will struggle. Considering that many of the drugs in schedule H2 are 'essential' and therefore under price control, the government may provide some monetary support or allow the companies to raise the prices slightly."

How does it change regulatory oversight?

Another reason for implementing the tracking mechanism is to improve the maturity level of the Indian drug regulator. The World Health Organization has a benchmark tool for rating regulators depending on the way drugs are approved, the mechanisms for surveillance and testing, and ways of recalling products.

When it comes to vaccines, the Indian regulator is already at Maturity Level 3, the second-best. Making each unit of a vaccine traceable is a step towards achieving the highest level, Maturity Level 4. Higher the maturity level, the easier it is for medicines from the country to be accepted in international markets, as their quality is seen as more trustworthy.

CURRENTLY MAINS ONE-PAGER SERIES | TOPIC 02

WHY MORE MEDICINES WILL NOW HAVE QR CODES ON THEIR PACKETS

Tracking, Transparency & Trust in India's Pharmaceutical Supply Chain

1st JULY 2026
By Rahul Sir
Faculty, UnderStand UPSC

GS-3 • Health • Science & Technology • Pharmaceutical Sector • Supply Chain Management • Digital Governance • Consumer Protection & Counterfeit Drugs

01 CONTEXT

The Union Health Ministry has mandated QR codes on the packs of vaccines, antimicrobials, narcotics, addictive drugs and anti-cancer drugs, and on 300 top brands (e.g., Aspirin, Crocin, Calpol).

Implementation for new categories will be in a phased manner:

- **July 2027** – Vaccines, Narcotics, Anti-cancer drugs
- **July 2028** – Antimicrobials

02 WHAT HAS CHANGED?

- Mandatory QR code (or barcode) on every blister pack/vial.
- Applies to new categories (from July 2027/28) and 300 top brands.
- QR code carries key data to enable the track-and-trace mechanism across the supply chain.
- Aim: Prevent counterfeiting, ensure quality and strengthen regulatory oversight.

03 HOW DOES IT WORK?

Track & Trace Mechanism

Data is logged on a specialised track & trace platform accessible to regulators, manufacturers, wholesalers and retailers.

04 WHY IS IT IMPORTANT?

- Prevents sale of spurious/fake drugs and protects patients.
- Ensures source & process verification and deters tampering.
- Enables efficient recall and quick removal of defective/unsafe batches.
- Improves transparency and builds public trust in medicines.
- Discourages market indiscipline and strengthens quality compliance.

05 GS-3 RELEVANCE

- **Health Sector Governance:** Strengthens drug safety, quality control & patient safety.
- **Digital Governance:** Technology-enabled regulation using track & trace systems.
- **Pharmaceutical Sector:** Enhances quality standards, competitiveness & exports.
- **Supply Chain Management:** End-to-end visibility and accountability.
- **Consumer Protection:** Ensures right to safe and quality medicines (Art. 21).

06 CHALLENGES

- **Cost Implications:** High cost of setup, integration and maintenance; burden on MSMEs.
- **Infrastructure Gaps:** Need for robust IT systems, data security and connectivity.
- **Industry Readiness:** Low awareness and capacity among some manufacturers/ retailers.
- **Compliance Burden:** Additional reporting and documentation requirements.
- **Data Security:** Ensuring privacy, integrity and protection from misuse.

07 WAY FORWARD

- Phased and hand-holding approach; financial & technical support for MSMEs and smaller firms.
- Strengthen digital infrastructure and interoperability of track & trace platforms.
- Capacity building and awareness for manufacturers, wholesalers and retailers.
- Strict enforcement with periodic audits and penal action for non-compliance.
- Leverage emerging tech (AI, blockchain, IoT) for better risk monitoring and analytics.

08 VALUE ADDITION

- **Legal Basis:** Drugs & Cosmetics Act, 1940 and Rules, 1945.
- **Regulatory Benchmark:** WHO Global Benchmarking Tool – maturity level upgraded from Level 3 to Level 4.
- **Constitutional Link:** Article 21 – Right to life includes right to health (Consumer protection & patient safety).
- **SDGs:** SDG 3 (Good Health & Well-being) SDG 9 (Industry, Innovation & Infrastructure) SDG 12 (Responsible Consumption).

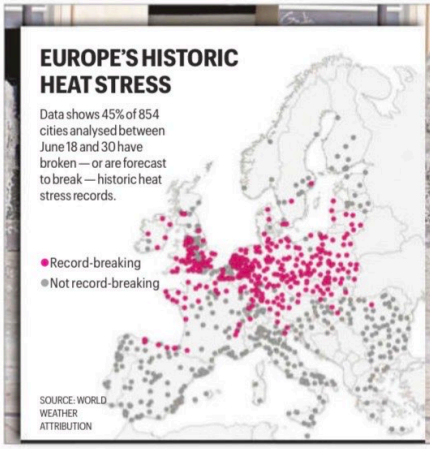
Source: Indian Express | Tuesday | 30 June 2026

•CLIMATE

Behind Europe's heatwave, climate change the culprit

While the link may seem self-evident, establishing scientific cause is key to driving policy action, which has been lacking

AMITABH SINHA



A man cools off at a fountain during a heatwave in Saint Germain en Laye, west of Paris, on Thursday. AP

A NEW study has confirmed what was already evident — climate change is behind the scorching heat in large parts of Europe right now.

A study by World Weather Attribution (WWA), a group of scientists that examines the causes of extreme weather events worldwide, has found climate change to be "unequivocally to blame" for the European heatwave, which has seen several places record unprecedented temperatures in recent days. WWA said this was the most severe heatwave ever recorded in Europe.

On Sunday, WHO Director-General Tedros Adhanom Ghebreyesus wrote in a post on X that "Europe is the fastest-warming continent on Earth, heating at twice the global average... More than 1300 excess deaths have been recorded since 21 June linked to high temperatures in Europe."

This is the third time in five years that Europe finds itself in the grip of an intense heatwave. Similar scenes were witnessed in 2022 and 2023 as well. More than 1,00,000 people are estimated to have died owing to extreme heat in those two years.

While the current episode of extreme heat is expected to slightly subside this weekend onwards, Europe's ordeal might not be over yet, according to forecasts by meteorological offices of the UK and France. Historically, June has not been the hottest month for Europe — July is. With the El Niño phenomenon in the Pacific Ocean expected to get stronger in July, Europe might be staring at fresh heatwave spells in the coming weeks.

Climate change-driven heatwave

The WWA study, however, was categorical in assigning the cause of this heatwave. It said it was not because of El Niño, which is still to reach its peak, or any other reason, but climate change.

"Both the daytime highs and overnight temperatures seen during this heatwave would have been virtually impossible to occur at this time of year as recently as 1976 — just 50 years ago," it said.

Many of the temperature records now being broken in Europe were set in 1976, when the region had experienced an unusually hot summer.

Europe experienced its first heatwave of this century in 2003. The study said that heatwave was nothing in comparison to what the region is witnessing now. The record-breaking high temperatures during the night are almost 100 times more likely today than they were in 2003, it said. The daytime peak temperatures observed during the current spell are almost 10 times more likely.

Daytime temperatures in most of Europe, barring the northern part, are usually between 20 and 30°C during June. Nighttime temperatures typically vary between 11 and 17°C. But in many parts of the region, peak temperatures during the ongoing heatwave have been 10 to 15°C higher than normal. A similar situation had prevailed in May this year as well, when an early heatwave had prevailed in Europe.

"The analysis found that the El Niño Southern Oscillation (ENSO) phase had no role in driving the heat (in this spell)," the study said.

ENSO is an ocean-atmospheric interaction over the Pacific Ocean region. El Niño is one of the two phases of ENSO and is known to have a warming effect on the planet. Its opposite phase, La Niña, tends to bring temperatures down.

Why accurate attribution is important

Though the intensity of this particular spell of European heatwave and the trend over the last few years had made the imprint of climate change fairly clear, scientists are usually wary of linking any individual extreme weather event to climate change without an attribution study like this one.

Climate attribution science is a relatively new discipline, developed just over the last two decades. It tries to examine the likelihood of a particular extreme weather event happening if climate change were not taking place.

Earlier, it used to take scientists a couple of months, even years, to make this assessment. But in the last three to four years, mainly owing to the efforts of WWA, a much faster assessment has been made possible, sometimes even when the event is still ongoing, as in the present case.

Attribution science seeks to remove ambiguity and determine the exact extent of responsibility of climate change in causing major extreme weather events.

In the last few years, it has established the footprints of climate change on several events. Besides preparing scientific evidence, this exercise is also aimed at forcing policymakers and decision-makers to act more rapidly on climate change.

Action awaited

The scientific evidence on climate change is already voluminous and compelling. Still, climate change seems to have dropped a few notches down in the list of global priorities, particularly after Donald Trump took office as US President. The recent G7 meetings, for example, hardly had any climate-related agenda or outcomes. A few years earlier, climate change used to be one of the most important items at such international meetings, especially those involving influential leaders.

Scientists insist that there is still time for countries to take rapid action and attempt to achieve the Paris Agreement targets of containing the global rise of temperatures within 1.5 or 2°C from pre-industrial times.

But governments appear to have all but given up on those targets. For them, it seems, these targets have already gone beyond reach, or require the kind of mobilisation of resources on a global scale that is neither practical nor realistic to organise.

Countries seem to have decided to let climate change play itself out and do their best to deal with its impact and adapt to it — a strategy scientists routinely warn against. Adaptation has its limits, they maintain.

But global action on climate change has continued to woefully lag behind global warming. Events such as the European heatwave are only expected to increase both in frequency and intensity over the next few years.

Concrete evidence

Climate attribution science is a relatively new discipline. It examines the likelihood of a particular extreme weather event, if climate change were not taking place.

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Attribution science seeks to remove ambiguity and determine the exact extent of responsibility that climate change bears.

I. Context (GS-III: Environment | Climate Change | Disaster Management)

A World Weather Attribution (WWA) study has concluded that the ongoing European heatwave is primarily driven by human-induced climate change, while El Niño–Southern Oscillation (ENSO) had no significant role. The study strengthens scientific evidence linking climate change with extreme weather events.

II. Why is Europe Facing an Extreme Heatwave?

i. Primary Cause

* Anthropogenic greenhouse gas emissions have increased global temperatures, making heatwaves more frequent and intense.

ii. Why not ENSO?

* Scientists found that the present European heatwave cannot be attributed to El Niño; climate change is the dominant driver.

iii. Role of Climate Attribution Science

* It estimates how much climate change has increased the probability or intensity of an extreme weather event.

III. Key Findings (Data)

* 45% of 854 European cities recorded or equalled historic June heat records.
* 1,300+ heat-related deaths reported since 21 June.
* Present heatwave is about 100 times more likely than a similar event in 2003.
* Daytime temperatures were 2–4°C higher due to climate change.
* Night temperatures increased by 1–4°C, increasing heat stress