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1. Distinguished Jurist: The Unused Route to Appoint an SC Judge
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• LEGAL

Distinguished jurist: The unused route to appoint an SC judge

Amaal Sheikh
New Delhi, September 1

DECADES AFTER the Constitution came into force, one route to becoming a Supreme Court judge has never been taken. At a convocation address on August 30, Supreme Court judge Justice Ujjal Bhuyan pointed to Article 124(3), which allows the appointment of a "distinguished jurist" as a Supreme Court judge, and called it an "unused mandate" of the Constitution that "needs our serious attention."

He said that having a distinguished jurist on the bench would "diversify the Bench" and that they "would not remain constricted by narrow technicalities thereby being in a stronger position to deal with public law issues." He said the "participation of... legal academia and scholars would have a defining impact on the judicial functioning of the Supreme Court."

What the Constitution states

Article 124 sets out how the Supreme Court is constituted. Article 124(3) lists who can be appointed as a judge, ie., a citizen of India who has either served as a High Court judge for five years, practised as an advocate for ten years, or "is, in the opinion of the President, a distinguished jurist."

The first two routes are how the court has always been staffed. Most judges have been elevated from the High Courts, while a smaller number of lawyers have been appointed directly from the Bar. The most recent was Justice V Mohana, recommended by the collegium in May 2026 and sworn in the following month. The third category, the appointment of distinguished jurists, has simply never been used.

Article 217 lays down the conditions for the appointment of a High Court judge. The 42nd Amendment, enacted during the Emergency, added a provision allowing the appointment of a "distinguished jurist" as a judge of the High Court. However, the provision was eventually repealed by the 44th Constitutional Amendment.

Where the clause came from

The clause was added during the Constituent Assembly debates on May 24, 1949, after H V Kamath moved an amendment saying the pool of candidates shouldn't be "necessarily confined to Judges or Advocates." He said that India needed a way to bring in "men or for that matter, women who are possessed of outstanding legal and juristic learning," even if they had never practised law. He pointed out that judges of the International Court of Justice at The Hague are chosen on similar terms.

B R Ambedkar didn't object to the idea itself. His only hesitation was over the word "distinguished", and he wondered whether "eminent" would be a better fit. He, however, left the final call to the Drafting Committee. The amendment eventually went through.

Who qualifies & why no one has

Justice Bhuyan offered two possible explanations for why the clause remains unused. "The first is that earlier in the view of the central government and thereafter of the collegium, there is not enough depth in the Indian academia to be considered for elevation as a judge of the Supreme Court. The second is that both the central government and the collegium have not seriously explored this provision thus far," he said.

A "distinguished jurist' is generally understood to be anyone engaged in serious work in the practice, teaching or research of law, including those who do not require courtroom experience to fit the description. But this interpretation runs into a separate problem in India, where the Bar Council rules generally prevent full-time law teachers from practising law.

A further complication is the process of Supreme Court appointments itself. Appointments today are initiated through the collegium system, meaning that a jurist would first have to be recommended by the Supreme Court collegium before the appointment goes to the government.

In an interview in 2015 with *LiveLaw*, Upendra Baxi recalled being addressed as "Judge Baxi" by a professor, who had been told by Justice P N Bhagwati that Baxi would be made a judge within a few months. That appointment never materialised. Addressing the matter, Baxi said that "the Presidents of India have been looking with a telescope and have not found any jurist worth appointing as a Supreme Court Judge" and thus called it "a dead issue."

Appointing a judge: 3 ways

- The Constitution sets out who can be made a SC judge: a citizen of India who has either served as a HC judge for 5 years; practised as an advocate for ten years; or 'is, in the opinion of the President, a distinguished jurist'.
- The first two routes are how the court has always been staffed. The third route has never been used.

With reference to Indian judiciary, consider the following statements :

1. Any retired judge of the Supreme Court of India can be called back to sit and act as a Supreme Court judge by the Chief Justice of India with prior permission of the President of India.
2. A High Court in India has the power to review its own judgement as the Supreme Court does.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

1. Distinguished Jurist: The Unused Constitutional Route to the Supreme Court

Source: *The Indian Express*
Subject: GS-2 — Indian Polity | Judiciary | Appointment of Judges

Context: Supreme Court Judge **Justice Ujjal Bhuyan** has highlighted the **unused constitutional provision under Article 124(3)** that permits the appointment of a **"distinguished jurist"** as a judge of the Supreme Court.

1. Constitutional Provision — Article 124(3)

Article 124(3) provides **three categories of persons eligible for appointment as a Supreme Court judge**:

● A person who has been a **High Court judge for at least 5 years**.

● A person who has been an **advocate of a High Court for at least 10 years**.

● A person who, **in the opinion of the President, is a distinguished jurist**.

● While the first two routes have been regularly used, the **distinguished jurist route has never been utilised**.

2. Who is a "Distinguished Jurist"?

● The Constitution does not prescribe a detailed definition or specific qualifications for a distinguished jurist.

● The expression can encompass persons with **exceptional legal knowledge and contribution to jurisprudence**, including those engaged in:

→ Legal research and scholarship
→ Teaching and legal academia
→ Development of legal thought and jurisprudence

● Justice Bhuyan argued that the provision could enable the judiciary to draw from a **wider pool of outstanding legal minds**, rather than restricting appointments largely to judges and practising advocates.

3. Why Has the Provision Remained Unused?

● **Absence of an established mechanism:** Neither the government nor the judiciary has developed a clear process for identifying and assessing candidates under this category.

● **Existing appointment practice:** Supreme Court appointments currently operate through the **collegium system**, under which candidates are first recommended by the Supreme Court Collegium before the appointment process proceeds with the government.

● **Difficulty in determining merit:** The absence of objective criteria for what constitutes a "distinguished jurist" creates questions regarding **selection and evaluation**.

● **Academic–practice divide:** Full-time legal academics generally face restrictions on practising law, creating an institutional gap between **academic expertise and courtroom experience**.

4. Significance of Activating the Provision

● **Diversification of the Bench:** Opens the possibility of bringing eminent legal scholars and academics into the Supreme Court.

● **Greater jurisprudential expertise:** Distinguished scholars could contribute to the development of **constitutional interpretation and legal doctrine**.

● **Broader talent pool:** Supreme Court appointments need not be confined exclusively to **career judges and practising advocates**.

● **Constitutional intent:** The provision reflects the Constitution-makers' intention to allow **exceptional legal expertise outside conventional judicial practice** to contribute to the Supreme Court.

The two balance sheets behind every e-waste decision

Suman Chandra

Senior IAS officer currently serving as Director in the Ministry of New and Renewable Energy

Abhinav Mathur

Former Senior Adviser, NITI Aayog, currently serving as an Adviser to the Board at Attero

Every few years, governments and companies replace thousands of computers, servers, networking devices and storage systems. What looks like a routine technology refresh is, in reality, the creation of a valuable mine. Discarded IT equipment contains copper, aluminium, gold, silver, palladium and critical minerals that the world is scrambling to secure. As economies digitise, these growing mountains of electronic waste are among the largest untapped sources of strategic raw materials – and, when poorly handled, hazardous waste. This is the promise of urban mining: recovering valuable materials from products that have already served their purpose, instead of digging deeper into the earth. It begins with recognising that yesterday's electronics can become tomorrow's resource base. The economics, however, are not always straightforward.

The long chain of recycling

Safely recovering materials from electronic waste requires sophisticated technology, secure data destruction, environmentally compliant processing and traceable supply chains, with collection and segregation adding to the cost. Yet the benefits go beyond recovered metals: less virgin mining, stronger domestic supplies of critical materials, lower import dependence and responsible handling of hazardous components.

This helps explain why advanced recycling has yet to become the default choice in India. Procurement in both the public and private sectors often rewards the lowest visible cost: maximise resale value, minimise processing cost. The strategic value of recovering critical minerals, ensuring secure data-destruction, environmental benefits and strengthening domestic industrial capability rarely appears on the invoice.

Every significant public or corporate decision creates two balance sheets. The first is financial and immediate: purchase price, resale value, savings achieved. It is measurable, auditable and reflected in annual budgets. The second is strategic. It remains open long after the transaction is complete, recording the consequences of today's decisions: resource security, environmental sustainability, industrial capability, supply-chain resilience, public health and national competitiveness. Good governance, and increasingly good business, depends on managing both. Some investments look expensive at first but can transform economies. Solar power is a good example. Fifteen years ago, it struggled to compete with conventional electricity on cost, and governments that invested early were criticised for paying too much. Today, scale and learning have made solar one of the world's cheapest sources of electricity, while countries that built manufacturing capacity early enjoy advantages that simple cost comparisons could not have predicted.

The economics of e-waste demand decisions beyond immediate cost savings

What organisations must ask

Investment in urban-mining infrastructure looks similarly expensive if judged only against the cost of disposing of a computer. The calculation changes when the value of recovered materials, avoided imports, environmental safeguards, data security and future industrial capability are counted together. Many costs excluded from an initial transaction return later in another form, and more expensive over-time. Pollution becomes health-care expenditure. Resource depletion becomes import dependence and high manufacturing costs. Weak domestic capability becomes strategic vulnerability.

Selecting a recycler solely because it offers the highest resale value may appear prudent. But organisations should also ask whether sensitive data is securely destroyed, whether refurbishment precedes recycling, and whether critical minerals are recovered efficiently and transparently. A marginal gain today can become tomorrow's cybersecurity risk, import dependence, reputational damage and permanent loss of strategic resources. The challenge is not confined to boardrooms. It also shapes public policy. Governments have traditionally relied on the valuable lowest-price principle to ensure transparency and fiscal discipline. But today's economy increasingly depends on renewable energy systems, batteries, electronics and advanced manufacturing, sectors where the lowest acquisition cost is rarely the lowest lifetime cost.

Many countries are now moving toward life-cycle costing and value-based procurement, asking "which option delivers the greatest long-term public value?" Procurement then becomes a tool of industrial policy, shaping which technologies scale and which capabilities are built. The same principle applies to compliance markets such as Extended Producer Responsibility, where judging compliance only on the cheapest available certificate rewards the lowest-cost provider rather than the highest-quality outcome. Rewarding traceability, recovery efficiency and technological capability would instead draw investment into advanced recycling and strengthen India's domestic supply of critical minerals.

Environmental costs never remain environmental alone; they become economic costs. Governments spend more on remediation, businesses face higher compliance costs, and citizens bear the burden through taxes and lost productivity. The costs may be delayed or redistributed, but are rarely avoided.

The choice made is important

Whether India's discarded computers, servers, batteries and electronics become a strategic national asset or an environmental liability depends on choices made today by governments and businesses alike. Every invoice records a price. Every decision creates two balance sheets. One closes with the transaction. The other continues to shape economic resilience and industrial and national capability. Therefore, the question is: Which decision is it that leaves behind the smallest unpaid bill?

The views expressed are personal

Due to improper/indiscriminate disposal of old and used computers or their parts, which of the following are released into the environment as e-waste?

1. Beryllium
2. Cadmium
3. Chromium
4. Heptachlor
5. Mercury
6. Lead
7. Plutonium

Select the correct answer using the codes given below.

(a) 1, 3, 4, 6 and 7 only

2. The Two Balance Sheets Behind Every E-Waste Decision

Source: *The Hindu*
Subject: GS-3 — Environment | E-Waste Management | Critical Minerals | Circular Economy

Context: The rapid growth of electronic consumption, technological obsolescence and shorter product life cycles is creating a large and steadily increasing **e-waste stream**, requiring India to balance environmental protection with resource recovery and economic value.

1. E-Waste: Scale of the Challenge

● **E-waste** comprises discarded electrical and electronic equipment such as computers, mobile phones, servers, networking equipment, appliances and other electronic components.

● **Global scenario:** The **Global E-waste Monitor 2024** estimates that **62 million tonnes (MT)** of e-waste were generated globally in **2022**, projected to rise to **82 MT by 2030**. Only **22.3%** was formally collected and recycled.

● **India:** With approximately **4.14 MT generated in 2022**, India was the **3rd-largest e-waste generator globally**, after China and the United States.

● **Key drivers:** Rapid technological advancement, rising consumption, shorter product life cycles, limited repair and reuse, and increasing digitalisation/electrification.

● The problem is significant not only because of the volume generated but also because poorly managed e-waste results in **loss of valuable materials and increased environmental risks**.

2. E-Waste as an Environmental Liability and Resource

● E-waste may contain **hazardous substances such as mercury and other toxic materials**; unsafe dismantling, burning and disposal can contaminate air, soil and water.

● At the same time, discarded electronics contain **iron, copper, aluminium, gold, silver, palladium and other valuable/strategically important materials**.

● The 2022 global e-waste stream contained approximately **31 MT of metals valued at around US$91 billion**, demonstrating the economic value embedded in discarded electronics.

● This creates the concept of **“urban mining”** — recovering secondary raw materials from discarded products instead of relying exclusively on primary mining.

● For India, efficient recovery can **reduce pressure on natural resources, lower import dependence, support critical-mineral security, reduce mining-related environmental damage and strengthen domestic manufacturing supply chains**.

3. Reorienting E-Waste Decision-Making

● The article’s central argument is that e-waste decisions should not be determined merely by **immediate disposal cost or resale value**.

● **Financial considerations:** disposal cost, recycling expenditure, scrap/resale value and short-term financial returns.

● **Strategic considerations:** recovery of critical minerals, environmental costs, data security, resource security, import dependence and development of domestic recycling capabilities.

● Thus, an option that appears **cheaper in the short term may generate higher environmental, economic and strategic costs over its life cycle**.

● Organisations should consequently adopt **life-cycle costing**, evaluating electronic equipment from procurement and use through **repair, refurbishment, reuse, recycling and final disposal**.

4. India’s Regulatory Framework

● The **E-Waste (Management) Rules, 2022** came into force on **1 April 2023**, replacing the 2016 Rules.

● The framework strengthened **Extended Producer Responsibility (EPR)**, placing prescribed end-of-life management responsibilities on producers.

● E-waste is required to be channelled through **registered/authorised recycling facilities**, promoting formal recycling and greater accountability.

● The broader objective is to shift from a **linear “use-and-dispose” model towards a circular economy**, in which materials are recovered and returned to productive use.

5. Key Implementation Challenges

● **Informal recycling:** Unsafe dismantling and processing can create environmental and occupational hazards.

● **Collection and traceability:** E-waste may remain with consumers or enter informal channels, making its final destination difficult to monitor.

● **Low recovery efficiency:** Valuable materials may be lost through inefficient recycling processes.

● **Technology constraints:** Recovery of critical minerals requires advanced separation, recycling and refining technologies.

● **Data-security concerns:** Discarded computers, servers and storage devices may contain sensitive information, requiring secure data destruction.

● **Short-term procurement incentives:** Focusing exclusively on immediate financial returns can overlook the long-term strategic value of material recovery.

6. Way Forward

● Adopt **life-cycle value assessment** rather than selecting disposal options solely on the basis of lowest cost.

● Strengthen **EPR implementation, collection, traceability and verification of actual recycling outcomes**.

● Promote **repair, refurbishment and reuse** to extend product life before recycling.

● Develop domestic capabilities for **advanced recovery of critical minerals and valuable metals**.

● Integrate informal-sector collectors into a **formal, regulated and environmentally safe recycling ecosystem**.

● Make **data security, environmental compliance and resource recovery** integral to institutional e-waste procurement.

China, US are in race to connect science with industry. India must catch up

RAJA MANDALA

BY C RAJA MOHAN

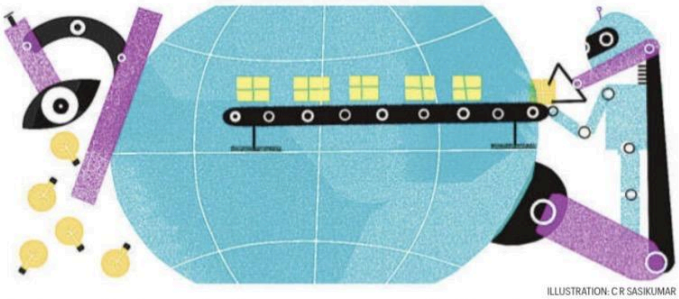


ILLUSTRATION: C R SASIKUMAR

BEHIND THE riot of robots running, dancing and playing at Beijing's second World Humanoid Games last week is an ambitious Chinese project to turn China into the world's leading science power. This ambition is rooted in President Xi Jinping's call to fully mobilise "new quality productive forces" being unleashed by the current revolutions in science and technology. Xi is convinced that China's next phase of growth cannot rely on cheap labour, large-scale manufacturing, infrastructure and capital accumulation. It must come from innovation.

AI is central to Xi's strategy. Beijing's objective is to diffuse AI across the physical economy — robotics, machine tools, automobiles, biotechnology, materials, energy, agriculture and scientific research. China's manufacturing depth is its advantage. Beijing is betting that fusing digital intelligence with the world's largest industrial ecosystem will make China the leading technological power.

For decades, China absorbed foreign technology, improved it through manufacturing and dominated production. It now wants to move upstream — from adaptation to original discovery. China spent 2.8 per cent of GDP on R&D in 2025; basic-research expenditure rose by 11 per cent. The manufacturing power now seeks to become a science superpower.

The logic is simple: AI accelerates discovery; discovery produces technology; technology transforms industry; industrial strength generates national power and gives China a geopolitical edge.

Washington is reaching a similar conclusion, coming from the opposite direction. The Trump administration's Science: A New Golden Age, released in July, has been billed as the first major reset in US science policy since World War II. It begins by recognising American strengths — its great universities, laboratories, technology companies and capital markets. It also acknowledges the American weakness — the erosion of the capacity to turn discoveries into production.

Globalisation separated American innovation from manufacturing. Companies designed at home, produced abroad and depended on long supply chains. That model generated wealth but also vulnerabilities exposed by the pandemic, China's rise and geopolitical rivalry. Washington now wants to reintegrate the production of knowledge and manufacturing.

Washington and Beijing see AI not merely as a general-purpose technology, but as an accelerator central to the production of new knowledge that in turn will transform industry. By making discovery continuous with design and manufacturing, AI-driven science will transform production itself — and turn scientific speed into economic power and geopolitical capability.

China begins with the largest manufacturing base and moves upstream into science. America begins with the strongest scientific system and moves downstream into manufacturing. China fears dependence on American technology; the US fears dependence on Chinese production. Both seek to close the gap between knowledge and production.

This contest is not about who unveils the cleverest AI model or the most sophisticated humanoid. It is about building the most effective ecosystem connecting universities, laboratories, entrepreneurs, finance, energy, factories, supply chains and markets. Where does this leave India? Delhi recognises the trend and has launched several new missions — on AI, semiconductor production and quantum technologies. It also has a draft robotics policy. But two weaknesses stand out.

This contest is not about who unveils the cleverest AI model. It is about building the most effective ecosystem connecting universities, laboratories, entrepreneurs, finance, energy, factories, supply chains and markets

First, ambition and imagination are concentrated in government declarations at a time when the private sector contributes more than ever to producing knowledge in the US and China. Indian capital rarely articulates a project for mastering the new forces of production or a new project for science and basic research. This was not always so. Jamsetji Tata helped create the Indian Institute of Science in 1909; the Kirloskars and other western Indian business families sent their children to the Massachusetts Institute of Technology from the 1920s. They recognised that independent India's future lay in mastering modern science. The Sir Dorabji Tata Trust supported Homi Bhabha in establishing the Tata Institute of Fundamental Research, which formed the nucleus of India's atomic energy and space programmes. Indian capital has sadly retreated from that tradition.

The Economic Survey 2025-26 puts India's R&D expenditure at 0.64 per cent of GDP. In comparison, China spends about 2.8 per cent and the US 3.5. The World Intellectual Property Organisation estimates India's total R&D spend at $75 billion in purchasing-power-adjusted dollars, against $786 billion for China and $782 billion for the United States. In nominal dollar terms, India will look even less impressive.

Second, India has not reformed its scientific institutions. China's reform era launched in the late 1970s by Deng Xiaoping put the revitalisation of science and technology at the heart of his Four Modernisations. India's reform era, beginning in the 1990s, produced no comparable overhaul.

India and China both benefited from access to American universities that offered valuable training in advanced sciences for their vast talent pools. China combined that opportunity with massive domestic investment in science and higher education and incentives for researchers to return. To say that India's science sector does not attract talent back is an understatement.

If the Congress era saw the steady bureaucratisation of Indian science, the BJP is adding cultural nationalism to it. Civilisational pride cannot make mythology a substitute for evidence, experiment and scientific temper. India's most confident claim should not be that all modern science was discovered in its past, but that the greatest Indian contributions lie in the future.

Equally unfortunate is the Indian tendency to talk tall. Delhi's radical posturing on technological "self-reliance" in the 1970s and 1980s isolated India from global technological advances. Today, again, there is grandiose talk of "technological sovereignty". India must necessarily walk on two legs: Deepen cooperation with global science, capital, technology and talent while building domestic research, industrial and institutional capacity.

Without reform of the state-led science system and a massive commitment from private capital, Indian industry could well become a subaltern to Chinese and American science-industrial systems that are set to become as breathtaking as the robots we saw in Beijing last week.

The writer is contributing editor on international affairs for The Indian Express. *He is a distinguished professor at the Motwani Jadeja Institute of American Studies, Jindal Global University and holds the Korea Foundation Chair on Asian Geopolitics at the Council for Strategic and Defence Research, Delhi*

3. China, U.S. Are in Race to Connect Science with Industry; India Must Catch Up

Source: *The Indian Express* — C. Raja Mohan

Subject: GS-3 — Science & Technology | Research & Development | Innovation | Industry–Academia Linkages

Context: China and the United States are increasingly linking **scientific research with industry, manufacturing, finance and markets**. India has scientific capability and new technology missions, but needs stronger R&D investment and research–industry linkages.

1. China and the U.S.: Two Models of Science–Industry Integration

● **China — Manufacturing to Innovation:** China is moving from **technology absorption and manufacturing dominance towards original scientific research**, using its large industrial base to commercialise new technologies.

● **Artificial Intelligence as an industrial driver:** China seeks to integrate AI with **robotics, machine tools, automobiles, biotechnology, materials, energy and agriculture**.

● **Scale matters:** China's strength lies in connecting **research → technology → manufacturing → commercialisation**, creating a continuous innovation cycle.

● **U.S. — Research to Manufacturing:** The U.S. possesses strong **universities, laboratories, technology companies, entrepreneurs and capital markets**, but is trying to reconnect scientific discovery with domestic manufacturing.

● **Strategic shift:** Competition with China and supply-chain vulnerabilities have encouraged the U.S. to integrate **knowledge creation with production capacity**.

● **Common lesson:** China is moving **upstream from manufacturing to science**, while the U.S. is moving **downstream from science to manufacturing**; both seek to close the **knowledge–production gap**.

2. India's Position: Strong Potential, Weak Linkages

● **Emerging capabilities:** India has launched missions in **Artificial Intelligence, semiconductors, quantum technologies and robotics**, creating a foundation for future technological growth.

● **Low R&D intensity:** India spends about **0.64% of GDP on R&D**, compared with **2.43% in China and 3.48% in the U.S.**

● **Limited industry participation:** Business contributes only about **41% of India's R&D expenditure**, compared with **77% in China and 75% in the U.S.**

● **Research-to-market gap:** Universities and laboratories remain insufficiently connected with **entrepreneurs, finance, manufacturing, supply chains and markets**.

● **Institutional constraints:** Bureaucratisation, limited research autonomy and inadequate incentives can restrict scientific experimentation, entrepreneurship and talent retention.

3. What India Can Learn from China and the United States

From China — Scale and Manufacturing

● **Increase R&D investment:** Raise both public and private expenditure, particularly on basic and frontier research.

● **Connect science with manufacturing:** Use India's expanding industrial base to convert **research into technologies and technologies into products**.

● **Build technological depth:** Move beyond assembly and technology adoption towards **indigenous design, innovation and advanced manufacturing**.

● **Retain scientific talent:** Provide stronger infrastructure, research opportunities, incentives and institutional autonomy.

From the United States — Ecosystem and Commercialisation

● **Strengthen university–industry partnerships:** Encourage joint research, industry-funded projects and technology transfer.

● **Mobilise private capital:** Connect research with **venture capital, start-ups and corporate investment**.

● **Strengthen the lab-to-market pipeline:** Convert research into **intellectual property, enterprises, products and scalable technologies**.

● **Build integrated ecosystems:** Connect **universities + laboratories + entrepreneurs + finance + factories + supply chains + markets**.

4. Strategic Roadmap for India

● **Raise R&D expenditure:** Move towards a significantly higher R&D-to-GDP ratio, with a greater role for the private sector.

● **Reform scientific institutions:** Provide greater **autonomy, flexibility, merit-based incentives and accountability**.

● **Strengthen industry–academia linkages:** Expand joint laboratories, industry-funded research and technology-transfer mechanisms.

● **Promote strategic technologies:** Build integrated ecosystems in **semiconductors, AI, quantum technology, robotics, biotechnology, advanced materials and clean energy**.

● **Combine global cooperation with domestic capability:** India should cooperate with global science, capital and talent while simultaneously building **domestic technological and manufacturing capacity**.

Pichavaram mangroves valued at ₹2,485 crore: study

K.C. Deepika
BENGALURU

How valuable are mangroves? A recent study of the Pichavaram mangrove ecosystem in Tamil Nadu estimated its total economic value (TEV) at ₹2,485.38 crore, with a per-hectare value of ₹1.83 crore, reflecting the ecological, economic, and social benefits it provides.

The Pichavaram Mangrove Forest is deemed one of the most ecologically significant coastal wetland ecosystems in India and plays a vital role in supporting biodiversity conservation, fisheries productivity, coastal protection, climate regulation, blue carbon sequestration, and livelihood security for coastal communities.

"Mangrove ecosystems provide a wide range of provisioning, regulating, supporting, and cultural ecosystem services that contribute significantly to ecological sustainability and human well-being. Despite their importance, many ecosystem services remain undervalued in conventional development planning because several ecological benefits are non-market in nature and are not reflected in market transactions," says the study "Economic valuation and blue carbon assessment of ecosystem services (ESV) in the Pichavaram Mangrove Forest".

Green gold: Pichavaram Mangrove Forest is a highly significant coastal wetland ecosystem in India. FILE PHOTO

The study, by M. Balasubramanian, Associate Professor, Centre for Ecological Economics and Natural Resources, Institute for Social and Economic Change, Bengaluru, was funded by the Deputy Conservator of Forests, Forest Genetics Division, Coimbatore. It was based on primary and secondary data; primary information was collected from 302 households across five mangrove-dependent villages: MGR Thittu, Kalaignar Nagar, Chinnavaikal, Patriadi, and Mudasalodai.

Carbon sink

"The blue carbon assessment highlights the critical role of the Pichavaram mangroves as a significant natural carbon sink and a valuable climate regulation asset," says the study.

The analysis further revealed that mangrove sediments constitute an even more substantial carbon reservoir. The average soil organic carbon stock of 251.14 tonnes of carbon per hectare was estimated to generate an economic value of ₹90.24 lakh per hectare, resulting in a total soil organic carbon value of ₹1,224.63 crore. When vegetation and soil carbon pools are combined, the total blue carbon asset value of the Pichavaram Mangrove Ecosystem is estimated at ₹1,612.40 crore

The study recommends the integration of ecosystem service valuation into coastal development planning and environmental decision-making, the recognition of mangroves as key nature-based solutions for climate adaptation and disaster risk reduction, and the development of blue carbon financing mechanisms, carbon credit programmes, and Payment for Ecosystem Services schemes.

Which of the following best explain(s) the rationale for protecting mangrove ecosystems in the context of climate resilience ?

1. Mangroves reduce tidal energy and store freshwater, making them ideal sites for paddy cultivation in saline estuarine belts.
2. Their salt-sensitive roots filter seawater, making mangroves key to converting coastal land into freshwater aquaculture zones.
3. By withstanding tidal surges and offering biomass resources, mangroves function both as natural bio-shields and livelihood bases for rural communities.

Select the answer using the code given below :

(a) 1 only

(b) 1 and 2

(c) 2 and 3

(d) 3 only

4. Pichavaram Mangroves Valued at ₹2,485 Crore: Study

Source: *The Hindu*
Subject: GS-3 — Environment | Mangroves | Blue Carbon | Ecosystem Services | Climate Resilience

Context: A study has estimated the **Total Economic Value (TEV) of the Pichavaram mangrove ecosystem in Tamil Nadu at ₹2,485.38 crore**, highlighting the often-unaccounted economic value of mangrove ecosystem services.

1. Mangroves: Ecosystem and Ecological Characteristics

● **Mangroves** are salt-tolerant forests found mainly in **intertidal zones** of tropical and subtropical coasts, particularly around estuaries, creeks, lagoons, backwaters and mudflats.

● They form a natural transition between **terrestrial and marine ecosystems** and are adapted to **salinity, tidal fluctuations, waterlogged conditions and oxygen-deficient soils**.

● Their specialised roots stabilise sediments and allow them to survive in conditions unsuitable for most terrestrial vegetation.

● In India, mangroves occur along **9 coastal States and 4 Union Territories**; the **ISFR 2023** recorded **4,991.68 sq. km** of mangrove cover.

2. Why Mangroves Are Important

● **Coastal protection:** Mangroves act as natural **bio-shields**, reducing the impact of **cyclones, storm surges, waves, coastal erosion and flooding**.

● **Blue-carbon storage:** Mangroves capture and store carbon in both **vegetation and, importantly, waterlogged sediments**, making them highly significant for climate mitigation.

● **Biodiversity:** They provide **breeding, feeding and nursery grounds** for fish, shellfish, crustaceans, molluscs and several other species.

● **Fisheries and livelihoods:** Healthy mangroves support **fisheries and coastal communities** dependent on fishing and other ecosystem-based activities.

● **Sediment stabilisation:** Their extensive root systems trap sediments, help **stabilise shorelines and promote land accretion**.

● **Water-quality regulation:** Mangrove ecosystems can trap sediments and pollutants, contributing to the **regulation and purification of coastal waters**.

● **Economic services:** They provide resources and opportunities associated with **fisheries, forest products, tourism and other livelihood activities**.

3. Pichavaram Study: Economic Value of Ecosystem Services

● The study estimated the **Total Economic Value of Pichavaram at ₹2,485.38 crore**, equivalent to approximately **₹1.83 crore per hectare**.

● The assessment demonstrates that mangroves generate substantial **provisioning, regulating, supporting and cultural ecosystem services**, many of which do not have conventional market prices.

● **Blue carbon constitutes a major component:** vegetation and soil carbon together were estimated to have a value of approximately **₹1,612.40 crore**.

● **Soil carbon is particularly significant:** average soil organic carbon was estimated at **251.14 tonnes per hectare**, generating an economic value of about **₹90.24 lakh per hectare**.

● The study therefore demonstrates that the economic value of a mangrove ecosystem extends far beyond directly marketable products.

4. Significance for India's Environmental Policy

● **Natural infrastructure:** Mangroves can perform functions that would otherwise require expensive physical infrastructure for coastal protection.

● **Climate adaptation:** Their role as coastal bio-shields makes them important for reducing vulnerability to **extreme weather and sea-level rise**.

● **Climate mitigation:** Protection of mangrove carbon stocks contributes to **carbon sequestration and climate goals**.

● **Natural-capital accounting:** Monetary valuation can make ecosystem services visible in **development planning, environmental decision-making and cost–benefit analysis**.

● **Blue economy:** Sustainable use of mangrove-linked resources can support **coastal livelihoods and economic activity** without undermining ecological functions.

5. Conservation and Policy Measures

● **MISHTI:** The **Mangrove Initiative for Shoreline Habitats & Tangible Incomes**, launched in 2023, seeks to restore and promote mangroves while enhancing coastal sustainability and livelihoods.

● **Regulatory protection:** Mangroves receive protection through instruments including the **Coastal Regulation Zone Notification, 2019**, under which mangrove areas are treated as ecologically sensitive.

● **Restoration:** Conservation should prioritise **ecologically suitable sites**, considering tidal flows, salinity, sediment conditions and freshwater availability rather than plantation targets alone.

● **Community participation:** Local communities and their **traditional ecological knowledge** should be incorporated into restoration and long-term management.

BUNIA

Congo's Ebola outbreak shows no signs of slowing; deaths top 3,000

AFP

Congo's Ebola outbreak has killed more than 3,000 people out of over 6,100 cases, the government data showed on Wednesday, as the disease is spreading at an unprecedented speed, faster than efforts to slow it. It was declared a global health emergency in May and remains the fastest-growing outbreak of Ebola ever. AP

5. Congo's Ebola Outbreak Shows No Signs of Slowing

Source: *The Hindu*
Subject: GS-2 — Health | Global Health Security | Epidemic Management

Context: An Ebola outbreak in the **Democratic Republic of the Congo (DRC)** has crossed **3,000 deaths and 6,100 confirmed cases**, with transmission expanding faster than containment efforts.

1. Ebola Virus Disease — Basics

● **Ebola Virus Disease (EVD)** is a severe viral disease that can cause **fever, weakness, diarrhoea, vomiting and bleeding**, with a high case-fatality rate.

● It spreads mainly through **direct contact with blood or other bodily fluids of infected people**, particularly during caregiving and unsafe burial practices.

● The present outbreak is caused by the **Bundibugyo virus**, a species of Ebola for which there is currently **no specifically approved vaccine or treatment**.

2. Current Outbreak in DRC

● As of the latest government figures, DRC has recorded **6,186 confirmed cases and 3,007 deaths** since the outbreak was declared in **May 2026**.

● The outbreak has spread across **six provinces**, with **Ituri** remaining a major centre of transmission and cases also emerging in **North Kivu**.

● The outbreak has become **DRC's deadliest Ebola outbreak**, with the rapid expansion raising concerns about a wider regional health emergency.

3. Why Containment Is Difficult

● **Weak surveillance and contact tracing:** Only a small proportion of new cases are linked to known contacts, indicating that many transmission chains remain undetected.

● **Conflict and insecurity:** Violence and attacks on health workers restrict access to affected communities and disrupt disease-control operations.

● **Poor health infrastructure:** Limited treatment capacity, logistics and healthcare access delay diagnosis and isolation.

● **Population mobility:** Movement of miners and communities increases the possibility of transmission between health zones and across borders.

● **Community disruption:** Schools, transport and routine healthcare services are also being affected by the outbreak.

4. Response and Global Health Significance

● **Vaccination:** DRC has begun administering **Ervebo**, a vaccine approved for the Zaire Ebola virus, to frontline workers while its effectiveness against Bundibugyo virus is assessed.

● **International coordination:** The **World Health Organization (WHO)** and Africa Centres for Disease Control and Prevention are supporting surveillance, vaccination and containment efforts.

● **Regional risk:** Cross-border movement creates risks for neighbouring countries, making **early detection, border surveillance and information-sharing** essential.

● **Global health security:** The outbreak demonstrates that epidemic control depends not only on vaccines and medicines but also on **functional health systems, surveillance, community trust and rapid international support**.

What's the reason behind the sudden surge in onion prices?

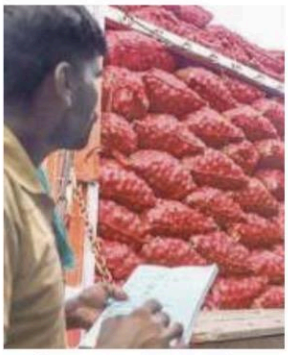
EXPLAINER

A. M. Jigeesh
NEW DELHI

The story so far: Days after sugar prices increased sharply, the price of onion, an essential commodity whose prices are considered a politically sensitive topic, nearly doubled from last year's.

On September 1, the all-India average price was ₹49.59 a kg, registering an over 74% increase from ₹28.48 on the corresponding day in 2025.

On August 1, the price was ₹35.47 a kg. In Kolkata and Chennai, the price has now reached ₹60. What has worried the Centre is the fact that over the past two weeks, the price has gone beyond ₹70 in certain retail markets, particularly in North India. This increase is unprecedented, and according to some officials, has left the Centre searching for reasons behind this surge, as the Opposition says the government has failed to curb the price rise of essentials.



Big farmers, traders try to keep the stock in cold storage, hoping to release it at better prices. PTI

What could be reason for the increase?

The production of onion is estimated at 307.37 lakh tonnes (lt) in 2025-26, which is in line with the previous year's production of 307.67 lt. The production is adequate for the domestic consumption and for export, which comes to about 15 lt. However, industry sources claim that the quality of onions, particularly after the delay in the rain and the subsequent delay in harvest in Maharashtra (the largest onion producing State), was not up to the standard. The fact that quality onions are less than last year is considered a reason for the price rise.

Historically, according to the government, onion prices have exhibited a seasonal uptick and volatility from August-September owing to increased demand during festive season, weather, supply-chain movements, and other demand conditions.

This year, as soon as the price of sugar increased, there was a tendency not to release the onion stocks, particularly among the big traders. Union Agriculture Minister Shivraj Singh Chouhan and Union Consumer Affairs Secretary Nidhi Khare have outlined hoarding and black marketeering as the reasons for the sudden increase in the prices of onion.

What steps are being taken to ease the prices?

As it is natural for traders and big farmers to look for better prices of what they produce and sell, the government says that it was expecting such a problem in the case of onions. Big farmers and big traders try to keep the stock in cold storage, hoping to release it when prices are right.

To counter this, the government has started a calibrated release of onion from its buffer stocks. It is selling onions at ₹35 a kg, to give a message to the consumer that it is the real price of onion and put pressure on those hoarding it, a senior official said.

6. Why Has There Been a Sudden Surge in Onion Prices?

Source: *The Hindu*
Subject: GS-3 — Agriculture | Food Inflation | Price Stabilisation | Supply Chain

Context: Onion prices have risen sharply despite **adequate estimated production**, highlighting the role of **seasonality, delayed harvest, quality concerns and withholding of stocks** in creating short-term supply pressure.

1. Current Price Situation

● The **all-India average onion price reached ₹49.59/kg on September 1, 2026**, compared with **₹28.48/kg** on the same day in 2025 — an increase of over **74%**.

● The price was **₹35.47/kg on August 1**, while retail prices in **Kolkata and Chennai have reached around ₹60/kg** and crossed ₹70/kg in some markets.

2. Production Is Not the Main Problem

● Onion production for **2025–26 is estimated at 307.37 lakh tonnes**, almost the same as **307.67 lakh tonnes in 2024–25**.

● Therefore, the problem is not necessarily an overall production shortage but **temporary market availability and supply management**.

● The government estimates that production is adequate for domestic consumption as well as exports.

3. Why Are Prices Rising?

● **Delayed harvest:** Delayed rains affected harvesting in **Maharashtra**, the largest onion-producing State, restricting immediate market arrivals.

● **Quality concerns:** Excessive/delayed rainfall affected onion quality, while the availability of good-quality onions is lower than last year.

● **Seasonal demand:** Onion prices normally become volatile during **August–September** because of increased demand during the festive season and changes in supply.

● **Stock withholding:** Large farmers and traders have reportedly retained stocks in **cold storage**, expecting higher prices later.

● **Hoarding and speculation:** The government has attributed part of the sudden increase to **hoarding and black-market activity**, which can artificially restrict market supply.

4. Government Response

● The government has begun **calibrated release of onion buffer stocks** to increase market availability and moderate prices.

● Buffer onions are being sold at **₹35/kg** through government-supported channels to provide relief to consumers and discourage excessive price expectations.

● The intervention aims to address the immediate **supply–price mismatch** rather than a fundamental shortage of onions.