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**“Peace does not come
to the man who refuses
to declare war on what
is destroying him.”**

— Seneca



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Today's Current Affairs | 6 October 2026

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1. Optogenetics: a new medicine for 'controlling' neurons with light

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Nicobar

6 | चिक

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र SC

Medicine Nobel: Optogenetics

चिकित्सा नोबेल

Trio wins medicine Nobel for 'controlling' neurons with light

The Hindu Bureau
CHENNAI

A trio of scientists was on Monday declared the winners of the 2026 Nobel Prize in Physiology or Medicine for discoveries leading to a technique called optogenetics, which allows scientists to control select nerve cells using light.

The Nobel Assembly said the work of the laureates — Karl Deisseroth, Peter Hegemann, and Georg Nagel — allowed neuroscience to move beyond observing correlations and testing how particular neurons and neural circuits are related to different behaviours and emotions. Today, optogenetics helps scientists study schizophrenia, depression, Alzheimer's and Parkinson's diseases, and test treatments to restore vision and hearing loss.

In the 1990s, Mr. Hegemann, now at Humboldt University in Berlin, and his team found that shining light on a microscopic alga called *Chlamydomonas* rapidly triggered an electric signal within its body. He reasoned that the molecule involved in detecting light might be, or linked to, a protein that less certain charged ions enter cells.

Optogenetics technique: The team of Mr. Deisseroth, who is at the Stanford University in U.S., published its first major result in 2005 using rat neurons, and a year later, the technique had its name: optogenetics.

In 2007, Mr. Deisseroth's group stimulated specific neurons in the brain of mice with light sent through a slender fibre-optic cable, mirroring

Bright minds

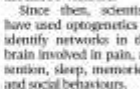
The trio won the Nobel for contributions towards optogenetics, which helps in the study of schizophrenia, depression, and Alzheimer's disease



Peter Hegemann
Humboldt University of Berlin, Germany



Karl Deisseroth
Stanford University, U.S.



Georg Nagel
University of Würzburg, Germany

the mice's whiskers. Since then, scientists have used optogenetics to identify networks in the brain involved in pain, attention, sleep, memories, and social behaviours.

Around 2000, Mr. Hegemann approached Mr. Nagel, currently at the University of Würzburg in Germany, who confirmed the idea in an experiment. The team identified two proteins that were channels, and they opened when exposed to light. Mr. Hegemann and Mr. Nagel showed that putting the gene for this protein in mammal cells also made them sensitive to light.

At Stanford University, Mr. Deisseroth realised this discovery could transform the way scientists study the brain. Genetic methods could make sure the protein was associated with a specific set of neurons, while light could turn those neurons on or off.

The laureates will share the prize, worth 12 million Swedish kronor (₹1.5 crore), equally.

• NOBEL MEDICINE PRIZE 2026

How scientists used light to control brain cells



ANONNA DUTT

THE NOBEL Prize in Physiology and Medicine for 2026 was jointly awarded to Karl Deisseroth, Peter Hegemann and Georg Nagel for their discovery of an alga protein that reacts to light and its use as a switch to study the functions of nerve cells.

Their explorations led to the creation of a new field of study called optogenetics, which may finally help scientists understand how the brain forms memories, feelings and behaviours.

"We were able to precisely pace the heart and look at the effects that different heart rates have on brain states... Communication across the body, from the body to the brain, but with the precision of a gain of function in a peripheral organ allowing us to see the effects on brain and behavioural state... this ability to execute a precision intervention in one organ and read out the effects in complex behaviours — this is something that people have wanted for a long time to be able to do," said Deisseroth.

In simple terms, they found a way to control cells with light. Imagine that the brain is a vast electrical network containing billions of tiny cells called neurons. These neurons communicate by sending electrical signals, allowing us to move, see, remember, feel pain and experience emotions. Deisseroth, Hegemann and Nagel helped scientists develop a remarkable way of controlling these electrical signals: using light.

Their research led to the discovery and

• 'For their discoveries concerning light-gated ion channels and optogenetics'



"Optogenetics... fundamentally altered our understanding of the brain," the press release said. It credited the three for ushering in a new era in neuroscience.

ON TUESDAY: NOBEL PRIZE IN PHYSICS



KARL DEISSEROTH, 54
The Howard Hughes Medical Institute and Stanford University



PETER HEGEMANN, 71
Humboldt University of Berlin, Germany



GEORG NAGEL, 73
University of Würzburg, Germany

The work laid the foundation for optogenetics, which has expanded knowledge of how the brain functions, and could help develop new therapies

How does it help to study the brain?

"Imagine the brain to be a building with lots and lots of rooms — now there was no way for us to know what happens if the light is switched on in just one room. Optogenetics has given us an extremely powerful way to switch on and off the neurons and see what happens. It has allowed us to manipulate nerve cells and study its effects with an unprecedented level of precision. It has completely changed the scale at which discoveries are happening in neurosciences," said Vidita Vaidya, senior professor at the Tata Institute of Fundamental Research.

Optogenetics is still largely used in laboratories to see which set of neurons regulates what type of behaviour in animals, helping scientists look into the black box. Vaidya says, Dr Sanjeev Kumar Mahito, professor at IIT BHU, said it has allowed scientists to see the functions of the brain and enhance the understanding of what causes certain conditions.

Deisseroth's research group introduced the gene for ChR2 in 2006 and successfully used light to activate neurons and control the movements of mouse whiskers. The same year, he used the technique to wake sleeping mice by manipulating a recently discovered type of nerve cell that was suspected to control wakefulness. His team also studied the brains of mice as they experienced fear, and noted which nerve cells appeared to form memory. When they later reactivated these nerve cells, the mice showed signs of fear, despite not being in danger at the time.

What kind of therapies are being developed based on this field?

There are ongoing clinical trials on restoring vision in people who have become blind due to *retinitis pigmentosa*, a disease that damages the light-sensitive cells in the retina.

Why the field matters

'Optogenetics has given us an extremely powerful way to switch on and off the neurons and see what happens.'

It has allowed us to manipulate nerve cells and study its effects with an unprecedented level of precision,' said

Dr. Hegemann. For reference, it takes 10 milliseconds for the human eye to react to light. Hegemann wondered, how could the response to light be more than 20 times faster in *Chlamydomonas*?

He hypothesised that a single protein complex both captured light and acted on it in the alga as opposed to the multi-step process in the human eye. Yet, finding this protein was a challenge because when the proteins in the algal eyespot were removed from their natural setting, they became unstable and easily damaged. This is when he discovered that Japanese researchers had mapped the DNA of *Chlamydomonas*, among which were the codes for two genes that shared similarities with light-capturing proteins.

Enter Nagel. He used egg cells of frogs to express the two proteins and confirm Hegemann's hypothesis. The alga detected and reacted to light using the protein channelrhodopsin-2 (ChR2). They then introduced the cells in different types of cells and found that they all became light sensitive.

Deisseroth found that ChR2 could control the activity of specific nerve cells in the

What is optogenetics?

It is a field of research that uses light to manipulate the activity of neurons or other types of cells and study the resulting effects. This is done by expressing the light-sensitive protein in the targeted cells. Within the brain, it has contributed towards identifying neural circuits responsible for sensing pain, social behaviours, thirst, food consumption, reward and attention or the understanding of how memories are created.

Interestingly, the field rests on a theory proposed by Francis Crick, the molecular biologist who was behind the discovery of the double helix structure of DNA, and was awarded the Nobel prize for it.

He envisioned activating individual nerve cells in the brain to investigate the mechanisms that underlie human consciousness. With nerve signals being extremely rapid, he realised it would only be possible if scientists were somehow able to manipulate the nerve cells with light. He himself admitted that the idea sounded far-fetched.

But it was made possible by the work of

Medicine Nobel 2026: Controlling Neurons with Light

चिकित्सा नोबेल 2026: प्रकाश से न्यूरॉन नियंत्रित करने वाली “ऑप्टोजेनेटिक्स” तकनीक को सम्मान



Optogenetics
ऑप्टोजेनेटिक्स

1 The winners | विजेता



Laureate विजेता	From संस्थान
Karl Deisseroth (54)	Stanford Univ., USA अमेरिका
Peter Hegemann (71)	Humboldt Univ., Berlin जर्मनी
Georg Nagel (73)	Univ. of Würzburg जर्मनी

2 The discovery | खोज



- ▶ Light-sensitive protein found in alga **Chlamydomonas**
शैवाल **क्लैमाइडोमोनास** में
- ▶ Protein = **ion channel** that opens with light
(**channelrhodopsin**)
प्रकाश से खुलने वाला चैनल
- ▶ Gene put into neurons → **switch them on/off with light**
प्रकाश से न्यूरॉन चालू/बंद

3 Prize facts | पुरस्कार तथ्य



12 mn SEK
≈ ₹11.5 crore
राशि

Equal

Shared three
ways
बराबर

2005

First
optogenetics
result
पहला परिणाम

Karolinska

Nobel Assembly
नोबेल सभा

Medicine Nobel: Optogenetics — in depth (1/2)

चिकित्सा नोबेल — विस्तार से (1/2)

4 Uses | उपयोग



- ▶ Study **depression, schizophrenia, Alzheimer's, Parkinson's**
मानसिक व तंत्रिका रोग
- ▶ Map circuits for **pain, sleep, memory, thirst**
दर्द, नींद, स्मृति
- ▶ Trials to restore **vision** (retinitis pigmentosa) & **hearing**
दृष्टि व श्रवण

5 Key terms | प्रमुख शब्द



Term शब्द	Meaning अर्थ
Neuron	Nerve cell sending electric signals तंत्रिका कोशिका
Ion channel	Gate letting charged ions in आयन द्वार
Optogenetics	Opto (light) + genetics प्रकाश + आनुवंशिकी

6 The idea's origin विचार का स्रोत



- ▶ Proposed by **Francis Crick** (DNA double helix)
फ्रांसिस क्रिक
- ▶ Nerve signals too fast — only **light** could control them
केवल प्रकाश ही तेज़
- ▶ 2007: mice **whiskers moved** with fibre-optic light
चूहों पर प्रयोग

Medicine Nobel: Optogenetics — in depth (2/2)

चिकित्सा नोबेल — विस्तार से (2/2)

7 How optogenetics works | ऑप्टोजेनेटिक्स कैसे काम करती है



Alga gene
शैवाल जीन

Light protein
प्रकाश प्रोटीन



Insert in neurons
न्यूरॉन में

Via virus
वायरस द्वारा



Shine light
प्रकाश डालें

Fibre optic
फाइबर



Neuron fires
न्यूरॉन सक्रिय

See behaviour
व्यवहार देखें

8 Did you know? क्या आप जानते हैं?



- ▶ 2025 Medicine Nobel: **immune tolerance** (Sakaguchi, Brunkow, Ramsdell)
प्रतिरक्षा सहनशीलता
- ▶ Physics Nobel announced **Tuesday**
भौतिकी नोबेल मंगलवार को

SC on Great Nicobar

ग्रेट निकोबार पर SC

SC refuses to stay proceedings against Nicobar project

Krishnadas Rajagopal
NEW DELHI

Saying that “preservation of culture is a constitutionally protected fundamental right”, the Supreme Court on Monday refused to agree with a Union government plea to stay Calcutta High Court proceedings in a petition filed by former Union Environment Secretary Meena Gupta challenging the Great Nicobar Island Project as a threat to the area’s fragile ecosystem and Forest Rights Act, 2006.

A three-judge Bench headed by Chief Justice of India Surya Kant instead urged the Calcutta High Court to hear the case and decide the issues without delay.

Appearing for the Centre, Attorney-General R. Venkataramani and Ad-

ditional Solicitor-General Aishwarya Bhati said the project worth over ₹72,000 crore involving a container terminal was of “immense” national importance and strategic value.

‘No loss of habitat’

Mr. Venkataramani said there was “no loss of habitation” for the indigenous tribal population like the endangered Shompen tribe of the Great Nicobar Island.

Ms. Bhati submitted that the National Green Tribunal (NGT) had already twice disposed of the apprehensions raised regarding the project.

It had cleared the environmental clearance given to the project, subject to conditions and the formation of a High Powered Committee to re-examine



specific ecological impacts. She said even a review against the environmental clearance was rejected by the NGT subsequently in April 2023.

Environmental threats

However, the Calcutta High Court had entertained writ petitions claiming that the project violated the Forest Rights Act, 2006, and highlighting severe environ-

mental threats it may allegedly cause.

Justice Joymya Bagchi, on the Bench along with Justice V. Mohana, said there should be some degree of filtration between what constitutes the security of the state and what involved commercial interests.

“Preservation of culture is a constitutionally protected fundamental right. When you are talking about tribe cultures in Nicobar ecology... tribe culture requires constitutional protection,” he observed orally.

In May, the High Court dismissed the Union government’s preliminary objections regarding the *locus standi* of Ms. Gupta, banking on the submission that she was not a local. The High Court had scheduled the case for Novem-

ber 25 and November 26 for hearing constitutional issues centring on fundamental rights and preservation of the tribals’ way of life.

Senior advocate S. Muralidhar, for Ms. Gupta, said the Centre’s argument in maintainability of the writ petitions before the High Court has become academic as the tribal councils have already been impleaded.

Maintainability worry

Mr. Venkataramani said the tribes were integrated, and were not in the protected category.

“There is a lot of international...” he said.

“The Shompen are classified as a Particularly Vulnerable Tribal Group,” Mr. Muralidhar intervened.

The Shompen and the Nicobarese tribes are said

to be affected by the project.

The Bench said the Union government could place the NGT decisions, with whatever persuasive value they may command, before the High Court.

Mr. Venkataramani urged the top court to at least allow the Centre to continue pressing the question of maintainability before the High Court.

But the Bench said it would limit itself to asking the High Court Chief Justice to decide the case, including all the petitions, without delay.

The petitions in the High Court had claimed that the diversion of over 130 sq. km of pristine tropical forest violated the Forest Rights Act, 2006, and threatened the Shompen and Nicobarese way of life and culture.

SC Refuses to Stay Proceedings Against Nicobar Project

सुप्रीम कोर्ट: ग्रेट निकोबार परियोजना के खिलाफ हाई कोर्ट की सुनवाई पर रोक नहीं



“Culture is a
fundamental right”
“संस्कृति मौलिक
अधिकार”

1

What SC said
SC ने क्या कहा



- ▶ Refused Centre's plea to stay **Calcutta HC** case
रोक से इनकार
- ▶ “**Preservation of culture** is a fundamental right”
संस्कृति का संरक्षण
- ▶ Bench: **CJI Surya Kant**,
Justices **Bagchi & Mohana**
CJI सूर्यकांत

2

Petitioners' concerns
याचिकाकर्ता



- ▶ Ex-Environment
Secretary **Meena Gupta**
मीना गुप्ता
- ▶ **130+ sq km** of tropical
forest diverted
130 वर्ग किमी वन
- ▶ Violates **Forest Rights**
Act, 2006; threat to
Shompen
वन अधिकार अधिनियम

3

Centre's case
केंद्र का पक्ष



- ▶ **₹72,000 cr+** project –
strategic value
सामरिक महत्व
- ▶ “**No loss of habitat**” for
tribes
आवास की हानि नहीं
- ▶ NGT cleared it (review
rejected **April 2023**)
NGT मंजूरी

AND THE PERILS

- **Over 8.5 lakh trees** to be **felled** over an area of **130 sq kms**
- Destruction of tropical rain-forests in Galathea National Park, home to **648 species of flora** and **330 species of fauna**, including Nicobar's **wild pig**, **tree shrew**, the Great Nicobar crested serpent eagle, Nicobar paradise flycatcher and the Nicobar **megapode**.
- **Threat to the Shompen tribe:** Proposed project areas have been important foraging grounds for the hunter-gatherer nomadic community.

- Threat to nesting sites of iconic species like **Giant leatherback turtle** and the **Nicobar megapode**.



- **Threat to coral and marine ecosystem:** ZSI reported presence of 117 species of scleractinian corals in Galathea. But the Environment Impact Assessment of the project states that there is no coral located in the Galathea Bay region.
- Threat to **Dugongs** due to loss of seagrass meadows, rising anthropogenic activities.



SC on Great Nicobar — in depth (1/2)

ग्रेट निकोबार पर SC — विस्तार से (1/2)

4 The project | परियोजना

- ▶ **International Container Transshipment Terminal at Galathea Bay**
गैलेथिया खाड़ी
- ▶ **Greenfield airport, power plant, township**
हवाई अड्डा, बिजली संयंत्र
- ▶ **Near Malacca Strait — key shipping route**
मलक्का जलडमरूमध्य

5 The tribes | जनजातियाँ

- ▶ **Shompen — a PVTG, hunter-gatherers**
शोम्पेन — PVTG
- ▶ **Nicobarese — coastal community**
निकोबारी
- ▶ **Tribal councils now part of the case**
जनजातीय परिषदें

6 Ecology at risk पारिस्थितिकी

- ▶ **Great Nicobar Biosphere Reserve (UNESCO MAB, 2013)**
जैवमंडल रिज़र्व
- ▶ **Leatherback turtle nesting, coral reefs**
लेदरबैक कछुआ
- ▶ **Seismic zone (2004 tsunami)**
भूकंप संभावित

SC on Great Nicobar — in depth (2/2)

ग्रेट निकोबार पर SC — विस्तार से (2/2)

7 What happens next | आगे क्या



Petitions
याचिकाएँ

Calcutta HC
कलकत्ता HC



SC: no stay
रोक नहीं

Decide quickly
शीघ्र फैसला



Hearing
सुनवाई

25–26 Nov
नवंबर



Balance
संतुलन

Security vs rights
सुरक्षा बनाम अधिकार

8 Did you know? क्या आप जानते हैं?



► **Indira Point** – India's southernmost tip – is on Great Nicobar

इंदिरा पॉइंट

► **Six Degree Channel** separates it from Indonesia

छह डिग्री चैनल

MP defends plan by simultaneous polls panel to meet CJJ

The Hindu Bureau New Delhi

Intending the study into the Supreme Court to be the apex body for the study, the MP said, the panel will be headed by the Chief Justice of India, and the panel will be composed of members of the Supreme Court and members of the Lok Sabha and Rajya Sabha. The panel will be constituted by the President of India.

The panel will be constituted by the President of India, and the panel will be composed of members of the Supreme Court and members of the Lok Sabha and Rajya Sabha. The panel will be constituted by the President of India.

More demands on U.S. deal 'very difficult': Sitharaman

The Hindu Bureau New Delhi

Finance Minister Nirmala Sitharaman said on Thursday that the Indian government is not ready to make any concession on the issue of trade and investment. She said that the Indian government is not ready to make any concession on the issue of trade and investment.

She said that the Indian government is not ready to make any concession on the issue of trade and investment. She said that the Indian government is not ready to make any concession on the issue of trade and investment.

Delhi Police file FIR against those seeking action against ACP

The Hindu Bureau New Delhi

Delhi Police has filed an FIR against a group of people who were demanding the removal of the then Deputy Commissioner of Police (ACP) from his post. The FIR was filed under the provisions of the Indian Penal Code.

The FIR was filed under the provisions of the Indian Penal Code. The FIR was filed under the provisions of the Indian Penal Code.

THE HINDU • 6 OCT 2026

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पृष्ठ 4 • समाचार

Articles covered from this page | इस पृष्ठ से लिए गए लेख

1. Switzerland agree to expand defence, nuclear cooperation: Modi

The Hindu Bureau New Delhi

Prime Minister Narendra Modi said on Thursday that India and Switzerland have agreed to expand their defence and nuclear cooperation. He said that the agreement will be signed by the two countries.

He said that the agreement will be signed by the two countries. He said that the agreement will be signed by the two countries.

2. SC: 24-hour monitoring cells to sexual offences, SC tells police

The Hindu Bureau New Delhi

The Supreme Court has directed the police to set up 24-hour monitoring cells for sexual offences. The court said that the police should ensure that the victims are not harassed and that the offenders are not released.

The court said that the police should ensure that the victims are not harassed and that the offenders are not released. The court said that the police should ensure that the victims are not harassed and that the offenders are not released.

1 India-Switzerland ties | भारत-स्विट्ज़रलैंड

2 SC: 24-hour monitoring cells | 24 घंटे निगरानी

Plea in SC asks whether States can redraw wards during Census

The Hindu Bureau New Delhi

A plea has been filed in the Supreme Court asking whether the States can redraw the wards during the Census. The plea was filed by a group of people who were demanding that the States should not be allowed to redraw the wards.

The plea was filed by a group of people who were demanding that the States should not be allowed to redraw the wards. The plea was filed by a group of people who were demanding that the States should not be allowed to redraw the wards.

BIP releases list of 8 candidates for Rajya Sabha polls

The Hindu Bureau New Delhi

The Bharatiya Janata Party (BJP) has released the list of eight candidates for the Rajya Sabha polls. The candidates are: [List of names]

The candidates are: [List of names]. The candidates are: [List of names].

Free speech case: top court may not hear reference on merits

The Hindu Bureau New Delhi

The Supreme Court may not hear the reference on the merits in the Free Speech case. The court said that the reference was not a proper one and that the court should not hear it.

The court said that the reference was not a proper one and that the court should not hear it. The court said that the reference was not a proper one and that the court should not hear it.

India–Switzerland Ties

भारत–स्विट्ज़रलैंड

India, Switzerland agree to expand defence, nuclear cooperation: Modi

The Hindu Bureau
NEW DELHI

India and Switzerland have identified new opportunities for cooperation in areas of defence and nuclear energy, Prime Minister Narendra Modi said, following a bilateral meeting with Swiss President Guy Parmelin on Monday.

Agreements signed by the two sides included one to extend visa durations and student permits.

Mr. Parmelin is in India for a three-day visit to commemorate the first anniversary of the Trade and Economic Partnership Agreement (TEPA) between India and the four-country European Free Trade Association (EFTA), which came into force on October 1, 2025.

"Today, we identified new opportunities for cooperation in military exchanges and defence production," Mr. Modi said in a statement following the meeting. "We also agreed



Swiss President Guy Parmelin and Narendra Modi at a joint press meet at Hyderabad House in New Delhi on Monday. ANI

to further deepen cooperation in nuclear energy."

The two countries also signed an agreement on transport, mobility, and infrastructure. "We invite Swiss infrastructure companies to invest in India at a large scale and participate in capacity building, design, and manufacturing," Mr. Modi said.

Mr. Parmelin is accompanied by a large business delegation, underscoring the Swiss business community's desire to make

the most of the TEPA. However, the Swiss President noted that there are unfinished aspects, which will spur further investments once complete.

"To continue stimulating investment, Switzerland hopes to conclude an investment protection agreement quickly," Mr. Parmelin said. "In this context, it is equally important to achieve results in the discussions on intellectual property protection."

The two countries

signed five agreements, including Memorandums of Understanding (MoU) and Letters of Intent (LoI), across a wide variety of sectors, the External Affairs Ministry said.

Multiple-entry visas

The MoU on Migration and Mobility Partnership "aims to develop migration and mobility cooperation under equal treatment principles, and to prevent and combat irregular migration/human exploitation/trafficking in accordance with national laws," the MEA said.

"It provides for multiple-entry visas for up to 5 years, including stays of up to 6 months on each visit, and renewable 1-year student permits," it added.

The Agreement on the Exchange of Young Professionals covers young people taking up temporary employment in the other country to enhance their professional and language skills within their field.

India, Switzerland to Expand Defence & Nuclear Cooperation

भारत-स्विट्ज़रलैंड: रक्षा व परमाणु ऊर्जा सहयोग बढ़ाने पर सहमति, 5 समझौते



TEPA at 1
TEPA का एक वर्ष

1 The visit | यात्रा



- ▶ Swiss President **Guy Parmelin** – 3-day visit
राष्ट्रपति गाय पारमेलिन
- ▶ Marks **1st anniversary of India–EFTA TEPA** (1 Oct 2025)
TEPA का पहला वर्ष
- ▶ Big **business delegation**
व्यापार प्रतिनिधिमंडल

2 New areas | नए क्षेत्र



- ▶ **Military exchanges & defence production**
रक्षा उत्पादन
- ▶ Deeper **nuclear energy** cooperation
परमाणु ऊर्जा
- ▶ Pact on **transport, mobility, infrastructure**
परिवहन व अवसंरचना

3 Mobility pact आवागमन समझौता



- ▶ **Multiple-entry visas up to 5 years**
5 वर्ष मल्टी-एंट्री वीज़ा
- ▶ Stays up to **6 months** per visit
हर बार 6 माह तक
- ▶ Renewable **1-year student permits**; young professionals scheme
छात्र परमिट

India–Switzerland Ties — in depth (1/2)

भारत-स्विट्ज़रलैंड — विस्तार से (1/2)

4

Swiss asks
स्विस अपेक्षाएँ



- ▶ Quick **investment protection agreement**
निवेश संरक्षण समझौता
- ▶ Progress on **intellectual property protection**
बौद्धिक संपदा
- ▶ India ended old BIT in **2017**
पुरानी BIT 2017 में समाप्त

5

TEPA recap | TEPA
सारांश



\$100 bn

Investment
target
निवेश लक्ष्य

15 yrs

Time frame
अवधि

10 lakh

Direct jobs
रोज़गार

4

EFTA nations
देश

6

Switzerland facts
स्विट्ज़रलैंड



- ▶ Capital **Bern**; currency **Swiss franc**
राजधानी बर्न
- ▶ Policy of **neutrality**; not in EU or NATO
तटस्थता
- ▶ Hosts UN Geneva, WTO, WHO
जिनेवा में संस्थाएँ

India–Switzerland Ties — in depth (2/2)

भारत–स्विट्ज़रलैंड — विस्तार से (2/2)

7 India–Swiss partnership | साझेदारी



1948

Friendship treaty
मैत्री संधि



Mar 2024

TEPA signed
हस्ताक्षर



Oct 2025

TEPA in force
लागू



Oct 2026

Defence, nuclear
रक्षा, परमाणु

8

Did you know?
क्या आप जानते हैं?



► India–Switzerland
Treaty of Friendship:
1948

1948

► Swiss presidency
rotates yearly among 7-
member Federal Council
हर वर्ष बदलती अध्यक्षता

SC: 24-hr Monitoring Cells

24 घंटे निगरानी

Set up 24-hour monitoring cells to curb sexual offences, SC tells police

Aaratrika Bhaumik
NEW DELHI

Underlining the need to take preventive measures against sexual offences, the Supreme Court on Monday asked the Delhi Police to set up 24-hour monitoring cells for continuous surveillance of vulnerable areas. The court also asked the police to strengthen patrolling, particularly around educational institutions and public spaces.

A Bench of Justices J.B. Pardiwala and K. Vinod Chandran observed that the mere installation of CCTV cameras in public spaces would serve little purpose without continuous monitoring to detect suspicious activity and enable a swift police response.

"When we are talking about surveillance through CCTV cameras, how far will they help curb crimes if there is no continuous monitoring at different war rooms? The cameras will



help you in catching hold of the culprit, but how will you prevent such crimes? There has to be a 24-hour cell which keeps monitoring what is happening," the Bench observed.

The court was hearing a *suo motu* case concerning a spate of sexual assault incidents involving minors and women in the Delhi-National Capital Region. It had earlier indicated that it intended to fix accountability on authorities entrusted with preventing crime and protecting vulnerable persons.

"Focus on educational institutions, colleges,

where there are goons [who] keep harassing young girl students. We are also told that there are hundreds of illegal eateries across NCT (National Capital Territory) of Delhi where all anti-social elements get together. Even liquor is provided over there. Start identifying all those vulnerable pockets," the Bench said.

Solicitor General Tushar Mehta, appearing for the Delhi Police, acknowledged that there appeared to be deficiencies in police patrolling.

'Interact with society'

The Bench also pointed to reports that, even prior to the gangrape of a 17-year-old at New Delhi's Astha Kunj Park, near Lady Shri Ram College, residents of the area had repeatedly flagged safety concerns in the locality to the police, but their concerns remained unaddressed.

"It has been reported that before this unfortu-

nate incident occurred, residents of that area had brought it to your notice that there are some anti-social elements who are creating nuisance... Nobody paid any heed to it. Therefore, what is important is one-to-one interaction with society. You are the protector," the Bench said, addressing senior police officers present in court.

Justice Pardiwala also stressed the need to instil a fear of the law among potential offenders as a deterrent against such crimes. Referring to the upcoming festival holidays, he asked the Delhi Police to heighten vigilance to ensure that such incidents did not recur. "You need to create a fright, a fear in the mind of a man who is prone to commit such offences... Unless and until you create that fear, that fright in the minds of those anti-social elements, you will not be able to prevent the commission of such crimes," he said.

Set Up 24-Hour Monitoring Cells to Curb Sexual Offences: SC

सुप्रीम कोर्ट: यौन अपराध रोकने के लिए दिल्ली पुलिस 24 घंटे निगरानी प्रकोष्ठ बनाए



Suo motu case
स्वतः संज्ञान

1 Directions | निर्देश

- ▶ **24-hour monitoring cells** for vulnerable areas
24 घंटे निगरानी
- ▶ More **patrolling** near schools, colleges, public spaces
गश्त बढ़ाएँ
- ▶ Identify **vulnerable pockets** (illegal eateries etc.)

2 Court's key point मुख्य बात

- ▶ **CCTV alone** is not enough – needs live watching
केवल CCTV काफी नहीं
- ▶ Prevent crime, not just **catch culprits**
रोकथाम जरूरी
- ▶ Create **fear of law** among offenders
क्रानून का भय

3 Bench & context पीठ व संदर्भ

- ▶ Justices **J.B. Pardiwala & K. Vinod Chandran**
न्यायमूर्ति पारदीवाला
- ▶ **Suo motu** case on assaults in **Delhi-NCR**
स्वतः संज्ञान
- ▶ Residents' complaints were **ignored** before a gangrape
शिकायतों की अनदेखी

SC: 24-hr Monitoring Cells — in depth (1/2)

24 घंटे निगरानी — विस्तार से (1/2)

4 Key laws | प्रमुख क़ानून

Law क़ानून	About विषय
BNS, 2023	Rape, stalking etc. अपराध
POCSO Act, 2012	Child sexual abuse बाल यौन शोषण
POSH Act, 2013	Workplace harassment कार्यस्थल
Nirbhaya Fund 2013	Women safety projects महिला सुरक्षा

5 Police & State पुलिस व राज्य



- **Police & public order – State List**
राज्य सूची
- Delhi Police is under the **Union Home Ministry**
दिल्ली पुलिस गृह मंत्रालय के अधीन
- **Art 142** lets SC pass orders for complete justice
अनुच्छेद 142

6 Community policing सामुदायिक पुलिसिंग



- **“You are the protector”** – talk to society
“आप रक्षक हैं”
- Act on residents’ complaints **early**
शिकायतों पर तुरंत कार्रवाई
- Extra vigilance in **festival season**
त्योहारों में सतर्कता

SC: 24-hr Monitoring Cells — in depth (2/2)

24 घंटे निगरानी — विस्तार से (2/2)

7 From camera to prevention | कैमरे से रोकथाम तक



CCTV
कैमरा

Public spaces
सार्वजनिक



24-hr cell
निगरानी कक्ष

Live watching
लाइव



Alert
सूचना

Suspicious act
संदिग्ध



**Quick
response**
त्वरित

Police reach
पुलिस पहुँचे

8 Helplines | हेल्पलाइन



► **112** – emergency
(ERSS)

आपातकाल

► **181** – women helpline;
1098 – children

महिला व बाल हेल्पलाइन

World Jobs Crisis

वैश्विक बेरोज़गारी

The looming crisis of world unemployment

A recent World Bank forecast reveals that the global economy stands at the precipice of a silent catastrophe. A recent warning issued by Bank President Ajay Banga is stark: over the coming decade, an astonishing 1.2 billion young men and women in the Global South will reach working age, but the global economy is projected to generate no more than 400 million viable jobs. This creates a staggering deficit of 800 million opportunities in the job market, a demographic chasm of such unprecedented magnitude that it threatens to convert what should be the greatest economic dividend of the 21st century into a catalyst for widespread instability.

A failing blueprint

For decades, economic theorists have championed the demographic dividend as the primary engine for lifting developing nations out of poverty. The formula appeared straightforward: as fertility rates decline, the proportion of working-age adults relative to dependents increases, creating a temporary window of high productivity, elevated domestic savings, and rapid capital accumulation that fuelled the East Asian economic miracle in the late 20th century. Today, however, that classic blueprint is failing. Developing nations such as India are experiencing their youth bulges at a historical moment when the traditional escalators of economic mobility are stalling. The sheer velocity of demographic growth in many countries is outstripping the rate at which domestic markets, infrastructure, and institutional frameworks can absorb new labour, turning the potential dividend into a looming crisis.

Central to the dilemma is the rigid evolution of global trade, technology, and manufacturing. Historically, light manufacturing served as the indispensable bridge for low-income nations transitioning away from subsistence agriculture, absorbing millions of unskilled and semi-skilled workers into productive urban employment. Today, automation, robotics, and advanced industrial software have drastically reduced the labour intensity of manufacturing. As a result, developing nations are experiencing premature deindustrialisation: their manufacturing sectors are losing jobs before reaching the income thresholds of industrial economies of the past. Furthermore, the modern global economy increasingly rewards high-skilled, technology-driven labour, widening the chasm for millions of youth in developing countries who lack access to modern digital infrastructure, quality vocational training, or tertiary education.

There is no easy solution. The World Bank recommends unlocking private sector capital and



Shashi Tharoor

Four-term Member of Parliament (Congress) for Thiruvananthapuram, who served nearly three decades at the United Nations, where he rose to the position of Under-Secretary-General. He has also been Minister of State for External Affairs and for Human Resource Development in the Government of India and is the bestselling author, among others, of 'The India: India and the World of the 21st Century'.

dismantling the regulatory sclerosis that throttles domestic enterprise in many developing economies. Potential entrepreneurs face prohibitive costs of capital, erratic regulatory environments and predatory taxation. Complex legal frameworks and weak property rights scion away long-term foreign direct investment, confining capital to speculative assets rather than employment generating ventures. Simplifying regulatory regimes, establishing transparent governance structures, and bolstering institutional integrity are essential preconditions for creating environments where small and medium-sized enterprises, the main engines of global job creation, can launch, grow, and hire.

India lags here, but does better in improving infrastructure, another key recommendation. A small business cannot compete in global supply chains, nor can it grow locally, if it suffers from routine power failures or exorbitant logistics costs caused by dilapidated roads and port congestion. Modernising physical and digital infrastructure serves a dual economic purpose: the construction and deployment phase itself absorbs massive quantities of immediate labour, while the resulting assets lower the cost of doing business across the economy.

Sector-specific strategies are ideal

Within this broader macroeconomic overhaul, targeted sector-specific strategies offer the most realistic pathway toward mass labour absorption. Agriculture still remains the largest employer in the developing world. Transitioning from low-yield subsistence farming to high value, technology-enabled agri-tech and commercial agribusiness can transform rural economies. By investing in cold-chain logistics, localised food processing, and climate-resilient farming techniques, nations can create sophisticated rural value chains that offer meaningful, remunerative employment to young people, reducing the desperate tide of distress migration to the cities.

Health care and the broader care economy offer other possibilities for employment expansion. The demand for trained health-care workers, nurses, community health personnel, and elder-care specialists is exploding. Investing in health human resources delivers a powerful double dividend: it creates millions of resilient, non-outsourcable domestic jobs (predominantly for young women who are often excluded from formal labour markets) while simultaneously building the human capital necessary to sustain long-term national productivity.

Similarly, tourism and culture offer an extraordinary vehicle for decentralised job creation. Tourism is inherently labour-intensive, engages semi-skilled and unskilled workers and is resistant to total automation. It possesses a

uniquely broad multiplier effect, driving revenues down to local transport providers, hospitality workers, artisans, and historical preservation efforts. Strategic investments in sustainable tourism infrastructure and international destination marketing translates directly into widespread employment.

Manufacturing, too, must be reimagined. Modern light assembly, green transition manufacturing (such as the production of solar components, electric two-wheelers, and energy-efficient materials) and decentralised production networks can still absorb substantial labour if paired with agile skill-building programmes.

History demonstrates that when vast cohorts of educated, energetic, and ambitious young people are denied access to productive economic life, the resulting frustration erodes trust in governments, fuels social polarisation, and creates fertile ground for extremist or criminal ideologies and civil unrest. In an interconnected world, failure to generate livelihoods in the Global South will inevitably accelerate forced migration flows toward the Global North, exacerbating political tensions worldwide.

Preventing prolonged youth unemployment from leading to global catastrophe requires an unprecedented alignment of international finance, domestic political courage, and private sector dynamism. Developed economies and multilateral financial institutions must facilitate affordable, long-term development financing and technology transfers, while developing nations must undertake the hard, often politically painful work of institutional reform. The global economy possesses the financial resources and technological tools required to meet this challenge. But can the international community muster the collective resolve to build an inclusive global order where every young person is afforded a fair opportunity to work, contribute, and thrive? In today's climate this writer would not count on it.

As the world's most populous nation, India sits at the epicentre of this dynamic, adding millions of young entrants to its workforce each year while grappling with an economy that has struggled to match GDP growth with employment creation. The nation's immediate challenge, in a dwindling demographic window, includes matching skills to markets, persistent underemployment, low female labour force participation, and an agrarian sector that still absorbs nearly half the population despite producing just 16% of GDP (FY24). India, with a median age under 30, must move toward labour-absorbing value creation. Otherwise its celebrated demographic dividend could collapse into a demographic disaster.

The Looming Crisis of World Unemployment

वैश्विक बेरोज़गारी का आसन्न संकट – जनसांख्यिकीय लाभांश आपदा न बन जाए



By Shashi Tharoor
शशि थरूर

1

The jobs gap | रोज़गार अंतर



1.2 bn

Youth reach working age
युवा

400 mn

Jobs likely
नौकरियाँ

800 mn

Shortfall
कमी

2

Why the old model fails
पुराना मॉडल क्यों विफल



► Automation & robots cut factory jobs

स्वचालन

► Premature deindustrialisation

समय-पूर्व विऔद्योगीकरण

► Economy rewards high skills

उच्च कौशल की माँग

3

India's challenge
भारत की चुनौती



► Farm sector: ~half of workers, only 16% of GDP

आधे श्रमिक, 16% GDP

► Low female labour participation

कम महिला भागीदारी

► Median age < 30 – window is closing

औसत आयु 30 से कम

World Jobs Crisis — in depth (1/2)

वैश्विक बेरोज़गारी — विस्तार से (1/2)

4 Solutions | समाधान



- ▶ Ease regulation; help **MSMEs** grow
MSME को बढ़ावा
- ▶ Better **infrastructure** & logistics
अवसंरचना
- ▶ **Agri-tech**, food processing, rural value chains
कृषि-तकनीक
- ▶ Labour-heavy sectors: **healthcare, care economy, tourism**
स्वास्थ्य, पर्यटन

5 Key terms | प्रमुख शब्द



Term शब्द	Meaning अर्थ
Demographic dividend	Growth from large working-age group जनसांख्यिकीय लाभांश
Youth bulge	High share of young people युवा उभार
LFPR	Labour force participation rate श्रम बल भागीदारी

6 Risks if ignored अनदेखी का खतरा



- ▶ Frustration, **social unrest**, extremism
सामाजिक अशांति
- ▶ Forced **migration** to the Global North
पलायन
- ▶ Dividend may turn into **demographic disaster**
लाभांश → आपदा

World Jobs Crisis — in depth (2/2)

वैश्विक बेरोज़गारी — विस्तार से (2/2)

7 Dividend or disaster? | लाभांश या आपदा?



Youth bulge
युवा उभार

Many workers
अधिक श्रमिक



Skills
कौशल

Training
प्रशिक्षण



Jobs
रोज़गार

MSMEs, services
MSME



Dividend
लाभांश

Growth
विकास

8 Did you know? क्या आप जानते हैं?



► World Bank President:
Ajay Banga
विश्व बैंक अध्यक्ष अजय बंगा

► India's jobs data: **PLFS**
by **NSO (MoSPI)**
PLFS सर्वे

High demand

The data for the charts were sourced from the the Central Electricity Authority, India Meteorological Department, the Ministry of Power, and the Ministry of Statistics and Programme Implementation

With inputs from Gauri Singavarapu, who is interning with The Hindu Data Team



CHART 1: As per the Central Electricity Authority, 85 out of 191 thermal power plants have critically low coal stock. The chart shows the number of critically low plants at the end of each month

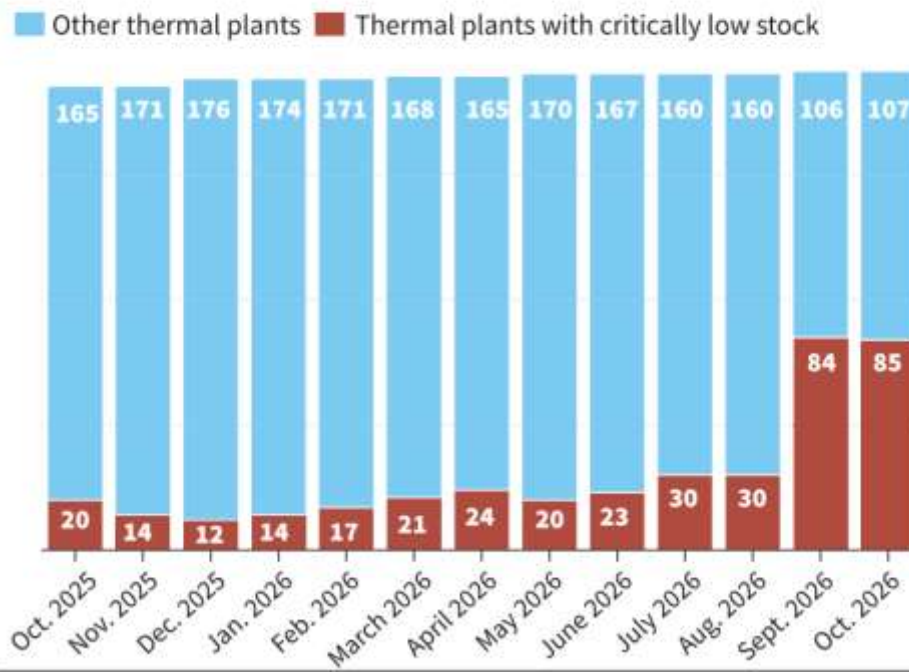


CHART 3: Coal still accounts for most of the energy generation in India. In 2024-25, 79% of total primary energy generation was from coal, as shown below

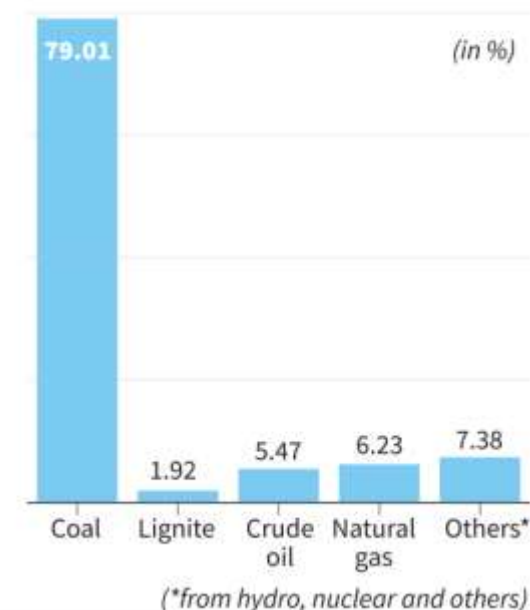


CHART 2: The rainfall departure percentage compares the rain that actually fell against the historical average for that exact location and period. The bars in red show years with moderate to strong El Nino events

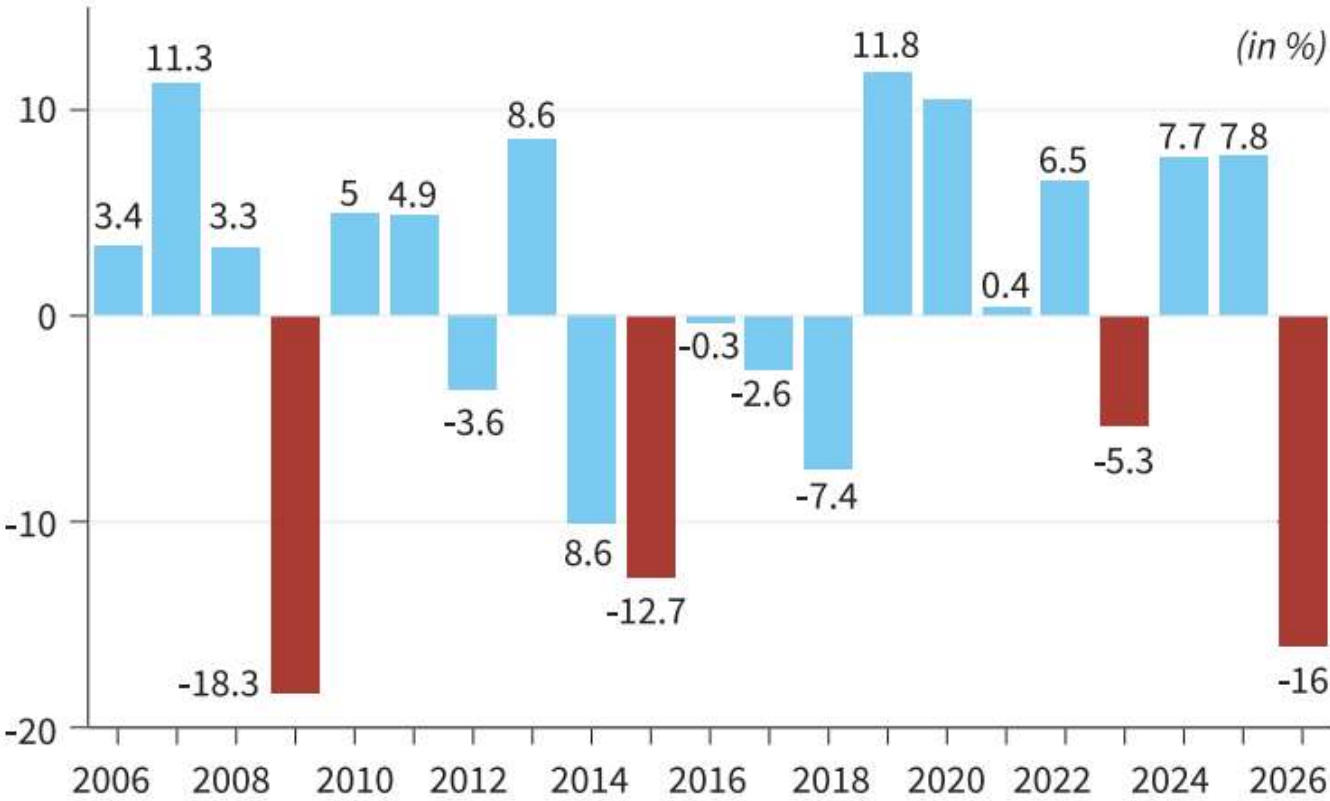
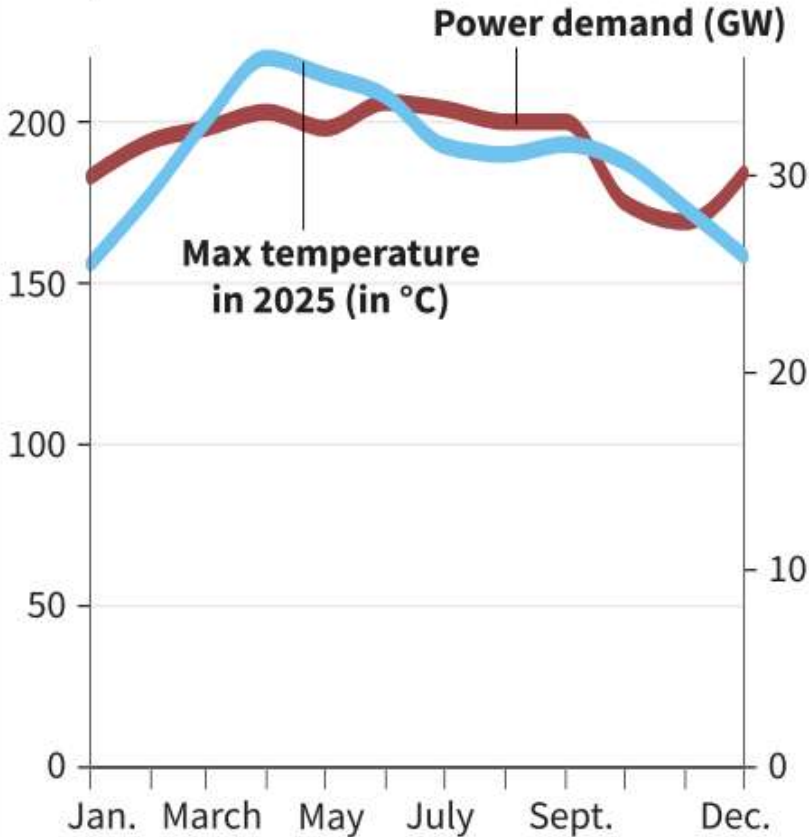


CHART 4: The average power demand rose in the beginning months of 2025 along with temperatures



Mining Amendment Row

खनन संशोधन विवाद

Why are States divided over the mining amendment?

Amendment curbs States' fiscal powers, but their responses vary with dependence and political alignment

Safira Hussain
Sanjay Kumar

In a federal country like India, differences between the Centre and the States over certain issues are not unusual. One such instance recently arose over the Mines and Minerals (Development and Regulation) Amendment Act, 2026, passed by Parliament.

Under the amended Act, the Centre's regulatory powers over mining have been expanded to cover not only mines and mineral development but also mineral-bearing lands. It bars States from imposing fresh taxes on mineral rights and mineral-bearing lands, except under conditions prescribed by the Union government. It also cancels mineral taxes imposed by States but not fully collected before the Act came into force.

Mines and minerals are a subject over which legislative powers are divided between the Centre and the States. State governments are empowered to regulate

mines and minerals under entry 23 of the State List, but this power is subject to central legislation as per entry 54 of the Union List. The latter entry gives Parliament the discretion to determine the extent of authority over mining regulation and development in the public interest. The Constitution also gives States powers to tax mineral rights and land through entries 50 and 49 of the State List. The recent amendment draws on the Centre's regulatory authority over mineral development to place new limits on these State-level taxing powers. So, the issue widens from mining regulation to the fiscal autonomy of mineral-rich States.

The amended provisions contradict the constitutional position articulated by the Supreme Court in 2024. The court held that States can tax mineral rights, subject to Parliament's power to limit this in the public interest, while their power to tax mineral-bearing land cannot be curtailed through Parliament's powers under Entry 54. The Centre has argued that uneven and multiple State-level taxes raise the

cost of domestic minerals, prompting industries to turn to imports and placing an additional burden on the exchequer. By invalidating unrecovered past dues, the law hits at the potential source of revenue for States, narrowing the prospective mineral-related revenue for some of the major mineral-bearing States.

The fiscal stakes

Mineral-related receipts account for 85% of non-tax revenue in Jharkhand and 80% in Odisha, compared with 48% in Karnataka, 41% in Madhya Pradesh and 39% in Rajasthan. Telangana and Chhattisgarh are less dependent, with mineral receipts making up 11% and 6%, respectively. For Jharkhand and Odisha, restrictions on the ability to impose or retain mineral-related levies therefore have significant fiscal implications, while the immediate impact may be smaller in Telangana and Chhattisgarh. Odisha is particularly revealing in this regard. Despite deriving a substantial share of its non-tax revenue from minerals, the State

has not responded with a unified position. The Opposition has demanded a special Assembly session. The BJP-led State government, however, has rejected the demand and argued that the amendment would not harm Odisha's mineral revenues. Telangana, where mineral receipts account for only about 11% of non-tax revenue, has also joined other non-NDA-ruled States intending to move the Supreme Court against the amendment. While Karnataka, Telangana, Himachal Pradesh and Kerala are planning to challenge the law in the Supreme Court, arguing that the restrictions on State taxation of mineral rights and mineral-bearing land undermine States' fiscal powers and federalism, Kerala has additionally argued that treating mineral-bearing land in this manner gives the Centre wider powers over areas such as the State's coastal and forest regions. Jharkhand has also raised objections, with the Chief Minister warning that the loss of revenue from mineral taxes could affect social-security schemes benefiting millions because the amended Act renders certain uncollected past dues invalid. By contrast, there has been no comparable challenge from States such as Madhya Pradesh, Rajasthan or Chhattisgarh so far.

The political geography of this discontent points to an interesting feature of Indian federalism. Even when the underlying concern is perceived erosion of States' fiscal space, the extent to which it becomes a federal issue varies across States. Mineral dependence creates a

material stake, while political alignment may influence whether that stake translates into an organised federal challenge.

India's fiscal federal structure comes across as asymmetric rather than purely decentralised. It gives greater taxation powers to the Centre while placing greater expenditure responsibilities on the States in several areas. The Centre has significant influence over borrowing and transfers to the States, which restricts State autonomy when they depend on the Centre's transfers or require its approval for borrowing. How much fiscal autonomy do States possess, and how far can the Union influence it often becomes a bone of contention between them.

The evolving Indian federal dynamic is marked by push and pull between the central authority and States' autonomy. Conflicts between the Centre and the States over legislative jurisdiction, fiscal resources, administrative control, and even foreign policy engagements have surfaced time and again, be it over the GST compensation, the terms of reference for Finance Commissions, the National Education Policy, the Citizenship Amendment Act, and proposed amendments to All-India Services rules, to list a few. This amendment therefore adds another fault line to India's continuing Centre-State contest over legislative authority and fiscal autonomy. (Safira Hussain is currently associated with Lokniti-CSDS; Sanjay Kumar is a Professor and an election analyst)

Why Are States Divided over the Mining Amendment?

खनन संशोधन अधिनियम 2026 पर राज्य बँटे क्यों हैं – राज्यों की कर शक्ति पर अंकुश



MMDR Amendment
2026
MMDR संशोधन

1

What the Act does
अधिनियम क्या करता है



- ▶ Centre's power extended to **mineral-bearing lands**
खनिज भूमि पर भी केंद्र
- ▶ States **can't levy new taxes** on mineral rights/lands without Centre's terms
नए कर पर रोक
- ▶ **Cancels** uncollected past State mineral taxes
पुराना बकाया रद्द

2

Fiscal stakes
राजकोषीय दाँव



State राज्य	Mineral share of non-tax revenue हिस्सा
Jharkh and	85%
Odisha	80%
Karnata ka	48%
Madhya Prades h	41%
Rajasth an	39%

3

Who opposes | विरोध



- ▶ **Karnataka, Telangana, Himachal, Kerala** to move SC
SC जाएँगे
- ▶ **Jharkhand CM** objects झारखंड की आपत्ति
- ▶ **Odisha govt (BJP)** says no harm
ओडिशा: नुकसान नहीं

Mining Amendment Row — in depth (1/2)

खनन संशोधन विवाद — विस्तार से (1/2)

4

Constitutional entries
संवैधानिक प्रविष्टियाँ



Entry प्रविष्टि	Subject विषय
Union List 54	Regulation of mines & minerals खान विनियमन
State List 23	Mines, subject to Entry 54 राज्य शक्ति
State List 49	Tax on lands भूमि कर
State List 50	Tax on mineral rights खनिज अधिकार कर

5

SC ruling, 2024
SC निर्णय 2024



- ▶ **Mineral Area Development Authority vs SAIL** (9 judges, 8:1)
9 न्यायाधीश
- ▶ **Royalty is not a tax**
राँयल्टी कर नहीं
- ▶ States **can tax mineral land**; Parliament can limit tax on mineral rights
राज्य कर लगा सकते

6

Centre's argument
केंद्र का तर्क



- ▶ Multiple State taxes raise **cost of minerals**
लागत बढ़ती
- ▶ Industry shifts to **imports**
आयात बढ़ता
- ▶ Need **uniform** national regime
एकरूप व्यवस्था

Mining Amendment Row — in depth (2/2)

खनन संशोधन विवाद — विस्तार से (2/2)

7 A new federal fault line | संघवाद में नई दरार



2024 SC
SC निर्णय

States can tax
राज्य कर सकें



2026 Act
अधिनियम

Limits States
अंकुश



Revenue loss
राजस्व हानि

Mineral States
खनिज राज्य



SC challenge
चुनौती

Federalism test
संघवाद

8

Did you know?
क्या आप जानते हैं?



► Parent law: **MMDR Act, 1957**

मूल क़ानून **MMDR 1957**

► Centre notifies **minor minerals**; States grant their leases

गौण खनिज

Articles covered from this page | इस पृष्ठ से लिए गए लेख

1 Ethanol diversion ban | इथेनाॅल हेतु चीनी पर रोक

Ethanol Diversion Ban

इथेनॉल पर रोक

MOVE AIMED AT ENSURING ADEQUATE SUPPLY OF THE SWEETENER

Govt may ban ethanol diversion

SANDIP DAS
New Delhi, October 5

WITH PROSPECTS OF a decline in sugar production looming large because of rain-fall deficiency in key growing regions, the government is likely to disallow the diversion of sugarcane juice and B-heavy molasses for ethanol production from the 2026-27 ethanol supply year (ESY), which commences from November 1.

Sources told *FE* the measure aims to stop mills from diverting sugar for ethanol production to ensure adequate domestic supplies of the sweetener in the 2026-27 season (October-September). The move comes as around 3 million tonne (MT) of sugar or 10% of the total output, was diverted for ethanol production in the current ESY.

Sugar mills will likely be allowed to use ethanol from C-

TACKLING SHORTAGE

■ Mills may continue using C-heavy molasses for ethanol production

■ Sugar-based feedstock could fall to **10-12%** of ethanol output from 26% currently

■ About 3 MT, or **10%**, of sugar output diverted to ethanol in 2025-26 ethanol supply year

■ In 2025-26 ESY, about 74% of ethanol came from grain-based feedstocks, led by maize



■ Deficient monsoon in Maharashtra, Karnataka could lower sugarcane output in 2026-27

heavy molasses, which contains less sugar content than other sugarcane feedstock.

A formal notification by the Food Ministry is likely to issue a formal notification soon. The ministry annually specifies the quantity of sugarcane juice or syrup and B-heavy molasses

that can be diverted for ethanol production to meet the 20% blending target with petrol.

"With the restriction on diverting sugarcane juice and B-heavy molasses for ethanol production, the share of sugar-based feedstock in ethanol

manufacturing in the next ESY may fall sharply to around 10% - 12% from the current year's level of 26%," a source said.

Industry sources estimate that only 2,750 million litres of ethanol, about 26% of the total requirement, was sourced

from sugar-based feedstocks for the 2025-26 ESY, compared to 7,610 million litres (74%) from grain-based sources—5,180 million litres from maize (47%) and 3,050 million litres from rice (27%).

There is a possibility of a fall in sugarcane output in the 2026-27 season, as major growing areas in Maharashtra and Karnataka have been hit by deficient monsoon rains, which

is likely to affect the yield. Sugar production, excluding diversion for ethanol, declined by 27% to around 28.1 MT in the 2025-26 season from 35.8 MT in 2021-22.

Consumption increased marginally, according to industry estimates, to 28.7 MT from 27.3 MT in the last five seasons. The average retail price of sugar stood at ₹55.28 a kg on Monday, up 20% year-over-year.

Govt May Ban Sugar Diversion for Ethanol in 2026-27

चीनी उत्पादन घटने की आशंका – इथेनॉल हेतु गन्ना रस व B-भारी शीरे के उपयोग पर रोक संभव



ESY from 1 Nov
1 नवंबर से

1 The proposal | प्रस्ताव

▶ No cane juice / B-heavy molasses for ethanol in ESY 2026-27

रस व B-शीरा नहीं

▶ Mills may still use C-heavy molasses

C-भारी शीरे की अनुमति

▶ Notification by Food Ministry expected

खाद्य मंत्रालय

2 Why | क्यों

▶ Deficient monsoon in Maharashtra, Karnataka

कमज़ोर मानसून

▶ Sugar output fell 27% to 28.1 MT (vs 2021-22)

उत्पादन 27% घटा

▶ Sugar price ₹55/kg, +20% y-o-y

कीमत +20%

3 Feedstock mix | कच्चा माल

74%

Ethanol from grains
अनाज से

47%

Maize
मक्का

26% → 10-12%

Sugar-based share
गन्ना आधारित

~3 MT

Sugar diverted 2025-26
चीनी

Ethanol Diversion Ban — in depth (1/2)

इथेनॉल पर रोक — विस्तार से (1/2)

4 Ethanol Blending Programme इथेनॉल मिश्रण

- ▶ Launched **2003**; **E20** (20% blend) achieved in **2025**
E20 लक्ष्य प्राप्त
- ▶ E10 reached in **June 2022**, ahead of target
E10 – 2022
- ▶ Ethanol supply year: **Nov–Oct**
आपूर्ति वर्ष नवंबर–अक्टूबर

5 Molasses types शीरे के प्रकार

Type प्रकार	Sugar left शेष चीनी
Cane juice गन्ना रस	All sugar (no sugar made) पूरी
B-heavy	More sugar अधिक
C-heavy	Least sugar (final) न्यूनतम

6 Trade-off | संतुलन

- ▶ **Food security** (sugar) vs **energy security** (ethanol)
खाद्य बनाम ऊर्जा
- ▶ Maize demand ↑ → **feed prices** rise
मक्का महंगा
- ▶ Mills lose higher **ethanol income**
मिलों की आय घटे

Ethanol Diversion Ban — in depth (2/2)

इथेनॉल पर रोक — विस्तार से (2/2)

7 From cane to car | गन्ने से गाड़ी तक



Sugarcane
गन्ना

Crushed
पेराई



Sugar mill
चीनी मिल

Sugar + molasses
चीनी + शीरा



Distillery
आसवनी

Ethanol
इथेनॉल



Petrol pump
पेट्रोल पंप

E20 blend
E20

8

Did you know?
क्या आप जानते हैं?



► India = world's **2nd largest** sugar producer
(after Brazil)

दूसरा सबसे बड़ा

► Cane price fixed by
Centre: **FRP** (on CACP
advice)

उचित व लाभकारी मूल्य

Asked in Exams — guess the answer! | पहले स्वयं उत्तर सोचें

RPF Constable 2024

Exam date: 5 Mar 2025 (Shift 1) • Topic: Great Nicobar

Which of the following tribes is primarily found in the Andaman and Nicobar Islands?

- (a) Shompen
- (b) Siddi
- (c) Kadar
- (d) Irular

UPSC CSE Prelims 2019 (GS Paper I)

Exam date: 2 June 2019 • Topic: Tribes (PVTGs)

Consider the following statements about Particularly Vulnerable Tribal Groups (PVTGs) in India: 1. PVTGs reside in 18 States and one Union Territory. 2. A stagnant or declining population is one of the criteria for determining PVTG status. 3. There are 95 PVTGs officially notified in the country so far. 4. Irular and Konda Reddi tribes are included in the list of PVTGs.

Which of the statements given above are

correct?

- (a) 1, 2 and 3
- (b) 2, 3 and 4
- (c) 1, 2 and 4
- (d) 1, 3 and 4

Answers & Explanation | उत्तर व व्याख्या

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Which of the following tribes is primarily found in the Andaman and Nicobar Islands?

(a) Shompen

(b) Siddi

(c) Kadar

(d) Irular

Answer: (a) Shompen – a PVTG of Great Nicobar Island.
शोम्पेन – ग्रेट निकोबार।

UPSC CSE Prelims 2019 (GS Paper I)

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(a) 1, 2 and 3

(b) 2, 3 and 4

(c) 1, 2 and 4

(d) 1, 3 and 4

Answer: (c) There are 75 PVTGs, not 95.
75 PVTG हैं, 95 नहीं।

Asked in Exams — guess the answer! | पहले स्वयं उत्तर सोचें

CDS (II) 2022 – General Knowledge

Exam date: 4 Sept 2022 • Topic: Ethanol

India has achieved the 10 percent Ethanol blending much ahead of the targeted date. Which one among the following greatly benefits from this?

- (a) Cassava plantations
- (b) Maize farming
- (c) Sugar industry
- (d) Wine industry

Answers & Explanation | उत्तर व व्याख्या

CDS (II) 2022 – General Knowledge

Exam date: 4 Sept 2022 • Topic: Ethanol

India has achieved the 10 percent Ethanol blending much ahead of the targeted date. Which one among the following greatly benefits from this?

- (a) Cassava plantations
- (b) Maize farming
- (c) Sugar industry**
- (d) Wine industry

Answer: (c) Most ethanol then came from sugarcane molasses.
चीनी उद्योग।

THE DAILY QUIZ

Test yourself on India's show at the recently conclude

V.V. Ramanan

QUESTION 1

The 85-medal tally is India's second-highest ever haul at the Asian Games, following the record 107 at Hangzhou 2022. With which country did India tie for the gold medals with 21?

QUESTION 2

Who was the only Indian to win all three types of medals, and in which events?

QUESTION 3

At 15 years, 6 months, and 6 days old, who became India's youngest-ever gold medal winner?

QUESTION 4

Which sport gave India the maximum gold medals with five?

QUESTION 5

Apart from Neeru Dhanda in shooting, who else returned with two gold medals to his/her name?

QUESTION 6

Pincky Balhara and Suchika Tariyal won bronze medals in which contact sports?



Visual Question:

Identify this person. She became the first Indian woman to win an individual gold medal in which sport? REUTERS

Test Yourself — Q1–4 | स्वयं को परखें

Q1 The 2026 Medicine Nobel was for:
2026 चिकित्सा नोबेल किसके लिए?

- (a) mRNA vaccines
- (b) Optogenetics
- (c) CRISPR
- (d) Immune tolerance

Q2 The light-sensitive protein used in optogenetics came from:
प्रकाश-संवेदी प्रोटीन किससे मिला?

- (a) A jellyfish
- (b) An alga
- (c) A firefly
- (d) A bacterium of soil

Q3 The Shompen tribe lives on:
शोम्पेन जनजाति कहाँ रहती है?

- (a) Little Andaman
- (b) North Sentinel
- (c) Great Nicobar
- (d) Car Nicobar

Q4 India's southernmost point is:
भारत का सबसे दक्षिणी बिंदु:

- (a) Kanyakumari
- (b) Indira Point
- (c) Rameswaram
- (d) Port Blair

Test Yourself — Q5–8 | स्वयं को परखें

Q5 Which is NOT an EFTA member?
कौन EFTA सदस्य नहीं?

- (a) Switzerland
- (b) Norway
- (c) Sweden
- (d) Liechtenstein

Q6 Under the new India–Swiss pact, multiple-entry visas can be up to:
मल्टी-एंट्री वीज़ा अवधि:

- (a) 1 year
- (b) 2 years
- (c) 5 years
- (d) 10 years

Q7 “Police” falls in which list?
“पुलिस” किस सूची में?

- (a) Union
- (b) State
- (c) Concurrent
- (d) Residuary

Q8 The emergency response helpline number in India is:
आपातकालीन हेल्पलाइन:

- (a) 100
- (b) 108
- (c) 112
- (d) 181

Test Yourself — Q9–12 | स्वयं को परखें

Q9 Regulation of mines and minerals is under which Union List entry?
खान विनियमन – संघ सूची की प्रविष्टि:

- (a) Entry 52
- (b) Entry 54
- (c) Entry 56
- (d) Entry 97

Q10 In 2024 the SC (9-judge Bench) held that royalty is:
2024 में SC के अनुसार रॉयल्टी:

- (a) A tax
- (b) Not a tax
- (c) A cess
- (d) A duty

Q11 Ethanol supply year in India runs from:
इथेनॉल आपूर्ति वर्ष:

- (a) April–March
- (b) November–October
- (c) January–December
- (d) July–June

Q12 Which feedstock gave the largest share of ethanol in 2025-26?
2025-26 में इथेनॉल का सबसे बड़ा स्रोत:

- (a) Cane juice
- (b) Maize
- (c) Rice
- (d) B-heavy molasses

Answer Key — Q1–6 | उत्तर व व्याख्या

1-b

Optogenetics — Controlling neurons with light.
ऑप्टोजेनेटिक्स।

2-b

An alga — Alga Chlamydomonas (channelrhodopsin).
शैवाल।

3-c

Great Nicobar — Great Nicobar Island.
ग्रेट निकोबार।

4-b

Indira Point — Indira Point, Great Nicobar.
इंदिरा पॉइंट।

5-c

Sweden — Sweden is in the EU.
स्वीडन।

6-c

5 years — Up to 5 years, 6-month stays.
5 वर्ष।

Answer Key — Q7–12 | उत्तर व व्याख्या

7-b

State — State List.
राज्य सूची।

8-c

112 — 112 (ERSS).
112।

9-b

Entry 54 — Entry 54.
प्रविष्टि 54।

10-b

Not a tax — Royalty is not a tax (MADA vs SAIL).
कर नहीं।

11-b

November–October — November–October.
नवंबर–अक्टूबर।

12-b

Maize — Maize ~47%.
मक्का।

Myth Buster of the Day — Science & Animals | आज का मिथक



MYTH | मिथक

“Bats are blind.”

चमगादड़ अंधे होते हैं।



FACT | तथ्य

No bat species is blind. Many bats see quite well, and big fruit bats see better than humans in dim light. Insect-eating bats also use echolocation – sending out sounds and listening for the echoes – to hunt in total darkness.

कोई भी चमगादड़ प्रजाति अंधी नहीं होती। कई चमगादड़ अच्छी तरह देखते हैं, और बड़े फल चमगादड़ कम रोशनी में इंसानों से बेहतर देखते हैं। कीट खाने वाले चमगादड़ अंधेरे में शिकार के लिए प्रतिध्वनि (इकोलोकेशन) का भी प्रयोग करते हैं।



Having an extra skill does not mean missing a basic one. अतिरिक्त कौशल होने का अर्थ यह नहीं कि मूल क्षमता न हो।

Word of the day

Vicissitude:

a variation in circumstances or fortune at different times in your life or in the development of something

Synonyms: ordeal, misfortune, tragedy, challenge, trouble, adversity, difficulty

Usage: *She faced many vicissitudes after moving to a new city.*

Pronunciation: newsth.live/vicissitude

International Phonetic Alphabet: /vɪsɪtɪd/



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