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No new Aadhaar cards for adults in Assam without special verification process

The Hindu Bureau

GUWAHATI

The Assam Cabinet has decided to stop Aadhaar cards being issued in the State through the regular enrolment process to people aged 18 and above.

The decision is aimed at preventing illegal immigrants from obtaining the unique identification number, Chief Minister Himanta Biswa Sarma said on Saturday.

He said the Cabinet approved a ban on fresh Aadhaar enrolment in Assam for adults except for people with disabilities and those from Scheduled Caste, Scheduled Tribe, and tea garden communities.

The exemption for applicants in these categories will remain valid until March 2027. “The restrictions will not apply to individuals below 18 years of age,” the Chief Minister said.

According to the blueprint, any “genuine” per-



Himanta Biswa Sarma

son aged 18 or above seeking an Aadhaar card will now have to undergo a special verification process through the office of the District Commissioner concerned.

In such cases, the District Commissioner will be required to submit a proposal to the government, which will take the final call on processing Aadhaar cards.

The Chief Minister said Aadhaar cards were still being issued although Assam has reached Aadhaar enrolment saturation, with some districts recording issuance of up to 115%.

“As Assam has already achieved 100% Aadhaar saturation, there are apprehensions over who is taking Aadhaar cards. We want no illegal immigrant to acquire an Aadhaar,” Mr. Sarma said.

Prevent ‘leakage’

The Chief Minister added that the intention was to stop the “leakage” in the issuance of Aadhaar.

The Assam Cabinet also approved the implementation framework of the Viksit Bharat Guarantee for Rozgar and Ajeevika Mission (Gramin) Act (VB-G RAM G), 2025, for the State. It will be implemented from July 1.

“The budget allocation for the Act is ₹2,000 crore, and 125 man-days will be provided for direct wage employment under the Act. Moreover, under the Act, besides providing employment, importance will be given to creating assets as a result of the man-days,” a government statement said.

Consider the following statements :

1. Aadhaar card can be used as a proof of citizenship or domicile.
2. Once issued, Aadhaar number cannot be deactivated or omitted by the Issuing Authority.

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

Consider the following statements :

1. Aadhaar metadata cannot be stored for more than three months.
2. State cannot enter into any contract with private corporations for sharing of Aadhaar data.
3. Aadhaar is mandatory for obtaining insurance products.
4. Aadhaar is mandatory for getting benefits funded out of the Consolidated Fund of India.

Which of the statements given above is/are correct ?

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

1. **Context:** Assam has mandated special verification for new Aadhaar enrolment of persons aged 18 years and above to prevent illegal immigrants from obtaining Aadhaar. The rule does not apply to minors and, till March 2027, to SCs, STs, tea garden workers and persons with disabilities.

2. Aadhaar: Core Basics

- * Aadhaar is a 12-digit unique identity number issued to a resident of India.
- * **Resident:** A person residing in India for 182 days or more during the preceding 12 months.
- * Based on demographic and biometric information.
- * Aadhaar is a tool for identity authentication and welfare delivery, not proof of citizenship.

3. UIDAI & State Government Role

UIDAI (Unique Identification Authority of India)

- * Established in 2009; became a **statutory authority under the Aadhaar Act, 2016.**
- * Functions under the Ministry of Electronics and Information Technology (MeitY).
- * Maintains the Central Identities Data Repository (CIDR) and issues Aadhaar numbers.

State Governments

- * Facilitate enrolment and verify residence, identity and supporting documents through local administration.

Assam's Measure: Since document and residence verification is undertaken through State authorities, Assam has introduced District Commissioner-level scrutiny before adult applications are forwarded to UIDAI.

4. Legal Significance & Uses

- * **Justice K.S. Puttaswamy (Aadhaar), 2018:** Supreme Court upheld Aadhaar's validity while reinforcing privacy safeguards.
- * **Major uses:** Direct Benefit Transfer (DBT), PM-KISAN, MGNREGA, pensions, scholarships and e-KYC services.

India, China in talks over joint UNESCO nomination for Xuanzang's work

Divya A

New Delhi, June 14

TO SPEED up the process of safeguarding heritage, the BRICS countries are deliberating on filing joint nominations for various UNESCO lists. In this line, India and China are in advanced stages of discussions over a joint nomination for 'The Great Tang Records on the Western Regions', a narrative of Chinese Buddhist monk and scholar **Xuanzang's** travels through medieval India in the 7th century.

The proposal, led by China and to be supported by India, is presently under consideration with the Ministry of External Af-

fairs, as per sources. China had earlier reached out through diplomatic channels to convey an interest in pursuing a joint nomination for an inscription in UNESCO's Intangible Cultural Heritage List.

The accounts of **Xuanzang**, also known as **Hiuen Tsang**, who spent 19 years travelling through India, remain a source for the study of early medieval India. He studied at the Nalanda University and captured the political, social and religious practices of the time in his accounts.

India also aims at securing a place for Panchatantra on the UNESCO list along with Iran as

E. EXPLAINED

Why joint nominations

The idea is to skip the queue since each country is allowed only two dossiers during the two-year cycle of UNESCO heritage lists, and most BRICS nations have a lot of heritage that needs safeguarding. As per officials, there is no limit on nations filing joint nominations, with the dossier led by one country, backed by others.

the fables have been a staple of Persian literature and folklore for over 1,500 years; as also for the philosophy of Satyagraha along with South Africa, official sources told *The Indian Express*.

This has come out of deliberations at the recent BRICS Culture Working Group meet under India's chair, which was attended by delegations from Brazil, China, South Africa, the UAE, Indonesia and Iran, with representatives from Russia, Ethiopia, and Egypt joining in hybrid mode.

The second meeting of the BRICS Culture Working Group was held in Varanasi earlier this month. At the inaugural session,

Union Culture Secretary, Vivek Aggarwal, highlighted BRICS countries are home to some of the world's oldest civilisations while also representing vibrant and evolving contemporary cultural landscapes. The recommendations from the Second Culture Working Group meet will be sent to BRICS Cultural Track ministerial meet in August in Bhopal, so they could be reflected in the joint statement by BRICS Culture Ministers.

At a panel discussion on "Collaborative Approaches for Safeguarding Shared Heritage: Joint Nominations under the UNESCO World Heritage Convention, Intangible Cultural

Heritage, and the Memory of the World Programme", during the meet, delegates explored opportunities for collaborative nominations among BRICS countries.

The idea is to skip the queue by filing joint nominations since each country is allowed only two dossiers during the two-year cycle of UNESCO heritage lists with most BRICS nations having a lot of heritage that needs to be safeguarded. As per officials, there is no limit on countries filing joint nominations, with the dossier led by one country, and supported by others.

In 2017, as India had sent Sowa-Rigpa, the Tibetan system of medicine, as its official entry

for UNESCO's Intangible Cultural Heritage list, China had also sent a similar entry, claiming Sowa-Rigpa as its own.

Ramesh C Gaur, Dean, Indira Gandhi National Centre for the Arts, the government's nodal agency for preparing and presenting these nominations, said, "BRICS nations have a lot of common, overlapping heritage — be it the Ramayana traditions equally popular in India and Indonesia, the Buddhist scriptures common to India and China, or Panchatantra in India and Iran. If we leverage joint nominations, we can achieve a lot towards safeguarding our civilisational heritage."

The Chinese traveller Yuan Chwang (Hiuen Tsang) who visited India recorded the general conditions and culture of India at that time. In this context, which of the following statements is/are correct?

1. The roads and river-routes were completely immune from robbery.
2. As regards punishment for offences, ordeals by fire, water and poison were the instruments for determining the innocence or guilt of a person.
3. The tradesmen had to pay duties at ferries and barrier stations.

Select the correct answer using the codes given below.

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

Which one of the following statements with regard to the Moidams, built by the Tai-Ahom kingdom and inscribed as a World Heritage Site by UNESCO, is/are correct ?

1. They acted as army fortresses.
2. They were recreation centres of the Royals and Nobles.
3. They were burial grounds of the Royals and Nobles.
4. They were battle drill centres of the Royals and Nobles.

Select the answer using the code given below :

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

Tungurahua Volcano, which was declared a Global Geopark by UNESCO in 2025, is situated in which one among the following countries ?

- (a) Ecuador
- (b) Peru
- (c) Bolivia
- (d) Colombia

1. **Context:** India and China are discussing a joint UNESCO nomination for “The Great Tang Records on the Western Regions”, written by the Chinese Buddhist monk Xuanzang (Hiuen Tsang). The proposal was discussed during the 2nd BRICS Culture Working Group Meeting, held in Varanasi under India’s BRICS Chairmanship.

2. UNESCO Joint Nomination

- * Two or more countries jointly nominate a heritage element having shared civilisational or cultural roots.
- * One country leads the dossier while others support it.
- * Multinational nominations receive greater priority in UNESCO’s evaluation process.

Examples under discussion

- * Xuanzang’s Records → India–China
- * Panchatantra → India–Iran (ancient Indian collection of animal fables with influence across Persia and West Asia)
- * Satyagraha → India–South Africa (linked to Mahatma Gandhi’s philosophy of non-violent resistance, shaped during his South African years)
- * Sowa-Rigpa → Traditional Tibetan medicine earlier claimed separately by India and China

3. 2nd BRICS Culture Working Group Meeting

- * Held in Varanasi under India’s chairmanship.

Objective: Promote joint heritage nominations among BRICS countries and safeguard shared cultural heritage.

4. Xuanzang (Hiuen Tsang): UPSC Basics

- * Chinese Buddhist monk who visited India during the reign of Harshavardhana.
- * Travelled across India between 629 CE and 645 CE and spent nearly 19 years studying Buddhism.
- * Studied at Nalanda Mahavihara.
- * Authored “Great Tang Records on the Western Regions” (Si-Yu-Ki).
- * Important source for understanding the political, social, religious and economic conditions of 7th-century India.

PYQ Fact: Xuanzang recorded that traders paid duties at ferries and barriers, and ordeals by fire, water and poison were used in judicial practices.

20 rebel Trinamool MPs seek to merge with NCPI

The leaders met Lok Sabha Speaker and requested separate seating arrangements; will seek recognition as the Trinamool in July, when Parliament session begins, says Bandyopadhyay

Shiv Sahay Singh
KOLKATA

After days of speculation, 20 rebel Trinamool Congress MPs on Sunday met Lok Sabha Speaker Om Birla at his residence in New Delhi and submitted a letter announcing their decision to merge with the National Citizens Party of India (NCPI).

The decision by the rebels to merge with a registered regional political party rather than form a separate bloc within the Trinamool Congress was to avoid any legal complications under the anti-defection law. The law states that when two-thirds of the legislators of a political party decide to merge with another party, neither those who join the new party nor the ones who stay with the original party face disqualification.

“The MPs met the Speaker and requested separate seating arrangements. We are more than two-thirds of MPs (of the Trinamool Congress) and will merge with the Nationalist Citizens Party of India. We will work with Prime Minister Narendra Modi and the NDA for the interest of the country,” Kakoli



Big changes: Lok Sabha Speaker Om Birla receiving a letter from Trinamool Congress MPs in New Delhi. PTI

Ghosh Dastidar, MP, told presspersons after the meeting.

Support of 20 MPs

The office of the Speaker confirmed that 19 MPs attended the meeting. The rebel faction, however, claims the support of 20 MPs, with Sudip Bandyopadhyay joining the group on Saturday.

Mr. Bandyopadhyay, the senior-most MP in the rebel camp, said that while the MPs were merging with the NCPI as of now, in July, when Parliament session begins, they would seek recognition as the Trinamool Congress since they had a

two-thirds majority.

“We will merge with the Nationalist Citizens Party, which is a registered regional party. This is the system. When you leave with two-thirds of the party, you cannot demand the name of that party on the first day itself. In July, we will seek recognition as the Trinamool Congress since we have two-thirds of its MPs. Then the courts will decide,” he said.

The NCPI was launched as National Citizens Party of India in Tripura in 2015 by a Kolkata-based woman Shewly Kundu.

Later, the party registered itself as Nationalist

Citizens Party of India in February 2, 2023 at Sankrail in Howrah district, data from the Election Commission suggest.

Separate bloc

After the defeat of the Trinamool Congress in the 2026 Assembly election in West Bengal, the majority of its Lok Sabha members had decided to set up a separate bloc and held meetings at the residence of Union Minister and Bharatiya Janata Party leader Bhopendra Yadav.

On Sunday, the majority of MPs had gathered at Mr. Yadav's residence before meeting the Speaker. The decision to merge with an almost unknown regional party has come as a surprise in political circles.

Before the rebel MPs met the Speaker, two MPs considered loyalists of Trinamool Congress supremo Mamata Banerjee also met Mr. Birla and submitted a letter from party leader Abhishek Banerjee.

The letter from the party's leader in Lok Sabha urged the Speaker to treat the Trinamool as a single party represented by its authorised whip and leader and urged him not to recognise any separate group.

Consider the following statements :

- I. If any question arises as to whether a Member of the House of the People has become subject to disqualification under the 10th Schedule, the President's decision in accordance with the opinion of the Council of Union Ministers shall be final.**

- II. There is no mention of the word 'political party' in the Constitution of India.**

Which of the statements given above is/are correct?

- (a) I only**
- (b) II only**
- (c) Both I and II**
- (d) Neither I nor II**



1. **Context:** A group of around 20 Trinamool Congress MPs has informed the Lok Sabha Speaker of its decision to merge with the National Citizens Party of India (NCPI). The group claims support of more than two-thirds of TMC MPs and seeks protection under the merger provision of the Anti-Defection Law.

2. **Anti-Defection Law: Split vs Merger**

- * Tenth Schedule (52nd Constitutional Amendment Act, 1985).
- * Split (1/3 members) was earlier exempt from disqualification but was removed by the 91st Constitutional Amendment Act, 2003.
- * Merger remains valid if at least two-thirds of legislators agree to join another political party.
- * In such cases, members are protected from disqualification.

3. **Why Merge with NCPI?**

- * Since the split exception no longer exists, merely forming a separate faction can attract disqualification.
- * Therefore, the MPs have chosen to merge with a registered political party and claim protection under the merger clause.
- * This is being called the first legal step before seeking recognition of their faction in Parliament.

Why was this not seen in Shiv Sena/NCP cases?

- * In those cases, the dispute was mainly over which faction represented the original party and controlled its name and symbol.
- * Here, the MPs are first relying on the merger provision of the Tenth Schedule through another registered party.

4. **Registered vs Recognised Party (PYQ Angle)**

- * Registered Party: Registered with ECI under Section 29A, Representation of the People Act, 1951.
- * Recognised Party: A registered party that fulfils ECI criteria for State Party or National Party status and gets a reserved symbol.
- * Every recognised party is registered, but every registered party is not recognised.

PYQ Fact: The term “political party” appears in the Constitution through the Tenth Schedule.

Droughts can drive antibiotic resistance in soil bacteria

Research has revealed that drought-induced soil stress concentrates natural antibiotics, accelerating evolution of resistant bacteria; this phenomenon threatens to worsen global antibiotic resistance by 2050, particularly in drought-prone regions

Sharmila Vaidyanathan

Droughts can increase the levels of antibiotic resistance in soil, researchers from the California Institute of Technology have reported. Their study also projected that by 2050, several parts of India and other drought-prone countries will grapple with severe antibiotic resistance (ABR).

The study, in *Nature Microbiology*, revealed that when soil dries due to drought stress, the concentration of natural antibiotics increases, favouring the survival of resistant bacteria. Soil has been an important source of antibiotics.

“The current study spotlights a broader ecological perspective where climate-driven environmental changes might also influence resistance,” the study’s authors, postdoctoral research scholar Xiaoyu Shan and the Gordon M. Binder/Amgen professor of biology and geobiology Dianne Newman, wrote in an email.

By analysing soil DNA datasets from the U.S., China, and Europe and across cropland, wetland, grassland, and a forest site, the team found that drought increased the prevalence of genes that both produce antibiotics and help organisms resist them. The team also replicated the findings using synthetic soil samples inoculated with soil bacteria and treated with a known antibiotic. When the soil was dried, antibiotic-resistant bacteria better survived the adverse conditions.

“Previous studies have

Under pressure

When soil dries, the concentration of natural antibiotics increases, favouring the survival of resistant bacteria



Per a 2024 report, 91 districts in India are in the ‘very high’ drought risk category while 188 districts face ‘high’ drought risk. AFP

■ New research has found that drought conditions increase natural antibiotic levels in soil, fuelling antibiotic resistance

■ Researchers project that several countries, especially India, will face severe antibiotic resistance challenges by the year 2050

■ Environmental stress from droughts independently shapes the evolution and enrichment of resistant bacteria within various soil ecosystems

■ Antibiotic resistance can move from the environment to humans through horizontal gene transfer and contaminated agricultural products

■ India faces heightened risks due to frequent droughts, dense populations, and heavy antibiotic use in livestock industries

■ Experts recommend using vaccines and integrated monitoring systems to reduce the disease burden amplified by climate change

documented antibiotic resistance genes in wastewater, rivers, and soils, but these patterns have largely been interpreted as consequences of anthropogenic contamination, such as antibiotic overuse in medicine and agriculture,” the two co-authors wrote. “Our work asked a fundamentally different question: could environmental stress, independent of direct antibiotic pollution, actively shape the evolution and enrichment of resistance?”

The links between climate change and ABR are becoming more prominent. In one recent study, scientists found that sub-lethal experimental grassland plots to warming conditions over 11 years rendered ABR genes 24% more abundant. Droughts are also becoming more

severe due to climate change.

The study’s authors examined hospital data in 116 countries and found that drier regions reported more infections due to antibiotic resistance. Research has already shown ABR resistance can move from the environment to humans through horizontal gene transfer, where genetic elements carrying antibiotic resistance are transferred to human pathogens, and bacterial transmission via aerosols, polluted soil and water, and agriculture.

“India is vulnerable because it simultaneously faces several challenges relating to increased frequency of droughts, heavy antibiotic use in humans and livestock, wastewater irrigation, dense human-animal-soil interactions,

and heavy agricultural dependence,” G. Ravikanth, senior fellow and convenor, Ashoka Trust for Research in Ecology and the Environment, Bengaluru, said.

“India’s drought-prone regions overlap substantially with the rural districts where access to formal healthcare is weakest,” Erta Kalanxhi, fellow and director of partnerships at One Health Trust, a global health research organisation, said. “In this context, climate change may intensify the selection pressure on [antibiotic resistance] in the populations least equipped to manage the clinical consequences.”

Dr. Ravikanth emphasised the need for long-term monitoring stations in arid regions to track microbial community shifts, drought intensity, and anti-

biotic resistance. He added that existing Krishi Vigyan Kendras could be mobilised for data on antibiotic residues in agricultural soils, poultry and dairy farms, and to understand the spread of resistant microbes.

In a recent One Health Trust policy brief, in collaboration with Christian Medical College, Vellore, the authors underscored the role of vaccines. “Apart from concentrating natural antibiotics in soil and intensifying resistance, droughts also create the conditions under which enteric pathogens such as *Salmonella typhi* thrive,” Dr. Kalanxhi said. “Scaling up vaccination suppresses the disease burden that drought amplifies and reduces the empirical antibiotic demand that drives resistance selection in clinics.”

The authors Drs. Shan and Newman also said the study encourages a deeper exploration of how these natural products shape the environments in which they reside – including understanding if antibiotics in soil have other functions or control the development of microbial communities near the roots of plants. They emphasised that integrated approaches that combine microbiome sampling and sequencing of soil, airborne dust, and the human body, epidemiological monitoring of exposed human populations, and longitudinal drought and climate records can help provide actionable insights.

(Sharmila Vaidyanathan is an independent writer from Bengaluru)

Which of the following are the reasons for the occurrence of **multi-drug resistance in microbial pathogens** in India?

1. Genetic predisposition of some people
2. Taking incorrect doses of antibiotics to cure diseases
3. Using antibiotics in livestock farming
4. Multiple chronic diseases in some people

Select the correct answer using the code given below.

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

1. **Context:** A Nature Microbiology study says drought stress can increase antimicrobial resistance (AMR) in soil bacteria by concentrating natural antibiotics in dry soil, favouring resistant bacteria. This may worsen AMR by 2050, especially in drought-prone regions like India.

2. **Antimicrobial Resistance (AMR):** occurs when microbes like bacteria, viruses, fungi and parasites stop responding to medicines, making infections difficult to treat.

Major drivers: wrong/incomplete antibiotic doses, overuse in humans, antibiotic use in livestock, wastewater and pharmaceutical pollution.

3. **Key Finding of the Study**

When soil dries due to drought, natural antibiotics become concentrated, creating survival pressure where resistant bacteria survive better. This shows that climate change can directly influence AMR, not just medical misuse.

India Relevance : India is vulnerable due to frequent droughts, high antibiotic use, livestock farming, wastewater irrigation and weak rural healthcare access.

Why an Assam-Nagaland pact raises hopes of higher oil & gas output from Northeast

Sukalp Sharma

New Delhi, June 13

THE UNION government, Assam and Nagaland Thursday signed a memorandum of understanding (MoU) that paves the way for the resumption of oil and gas exploration along the resource-rich and contested boundary of the two states after three decades.

The Northeast is considered the birthplace of India's oil and gas industry and Assam is among India's major oil and gas producing states.

This agreement is part of that effort, and comes at a time when the country is grappling with high prices of imported oil and gas, as well as supply constraints, owing to the effective closure of the Strait of Hormuz amid the West Asia war.

The government has implemented several policy reforms to encourage investments in India's oil and gas exploration and production sector.

Resumption of oil, gas exploration in contested border

Although these "upstream" activities have long gestation periods, the agreement could augment the country's domestic oil and gas production in the medium to long term. According to officials aware of

the matter, the MoU specifically targets the disputed area belt, or DAB, along the Assam-Nagaland border. With the MoU in place, oil and gas exploration and production are expected to gather pace across more than 1,000 sq km along the Assam-Nagaland border.

Oil, gas, and mineral exploration activities have remained suspended in the DAB for three decades owing to law and order issues amid boundary disputes between the two states.

The DAB is expected to contain promising hydrocarbon prospects. According to the Ministry of Home Affairs (MHA), the MoU establishes a coordinated framework for facilitating mineral oil operations in the area, ensuring operational continuity, safety and security of personnel and assets, and effective coordination among all stakeholders.

The framework is expected to support exploration and production activities, encourage investment in the upstream petroleum sector and contribute towards the country's energy security objectives, it said.

The MHA said that both states decided that they would not allow any obstacle to India's oil exploration, and would advance on the path of mutual cooperation, as these resources constitute national wealth.

According to the MHA re-



Oil, gas, and mineral exploration activities have remained suspended in the contested area for three decades now. REUTERS

lease, apart from six designated oil and gas fields, the Nagaland government has agreed to oil exploration across Nagaland.

"He (Home Minister Amit Shah) stated that the Government of Assam is also in agreement, as this is a win-win situation for all stakeholders. The Home Minister said that this tripartite agreement will pave the way for mineral exploration and mining across the entire North-East region," the release said.

Govt sees significant oil, gas potential in region

"Since Assam alone accounts for nearly 22% of India's crude oil reserves and around 15% of the country's natural gas

reserves, while Nagaland possesses significant hydrocarbon potential in the Naga-Schuppen Belt of the Assam-Arakan Basin, resources where hydrocarbons flow naturally and those which have huge un-



tapped resources, the outlook for E&P [exploration and production] activities in the North East is therefore extremely promising," Petroleum Minister Hardeep Singh Puri posted on social media platform X, adding that the MoU paves the way for Nagaland to produce oil and gas after 31 years. According to the MHA release, Shah said that the MoU could potentially help increase oil production capacity from the Northeast from the current capacity of 1,000-1,500 barrels per day by more than

tenfold, adding that the region also possesses "and immense wealth of minerals". While it is difficult to predict exactly how soon this tripartite agreement would start bearing fruit, Shah emphasised that in due course, it will bring significant relief to India and enhance the country's self-reliance.

"Union Home Minister Shri Amit Shah expressed confidence that the extraction of oil and gas resources available in Nagaland would significantly reduce India's dependence on foreign sources in this sector. He said that, in the absence of such an agreement and due to certain longstanding challenges, the economic development of both states had remained affected for a considerable period.

"However, he noted that the agreement signed today will open a major pathway for the economic development of both Assam and Nagaland," the MHA release said.

"By creating a framework for cooperation between the governments, this MoU signed in the presence of HM Sh @AmitShah Ji, provides certainty to investors, facilitates operational continuity, enables regulatory coordination and creates conditions necessary for long-term investment decisions." Petroleum Minister Hardeep Singh Puri said.

Consider the following activities :

- I. Production of crude oil**
- II. Refining, storage and distribution of petroleum**
- III. Marketing and sale of petroleum products**
- IV. Production of natural gas**

How many of the above activities are regulated by the Petroleum and Natural Gas Regulatory Board in our country?

- | | |
|-----------------------|-------------------------|
| (a) Only one | (b) Only two |
| (c) Only three | (d) All the four |

1. **Context:** The Centre, Assam and Nagaland have signed an MoU to resume oil and gas exploration in the Disputed Area Belt (DAB) along the Assam–Nagaland border after nearly 30 years. The agreement aims to unlock hydrocarbon resources, increase domestic production and strengthen India’s energy security.

2. **Northeast Hydrocarbon Potential**

* Assam is the birthplace of India’s oil industry (Digboi) and accounts for nearly 22% of India’s crude oil reserves and around 15% of natural gas reserves.

* Major fields: Digboi, Naharkatiya, Moran, Lakwa, Rudrasagar.

* Nagaland has significant untapped hydrocarbon potential in the Naga Schuppen Belt of the Assam–Arakan Basin.

* The MoU covers a resource-rich belt of over 1,000 sq km along the inter-state border.

3. **Upstream, Downstream & PNGRB**

Upstream: Exploration, drilling and production of crude oil and natural gas.

Downstream: Refining, processing, storage, transportation, distribution and marketing of petroleum products and natural gas.

Petroleum and Natural Gas Regulatory Board (PNGRB)

* Statutory body under the PNGRB Act, 2006.

* Regulates downstream activities only (pipelines, City Gas Distribution, transportation and marketing).

* Does not regulate upstream activities such as exploration and production.

PYQ Fact: Exploration and production of crude oil/natural gas fall outside PNGRB’s jurisdiction; transportation, distribution and marketing fall within it.

India's push beyond E20 fuel: Reasons, and pitfalls



ANIL SASI

THE CENTRE last week exempted higher ethanol-petrol blends (22%-30% ethanol) from central excise duty, putting their tax treatment on a par with the 20% ethanol blend (E20) that's the standard at pumps.

The government has also proposed amendments to recognise 85% ethanol-blended fuel and 100% ethanol fuel under the Central Motor Vehicles Rules.

Both measures signal the government's intent to prepare the country's vehicular and fuel ecosystems for the next stage of ethanol adoption. But they have differing implications.

The first measure — the transition from E20 fuel to higher blends — is aimed at most petrol cars.

The second move — the draft amendment to recognise E85 and higher fuel — targets an entirely new category called flex fuel vehicles. Such vehicles are designed to operate on varying blends of petrol and ethanol but are still some way away from being widely introduced to the Indian market.

For now, it is the first proposal that has caused concern among carmakers and motorists — especially considering their experience with the initial transition to the E20 ethanol blend from E10.

The problems for consumers...

Last year, India achieved 20% ethanol blending in petrol, five years before target. E20 fuel, denoting 80 parts petrol to 20 parts of ethanol, is now the standard petrol variant nationwide.

For people with vehicles E10-certified or older, the transition to E20 came in just three years, with little warning of the pitfalls.

There are multiple problems with using a higher ethanol blend in petrol for engines not designed for them.

ENGINE DAMAGE: Ethanol has a higher content of water, which is corrosive. So, E20 or higher ethanol blends could damage the parts of the internal combustion engine (ICE). This is especially true for older engines and the ones used on two-wheelers, where high-grade aluminum or steel cast parts are not used for the engine block.

MILEAGE: Many customers had flagged a drop in mileage after the E10 to E20 shift. The drop could be between 5-12%, depending on when the car was manufactured. The

• HOW A FLEX FUEL CAR IS POWERED

THE ECM: Controls the fuel mixture, ignition timing, and emissions system; detects and troubleshoots problems.

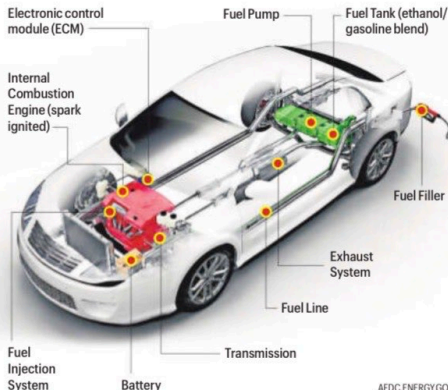
FUEL FILLER: A nozzle from a fuel dispenser attaches to the receptacle on the vehicle to fill the tank.

FUEL INJECTION SYSTEM: Introduces fuel into the engine's combustion chambers for ignition.

FUEL LINE: A metal tube or flexible hose (or a combination of these) transfers fuel from the tank to the engine's fuel injection system.

FUEL PUMP: A pump that transfers fuel from the tank to the engine's fuel injection system via the fuel line.

FUEL TANK (ETHANOL/GASOLINE BLEND): Stores fuel on board the vehicle to power the engine.



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Petroleum Ministry, however, has said that the drop in mileage would be "marginal".

THE ONLY OPTION: Vehicle owners in India currently do not have an option to choose different fuels at the petrol pump, unlike their counterparts in Brazil — a country that has successfully and structurally integrated ethanol with its automobile ecosystem. Brazilian law, unlike India, also provides for a discount for higher ethanol blends.

IGNITION ISSUE: Regular ICE cars running on higher ethanol blends are hard to start on winter mornings because ethanol burns at a higher temperature than petrol.

EXPONENTIALLY WORSE PERFORMANCE: While a fuel with 10% ethanol (E10) makes little difference to a car's performance, anything above is said to cause problems in engines not specifically built for it. And this performance worsens exponentially as the blending levels increase. The Petroleum Ministry has said that these concerns around higher ethanol blends are not backed by "scientific evidence".

A senior technical expert at a major automaker acknowledged that there are no conclusive studies on the long-term impact of blended fuel on non-compliant vehicles. But the expert also said it could definitely have an impact on the engine's life, its various rubber parts, valves and piston heads, among others.

"In case of this new transition too, the

Brazil's way

Brazil's ethanol programme, which kicked-off in the 1970s, was in response to the uncertainties of the oil market.

At nearly every petrol pump in Brazil now, people have the option to either choose between blended petrol, which typically includes 27-32% ethanol, and E100, which is pure hydrous ethanol. Brazil also got carmakers to usher in flex fuel cars.

consumer will likely end up bearing the brunt of any drop in fuel efficiency. For older vehicles, there is the added question over vehicle damage due to the high ethanol mix. That too is left to the consumer," a representative of an auto manufacturing association said.

...and for automakers

The E25 transition will require additional engineering and validation work around engine calibration, fuel-system durability, corrosion resistance and material compatibility. All this, just months after the E20 transition.

Vehicle costs will increase and likely fall on the consumer.

Carmakers have called for greater policy clarity and alignment before higher ethanol blends can be rolled out at scale.

Beyond that, in private, they're willing to talk about some anomalies in this E20 to E25 transition.

"Some of the concerns have been conveyed, especially through (auto) industry representatives. Indications are that the transition towards a base fuel having a higher blend of ethanol (above E20) is likely to happen, alongside the progressive roll-out of the E85-E100 fuels," a senior auto industry executive told *The Indian Express*.

Oil marketing companies (OMCs) such as Indian Oil and Bharat Petroleum, too, will face challenges. A government source

India is looking to transition from E20 fuel to higher blends to reduce its dependence on oil imports. But the plan has raised concerns

involved in the process indicated that OMCs have made it clear that they can only offer two ethanol blends at any given point.

Behind the measure

The government is looking to progressively increase ethanol blending in petrol from the current E20 level to E25, before transitioning towards flex-fuel vehicles and E85-E100 fuels.

This is an integral part of India's strategy to reduce its dependence on imported fossil fuels — especially after the experience with the West Asia conflict that drove up prices.

India currently imports nearly 88.5% of its crude oil requirement, making the economy and energy security vulnerable to geopolitical disruptions.

There's a political angle too: the agricultural lobby, especially from Maharashtra and Uttar Pradesh, is pushing hard for ethanol blends to be hiked since farmers, such as those growing sugarcane, are sitting on significant overcapacity.

The government maintains that the rollout of higher ethanol-petrol blends will only be done after proper testing and consultations. The Bureau of Indian Standards (BIS), on May 19, also notified fuel standards for these higher ethanol blends.

According to a source in the government, the move towards blends higher than E20 is "not being pushed through in a hurry and there will be enough time given for vehicles and oil companies to gear up for this transition". "Too much should not be read into (Wednesday's) notification" on the excise duty exemption, said this source.

The transition process

In the medium term, consumers may have two categories of fuel available at petrol pumps. One would be the standard fuel — E20 today, and potentially E25 if the government pushes ahead with its plans. The other would be high-ethanol fuels such as E85 or E100.

The high blend would likely be priced lower. A consumer with a flex fuel vehicle can also consider the pricing before deciding which one to use.

For new vehicles, manufacturers would have to recalibrate engines and undergo fresh emissions certification and homologation, since current models have been tested and approved using E20 fuel. Homologation, the process of certifying a vehicle's roadworthiness, would need to be repeated for E25, just as it was done when E20 was introduced.

Ultimately, however, they will likely make a shift to flex fuel vehicles — a project delayed on multiple counts.

Consider the following types of vehicles :

- I. Full battery electric vehicles**
- II. Hydrogen fuel cell vehicles**
- III. Fuel cell-electric hybrid vehicles**

How many of the above are considered as alternative powertrain vehicles?

- (a) Only one (b) Only two**
- (c) All the three (d) None**



1. **Context:** After achieving the 20% ethanol blending target (E20) ahead of schedule, India is preparing for higher ethanol blends (E25–E30 and E85) and the adoption of flex-fuel vehicles (FFVs) to reduce crude oil imports and strengthen energy security.

2. Alternative Powertrain Vehicles & Flex-Fuel Vehicles

Alternative Powertrain Vehicles use fuels or propulsion systems other than conventional petrol/diesel engines.

Important Types (PYQ Theme)

- * Battery Electric Vehicle (BEV)
- * Hydrogen Fuel Cell Vehicle (FCEV)
- * Fuel Cell-Electric Hybrid Vehicle (FCEHV)
- * Flex-Fuel Vehicle (FFV)

Flex-Fuel Vehicle (FFV)

- * Can run on different petrol-ethanol blends.
- * Uses an **Engine Control Module (ECM)**, an onboard computer that detects the fuel blend and automatically adjusts engine performance.
- * Engine and fuel system components are designed to handle higher ethanol content.

E20: 20% Ethanol + 80% Petrol (current national target achieved).

E85: 85% Ethanol + 15% Petrol (requires FFVs and supporting infrastructure).

3. Why Is India Moving Beyond E20?

- * India imports nearly 85% of its crude oil requirement.
- * Higher ethanol blending can further reduce import dependence.
- * Supports domestic biofuel production and farmer incomes.
- * Long-term roadmap: E20 → Higher Ethanol Blends → Flex-Fuel Ecosystem.

4. Brazil's Experience & India's Challenges

Brazil

- * Ethanol programme started in the 1970s.
- * Flex-fuel vehicles dominate the market.
- * Consumers can choose petrol, ethanol or blends at fuel stations.

India

- * Most vehicles are currently optimised for E20.
- * Higher ethanol blends may reduce mileage due to lower energy content of ethanol.
- * Requires vehicle modification, fuel infrastructure and adequate ethanol supply.