

The Hindu Important News Articles & Editorial For UPSC CSE

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The Joint Parliamentary Committee (JPC) on the Waqf (Amendment) Bill held a meeting where 32 amendments out of over 500 proposed by members were accepted after a vote.

- ➔ The BJP and its allies, having a majority, saw all their proposed amendments accepted, while the Opposition's amendments were rejected.

JPC rejects all amendments to Waqf Bill made by Opposition

Parliamentary panel accepts 32 amendments moved by BJP and its allies; Opposition MPs issue joint statement claiming no discussion clause by clause was permitted by the Chairperson; committee will meet tomorrow to finalise the report

Sobhana K. Nair
NEW DELHI

Amid the Opposition's complaint that its voice was not heard, the Joint Parliamentary Committee (JPC) on the Waqf (Amendment) Bill accepted 32 out of the more than 500 amendments moved by the members, after a vote.

With the BJP and its allies having numerical majority, all amendments moved by them were accepted at the JPC meeting, while those moved by the Opposition were rejected. The panel will meet on Wednesday to finalise the report.

The Bill originally proposed to remove the concept of "Waqf by user", under which properties are deemed Waqf-based solely owing to their long use for religious purposes. The move set off a massive outrage owing to the fear that it would endanger several religious structures that have been in use for generations.

Registration mandatory
Offering a concession, BJP MP Nishikant Dubey's amendment, which was accepted by the panel, said the "Waqf by user" would remain Waqf properties except those in "dispute or government facilities". However,

Key changes

Some of the amendments that were accepted to the Waqf (Amendment) Bill

- A Waqf Board can now have even four non-Muslim members instead of two mentioned in the Bill
- Existing 'Waqf by user' properties will remain so, except when they are in 'dispute or are government facilities.' 'Waqf by user' refers to a property that may or may not have record proving it to be Waqf but has been used for religious purposes. However, the amendment makes it clear that such existing properties must be registered before the new law comes into force
- Collector no longer allowed to conduct an inquiry into disputes over a Waqf property. Instead State governments allowed to designate an officer above the rank of Collector
- The deadline for registration of Waqf properties extended from six months as laid down by the proposed Bill
- While the Bill states that only a person practising Islam for at least five years may declare a Waqf, an amendment adds that such a person should be showing or demonstrating that he or she is practising the religion for five years



Discussion time: Waqf Bill panel Chairperson Jagdambika Pal and committee members leave after the conclusion of a meeting in New Delhi. FILE PHOTO

however, the amendment made it clear that such existing properties must be registered before the new law came into force, the sources said.

Among the other amendments adopted by the panel include the decision to do away with vesting any inquiry into disputes over a government property with the District Collector concerned. The amendment proposed by BJP MP Brij Lal said the "State government may, by notification, designate an officer above the rank of Collector" to carry out an inquiry, as per law. This provision was also questioned by Muslim bodies, which had pointed out that

the Collector, who was also head of the revenue records, could not be an impartial judge to such disputes.

One of the biggest objections was on including non-Muslims to the Waqf Board. The accepted amendment ignores this concern. One of the changes accepted by the panel said "two of total members of the Board appointed under this sub-section, excluding ex-officio members, shall be non-Muslim". The phrase "excluding ex-officio members" did not feature in the Bill. This, as per sources, will allow the Board to have even four non-Muslim members instead of two.

With the Bill making it mandatory on every Waqf registered under the existing law to declare the property's details on its website within a period of six months from the proposed Act coming into force, another cleared amendment will now give the "Mutawalli (caretaker)" the authority to extend the period, subject to the consent of the Waqf tribunal in the State. An amendment proposed by BJP MP Sanjay Jaiswal and accepted by the committee seeks inclusion of one person having knowledge of Muslim law and jurisprudence as a member of such tribunals.

The Opposition moved amendments to all the 44

clauses, specifically seeking to delete 28 of these to restore the law to the 1995 principal Act. The Opposition had moved amendments against the institution of separate Waqf Boards for Aghakhani and Bohra sects. They also moved an amendment to remove clause 9 that allows inclusion of two non-Muslim members to the Central Waqf Council. All the 11 Opposition MPs moved an amendment to remove clause 40, which seeks to delete the provision that allows non-Muslims to also donate property to Waqf, from the original Act.

In a joint statement, 11 panel members from the Opposition said they were "stopped from placing their views on the amendment" and that no discussion on clause by clause was permitted by the chairman. They further said that 95% of the stakeholders who deposed before the panel opposed the Bill. In "grave departure" from the established rules, the Opposition said the minutes of the sittings held in Delhi and other places were not supplied to the members. "...our sincere efforts to protect the constitutional assurances given to the minorities are being defeated," the statement read.

Key Features of the Bill

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Daily News Analysis

- ➔ **Main Proposal:** The Bill initially sought to remove the concept of "Waqf by user", which allowed properties to be considered Waqf simply due to their long-term use for religious purposes. This proposal caused concern over the potential threat to several religious structures.
- ➔ **Amendments Accepted:**
 - **Waqf by User:** A concession was offered, allowing Waqf properties under "Waqf by user" to remain, except for those in dispute or government facilities. These properties must be registered before the new law comes into effect.
 - **Dispute Resolution:** The Bill removed the requirement for District Collectors to inquire into disputes over government property, instead allowing state governments to designate a higher-ranking officer for the task.
 - **Non-Muslim Members on Waqf Board:** The amendment allows up to four non-Muslim members on the Waqf Board, even though this move was opposed by Muslim bodies.
 - **Mutawalli Authority:** An amendment gives the caretaker (Mutawalli) authority to extend the period for declaring property details, with consent from the Waqf tribunal.
 - **Waqf Tribunals:** An amendment was made to include a member with knowledge of Muslim law in Waqf tribunals.

Opposition's Concerns

- ➔ The Opposition moved amendments to remove provisions they felt were detrimental to minority rights, including the inclusion of non-Muslims in the Waqf Board and the donation rights for non-Muslims.
- ➔ They expressed dissatisfaction with being unable to discuss amendments or present their views, citing their concern over minority protection.

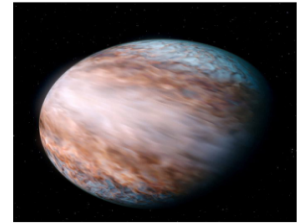
UPSC Mains Practice Question

Ques: Discuss the key provisions and objectives of the Waqf (Amendment) Bill and its potential impact on religious properties in India. **(150 Words /10 marks)**

Supersonic jet-stream winds of 33,000 km/h have been detected on the exoplanet WASP-127b, making them the fastest winds observed on any known planet.

Analysis of the news:

- ➔ WASP-127b, a gas giant exoplanet, has the fastest jet-stream winds, blowing at 33,000 km per hour.
- ➔ It orbits a star similar to our Sun, located 520 light-years from Earth.
- ➔ The planet's diameter is 30% larger than Jupiter, but its mass is only 16% of Jupiter's.
- ➔ WASP-127b is a "hot Jupiter," with no solid surface, composed mostly of hydrogen and helium.
- ➔ Its atmosphere is about 2,060°F (1,400 K), with the day side facing the star constantly, and the night side facing away.
- ➔ The intense irradiation from its host star drives the planet's extreme winds.
- ➔ The planet has been studied to understand atmospheric dynamics and wind patterns in exoplanets.



An impression of WASP-127b shows its newly discovered supersonic winds. REUTERS

Astronomers spot ferocious winds on alien planet

Reuters

In the earth's upper atmosphere, a fast-moving band of air called the jet stream blows with winds of more than 442 km per hour, but they are not the strongest in our solar system. The comparable high-altitude winds on Neptune reach about 2,000 km per hour. Those, however, are a mere breeze compared to the jet-stream winds on a planet called WASP-127b.

Astronomers have detected winds howling at about 33,000 km per hour on this large gaseous planet, located in our Milky Way galaxy approximately 520 lightyears from the earth in a tight orbit around a star similar to our sun.

The supersonic jet-stream winds circling WASP-127b at its equator are the fastest of their kind on any known planet. "There is an extremely fast

WASP-127b is a type called a hot Jupiter, a gas giant that orbits very close to its host star. WASP-127b's diameter is about 30% larger than Jupiter, our solar system's largest planet. WASP-127b is about 30% larger than Jupiter, our solar system's largest planet.

circumplanetary jet wind found on the planet. The velocity of the winds is surprisingly high," said astrophysicist Lisa Northmann of the University of Göttingen in Germany, lead author of the study published on Tuesday in the journal *Astronomy & Astrophysics*.

More than 5,800 planets beyond our solar system, called exoplanets, have been discovered. WASP-127b is a type called a hot Jupiter, a gas giant that orbits very close to its host star. WASP-127b's diameter is about 30% larger than Jupiter, our solar system's largest planet. But its mass is only about 16% that of Jupiter, making it one of the puffiest planets ever observed.

"WASP-127b is a gas giant planet, which means that it has no rocky or solid surface beneath its atmospheric layers. Instead, below the observed atmosphere lies gas that becomes denser and more pressurized the deeper one goes into the planet," said astrophysicist and study co-author David Cont of Ludwig Maximilian University of Munich in Germany.

It orbits its star every roughly four days at just about 5% of the distance between the earth and the sun, leaving it scorched by stellar radiation. Like our moon is to the earth, one side of WASP-127b perpetually faces its star – the day side. The other side always faces away – the night side. Its atmosphere is about 2,060 degrees Fahrenheit (1,400 degrees Kelvin/1,127 degrees Celsius), with its polar regions less hot than the rest.

Like Jupiter, WASP-127b is composed mainly of hydrogen and helium, but its atmosphere also contains traces of more complex molecules such as carbon monoxide and water, which were identified in this research.

"The fact that a hot Jupiter's day side is highly irradiated is believed to be a major driver of atmospheric dynamics.

"Answering the question of what drives these intense winds is challenging, as several factors influence wind patterns in exoplanet atmospheres," Mr. Cont said.

"The primary source of energy for these winds is the intense irradiation from the host star," Mr. Cont added, but other factors also play an important role in shaping the wind patterns.

Higher atmospheric wind speeds have been detected on two other exoplanets, in winds from their day side to night side, but not in winds flowing around the entire planet.

The news highlights the environmental impact of coal mining in Jharsuguda, Odisha, focusing on vegetation damage caused by dust pollution and satellite-based monitoring solutions.

In Odisha, coal dust is clogging leaves, blocking carbon uptake

A recent study found that plants covered in mining dust absorbed 2-3 grams less carbon per square meter, emitting more carbon dioxide into the atmosphere, potentially exacerbating global warming; the dust also diminished the plants' capacity to release water vapour through transpiration

Savyantam Datta
SRI CITY

The Bengal Nagpur Railway had been tasked by the British Indian government with developing rail networks in eastern and central India. In 1900, when its workers were digging in Jharsuguda, now a district in Odisha, they stumbled upon large coal deposits. Nine years later, Jharsuguda's first coal mine was established and a century later the region was producing more than 15 million tonnes of coal in a year. Coal is a fossil fuel produced by the decomposition of dead plants trapped in layers of soil. Around three-fourths of India's electricity is produced by coal-fired power plants. It is also critical in the iron, steel, cement, and fertiliser industries. India is one of the largest producers and consumers of coal worldwide, second only to China.

A patina of dust
In Jharsuguda, most coal mines are open-cast. Miners here start at the surface of the soil, removing soil and rocks to expose the coal deposits. This is more cost-effective than underground mining, which requires digging tunnels to access the deposits.

But open-cast mining pollutes the air more. The dust from blasting rocks, drilling holes in the ground, and transporting the coal and rock waste disperses through the air and can choke lungs when inhaled. The dust also settles on the leaves of plants nearby. When this happens, stomata – the small pores on leaves through which plants exchange carbon dioxide, water vapour, and oxygen – are clogged, affecting photosynthesis and temperature regulation in the plants. Estimating the impact of mining dust on nearby vegetation requires researchers to collect a large number of dust-laden leaves from plants spread in the area surrounding a mine. With the dust spreading as far as 30 km away from the mining site, this is a Herculean task.

In a October 2024 study published in the *Journal of Geophysical Research: Biogeosciences*, researchers from the University of Southampton in the U.K. and the National Institute of Technology (NIT), Rourkela, reported using freely available data from several satellites to investigate how plants are affected by mining dust.

"Use of satellite data provides a great opportunity to efficiently monitor larger areas," Jadu Dash, study co-lead and University of Southampton professor of remote sensing, said. The data suggest the dust has significant effects on the ability of vegetation to absorb carbon dioxide.

Amit Kumar Gorai, professor of mining engineering at NIT Rourkela and the other lead, added, "The study emphasises the importance of tackling dust pollution to protect vegetation and promote sustainable urban and industrial development."

Eyes in the sky
The study was performed by Avinash Kumar Ranjan, who undertook the project as a part of his doctoral research at NIT Rourkela. He began by estimating the amount of



An open-cast coal mine in Jharkhand, UNIVERSITY OF SOUTHAMPTON/SPECIAL ARRANGEMENT

mining dust settling on leaves in areas surrounding coal mines in Jharsuguda. To do this, he used data from two satellites, Landsat-8 and -9, and two satellite clusters, Sentinel-2 and PlanetScope. The U.S. Geological Survey and NASA launched the Landsat satellites in 2013 and 2021 while the European Space Agency launched Sentinel-2B (which supplied data for the study) in 2017 and Planet Labs launched PlanetScope in 2016-2022.

Light falling on leaves is composed of different wavelengths; we can see some (blue, green, red) but not others (e.g. infrared). The leaves absorb some of these wavelengths and reflect the rest. Like a camera snaps our photographs by capturing the visible light reflected by our bodies, satellites can capture images of an area in different wavelengths using special instruments.

When dust settles on leaves, it changes how much of a certain wavelength of light the leaves reflect. This changes the images of an area captured by a satellite for that particular wavelength.

By comparing satellite images of areas farther from the coal mines with those that were closer, the researchers could estimate the amount of dust settling on leaves.

To validate their estimates, the team also visited two sites in Jharsuguda and collected 300 leaf samples with dust on their surfaces. In their laboratory, they weighed each dusty leaf, and brushed the dust off and weighed the leaf again. The difference between the two readings yielded another estimate of the amount of dust settling on plant leaves around the coal mines.

Finally, they used statistical methods to find that the actual readings were remarkably close to those calculated from

Around three-fourths of India's electricity is produced by coal-fired power plants. Coal is also critical in the iron, steel, cement, and fertiliser industries. India is one of the largest producers and consumers of coal worldwide, second only to China

satellite data, demonstrating that satellite images could be used to estimate the amount of mining dust settling on the local flora.

Narayan Kayet, a scientist at the Environmental Management and Policy Research Institute, Bengaluru, said the strength of the study lay in "the use of data from multiple satellites, which ensures comprehensive coverage and cross-validation of results."

Mr. Kayet has previously studied the amount of mining dust settling on plants surrounding coal mines in Jharkhand. He wasn't involved in the new study.

"Incorporating measurements from the field strengthens the credibility" of estimates derived from remote-sensing data, he added.

Dusty leaf, sick plant
The researchers also used statistical models to correlate the amount of dust on leaves with vital physiological processes. For the latter, they used readings from two other space-based instruments called ECOSTRESS and MODIS. Their data can be used to compute the temperature of plants in an area and the amount of water vapour they release, both in high resolution.

The team's models suggested that plants with one gram of mining dust on their leaves absorbed "approximately 2-3

grams less carbon per square meter of area," Mr. Gorai said.

While the amount might seem small for an individual plant, "when you multiply it across large areas of forests or vegetation near mining sites, the loss of carbon absorption becomes significant over time," he added.

Apart from being important for photosynthesis in plants, carbon absorption lowers the amount of carbon dioxide in the air. But when dust clogs the stomata, the plant absorbs less carbon and leaves more carbon dioxide in the atmosphere. This could worsen global warming over time.

Another effect of clogged stomata is that plants become less able to exude water vapour in a process called transpiration. Plants that transpire well are able to maintain their temperature better; those that don't become warmer.

"When leaves are too hot, they struggle to photosynthesise efficiently," Mr. Gorai explained. "Over time, this can lead to stunted growth or even the death of plants." This then leads to long-term damage to local ecosystems.

Mr. Dash and Mr. Gorai also said their study provides a quick and effective way for governments to monitor dust pollution in and around coal mines, identify hotspots, and implement timely measures to prevent long-term damage to surrounding vegetation and local ecosystems.

Such measures could include water sprays and dust barriers, Mr. Dash said. Mr. Kayet agreed: "We need stringent measures to reduce dust emissions in mining regions to mitigate vegetation stress."

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Discovery of Coal in Jharsuguda

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Daily News Analysis

- ➔ Jharsuguda, Odisha, became a coal-rich area after coal deposits were discovered in 1900 during railway construction.
- ➔ The first coal mine in the area was established in 1909, and the region now produces over 15 million tonnes of coal annually.

Importance of Coal

- ➔ Coal is formed by the decomposition of plants and is vital for electricity generation, iron, steel, cement, and fertilizer industries.
- ➔ Around three-fourths of India's electricity comes from coal-fired power plants, making India the second-largest global coal producer and consumer after China.

Impact of Open-Cast Mining

- ➔ Open-cast mining, the dominant method in Jharsuguda, creates more air pollution than underground mining due to dust generation.
- ➔ Dust from mining operations spreads up to 30 km, affecting nearby vegetation and air quality.
- ➔ Dust clogs the stomata of plants, hampering photosynthesis and temperature regulation.

Use of Satellite Data for Monitoring

- ➔ Researchers used data from satellites like Landsat and Sentinel to study dust effects on vegetation.
- ➔ Satellite data showed significant impacts of dust on plants' ability to absorb carbon dioxide.
- ➔ Field samples validated the accuracy of satellite estimates.

Environmental Consequences

- ➔ Clogged stomata, caused by the settling of dust on plant leaves, hinder the plant's ability to absorb carbon and release oxygen.
- ➔ Increased carbon dioxide in the atmosphere contributes to global warming over time.
- ➔ The reduced ability for transpiration causes plants to retain excess heat, leading to overheating.
- ➔ Overheated plants struggle to photosynthesize efficiently, causing stunted growth.
- ➔ In severe cases, plants may die due to the inability to regulate temperature and carry out essential functions.
- ➔ These changes ultimately harm local ecosystems, reducing biodiversity and disrupting the ecological balance.

Recommendations and Conclusion

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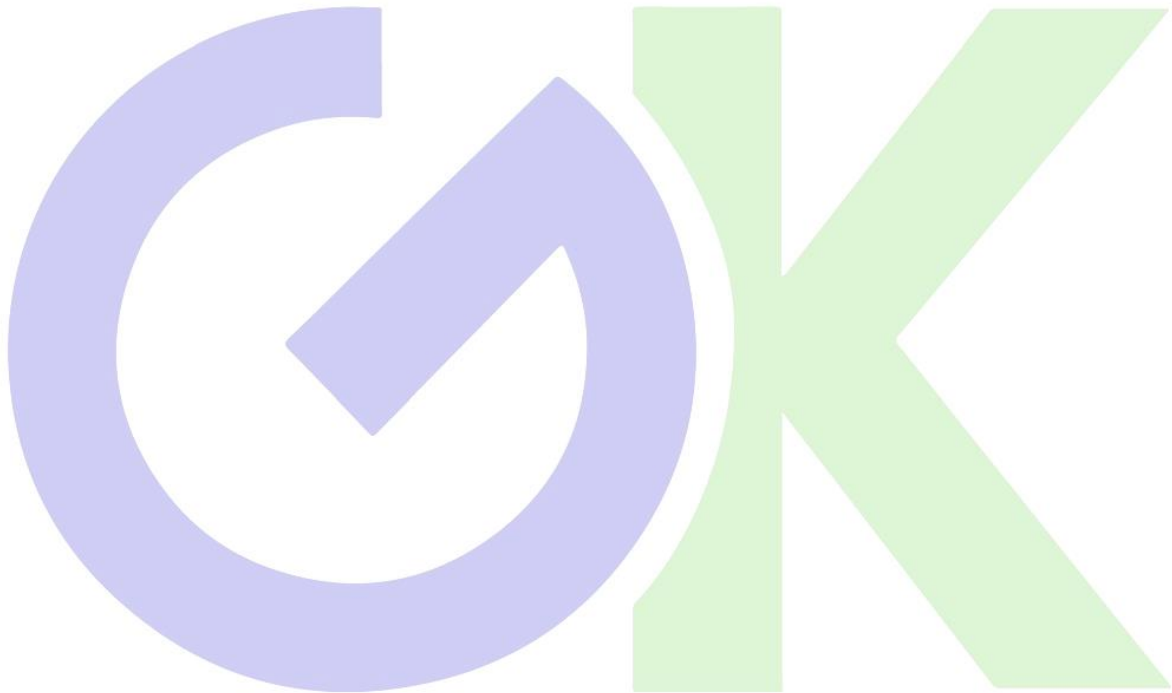
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Daily News Analysis

- Governments can use satellite data to monitor dust pollution and address hotspots.
- Measures like water sprays and dust barriers can reduce mining dust and protect vegetation.

UPSC Mains PYQ : 2017

Ques: In spite of adverse environmental impact, coal mining is still inevitable for development." Discuss. (150 words/10m)



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IIT-Madras director V. Kamakoti claimed that cow urine has antifungal, antibacterial, and anti-inflammatory properties.

Does cow urine have anti-infective properties?

Why did IIT-Madras director V. Kamakoti's statements on cow urine spark outrage? Which are the papers he listed which elaborated on the benefits of bovine urine? Have any conclusive studies been undertaken in India about the same?

EXPLAINER

Arkatapa Basu
Priyali Prakash

The story so far:

In January 15, IIT-Madras director V. Kamakoti said that cow urine had antifungal, antibacterial, and anti-inflammatory properties at a goshala in West Mambalam in Chennai. In a media interaction five days later, Dr. Kamakoti listed five peer-reviewed papers that he said validated the "anti-infective" properties of cow urine. His statements have since gone viral on social media as many questioned his claims and deemed his observations to be inappropriate as the head of a scientific institution.

What did the papers state?

One paper titled 'Peptide profiling in cow urine reveals molecular signature of physiology-driven pathways and in-silico predicted bioactive properties' was published on June 14, 2021, in the journal *Nature Scientific Reports*. "The researchers have experimented and presented their findings. *Nature* is one of the top journals in the United States of America. The output in the research papers is the evidence," Dr. Kamakoti said. However, *Nature* and *Nature Scientific Reports* are two different journals. Independent experts said the research article itself "does not seem bad" but that it is just an analysis of bovine urine. "Authors say that there are a lot of studies of peptides in human urine, but not much work has been done in the case of bovine urine."

Aniket Sule, associate professor at the Homi Bhabha Centre for Science Education in Mumbai, told *The Hindu*. "There are also similar studies about donkey urine. Essentially, all mammals pass some peptides in their urine and those peptides give a lot of indications about the health of that individual. That is also the reason why we do urine analysis



Exaggerated claims: Cows covered in jute blankets to keep warm at a barn in Surat in 2024. ANI

in pathology labs. So, they are just presenting their analysis of bovine urine. There is no claim beyond that." Dr. Sule added that there have been papers from China discussing the use of cow dung as fertilizer. "However, developing a fertilizer from mammal urine/excreta is a different thing from human consumption of urine/excreta," he said. Dr. Sule quoted the example of U.S. President Donald Trump asking scientists in his first term, during the COVID-19 pandemic, about the alleged benefits of drinking bleach. "Just because bleach is anti-bacterial on the floor doesn't mean it is medicinal for humans," Dr. Sule said.

Gautam Menon, dean of research and professor of physics and biology at Ashoka University in Sonapat, said the paper is "perfectly reasonable scientific work, although whether it is interesting or not is another matter". "Checking

antibiotic effects on two standard bacterial species is a common thing to do. Their result is not particularly surprising nor is it claimed to be," he added.

The second paper Dr. Kamakoti referred to was entitled 'Benefits of cow urine' and published in the *International Journal of Recent Advances in Multidisciplinary Research* on September 29, 2017. The paper reviews previous research articles describing the medicinal benefits of cow urine, a form of research called a meta-analysis. According to the paper, "Many researches have also been done, which shows its use for treatment of skin diseases, stomach diseases, kidney diseases, heart diseases, stones, diabetes, liver problem, jaundice, athlete's feet, cyst, haemorrhoid, etc. and show its immunostimulant, bioenhancer, anticonvulsant, anti-cancerous, wound-healing, antioxidant, and

antimicrobial properties." The abstract of the study concludes by calling for more public awareness of the importance of cow urine. However, Dipshikha Chakravorty, professor at the department of microbiology and cell biology at the Indian Institute of Science, Bengaluru, said in an email to *The Hindu*, "Consumption of any urine is detrimental and dangerous, including healthy individual urine. Urine contains resident bacteria, and that can be detrimental." She added that there have been reports of various types of urine containing bacteria that could be pathogenic. The prevalence of grammatical and typographical mistakes in the paper indicate the journal's editors didn't copy-edit it, a symptom – albeit not a conclusive one – of low-quality publishers.

What do other studies say?

In 2022, Bhoj Roj Singh, who recently retired as the epidemiology head of the Indian Veterinary Research Institute, Bareilly, led a study that showed the undesirability of humans consuming cow urine. In the study, the team found that fresh urine from cows and bulls contains at least 14 types of harmful bacteria, including *Escherichia coli*. The study also reported that urine can't inhibit bacterial growth. "In case one gets infected from the bacteria, [the infections] can lead to life-threatening infections, particularly among those consumers who are already sick or have weak immune systems," Dr. Singh said.

He also said proponents of drinking cow urine had criticised the study for using fresh urine while they advocated the consumption of urine distillates. His lab analysed these distillates as well as packaged urine found in the market. "We reported those too to be risky and full of microbes (no-quality control practised). Moreover, the antimicrobial activity detected may hardly be of any therapeutic utility as it may not be feasible to consume such a large amount of urine safely to get its antibacterial action in our bodies," he said.

THE GIST

One paper titled 'Peptide profiling in cow urine reveals molecular signature of physiology-driven pathways and in-silico predicted bioactive properties' was published on June 14, 2021, in the journal *Nature Scientific Reports*.

The second paper Dr. Kamakoti referred to was entitled 'Benefits of cow urine' and published in the *International Journal of Recent Advances in Multidisciplinary Research* on September 29, 2017.

In 2022, Bhoj Roj Singh, who recently retired as the epidemiology head of the Indian Veterinary Research Institute, Bareilly, led a study that showed the undesirability of humans consuming cow urine.

➡ He referred to five peer-reviewed papers to support his statements, which sparked viral reactions and questions about their validity.

Details of the Papers Cited

➡ Peptide Profiling in Cow Urine

- Published in *Nature Scientific Reports* in 2021, this study analyzed peptides in bovine urine.

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Daily News Analysis

- Experts, however, stated that the study was a basic analysis of urine and did not support medicinal claims.
- There are similar studies on other mammal urine, and the study did not suggest human consumption of cow urine.

➔ **Benefits of Cow Urine**

- This paper, published in 2017, listed several claimed health benefits of cow urine, such as treating diseases like diabetes, kidney issues, and cancer.
- Experts, however, warned that consuming urine could be harmful due to the presence of bacteria.

➔ **Other Studies on Cow Urine**

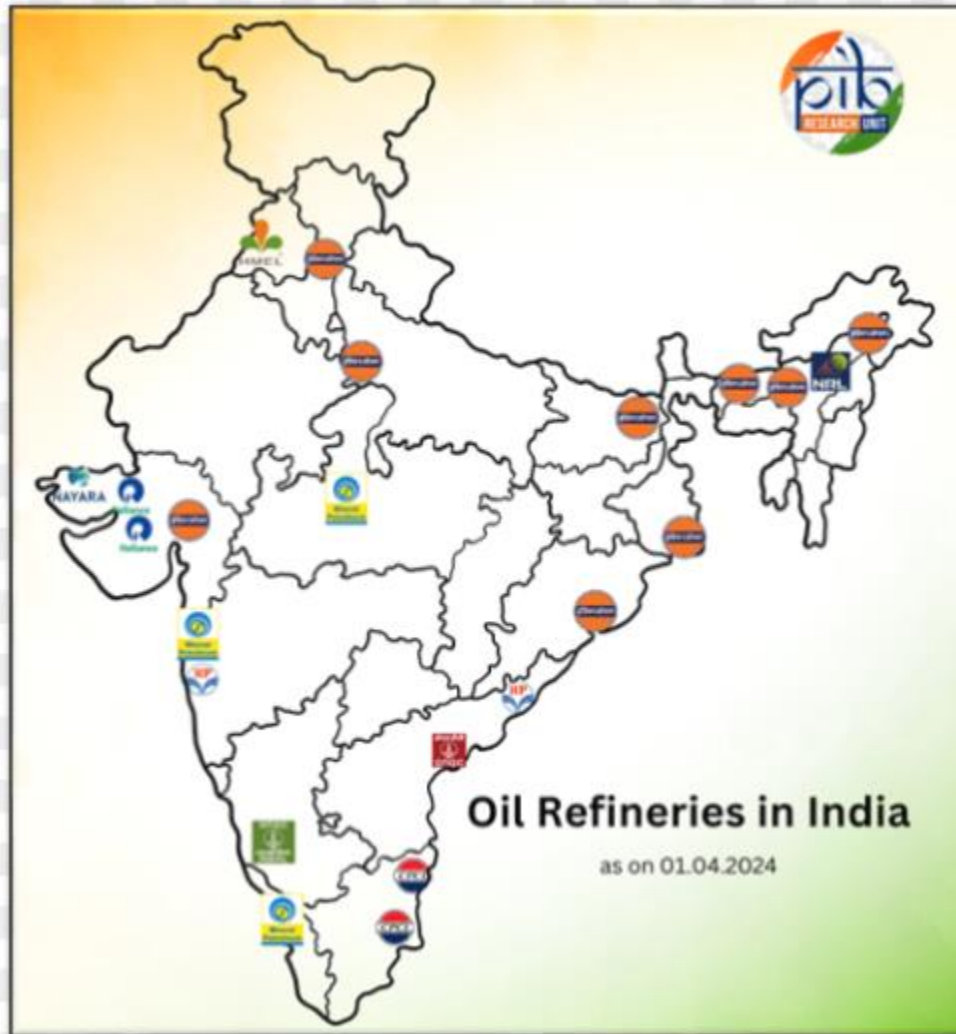
- A 2022 study by Dr. Bhoj Roj Singh found that cow urine contains harmful bacteria, including E. coli, and does not inhibit bacterial growth.
- Even urine distillates, sold commercially, were found to contain microbes, making their consumption risky and not therapeutically beneficial.

UPSC Mains Practice Question

Ques: What are the potential benefits and harmful effects of cow dung and cow urine, particularly in the context of their use for medicinal purposes. Highlight the scientific evidence supporting these claims and the risks associated with their improper use. **(150 words/10m)**

In News : India's Petroleum Industry : Fueling Growth and Innovation

India's petroleum industry is vital for energy security, economic growth, and technological advancement. The sector is evolving with increased exploration, refining capacity, and green energy initiatives.



Introduction to India's Petroleum Industry

- India's petroleum industry includes exploration, production, refining, distribution, and marketing of petroleum products.
- The sector is divided into upstream (extraction), midstream (transportation and storage), and downstream (refining and distribution) activities.
- India's petroleum industry ensures energy security and supports economic activities.

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Daily News Analysis

- India has 19 public sector refineries, 3 private refineries, and 1 joint venture refinery.
- The country's refining capacity has increased from 215.066 Million Metric Tons per annum (MMTPA) in 2014 to 256.816 MMTPA in 2024.

Origin and History

- India's petroleum journey began in 1867 with the first oil well drilled in Digboi, Assam.
- The Indian Oil Corporation was established in 1959 to refine and distribute petroleum products.
- Over time, India's petroleum industry expanded to meet both domestic and export needs.

Industry Development

- The 1990s saw economic liberalization, leading to more private and foreign investments.
- Public sector companies like ONGC and Indian Oil Corporation played key roles in exploration and refining.
- The development of modern refineries, such as the Jamnagar Refinery, has made India a major refining hub.
- India has 651.8 million metric tons of crude oil reserves and 1,138.6 billion cubic meters of natural gas reserves.

Recent Updates in the Petroleum Industry

- India aims to increase exploration acreage to 1 million square kilometers by 2030, with a 16% increase expected by 2025.
- The cost of a domestic LPG cylinder is among the lowest worldwide, priced at Rs. 803 for a 14.2 kg cylinder.
- The approval process for exploration and production has been streamlined from 37 to 18 processes.
- The Oilfields (Regulation and Development) Amendment Bill passed in 2024 supports policy stability for oil and gas producers.

Foreign Trade in Petroleum

- India's refining capacity of over 250 million metric tonnes per annum allows it to cater to global markets.
- Key export destinations include South Asian, African, and European countries.
- The government's focus on export growth and establishing Special Economic Zones has boosted petroleum exports.

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Contribution to GDP

- The Gross Value Addition (GVA) from refined petroleum products increased from Rs. 1.56 lakh Crore in 2012-13 to Rs. 2.12 lakh Crore in 2022-23.
- The sector provides direct and indirect employment in exploration, refining, distribution, and retail, supporting other industries like petrochemicals and logistics.

Global Positioning

- India ranks in the top five globally for refining capacity and is the seventh-largest exporter of refined petroleum products.
- India is the second-largest country in ethanol blending and third-largest in biofuel production.
- India also has the fourth-largest LNG terminal capacity and refining capacity globally.

Technological Advancements

- The petroleum industry has embraced enhanced oil recovery (EOR) techniques and AI for better exploration and production.
- Refineries are adopting green technologies to reduce environmental impact.
- The industry is also focusing on alternative fuels like compressed biogas (CBG) and bio-refineries.

Government Initiatives

- Several government schemes aim to strengthen the petroleum sector, such as:
- Pradhan Mantri JI-VAN Yojana for bio-ethanol production.
- Strategic Petroleum Reserves to ensure energy security.
- Ethanol Blending Program, with a target of 20% ethanol blending in petrol by 2025-26.
- Expansion of City Gas Distribution Networks and investments in energy security.

Greener Fuels and Sustainability Initiatives

- The SATAT Initiative promotes compressed biogas production using agricultural residue and waste.
- Mission Green Hydrogen aims to produce 5 million metric tons of green hydrogen by 2030.
- National Bio-Energy Program focuses on bio-energy production and waste reduction.

Implications for Growth and Development

- The petroleum industry drives economic growth by increasing GDP, boosting foreign exchange, and supporting industrial expansion.

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- ➔ It strengthens India's political and energy independence.
- ➔ The industry also fosters rural development by improving energy access and creating jobs.

Conclusion

- ➔ India aims for substantial growth in refining capacity, ethanol blending, green hydrogen production, and exploration acreage by 2030.
- ➔ These efforts will help India maintain its global leadership in the energy sector while addressing environmental goals.

UPSC Mains Practice Question

Ques: Analyze the role of India's petroleum industry in driving economic growth, energy security, and environmental sustainability. What strategies should be adopted to enhance its future prospects? **(150 Words /10 marks)**

The Union Budget as a turning point for climate action

All eyes will be on Union Finance Minister Nirmala Sitharaman when she takes centre stage on February 1 to present the Union Budget. As the nation grapples with increasingly frequent extreme weather events and mounting pressure to meet its climate commitments, the FY26 Budget carries the weight of both urgency and opportunity. With just five years left to achieve India's first interim Net-Zero target, the Budget must take decisive steps to protect those on the frontlines of climate change.

Previous Budgets have demonstrated the government's commitment to climate action, notably through initiatives such as the PM Surya Ghar Muft Bijlee Yojana, support for electric vehicle charging infrastructure, viability gap funding for offshore wind energy, and increased allocations for the National Green Hydrogen Mission. Yet, with a total renewable energy installed capacity of 203.18 GW, far short of the 2030 target of 500 GW, accelerated investment and policy support are imperative.

There is much work to be done

The Budget must prioritise key policy measures to strengthen India's climate response and accelerate progress on both adaptation and mitigation fronts. First, to accelerate India's green energy transition, the PM Surya Ghar Muft Bijlee Yojana needs a comprehensive review. While the scheme has seen around 1.45 crore registrations, the completion rate of only 6.34 lakh installations (4.37%) indicates the presence of significant implementation gaps. To address this, the FY26 Budget must take a multi-pronged approach. In the first instance, fiscal allocations should prioritise the Renewable Energy Service Company (RESOCO) model, effectively transforming the prohibitive upfront costs into manageable operating expenses for lower-income households through innovative financial instruments and credit guarantees.

In the second instance, the Budget must expand the scope of production-linked incentives (PLI) across the solar module supply chain, addressing the critical supply-demand mismatch, where domestic manufacturing fulfils only 40% of



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The Budget should reflect the seriousness of the government in integrating climate competitiveness into India's fiscal framework

current requirements. This expansion would boost manufacturing capacity and create economies of scale, potentially reducing costs that are 65% higher for domestically manufactured panels than those imported to the country.

In the third instance, India's vast railway network offers untapped potential for renewable energy generation. Estimates suggest that the Railways' extensive land banks and track corridors could host up to 5 GW of solar and wind installations. The Budget should encourage innovative public-private partnership models to unlock this opportunity.

EU mechanism and India

Second, the European Union's Carbon Border Adjustment Mechanism (CBAM), which will take effect on January 1, 2026, necessitates urgent budgetary interventions to protect India's export competitiveness. India's total exports of CBAM products to the EU amount to \$8.22 billion annually and will likely face carbon levies ranging from around 20% to 50%.

This presents an existential challenge for India's Micro, Small and Medium Enterprises (MSME), which have a contribution of 30% of GDP and 45% of exports. The Budget can establish a dedicated 'Climate Action Fund', modelled after successful initiatives such as Japan's Green Transformation (GX) Fund for industrial decarbonisation, particularly across the most vulnerable export sectors. The Fund can also support the capacity-building initiatives for MSMEs to ensure proper compliance and reporting under CBAM.

Third, the Budget must accelerate India's transition to a circular economy. A recent study by the Council on Energy, Environment and Water estimates that the benefit of adopting a circular economy can yield an annual profit of ₹40 lakh crore (\$624 billion) for India by 2050 while reducing greenhouse gas emissions by about 44%. A weighted deduction of 150% on investments in recycling infrastructure and refurbishment technologies, complemented by accelerated depreciation benefits for circular economy assets, can encourage businesses to

invest in recycling and refurbishment technologies. The Budget should establish a sovereign green bond framework specifically for financing circular economy infrastructure.

On insurance products, green finance

Fourth, there is a strong need to strengthen climate resilience. India's insurance penetration remains worryingly low. According to the Insurance Regulatory and Development Authority of India (IRDAI) 2023-24 Annual Report, it has declined from 4% in FY23 to 3.7% in FY24. To address this challenge, the Budget could offer tax deductions to insurance companies on income from climate-linked policies and advocate lower Goods and Services Tax (GST) rates on premiums for insurance products specifically designed for climate resilience and disaster protection.

Finally, some estimates indicate that standardising green finance definitions could help build investor confidence and help India get part of the ₹162.5 trillion (\$2.5 trillion) needed to achieve the Nationally Determined Contributions by 2030. The Budget should allocate funds to build the institutional and technical infrastructure required to implement the climate finance taxonomy effectively, including for market readiness programmes, verification systems, and capacity building of financial institutions.

The Budget can further catalyse this transition by introducing differential tax treatment for taxonomy-aligned investments and committing to classify government expenditure according to green criteria.

Climate-linked economic policies are no longer peripheral but central to maintaining competitiveness in international trade and investment flows. With rising global demand for low-carbon goods and the increasing alignment of capital markets with sustainability metrics, India must act decisively and integrate climate competitiveness into its fiscal framework. The Budget will indeed signal the seriousness of the government's intent in this regard.

The views expressed are personal

GS Paper 03 : Indian Economy & Environment

PYQ: (UPSC CSE (M) GS-2 2022): Clean energy is the order of the day. Describe briefly India's changing policy towards climate change in various international fora in the context of geopolitics. (250 Words /15 marks)

UPSC Mains Practice Question: How can the Union Budget FY26 strengthen India's response to climate change through renewable energy, MSME support, and circular economy measures? (250 Words /15 marks)

Context :

- The FY26 Union Budget must address India's climate goals by prioritizing renewable energy, decarbonization, circular economy, green finance, and climate resilience measures.

Focus on Climate Action Amidst Urgent Challenges

- With only five years left to meet India's interim Net-Zero targets, the Budget must prioritize policies addressing climate change.
- Extreme weather events and global climate commitments necessitate immediate and decisive steps to protect vulnerable populations.

Past Achievements in Climate Initiatives

- The government has introduced impactful programs like the PM Surya Ghar Muft Bijlee Yojana, support for EV charging infrastructure, and funding for offshore wind energy projects.
- The National Green Hydrogen Mission received increased funding.
- India's renewable energy capacity stands at 203.18 GW, far short of the 2030 target of 500 GW, requiring significant acceleration.

Key Priorities for the FY26 Budget

- **Strengthening the Green Energy Transition**
 - **Review of PM Surya Ghar Muft Bijlee Yojana**

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- Despite 1.45 crore registrations, only 6.34 lakh installations (4.37%) have been completed, indicating major implementation gaps.
- Increased fiscal support should prioritize the Renewable Energy Service Company (RESCO) model to make solar energy affordable for low-income households.
- **Expanding Solar Manufacturing**
 - Domestic production meets only 40% of solar panel demand, with local panels costing 65% more than imports.
 - The Budget must expand production-linked incentives (PLI) for the solar module supply chain to address this gap.
- **Renewable Energy Potential in Railways**
 - Indian Railways' land and corridors could support up to 5 GW of solar and wind energy.
 - Public-private partnerships should be encouraged to unlock this potential.

Addressing the EU Carbon Border Adjustment Mechanism (CBAM)

- ➡ The EU's CBAM, effective January 2026, will levy carbon taxes of 20%-50% on \$8.22 billion worth of Indian exports annually.
- ➡ MSMEs, contributing 30% to GDP and 45% to exports, face major risks.
- ➡ A dedicated 'Climate Action Fund,' similar to Japan's Green Transformation Fund, can support decarbonization in vulnerable export sectors and build MSME capacity for CBAM compliance.

Carbon Border Adjustment Mechanism (CBAM)

- ➡ The EU's Carbon Border Adjustment Mechanism (CBAM) will be implemented on January 1, 2026.
- ➡ It is designed to prevent carbon leakage by imposing carbon taxes on imported goods with high carbon footprints.
- ➡ CBAM applies to sectors like iron, steel, cement, aluminum, fertilizers, electricity, and hydrogen. Carbon levies are expected to range from 20% to 50% of product value.
- ➡ It poses a significant challenge for India's MSME sector, which contributes 30% to GDP and 45% to exports.
- ➡ The mechanism aims to align global trade with climate goals, incentivizing exporters to adopt greener production methods.

Promoting a Circular Economy

- ➡ A circular economy could reduce greenhouse gas emissions by 44% and yield ₹40 lakh crore annually by 2050.

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- ➔ The Budget should incentivize recycling and refurbishment through:
 - A 150% weighted deduction on investments in recycling infrastructure.
 - Accelerated depreciation benefits for circular economy assets.
- ➔ Establishing a sovereign green bond framework to finance circular economy projects is essential.

Enhancing Climate Resilience Through Insurance

- ➔ India's insurance penetration dropped from 4% in FY23 to 3.7% in FY24.
- ➔ Tax deductions for insurance companies offering climate-linked policies and lower GST rates for such premiums can improve resilience.

Advancing Green Finance

- ➔ Standardized green finance definitions can attract a share of the ₹162.5 trillion required for India's climate goals by 2030.
- ➔ Allocations should focus on creating a climate finance taxonomy, verification systems, and financial institution capacity building.
- ➔ Differential tax treatment for green investments can further catalyze progress.

Conclusion

- ➔ Climate policies are critical to maintaining trade and investment competitiveness.
 - ➔ Integrating climate action into fiscal planning is key to meeting global sustainability standards and leveraging market opportunities.
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