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THE HINDU
INDIA'S NATIONAL NEWSPAPER SINCE 1878

Daily News Analysis

The Hindu Important News Articles & Editorial For UPSC CSE

Tuesday, 15 April, 2025

Edition: International

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Page 01 : Prelims Fact

A troupe performed for Rongali Bihu celebrations in Guwahati, marking the Assamese New Year. Bihu is a significant cultural and agricultural festival in Assam, symbolizing the spirit, rhythm, and agrarian heritage of the region.

Bihu beats

Rhythmic spirit: A troupe performs for Rongali Bihu, which marks the Assamese New Year, in Guwahati on Monday. RITU RAJ KONWAR

Key Facts about :

- **Types of Bihu:**
  - Rongali Bihu (Bohag Bihu) – Celebrated in April; marks the Assamese New Year and the beginning of the sowing season.
  - Kongali Bihu (Kati Bihu) – Celebrated in October; a more solemn festival, linked with crop protection.
  - Bhogali Bihu (Magh Bihu) – Celebrated in January; harvest festival, involves feasting.

Cultural Significance:

- Involves Bihu dance, dhol (drum) beats, and traditional songs.
- Popular among Assamese communities regardless of religion or ethnicity.

UNESCO Recognition:

- In 2023, a record number of dancers performed the Bihu dance, earning a Guinness World Record, increasing global attention to the tradition.

Associated Terms:

- Bihu Dance – A vibrant folk dance performed by both men and women, characterized by fast-paced steps and rhythmic music.
- Dhol, pepa, taal – Traditional instruments used.

UPSC Prelims Practice Question

Ques :Consider the following statements regarding Rongali Bihu:

1. It is celebrated as the Assamese New Year.

2. It marks the beginning of the harvest season.

3. It involves traditional dance and music performed with instruments like dhol and pepa.

Which of the statements given above is/are correct?

(A) 1 and 2 only

(B) 2 and 3 only

(C) 1 and 3 only

(D) 1, 2 and 3

Ans: (D)

Page : 07 :GS 3 : Agriculture

A recent study has found that land-holding farmers who engage in non-farming activities tend to improve labour use efficiency on their farms. These activities may include migration, local businesses, or skill-based jobs. The findings are based on ICRISAT data from rural areas across 8 Indian states between 2010–2014.

Women transplant paddy at Pathukannu near Puducherry, on April 09, 2020. KUMAR S.S.

'Land-holding farmers doing non-farming activities helps efficiency'

R. Sujatha

Land-holding farmers who engage in non-farming activity tend to improve labour efficiency on their farms, a recent study has found.

The study aimed to understand the impact of multiple job holding on farm labour use efficiency. The researchers used data from the International Crop Research Institute for Semi-Arid Tropics (ICRISAT) of farmers from States such as Odisha, Maharashtra, Telangana, Andhra Pradesh, Bihar, Jharkhand, Karnataka, and Madhya Pradesh for the period between 2010 and 2014.

"This is important as participation in non-farm activities alters farmers' labour allocation decisions between farm and non-farm activities," the researchers said in their paper.

The data came from the Village Dynamics in South Asia Project. The researchers adopted data envelopment analysis to estimate labour use efficiency. This is a mathematical technique that compares the efficiency of multiple workers doing the same kind of task without having to get into exactly how they do it.

Anviksha Drall, assistant professor of economics at the National Law School of India University, Bengaluru; and Sabuj Kumar Mandal, associate professor in the Department of Humanities and Social Sciences at IIT-Madras, conducted the study.

Their article, 'Does multiple job holding raise labour use efficiency of farm operators? Evidence from rural India?'

When farmers migrated, either within their State or outside, they gained new knowledge about farming practices that they applied to their own farms when they returned

was published in the peer-reviewed journal *Applied Economics*.

The researchers found that when farmers migrated, either within their State or outside, they gained new knowledge about farm practices that they applied to their farms when they returned. Often, farmers had time on their hands after sowing seeds. In the intervening months, their family carried on the agricultural work. Large farmers with financial wherewithal hired labour to work in their absence, Mr. Mandal said.

Ms. Drall said, "The study recommends promoting structured non-farm employment opportunities in rural areas to maximise positive spillover effects on farming."

Mr. Mandal added: "Farming is becoming riskier because of climatic shock and price fluctuation. Farmers are diversifying into non-farm activities, either by starting a family occupation such as carpentry, craftsmanship, or a salon, or they migrate. When they migrate, they learn how those in other states conduct their farming activities and the use of technology."

The migration and multiple job holding help in two ways: to invest in new farming practices and improve labour efficiency. "We argue that instead of concentrating only on farming, you can diversify into non-farming activities," Mr. Mandal explained.

"But to start a business, you need money. Farmers face credit constraints. Therefore, we suggest that governments should come in and help farmers to diversify into non-farming activity," he added.

The researchers said they deliberately selected data from villages in semi-arid and humid tropics in the country. Households were chosen randomly based on village listing in each selected village.

Key Findings of the Study:

- Source of Data:
  - Collected by ICRISAT under the Village Dynamics in South Asia Project (2010–2014).
  - Covered states like Odisha, Maharashtra, Telangana, Andhra Pradesh, Bihar, Jharkhand, Karnataka, and Madhya Pradesh.
- Methodology:
  - Used Data Envelopment Analysis (DEA) to assess labour use efficiency, which compares workers' efficiency without requiring identical work processes.
- Major Findings:
  - Migrant farmers gain knowledge of advanced farming techniques and practices and apply them upon return.
  - Non-farm employment during idle months helps generate income and reduces labour idle time.
  - Larger farmers often hire labour in their absence, while family members manage smaller holdings.

Relevance & Analysis

1. Agricultural Diversification and Sustainability

- Non-farm activities help diversify income sources, thereby reducing the risk from climate shocks and market volatility.
- It promotes resilience in farming and enables reinvestment into agriculture.

2. Labour Efficiency and Productivity

- Exposure to non-farm sectors leads to improved time management, skills, and adoption of technology.
- Labour efficiency improves when workforce allocation is optimized across sectors.

3. Rural Employment and Entrepreneurship

- Structured non-farm employment (e.g., carpentry, crafts, small businesses) enhances rural livelihoods.
- It reduces overdependence on agriculture and generates local employment.

4. Policy Implications

- The study suggests the need for government support to help farmers overcome credit constraints.
- Policies should focus on:
    - Skill development
    - Easy credit access
    - Promotion of rural micro-enterprises

UPSC MainsPractice Question

Ques :How does multiple job holding by land-holding farmers improve labour use efficiency? Can this model promote sustainable rural development? Discuss.

The article reports a major breakthrough in silicon photonics — the successful integration of miniature lasers directly onto silicon chips, overcoming a key technological hurdle in high-speed, energy-efficient computing.

Miniature laser grown onto silicon chip could revolutionise computing

Computing may be set for the next great breakout, with scientists growing lasers directly onto a standard silicon chip, making it easy to integrate with current manufacturing infrastructure; information will be carried by photons, which are particles of light, that will replace electrons

Tejasri Gururaj

The invention of silicon chips revolutionised communications. Even today they are the cornerstone of the technologies we use to move information around the world.

The way they work has changed significantly, however. They have become better: for a long time this was because experts improved the hardware to operate as efficiently as possible. But more recently, researchers have started to replace the electrons with photons, the particles of light, as the agents responsible for storing and manipulating information.

Thus today we have silicon photonics with valuable applications in data centres and sensors as well as potential ones in quantum computing.

Silicon photonics is quickly gaining traction due to the many advantages it offers over traditional semiconductor chips.

In a study in *Nature*, scientists from the US and Europe reported that they had successfully fabricated the first miniaturised lasers directly on silicon wafers, marking a significant advance in silicon photonics.

Photons carry information faster, with greater data capacity and lower energy losses than electrons.

But photons aren't silver bullets. A significant challenge associated with using photons is integrating the source of these particles – a light source – with the silicon chip itself.

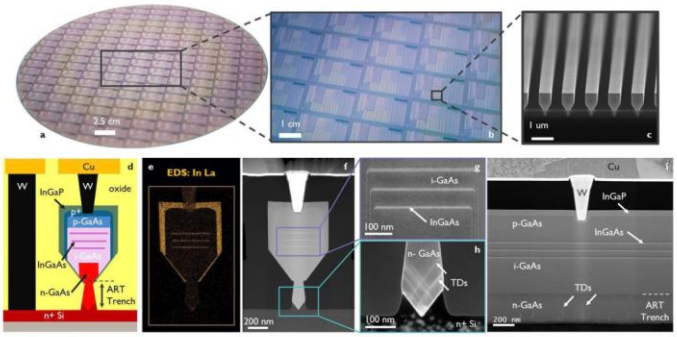
Currently, engineers' best bet is to attach a separate laser light source to the chip.

The resulting device operates more slowly than a chip with an integrated light source because of the small but significant mismatches that arise due to being manufactured independently. Separately manufacturing and attaching the lasers is also more expensive.

In the new study, the researchers surmounted this problem by "growing" the laser directly on a silicon chip, in a process that is also more scalable.

The research team also conducted its entire process in a standard complementary metal-oxide-semiconductor (CMOS) manufacturing line, which the technology industry currently uses to manufacture electronic chips.

Thus, the new technique could be compatible with existing manufacturing methods.



Top, L-R: photograph of a fabricated 300-mm silicon wafer containing thousands of GaAs devices; close-up view of a fabricated 300 mm wafer showing multiple dies; and scanning electron micrograph of a GaAs nano-ridge array before encapsulation. The bottom row shows various components of chip. ARXIV:2309.04473V1

Getting on the chip

A typical silicon chip has four components: a source to produce the electrons or photons, waveguides, modulators, and photodetectors.

In a photonic chip, a laser is the light source. This is the hardest part to make on the silicon chip itself.

The waveguides act as paths for the photons, similar to how wires are paths for electrons.

Modulators are devices that encode information onto light (or decode information from a light signal).

They do this by transcribing the information in some physical property of the light, like varying its intensity, wavelength, or phase. (Similarly, they extract information by "reading" these variations in an incoming carrier signal.)

Finally, photodetectors convert light into electrical signals.

Switching the laser on

In its simplest form, a laser – an acronym of 'light amplification by stimulated emission of radiation' – works by amplifying light in a process called stimulated emission.

Here, an electron in a higher energy level is "kicked" by an incoming photon to lose some energy and drop to a lower energy level. This energy lost is in the form of another photon whose energy matches that of the incident photon. When this process occurs repeatedly, the population of electrons generates a coherent beam of light. This is a laser.

Silicon itself can't emit light efficiently as it has an indirect bandgap. In other words, in a silicon atom, an electron in a higher energy level cannot drop to a lower one on its own; instead, it requires an additional particle to help release the electron's energy and drop down.

Most lasers use semiconductor materials like gallium arsenide to produce the light. These materials have a direct band gap, meaning that electrons inside the material can drop from a higher energy level to a lower one by emitting a photon.

Direct band-gap materials allow electrons to directly emit photons without requiring them to be kicked, converting more electrical energy into light without additional interactions. Thus, the laser is more energy-efficient.

Integrating gallium arsenide with silicon is a major challenge because of the different arrangement of atoms in each of the elements. When gallium arsenide is grown layer by layer on silicon, the mismatch in the crystal structure of the materials causes imperfections where the atomic patterns don't line up properly.

The photonic silicon chip is novel because it's the first demonstration of a fully monolithic laser diode on a silicon wafer. The team's process is also scalable and cost-effective

Imagine trying to fit two puzzle pieces together when they are not part of the same puzzle.

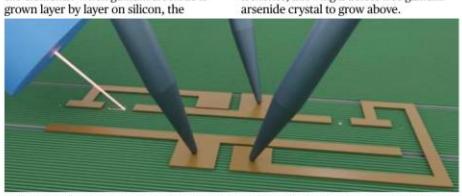
When electrons encounter these defects, they lose energy as heat rather than as light, rendering the laser less efficient.

In the trenches

In their study, the researchers successfully created a chip that consisted of a silicon wafer base, nanometre-sized ridges through which photons travelled, and a small region that produced these photons.

The idea of the ridges came from a 2007 study, in which researchers from AmberWave Systems Corp. found that if gallium arsenide is deposited on silicon at the bottom of a narrow, deep trench surrounded by an insulating material, the defects become 'trapped,' meaning they don't interfere with the laser's ultimate operation.

So the researchers carved nanometre-wide ridges in a 300-mm-long silicon wafer and applied silicon dioxide as the insulating material. Any defects were confined to the bottom of these trenches, allowing a defect-free gallium arsenide crystal to grow above.



A 3D drawing of a wafer-scale test configuration depicting light radiated upwards by the left facet and collected by a multimode fibre and three electrical probes driving the nano-ridge laser and monitoring the ridge photodiode. ARXIV:2309.04473V1

Next, on the same wafer, the researchers deposited three few-atoms-thick layers of indium gallium arsenide (i.e., gallium arsenide where 20% of gallium atoms had been replaced with indium to achieve optimal light emission). These layers together functioned as the laser.

Finally, the team deposited a layer of indium gallium phosphide on top of the whole setup for protection.

To make the laser work, the researchers added electrical contacts connected to an external current source. When a current flowed into the indium gallium arsenide region, the latter emitted photons that flowed through the waveguides.

Solving a long-standing problem

The researchers were able to embed 300 functional lasers on a single 300-mm silicon wafer.The size of the wafer is important because it's the industry standard in modern semiconductor manufacturing and can thus be integrated without demanding significant changes.

The laser produced light with a wavelength of 1,020 nm, which is well-suited for short-ranged transmissions between computer chips.

Thus, the researchers expect their chip could lead to a substantial improvement in computing performance and reduce energy consumption in data centres.

The threshold current required to run the laser was as little as 5 mA, comparable to that required for an LED in a computer mouse. The laser's output was around 1MW.

The laser could continuously operate for 500 hours at room temperature (25° C). At around 55°C, its efficiency dropped.

While this duration is promising, recent research on optical silicon chips has demonstrated continuous operation at temperatures up to 120°C, highlighting ongoing challenges in developing stable semiconductor lasers.

In sum, the photonic silicon chip is novel because it's the first demonstration of a fully monolithic laser diode on a silicon wafer of this size. The team's process is also scalable and cost-effective.

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News Summary:

- Researchers have grown gallium arsenide-based lasers directly on standard silicon wafers, making integration with current chip manufacturing (CMOS) processes possible.
- This innovation could drastically improve data transmission speeds, reduce energy losses, and enable more efficient computing, especially for data centres and AI computing systems.
- The laser integration method is scalable, cost-effective, and compatible with existing infrastructure.

What is Silicon Photonics?

- Silicon Photonics is a technology where light (photons) rather than electrons is used to transfer data within and between chips.
- Advantages over traditional electronics:
  - Faster data transmission
  - Higher bandwidth
  - Lower power consumption
  - Reduced heat generation

Scientific Challenge and Breakthrough:

Aspect	Challenge	Breakthrough
Material mismatch	Silicon has an indirect band gap and cannot efficiently emit light; gallium arsenide (GaAs) has a direct band gap but is structurally mismatched with silicon.	Researchers used nano-ridge trench design to grow defect-free GaAs lasers directly on silicon.
Integration	Traditionally, lasers are manufactured separately and attached — this causes speed and energy inefficiencies.	Lasers were monolithically grown on the wafer — seamless integration.
Manufacturability	Independent manufacturing increases cost and complexity.	Entire process done using CMOS-compatible techniques — mass production possible.

Why is this Important?

1. Boost to Next-Gen Computing:
   - Could drive optical computing, quantum technologies, and AI chip development.
   - Enables faster inter-chip communication, especially in large-scale systems like data centres.
2. Energy Efficiency:
   - Photons don't generate heat like electrons — critical for sustainable data infrastructure.

- The threshold current (5 mA) is as low as that in a basic LED.

3. Make in India/Atmanirbhar Bharat Context:
   - Highlights importance of indigenous research in chip innovation.
   - Opens doors for India's semiconductor ecosystem, especially with recent policy pushes.

Policy and Industrial Implications:

Sector	Impact
Semiconductor Industry	Opens a new frontier in chip design, reducing dependence on traditional electronics.
Digital Infrastructure	Enhances capacity of data centres, cloud computing, and telecom networks.
R&D Investment	Shows value of long-term public-private partnerships in deep-tech innovation.
Sustainability	Reduces energy footprint of computing — aligns with green technology goals.

Challenges and Limitations:

- Current operational stability limited to ~500 hours and lower temperatures (~55°C).
- Needs improvement to match long-term industrial-grade durability (120°C+).

UPSC Mains Practice Question

Ques : Discuss the significance of recent developments in silicon photonics and their implications for India's digital infrastructure. **(250 words)**

A recent study by Sujit R. Jagadale and Javed M. Shaikh (IIM Amritsar) investigates the stubble burning crisis in North India, not merely as an environmental or behavioural issue but as a systemic failure arising from governmentality, market distortions, and neoliberal policy frameworks. The research frames stubble burning as a structural outcome, not individual neglect.

ABSTRACT

Toxic fumes: Stubble is burned to remove paddy crop residues from a field on the outskirts of Sangrur district in Punjab on November 2, 2024. SHASHI SHEKHAR KASHYAP

How governmentality exacerbates the problem of farmers' stubble burning

A new study by researchers Sujit Raghunathrao Jagadale and Javed M. Shaikh at the Indian Institute of Management, Amritsar analyses the problem of stubble burning from the lens of 'governmentality' and market failure

Jacob P Koshy

Jagadale, S. R., and, Shaikh, J. M, 'Governmentality and Marketing System Failure: The Case of Stubble Burning and Climate Change in Neoliberal India', *Journal of Macromarketing*, 2025 https://doi.org/10.1177/02761467251318608

Come November, the Indo-Gangetic Plain is often clouded in a pall of pollution. The cessation of monsoon winds from the preceding four months and a drop in temperatures lead to pollutants from year-round sources, such as vehicles, power plants, construction dust and other suspended particulate matter, persisting as a black shroud because of the formation of an 'inversion layer'. This means that these particles aren't 'flushed out' from the region by the stronger winds at the higher atmospheric reaches. Add to this the contribution of stubble burning. Particulate matter from the burning of farm stubble – rice chaff – by farmers in Punjab, and to a smaller extent Haryana, Rajasthan and Uttar Pradesh – is added to this haze, worsening the already noxious air quality in Delhi and several other north Indian cities. Farm stubble is burnt in October and November because it is the cheapest method employed by farmers to prepare their soil for Rabi wheat.

A wealth of correlational studies in the last two decades have linked particulate matter from stubble burning and winds originating from Punjab and Haryana to pollution levels in Delhi. In the case of Punjab, during winter, 54% of the time the wind from the State blew towards Delhi, it led to a spike in air pollution; when the wind originated from Haryana, the figure stood at 27%. Every additional fire incident was correlated with an increase in PM2.5 levels of 12.44 units. Studies over the years, most recently in 2023 by a consortium of IIT Kanpur, IIT Delhi, TERI, and Airshed, Kanpur, found that from mid-October to the end of November 2022, the role of stubble burning to air quality was on average 22% and peaked to as much as 35%. This is fairly consistent with previous studies that have estimated the contribution of stubble-burning to range from 20%-40%. Many studies have also examined causes for farmers actions. The prescriptions also often analyse what may be changed that could incentivise farmers to cease from such burning.

How policy affects pollution

A new study by researchers Sujit Raghunathrao Jagadale and Javed M. Shaikh at the Indian Institute of Management, Amritsar analyses the problem from the lens of 'governmentality' and market failure. 'Governmentality' is a concept by French sociologist and philosopher, Michel Foucault that refers to how institutions of power – in this case the government – rather than employing explicitly coercive measures induce citizens to adopt self-policing or self-regulating behaviour to govern themselves.

Their study shows that governmentality can end up being counterproductive. The state's implicit directive to farmers to keep increasing grain output ends up promoting "suboptimal behaviours, like stubble burning, among farmers within India's struggling agricultural marketing system."

India's "neoliberal policies," such as the Minimum Support Price (MSP) system, paradoxically exacerbates the issue. While MSP guarantees procurement prices for staple crops like wheat and rice, it ends up incentivising mono-cropping, leaving farmers dependent on short-term, unsustainable methods. The study argues that state and market forces create a cycle of marginalisation, pushing farmers toward stubble burning as a survival tactic.

The authors relied on semi-structured interviews with 18 farmers across three Punjab districts (Amritsar, Gurdaspur, Tarn Taran) and an analysis of national newspaper articles. The farmers interviewed ranged from smallholders (2-5 acres) to larger landowners, capturing diverse economic backgrounds. Interviews focused on farmers' decision-making, perceptions of state policies, and interactions with market actors. What they found was that the Union government's MSP policy prioritises wheat and rice production, discouraging crop diversification. Farmers face contradictory signals: the state penalises stubble burning but also offers no affordable alternatives. Farmers also viewed the state as favouring urban-industrial interests ("India") over rural communities ("Bharat"). For example, while stubble burning is vilified, industrial pollution is overlooked. The farmers saw themselves as reliant on middlemen (*arhatias*) who control crop prices, credit access, and market linkages. Farmers sell produce at artificially low prices set by *arhtias*, who profit by reselling at market rates. Debt bondage is common: farmers borrow from *arhtias* for seeds or emergencies, cementing dependency. One farmer noted, "Commission agents deduct expenses from our next income, trapping us in cycles of debt." Stagnant MSP rates (for example, wheat prices rose only 5% over a decade) fail to cover rising cultivation costs, including labour and equipment. The study's novel contribution is to reposition stubble burning not as individual negligence but as a systemic outcome of distorted marketing systems and neo-liberal governance.

Plausible remedies

As solutions, they suggest that remedial interventions primarily focus on developing a market for stubble and stubble-based products, such as fodder, energy products like pellets and packaging materials, aiming to boost farmers' income while simultaneously addressing climate change challenges. For this approach to be successful, efforts are needed to strengthen the value chain through diverse technologies within an enabling ecosystem. Currently, there is a significant lack of an efficient market mechanism for farm-waste, underscoring the need for policy and market interventions to bridge this gap. Although such interventions may require time to be implemented effectively, they necessitate the involvement of stakeholders, including state and market actors, across the value chain.

Regulatory interventions could be conceptualised at three levels: prohibiting stubble burning, managing it through selective permits, and promoting stubble usage by incentivising stubble-based products. Here, active participation from state actors is critical.

A key intervention involves ensuring that farmers receive fair prices for their produce by addressing existing inefficiencies within the market system. The commodities market in India is deeply embedded in socio-political structures, as previously discussed, and requires state-led efforts to enhance price transparency and fairness to support farm incomes.

Moreover, the socio-economic pressure on farmers to engage in aspirational consumption – often detrimental due to limited income – should be acknowledged. Addressing this issue may benefit from fostering cultural change, where socio-cultural organisations, including religious groups, could play a role in de-marketing non-essential aspirational consumption, the authors conclude.

Key Concepts Introduced:

1. Governmentality (Michel Foucault's concept):

- A form of governance where the state induces self-regulation among citizens rather than enforcing control directly.
- "The state pushes farmers to maximise grain production (wheat/paddy) while expecting them to self-regulate pollution, creating conflicting behavioural expectations. "

2. Marketing System Failure:

- MSP policies incentivize monoculture (wheat/paddy), discouraging crop diversification.
- The procurement system supports short-term gains, not sustainable farming.
- Arhatias (middlemen) dominate pricing, credit, and sale channels, deepening farmer dependency.

Why Do Farmers Burn Stubble? – Systemic Factors

Structural Cause	Explanation
MSP Policy Bias	Focus on wheat and rice due to assured procurement. No price assurance for alternative crops.
Short harvest window	Less than 15 days between kharif harvest (paddy) and rabi sowing (wheat). Burning is the fastest method.
Lack of affordable alternatives	Happy Seeder and other mechanised tools are **costly**, poorly distributed, and lack supporting infrastructure.
Credit and market control	Farmers rely on **middlemen** for both loans and sales, making them economically vulnerable.
Inversion layer and winter wind patterns	Traps PM2.5 in the Indo-Gangetic Plain, making pollution long-lasting and transboundary.

Core Argument of the Study

- Stubble burning is not a farmer's individual failure but the outcome of systemic policy contradictions, neoliberal agricultural governance, and a broken market structure.
- Contradiction:
  - State: "Increase paddy yield for MSP procurement."
  - Also State: "Do not burn stubble left after paddy harvest."

  Farmers are trapped between production pressure and regulatory punishment with no viable options.

Recommendations / Way Forward

1. Market for Stubble-based Products:

- Create a value chain for stubble-based fodder, biofuel pellets, packaging material, etc.
- Encourage private and public investment in circular economy-based agro-waste utilization.

2. Market & Policy Interventions:

- Reform MSP policies to promote crop diversification.
- Establish price transparency in APMC markets and reduce middlemen control.
- Provide direct cash incentives or subsidies for eco-friendly farm equipment.

3. Regulatory Innovations:

- Tiered approach:
  - Prohibit stubble burning,
  - Allow conditional burning permits,
  - Incentivize stubble management alternatives.

4. Cultural & Behavioural Shift:

- Acknowledge rural-urban divide ("India vs Bharat" perception).
- Engage religious/cultural organisations to de-market aspirational consumption leading to farmer indebtedness.

UPSC Mains Practice Question

Ques :Examine how the intersection of government policy, market failure, and structural inequality contributes to the issue of stubble burning in North India. Suggest holistic reforms.

In News : KATRIN Experiment

The KATRIN (Karlsruhe Tritium Neutrino Experiment) has made a groundbreaking achievement by measuring neutrino mass with a new precision.

About the KATRIN Experiment:

- The KATRIN is located at the Karlsruhe Institute of Technology (KIT), specifically on its Campus North site in Karlsruhe, Germany.
- It is aimed at measuring the mass of the electron antineutrino with sub-eV precision.
- It has measured the mass of neutrinos by studying the beta decay of tritium, a radioactive form of hydrogen.
- The mass was inferred by analyzing the energy of the emitted electrons.

Technological Setup:

- A 70-meter-long beamline with a powerful tritium source.
- A 10-meter-wide spectrometer to measure the energy of emitted electrons with high precision.

Key Findings:

- KATRIN has set a new upper limit for neutrino mass at less than 0.45 eV/c^2 (8×10^{-37} kg), nearly twice as precise as previous measurements from 2022.
- Data Collection was based on five campaigns from 2019-2021, totalling 250 days of data.
- Neutrinos and Their Properties
- Neutrinos are extremely light subatomic particles that rarely interact with matter, making them difficult to detect.
- They are found in cosmic rays and solar radiation.

Properties:

- Mass: Their small mass influences cosmic structure formation, such as galaxies and clusters.
- Weak Interaction: They interact via the weak nuclear force, allowing them to pass through vast amounts of matter.
- They are essential in particle reactions and play a key role in galaxy formation and the study of dark matter.

UPSC PrelimsPractice Question

Ques :With reference to the KATRIN experiment, consider the following statements:

1. It is aimed at measuring the mass of the muon neutrino with sub-eV precision.

2. It uses tritium beta decay to determine the neutrino mass.

3. It is located in Germany.

Which of the above statements is/are correct?

(A) 1 and 2 only

(B) 2 and 3 only

(C) 1 and 3 only

(D) 1, 2 and 3

Ans : b)

Unnecessary change

Amending the RTI Act through the Data Protection Bill is unwarranted

That the Right to Information Act and the use of RTIs have enhanced the accountability of those in governance in India goes without saying. In the last few years there have been attempts to dilute the provisions of the Act, a landmark one that was passed 20 years ago. Clearly, some in governance and administration have treated the Act and its provisions on transparency and disclosure to be encumbrances. A significant threat has now emerged in the amendment to Section 8(1)(j) of the Act, which has been introduced in Section 44(3) of the Digital Personal Data Protection (DPDP) Act, 2023. The Act itself is an outcome of *K.S. Puttaswamy* (2017), a judgment that upheld the right of privacy as a fundamental right under Article 21 of the Constitution. Section 8(1)(j) of the RTI Act allows government bodies to withhold "information which relates to public information" provided its disclosure is not related to public interest or results in an unnecessary invasion of privacy. While doing so, it provides the safeguard that if the Public Information Officer or an appellate authority finds public interest in disclosing such information, it could still be available. This safeguard is important. Some information related to public servants, such as college degrees or caste certificates, might be private, but as a recent and controversial case of a bureaucrat using a fake caste certificate showed, such information could be released in public interest. Section 44(3) of the DPDP act amends Section 8(1)(j) by allowing government bodies to simply withhold "personal information" without the safeguard provisions on public interest or other such exceptions.

In a letter to Congress leader Jairam Ramesh, Union Minister of Information and Broadcasting, Ashwini Vaishnaw defended the amendment, saying that Section 44(3) was aimed at preventing the RTI Act's "misuse" and was to harmonise the requirement of right to privacy and the right to information. He also said that information such as salaries of public officials would still remain accessible through Section 3 of the DPDP Act. But by amending the RTI Act itself – an outcome that was never the intention of *K.S. Puttaswamy* – and by defining "personal information" vaguely in Section 44(3) of the DPDP Act, authorities could deny RTI requests of previously public data by classifying them as "personal" – and lessen public scrutiny. The RTI Act already harmonises concerns related to the right to information and privacy by subjecting them to the question of public interest. Therefore, the amendment using the DPDP Act is unnecessary and unwarranted. The government must take the concerns of civil society and transparency activists and remove the provision amending the RTI Act, in the DPDP Act.

Paper 02:Indian Polity

UPSC Mains Practice Question:The Right to Information (RTI) Act has been instrumental in promoting transparency and accountability in governance. Critically examine the role of Section 8(1)(j) of the RTI Act in this regard and evaluate how recent amendments under the Digital Personal Data Protection (DPDP) Act, 2023, may dilute its impact. (250 words)

Context :

- The Right to Information (RTI) Act has clearly helped make those in power more accountable in India. However, in recent years, there have been efforts to weaken some of its important provisions, even though the Act — a major reform — was passed 20 years ago.

What is the role of Section 8(1)(j) of the RTI Act in promoting transparency?

- Balances Privacy and Public Interest: Section 8(1)(j) permits denial of personal information only if it has no relationship to public activity or interest or causes an unwarranted invasion of privacy. Eg: An officer's medical records may be withheld, but details of their salary or qualifications can be disclosed if it serves public interest.
- Includes a Public Interest Override: Even if information is personal, it must be disclosed if larger public interest is involved. Eg: A bureaucrat's caste certificate was disclosed in public interest when he was accused of using a fake caste certificate to secure a reserved post.
- Enhances Accountability of Public Officials: Prevents misuse of power by allowing scrutiny of officials' actions, qualifications, and benefits. Eg: RTI queries have uncovered cases of bogus educational degrees among elected representatives and civil servants.
- Empowers Citizens to Seek Information: It strengthens democratic participation by giving citizens access to relevant information on public functionaries. Eg: Citizens have used RTI to access asset declarations of elected representatives and government officers.
- Prevents Blanket Denial of Information: Ensures that authorities cannot reject RTI requests merely by labeling the information as 'personal'; they must justify how it affects privacy and weigh it against public interest. Eg: Information about government employees' attendance records or transfers can be accessed to detect nepotism or irregularities.

Why does Section 44(3) of the DPDP Act, 2023 worry transparency advocates?

- Removes Public Interest Safeguard: Section 44(3) amends Section 8(1)(j) of the RTI Act by eliminating the provision that allowed disclosure of personal information in public interest. Eg: A

fake caste certificate case could now be shielded from scrutiny as the information might be denied without evaluating public interest.

- Enables Blanket Denial Through Vague Definition: The term "personal information" is broad and undefined, enabling authorities to classify many types of public-relevant data as private. Eg: Details like educational qualifications or property disclosures of public servants could be denied under the label of "personal".
- Undermines RTI as a Transparency Tool: It weakens the RTI Act's core intent by restricting access to information that previously helped expose corruption and misconduct. Eg: RTI requests that once revealed official misconduct or nepotism in postings may now be rejected citing privacy under the DPDP Act.

How does the DPDP amendment deviate from the intent of the K.S. Puttaswamy judgment?

- Ignores the Balancing Principle of Privacy and Transparency: The K.S. Puttaswamy judgment (2017) upheld the right to privacy but emphasized that it must be balanced with other fundamental rights, including the right to information and public interest. Eg: The DPDP amendment removes the RTI Act's public interest test, allowing personal information to be withheld even when it reveals corruption or fraud.
- Undermines Democratic Accountability: The judgment did not suggest overriding transparency laws like RTI but stressed minimum and necessary restrictions on information access. Eg: Instead of proportionate safeguards, the DPDP Act allows authorities to blanket-deny RTI requests without assessing public relevance.
- Distorts the Spirit of "Informed Citizenry": Puttaswamy emphasized that transparency is essential for democracy, and privacy cannot be used to shield public officials from scrutiny. Eg: Information such as public officials' property details or caste certificates may now be refused, limiting citizens' ability to hold them accountable.

What information could now be denied under the amended RTI provisions as 'personal'?

- Educational Qualifications and Certificates: Details about the academic background or degrees of public servants could be withheld as "personal information" under the amended provision. Eg: RTI queries that previously revealed fake degrees of elected representatives may now be denied.
- Caste and Community Certificates: Information related to caste status, often crucial in verifying eligibility for reservation benefits, may be deemed private. Eg: In cases where a public official allegedly used a fake caste certificate, such details could be denied under the privacy shield.
- Property, Assets, and Financial Disclosures: Disclosures regarding property holdings, assets, and liabilities of government employees might be refused by classifying them as personal. Eg: RTI applications that earlier exposed disproportionate assets could now be blocked.

Way forward:

- Restore Public Interest Safeguard: Amend the DPDP Act to reinstate the public interest clause from Section 8(1)(j) of the RTI Act, ensuring transparency is not overridden by vague privacy claims.

- Define 'Personal Information' Clearly: Provide a narrow and precise definition of "personal information" to prevent misuse and ensure critical public accountability data remains accessible.