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ARTIFICIAL INTELLIGENCE IN GOVERNANCE: TRANSFORMING INDIA'S PUBLIC ADMINISTRATION

Context

- India's increasingly complex governance difficulties demand a shift from fragmented and periodic administration to AI-enabled, real-time, predictive and evidence-based government.

Current Governance issues

- Fragmentation of governance architecture:** Government departments operate thru separate databases, reporting formats and monitoring mechanisms, which constrain information integration and undermine whole-of-government approach.
- Delayed Monitoring:** Excessive reliance on periodic reports and reviews may lead to late detection of project delays, financial leakages, cost overruns and gaps in public-service delivery.
- Departmentalisation of Decision-Making:** Although issues such as health, agriculture, energy, and welfare and employment are closely interrelated, policies are often made and evaluated in isolation in individual departments.
- Limited Real-Time Visibility:** Policymakers suffer from a lack of real-time information and are unable to detect emerging issues and act before they become larger administrative or fiscal problems.

Significance of AI in Governance

- Predictive Governance:** AI-driven predictive models can spot potential problems like disease outbreaks, infrastructure delays, unusual spending trends, and resource shortages, allowing for timely preventive actions.
 - Example:** The **Integrated Disease Surveillance Programme (IDSP)** can leverage digital disease-surveillance data and AI-based analytics to identify emerging disease trends and support early public-health interventions.
- Better Public Service Delivery:** AI is able to improve targeting and delivery of welfare schemes by detecting duplication, exclusion and matching public resources to emerging needs.
 - Example:** **Aadhaar-enabled data systems and data analytics** can help identify duplicate or ineligible beneficiaries in welfare programmes

- Improving Fiscal Management:** Artificial Intelligence can help in detecting unusual financial transactions, lags in fund utilisation and impending fiscal stress and hence, enhance the management of expenditure and reduce possible leakages.
- Integrated Governance:** AI may assist to analyse information across departments, so that policymakers can understand the interlinks across different sectors and take a whole-of-government approach.
 - Example:** The **PM GatiShakti National Master Plan** integrates data from multiple ministries and infrastructure sectors on a common GIS platform, helping improve coordinated infrastructure planning.
- Evidence Based Decision Making:** AI based analytics can help policymakers make data based decisions and reduce the over reliance on late reports and subjective judgements.

Challenges

- Poor data quality** causes unreliable AI output. Inaccurate, incomplete or outdated government records can compromise the effectiveness of predictive systems.
- Algorithmic bias**, when artificial intelligence systems are trained on unrepresentative data, can reinforce existing social or administrative biases.
- Digital divide:** It can marginalise citizens who do not have access to internet, electronic literacy, or digital devices. AI-enabled services should therefore complement physical and human channels of service delivery.
- Institutional capacity:** AI governance requires trained staff, strong digital infrastructure, cybersecurity capabilities and appropriate regulatory structures.

Way Ahead

- Build interoperable governance platforms:** Government agencies should use common data standards and interoperable digital systems to allow **secure and legal exchange of information** between agencies and levels of government.
- Improve data quality:** The effectiveness of AI is highly dependent on the quality of underlying data. Governments should ensure that public datasets are accurate, updated, standardised and representative.

- **Employ a human-in-the-loop approach:** AI should support administrative decision-making and not replace human judgement, especially when decisions touch upon welfare entitlements, public services and individual rights.
- **Cybersecurity:** AI-enabled governance should adhere to India's data-protection framework and include strong safeguards to prevent data misuse, unauthorised access and cyberattacks.
- **Ensure algorithmic accountability:** Regular audits on bias, accuracy and explainability of artificial intelligence systems used in governance should be conducted with clear mechanisms for human review and grievance redressal.

Source: TH

LADAKH TO LEAD INDEPENDENT INDIA'S FIRST CASTE ENUMERATION

Context

- Ladakh will become the **first place** in independent India to **enumerate caste as part of a regular Census** in the **Census 2027**.

About

- Ladakh and the other snow-bound areas **are being surveyed months ahead** of the rest of India **because of geography and weather**.
- These regions are classified as **"snow-bound non-synchronous areas,"** where door-to-door enumeration during the usual February window becomes difficult.

What is the Census?

- The Census refers to a **periodic and systematic collection** of demographic, economic, and social data of a population within a specific region.
 - ♦ It provides **crucial data that governments, businesses, researchers, and policymakers** use for various purposes such as planning public services, allocating funding, and making informed decisions.
- **Conducted By:** The Registrar General and Census Commissioner of India.
- **Census 2027:** Until the 2011 Census, data was collected on paper schedules, with layout map sketches prepared manually. These paper records were later digitised through scanning, a process that was both time-consuming and prone to inconsistencies.
 - ♦ In the 2027 census, Digital Layout Maps and the geo-tagging of all buildings will be

prepared within each Houselisting Block (HLB).

- ♦ **Both phases of the Census** i.e. houselisting and population enumeration will be completed **between April 1, 2026 and February 28, 2027**.
- ♦ **The second phase** will also count the **population by caste for the first time in Independent India**.

Census in India

- The Census in India has been conducted **regularly since 1871**. The first complete Census was conducted in **1881**.
- **Constitutional Mandate:** The Census of India is conducted under the **provisions of the Census Act of 1948**, which empowers the Government of India to conduct periodic population surveys.
- **Frequency:** The Census of India is conducted decennially, meaning it takes place **every ten years**. The most recent censuses were conducted in **2011**.

Caste Based Census

- **Caste Based Census:** It involves enumerating the population based on their caste affiliations during the national census. This data is used to understand the **socio-economic status** of different caste groups, identify disparities, and design policies for affirmative action.
- **Background:** In 2011, the government undertook the **first-ever Socio-Economic Caste Census (SECC)**; however, it was never made public.
 - ♦ There were many anomalies in the caste data as a large section of the population chose different ways to identify their castes.
 - ♦ That's why Census 2027 is being called the first caste enumeration within the regular Census since Independence.
- **Constitutional Recognition:** Post-independence, the Constitution institutionalised affirmative action through **Articles 16(4) and 340**, recognising the socio-economic backwardness of certain groups.
 - ♦ However, these classifications were often based on **"expert assessments" rather than empirical data**, as seen with the Mandal Commission.
- While repeated calls for a national caste Census did not materialise, **Bihar conducted its own caste based census in 2023**.

Last Caste Based Census Data

- **The 1931 Census** is widely regarded as the **last comprehensive caste count** whose findings were published before Independence.
- **After 1947**, subsequent Censuses continued to record Scheduled Castes and Scheduled Tribes but **stopped enumerating other caste groups**.
- **As a result, the 1931 figures** became the default reference point for any discussion of India's caste composition, including estimates of the Other Backward Classes population.

Arguments in the Favour of the Caste Based Census

- **Accurate Data for Targeted Welfare:** It can provide precise data on the socio-economic conditions of different caste groups, allowing the government to tailor welfare programs effectively for marginalized communities.
- **Identify Disparities:** It helps identify existing inequalities in education, employment, and access to resources.
- **Strengthen Affirmative Action:** It helps ensure that affirmative action policies like reservations are based on accurate and updated data, ensuring fair representation for underrepresented communities.
- **Social Justice:** The census could push for better policies for upliftment, enhancing social justice for historically disadvantaged groups.
- **Policy Evaluation and Reform:** The data could be used to assess the impact of existing policies on different caste groups, leading to better policy reforms and improved governance.

Arguments Against the Caste Based Census

- **Perpetuation of Caste Divisions:** It might reinforce caste identities, potentially deepening social divisions and promoting discrimination instead of fostering unity.
- **Focus on Caste Over Development:** Critics argue that focusing on caste may divert attention from more universal issues like poverty, education, and healthcare, which affect all communities.
- **Inaccurate Representation:** Some believe that caste-based data may be inaccurate due to the fluidity of caste identities and the reluctance of people to disclose their caste openly.
- **Risks to National Integration:** Some fear that caste-based enumeration could undermine national integration by creating a sense of

competition among groups, rather than promoting a cohesive national identity.

Conclusion

- Caste enumeration has been included into the main Census itself, rather than run as a standalone survey the way the SECC was in 2011.
 - ♦ The task of converting individual, open-ended caste responses into clean, standardised data remains the central challenge as it was in 2011.
- Census 2027 would give India **its first official, nationwide caste-wise population count** within a regular Census since Independence, one likely to carry weight in future debates over welfare policy, political representation and reservations.

Source: TH

INDIA'S NEXT ENERGY TRANSITION: TO ELECTRIFY INDUSTRIAL HEAT

Context

- India's next phase of energy transition **must focus on electrifying industrial heat** which **can help scale the transition and strengthen manufacturing competitiveness**.

About

- **Renewable-powered Sectors:** Electric mobility is replacing internal combustion engines, agriculture is increasingly powered by solar irrigation, and buildings are adopting smarter appliances.
- **The next phase lies in electrifying industrial heat**, particularly across India's MSMEs, to **strengthen manufacturing competitiveness, energy security and decarbonisation**.
- **India's solar photovoltaic revolution** reduced solar tariffs by more than **85% over the past decade** through a coordinated ecosystem of supportive policies both at the national and state level.
 - ♦ **Now, scaling industrial heat electrification** will require a similar approach.

Industrial Heat Electrification

- Industrial heat electrification is the process of **replacing fossil-fuel-based heat generation in industrial processes** (such as burning natural gas, coal, or oil) with technologies powered by electricity.

- When that **electricity comes from low-carbon sources** like wind, solar, hydro, or nuclear power, it can **significantly reduce greenhouse gas emissions**.

Factors Supporting Industrial Heat Electrification

- **Large Consumption of Energy:** The Industrial Sector accounts for **almost half of India's final energy use**. **Over 40%** of that energy is coal that manufacturers burn onsite, **creating severe air pollution and public health impacts**.
- **Dependence on Imported Energy:** **A 27%** is from petroleum and natural gas, heavily imported fuels that typically cost **4-4.5 times more than coal per unit energy**, and can soar even higher in price during global supply chain shocks.
- **Clean Energy Targets:** India is the **7th most vulnerable country** to climate change and the **3rd largest emitter of climate-warming CO₂**.
 - ♦ Because of this, in 2021, India **committed to reach net-zero emissions by 2070**.
 - ♦ **Cleaning up India's vast and growing industrial sector** will play a major role in achieving that goal.
- **Availability of Solar Energy:** India has the **lowest solar prices among major economies**. By switching to solar energy, and to commercially available electric technologies like heat pumps and thermal batteries, **Indian industry can slash its costs, cut its energy use, and deliver clean air**.
- **Cost Effectiveness:** **Electrified heat is also cheaper** than coal-based heating in three out of five temperature bands (<100°C, 100-200°C, and 1,000-1,800°C), which **together account for 55% of India's combustion-based industrial heating**.
- **Reduction in Energy Use:** Electrification **can reduce industrial energy use by 22%** and cut over half of the sector's CO₂ emissions when backed by clean energy.
- **Environmental and Health Gains:** Industrial electrification can also reduce sector-wide emissions of non-GHG pollutants, cutting particulate matter (PM_{2.5}) by 38%, sulfur dioxide (SO₂) by 60%, and nitrogen oxide (NO_x) by 53%.
 - ♦ By avoiding those air pollutants, electrifying all eligible industrial processes in India can save nearly 794,000 lives annually while also

halving the incidence of numerous nonfatal health complications.

How Can it be Achieved?

- **Facility-level Engineering Assessments** should become the **foundation of industrial heat electrification**. Without robust engineering assessments, industries **risk investing in technologies unsuited to their process requirements**.
 - ♦ These assessments can support **district-level industrial decarbonisation plans** tailored to local industrial profiles, renewable resources, and infrastructure readiness.
- **Technology-inclusive Approach:** Industrial processes vary widely in temperature, production schedules, and thermal demand. **So a single technology solution is impractical**.
 - ♦ **Thermal energy storage solutions** can act as thermal buffers by storing surplus heat generated when renewable electricity is abundant and releasing it when process heat is required.
- **Access to Capital:** Reforms should focus on **reducing costs** by streamlining open-access procedures, rationalising banking provisions, reducing transactional complexity, and strengthening grid infrastructure.
- **Renewable electricity planning should be integrated with industrial electrification**, enabling industries to align thermal demand with periods of renewable generation.
- **Engineering Transition:** Scaling it requires a **workforce of engineers, technicians, and operators** with capabilities in process integration, system design, installation, commissioning, operation, and maintenance, and digital automation and control systems.
- **Demonstration Projects:** India needs demonstration projects before it needs large-scale mandates. This will generate engineering evidence, validate business models, and reduce investment uncertainty.
- **National Framework:** Industrial heat electrification needs a **coordinated national framework supported by place-based implementation**.
 - ♦ It should establish engineering standards, designate institutional responsibility, facilitate

demand aggregation, mobilise finance, and support early demonstration projects.

Conclusion

- With its record-low solar prices and limitations on fossil fuel use, **India has a unique opportunity to be a global leader in the clean industry.**
- **With targeted policies and deployment efforts,** India can reap the economic, environmental, and public health benefits of the solar-powered industry and set its economy up for success for decades to come.

Source: TH

PROGRESS OF PRADHAN MANTRI AWAS YOJANA – URBAN (PMAY-U)

In News

- Pradhan Mantri Awas Yojana–Urban (PMAY-U) has sanctioned over 1.25 crore houses, with more than 1 crore completed and delivered to beneficiaries.

Pradhan Mantri Awas Yojana – Urban (PMAY-U)

- It was **launched in 2015** to transform the urban housing landscape in India.
- It aimed at providing **dignified housing for urban migrants** and the economically disadvantaged.
- It addresses the acute housing shortage faced by the Economically Weaker Section (EWS), Low Income Group (LIG), and Middle-Income Group (MIG), including slum dwellers.
- Guarantee that all eligible urban households have access to permanent, durable housing.



Implementation Verticals of PMAY-U



Progress

- Pradhan Mantri Awas Yojana–Urban (PMAY-U) has reached a major milestone with **more than 1.25 crore houses sanctioned** and more than 1 crore completed and delivered **under PMAY-U and PMAY-U 2.0.**
- Recently, sanction was given for the construction of more than 2.09 lakh additional houses for EWS families, which includes 1.42 lakh houses under Beneficiary Led Construction (BLC) and 67,045 houses under Affordable Housing in Partnership (AHP). With these approvals, PMAY-U 2.0 has crossed 18.38 lakh sanctioned houses.
- The scheme also lays a lot of emphasis on women empowerment.
 - Of the latest allotment of 2.03 lakh houses, 2.03 lakh have been allotted to women and around 1 crore houses are registered in women's names or in joint ownership.

Significance

- **Economic:** Huge housing construction generates huge demand in allied sectors like steel, cement, brick making, hardware etc., and also creates huge employment opportunities for skilled and unskilled labour.
- **Women Empowerment:** Mandatory female head ownership or joint ownership has resulted in a substantial increase in legal asset ownership among women.
- **social inclusion :** It also encourages social inclusion by facilitating support to SC, ST, OBC, senior citizens and other marginalised groups.
- **Slum Rehabilitation:** It improves basic quality of life, sanitation and safety by relocating informal dwellers from unsafe shanties to all-weather pucca homes.
- **Infrastructure Convergence:** It complements national infrastructure schemes like Jal Jeevan

Mission (water connection), PM Saubhagya (electricity), and Swachh Bharat Mission (sanitation), promoting integrated habitat development instead of isolated housing units.

Implementation Challenges

- **Acquisition Costs:** The limited availability of land and high prices in city centers push affordable housing projects to the periphery, which leads to a spatial mismatch and increases workers' commuting time and transportation costs.
- **Low Private Sector Participation:** Adverse profit margins, complicated land titling issues, and long lead time for statutory regulatory clearances have limited private developer participation in joint housing partnerships.
- **Identification Issues:** A large proportion of urban poor are informal sector workers who do not have formal proof of income, pay slips and credit histories.
 - ♦ This makes primary lending institutions (PLIs) reluctant to give home loans.
- **Project Delays:** Inflation of raw construction materials (cement, steel, aggregate) costs imposes fiscal burdens, leading to project timelines being stretched and units remaining unfinished.

Way Forward

- Urban Local Bodies should implement land pooling policies, land banking and GIS-based land mapping to unlock unutilised government and municipal lands in the inner-city zones for affordable housing.
- Financial institutions may consider the introduction of alternative mechanisms for the evaluation of creditworthiness such as utility payment histories, registrations with trade unions and cash-flow banking to enable them to extend housing finance to informal sector workers.
- With time-bound digital single-window approvals at the city level, pre-construction holding costs can be reduced, and project delays can be avoided.
- Tax incentives can encourage private builders to enter the domain of Affordable Housing in Partnership (AHP) and Affordable Rental Housing (ARH).
- Scaling up modern, low-carbon building materials and climate-resilient designs will reduce lifecycle operational costs for low-income residents and contribute to national decarbonisation targets.

Source: PIB

AI, DATA CENTRES AND INDIA'S EMERGING WATER FOOTPRINT

Context

- The rapid expansion of AI and data centres has **highlighted their hidden water footprint**, raising concerns over groundwater depletion, cooling requirements and sustainability in water-stressed regions.

Emerging Water Footprint of AI

- Artificial Intelligence (AI) is often discussed in terms of computing power and electricity consumption, but **water is an equally important resource for data-centre operations**, particularly for cooling high-density computing systems.
- The University of California has estimated that a typical ChatGPT conversation of around 20–50 exchanges can have a water footprint of up to **about 0.5 litre**, depending on the location, cooling technology and electricity mix.
 - ♦ It illustrates how seemingly intangible digital services have a physical environmental footprint.
- According to a **UN assessment**, data centres could have a **water footprint of around 4.5 trillion litres in 2025**, potentially rising to **9.3 trillion litres by 2030**.
 - ♦ It arises both from direct cooling requirements and indirectly through water used in electricity generation.

India's Data-Centre Expansion

- India is emerging as a major global data-centre hub owing to rapid digitalisation, cloud computing, AI adoption and increasing data generation.
- Data-centre capacity reportedly increased from around **375 MW in 2020 to nearly 1,500 MW in 2025**, with projections of **13.56 GW by 2031–32**.
 - ♦ **Andhra Pradesh's Data Centre Policy 4.0**, for instance, provides incentives such as GST reimbursement and stamp-duty exemptions.
 - ♦ Uttar Pradesh's 2026 policy targets more than **2 GW of additional capacity**.
 - ♦ Gujarat's 2026–29 policy aims at **7.5 GW** and investments of around **₹6 lakh crore**.

Key Issues & Concerns

- **Groundwater stress:** The **Central Ground Water Board (CGWB)'s 2024 assessment** puts India's stage of groundwater extraction at **60.47%**, with 11.1% of assessment units classified as over-exploited.

- ♦ The challenge becomes sharper when data centres are concentrated in already water-stressed urban clusters.
- ♦ **For Example:**
 - Gautam Buddha Nagar has numerous existing and upcoming data centres, while its groundwater extraction level has been assessed at **104.79%**.
 - Hyderabad is also classified as over-exploited. Visakhapatnam, despite Andhra Pradesh's relatively comfortable state-level groundwater position, faces local resource constraints.
- **Lack of transparency:** Many data centres do not publicly disclose their **monthly or peak water consumption, water sources or proportion of potable, groundwater and reclaimed water** used.
 - ♦ It makes meaningful assessment of their local environmental impact difficult.
- **Water Energy Nexus:** Data centres are highly electricity-intensive. Electricity generation itself can have a water footprint, creating an interconnected **water-energy challenge**.
 - ♦ Excessive dependence on water-intensive cooling can also intensify competition between industrial and domestic requirements.
- **Coastal risks:** Seawater cooling can reduce dependence on freshwater. However, the discharge of concentrated **brine** can affect marine ecosystems if inadequately managed.
- **Mandatory disclosure:** Data centres should report monthly and peak water consumption, source-wise use and water intensity per unit of computing.
- **Water-stress-based regulation:** New projects in over-exploited or stressed areas should face stricter environmental and groundwater permissions.
- **Prioritise non-potable water:** Mandate greater use of treated wastewater and reclaimed water for cooling wherever technically feasible.
- **Promote water-efficient cooling:** Encourage closed-loop, liquid, dry and hybrid cooling technologies according to local climatic conditions.
- **Integrated planning:** Data-centre approvals should consider the combined **water-energy-land and ecological carrying capacity** of the region.
- **Responsible coastal cooling:** Seawater systems should incorporate stringent brine-treatment and marine-impact monitoring.

Source: TH

NEW STUDY BREAKS THE MENDEL'S LAW OF INHERITANCE

Context

- Researchers have found that several inherited traits in the mouse genome break the **rules Gregor Mendel** laid down in the **19th century** about how genes work.

Efforts & Initiatives

- **Andhra Pradesh Data Centre Policy 4.0** provides fiscal and energy-related incentives for large data-centre projects.
- **UP Data Centre Policy, 2026** seeks to expand capacity by over 2 GW.
- **Gujarat Data Centre Policy, 2026–29** targets 7.5 GW of capacity.
- Companies are exploring **seawater cooling**, as demonstrated by Google's data centre in Finland.
- Greater adoption of **reclaimed wastewater, closed-loop cooling and energy-efficient cooling technologies** can reduce freshwater dependence.

Way Forward

- India needs to pursue '**digital growth with water security**' rather than treating water availability as an externality.

Outcomes of the Study

- **Genome-wide association studies**, studies that look for the genetic variants linked to diseases — may be **missing a significant fraction of heritable variation** because **that variation is not in the sequence**.
- **Allele-specific epigenome-wide association studies**, which trace **methylation patterns** rather than sequence variants, could find parts of the genome associated with diseases that conventional methods miss.
 - ♦ **DNA methylation** is an epigenetic mechanism involving the **transfer of a methyl group onto the C5 position of the cytosine** to form 5-methylcytosine.
 - ♦ It **regulates gene expression** by recruiting proteins involved in gene repression or by inhibiting the binding of transcription factor(s) to DNA.

- The study may have **implications on human health**, and be able to explain conditions that have long resisted genetic analysis.

About Mendel's Law of Inheritance

- **Mendel** is known as the **father of genetics** because of his ground-breaking work on **inheritance in pea plants 150 years ago**.
- **Law of Segregation:** Each individual has two alleles for a trait, but only one allele is passed on to the offspring during gamete formation. Traits are determined by pairs of alleles.
 - ♦ During meiosis, the two alleles segregate (separate), so each gamete receives only one allele.
- **Law of Independent Assortment:** Genes for different traits assort independently of one another during gamete formation.
 - ♦ The inheritance of one trait (e.g., plant height) does not affect the inheritance of another trait (e.g., seed color), assuming the genes are on different chromosomes. This explains the variety in traits among offspring.
- **Law of Dominance:** When two different alleles are present in a pair, one (the dominant allele) masks the expression of the other (the recessive allele).
 - ♦ In a heterozygous condition (e.g., Tt), the dominant trait (tallness) is expressed, and the recessive trait (shortness) is hidden.
- **Significance:** Mendel's principles are the basis for classical genetics, helping us understand how traits are passed from one generation to another.

Source: TH

NEWS IN SHORT

GURUDEV RABINDRANATH TAGORE

Context

- Poet Laureate Gurudev Rabindranath Tagore's death anniversary was observed recently.

About Gurudev Rabindranath Tagore (1861-1941)

- He was born on 7 May 1861 in Calcutta & his birth anniversary is celebrated as Pochishe Boishakh in West Bengal and Bangladesh.
- He was an eminent poet, novelist, playwright, composer, philosopher, painter, and social reformer.

- His father Debendranath Tagore is a prominent leader of the Brahmo Samaj.

Literary Contributions

- Tagore wrote more than fifty volumes of poetry, along with novels, essays, short stories, and plays.
 - ♦ **Gitanjali (Song Offerings):** A collection of devotional poems, and the work that brought him international fame.
 - ♦ **Gora:** Deals with questions of nationalism, identity, and religion.
 - ♦ **Ghare-Baire (The Home and the World):** A critical look at aggressive nationalism.
- Modernised Bengali literature and music by blending tradition with contemporary themes.

Education & Social Reform

- Founded an experimental school at Shantiniketan, which later became Visva-Bharati University (1921), now a **UNESCO World Heritage Site**.
- Advocated humanism, creativity, freedom of thought, harmony with nature, and holistic education.

Honours & Legacy

- He won 1913 Nobel Prize in Literature and become first Indian and non-European Nobel laureate, awarded for Gitanjali.
- Composed the national anthems of:
 - ♦ **India:** Jana Gana Mana
 - ♦ **Bangladesh:** Amar Shonar Bangla
- His song Banglar Mati Banglar Jol is the **State Anthem of West Bengal**.
- Knighted by the British in 1915, but renounced the **knighthood in 1919 in protest against the Jallianwala Bagh Massacre**.
- He was revered as **Gurudev, Kobiguru, and Biswokobi**.

Source: AIR

QUIT INDIA MOVEMENT

In News

- Recently, the Prime Minister paid homage to brave participants of the **Quit India Movement**.

Quit India Movement

- It was launched under the leadership of Mahatma Gandhi on August 9, 1942, during the All-India Congress Committee (AICC) session in Bombay.

- The historic slogan ‘**Do or Die**’ (**Karo ya Maro**) was given by Mahatma Gandhi to the nation, and it inspired millions to demand nothing short of complete **independence (Purna Swaraj)**.

Reasons

- The major trigger was the **failure of the Cripps Mission** at the beginning of 1942.
- The British offered **post-war “dominion status,” which Indian leaders rejected**, saying that they wanted immediate and full independence.
- In addition, the acute shortages and inflationary pressures of World War II, combined with the looming spectre of a Japanese invasion on India’s eastern borders, served to generalise anti-British discontent.

Major leaders

- Mahatma Gandhi led the way with his historic **resolve, “Do or Die”**.
- But the colonial government acted ruthlessly, arresting the top leadership, including Gandhi, Jawaharlal Nehru, Sardar Vallabhbhai Patel and Abul Kalam Azad.
- The movement was thus kept alive by young underground leaders like Aruna Asaf Ali, Jayaprakash Narayan, Ram Manohar Lohia and Usha Mehta (who ran a secret radio station).

Effects

- In the face of severe and violent repression by the British authorities, including mass arrests and censorship, the movement became a spontaneous, leaderless, nationwide agitation.
- It brought together peasants, factory workers, women, students and rural communities into active opposition, creating deep-rooted national unity.
- It redefined the Freedom Struggle by moving the political agenda from negotiating minor constitutional reforms to demanding the absolute and non-negotiable exit of the British Empire.

Source: TH

MITHILA MAKHANA

In News

- The Agricultural and Processed Food Products Export Development Authority (APEDA) has facilitated the first-ever commercial sea shipment of **GI-tagged Mithila Makhana from Bihar to Australia**.

About Mithila Makhana

- Makhana, also called **fox nut or gorgon nut**, is the seed of the prickly water lily (*Euryale ferox*), grown in stagnant freshwater bodies like ponds and wetlands.
- It’s sometimes called the “**Black Diamond**” because of its dark outer shell, which turns white once processed.
- Mithila Makhana received its GI tag in 2022**, legally linking the product to the **Mithila region of Bihar** (mainly **Darbhanga, Madhubani, and Purnia**) and protecting it from being marketed under the same name by other regions.

Makhana Board

- In the Union Budget 2025–26, the government announced the **creation of a Makhana Board in Bihar**, along with a **National Makhana Research Centre**, to strengthen production, processing, value addition, and marketing of the crop.
 - Bihar accounts for nearly **85% of India’s total Makhana production**.
 - Makhana is also covered under the **government’s One District One Product (ODOP) scheme**.
- It follows the same sector-specific model used for boards like the Tea Board, Coffee Board, and the more recently announced Turmeric Board.

Source: PIB

SHARKS AS THE REAL-TIME OCEAN-DATA OBSERVERS

Context

- Researchers are **testing whether sharks can serve as mobile near-real-time ocean-data observers**.

About

- Sensors** to be used that measure ocean conditions to inform oceanographic, atmospheric and climate models.
 - These CTD tags are small electronic devices** that measure ocean electrical conductivity (a metric closely related to salinity) as well as temperature and depth, as marine creatures to which they are attached swim and dive.
- Animal-borne sensors** have been used successfully by oceanographers for years, particularly on elephant seals in polar regions where scientific observations are scarce.

- **Sharks offer a new opportunity in such research because** they are abundant, widely distributed and easier to access than many protected marine mammals.
 - ♦ Previous analyses identified shortfin mako sharks, blue sharks, smooth hammerheads and juvenile great white sharks as strong candidates for such research in the North Atlantic.
- The tagging is carried out under **institutional animal care oversight** to minimise impact on the sharks.
 - ♦ The tags are attached using materials **designed to corrode and fall off over time.**

Source: TH

INDIAN PEAFOWL

In News

- India has donated five Indian peafowls, four blue and one white, to the United Nations Office at Geneva (UNOG), renewing a long tradition of peacocks at Ariana Park.

Background

- India previously sent a breeding pair from Delhi Zoo to Geneva in 1981, during Indira Gandhi's tenure as Prime Minister.
- The latest donation therefore revives a 45-year-old tradition connecting India's national bird with UN Geneva.
- The move highlights India-UN cooperation, multilateralism, biodiversity conservation and responsibility for the environment.

Indian Peafowl (*Pavo cristatus*)

- The Indian Peafowl is a large terrestrial member of the pheasant family that is easily recognised.

- ♦ This species displays clear sexual dimorphism, with males (peacocks) and females (peahens) easily distinguished by physical characteristics
- **Physical characteristics:**
 - ♦ **Males (Peacocks):** Known for their bright blue feathers and spectacular, iridescent tail trains, which they display in elaborate fashion to attract mates.
 - ♦ **Females (Peahens):** Much smaller than the males, and with drab brown plumage, shorter tails, and slight green accents on their necks. These colours afford important concealment when the Peafowls are nesting.
- **Diet and Vocalisations:** Peafowl are vocal birds, most famous for their loud, carrying 'may-yow' call, which becomes more intense during the monsoon breeding season.
 - ♦ They are opportunistic omnivores, and have a natural diet of seeds, flowers, insects and small reptiles or mammals.
- **Range and Habitat:** They are native to the Indian subcontinent and Sri Lanka, occurring in open woodland, forest edges and agricultural areas.
 - ♦ The Indian peacock (male) is the official national bird of India and is deeply embedded in the heritage of the area.
- **Conservation and Legal Protection**
 - ♦ IUCN Red List: Listed as Least Concern because of its wide distribution.
 - ♦ Legal Protection: Strict legal protection as per Schedule I of Wildlife (Protection) Act, 1972 in India.

Source: IE

