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## Current Affairs - 12 October 2025

### WHAT IS PRADHAN MANTRI DHAN-DHAANYA KRISHI YOJANA (PMDDKY)?



- It is a new scheme by the Indian government to **support farmers**.
- Under this scheme, farmers get **direct financial help, new farming tools, crop insurance, and better market access**.
- It **targets 100 underperforming districts** where farming faces challenges like low crop yields, water scarcity, and limited access to resources.
- It aims to support 1.7 crore farmers, **particularly small and marginal farmers** owning less than 2 hectares of land, who constitute 86% of India's farming population.
- PMDDKY **consolidates 36 existing agricultural schemes across 11 ministries**, including PM-KISAN (cash transfers), PMFBY (crop insurance), PMKSY (irrigation), and Rashtriya Krishi Vikas Yojana (RKVY), into a unified program to streamline efforts and maximize impact.
- PMDDKY **focuses on regions with low crop yields** (e.g., wheat yields below 3.5 tonnes/hectare compared to the national average), **moderate cropping intensity** (below 155%, meaning fewer than 1.55 crop cycles per year), and **limited access to credit**.
- The scheme **operates under the Ministry of Agriculture and Farmers' Welfare, with oversight from a National Steering Committee, state-level nodal committees, and District Dhan Dhaanya Samitis led by District Collectors**.
- PMDDKY's Objectives:
  - **Increase crop yields by 20-30%** through **high-quality inputs** and technology.
  - Reduce reliance on monsoons with **advanced irrigation systems** like drip and sprinkler.
  - Provide affordable tools and mechanization to enhance efficiency.
  - **Build storage infrastructure to cut post-harvest losses to under 5%**.



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- **Offer loans and direct market access** to double farmer incomes by 2030, aligning with the government's extended goal from 2022 due to economic disruptions like COVID-19.
- **Promote sustainable practices like organic farming** to protect soil and water resources.
- Support women, youth, and allied sectors (e.g., dairy, fisheries, poultry) to diversify income sources.
- **Achieve self-sufficiency in foodgrains, pulses, and oilseeds** to reduce India's dependence on imports.
- **Key Benefits of PMDDKY:**
  - **Increased Crop Yields:** Access to high-yielding seeds (e.g., hybrid wheat yielding 4 tonnes/hectare), bio-fertilizers, and mechanized tools like seed drills to boost production.
  - **Higher Income:** Diversifying into high-value crops like pulses (₹80-100/kg) and vegetables, and direct market access through apps to increase profits by 20-40%.
  - **Sustainable Farming:** Organic fertilizers, water-saving irrigation, and climate-resilient crops to maintain soil health and reduce environmental impact.
  - **Irrigation Systems:** Drip and sprinkler systems to ensure water availability, enabling year-round farming in dry regions.
  - **Storage Facilities:** Village and block-level warehouses and cold storage to prevent spoilage of 20% of perishables like fruits, vegetables, and dairy.
  - **Financial Support:** Subsidies (50-80% off inputs) and loans (short-term: ₹50,000-₹1 lakh; long-term: ₹1-10 lakh) through Kisan Credit Cards or NABARD.
  - **Market Access:** Digital platforms like e-NAM and new PMDDKY apps to connect farmers directly to buyers, reducing middlemen and boosting profits.
  - **Women Empowerment:** Support for 10,000 women producer groups with training, loans, and market linkages for activities like dairy or organic farming.



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### AIR INDIA 787 INCIDENT: DGCA ORDERS PROBE INTO RAT ACTIVATION

An Air India Boeing 787-8 (flight AI-117) flying from Amritsar to Birmingham experienced an unexpected deployment of its Ram Air Turbine (RAT) — a last-resort emergency power system — during final approach, despite all electrical and hydraulic systems functioning normally.

The aircraft landed safely and was grounded for inspection, but no technical anomalies were found. The Directorate General of Civil Aviation (DGCA) has launched a formal investigation into the incident.

#### **Last-Resort Power: How the Ram Air Turbine (RAT) Works on Aircraft**

- The RAT is a small propeller-like device designed to automatically deploy only in severe emergencies such as dual engine failure or total power loss.
- Its unexpected activation is extremely rare and typically indicates a technical malfunction.
- The RAT harnesses airflow pressure generated by the aircraft's speed to produce power.
- A similar RAT deployment occurred during the June 12 Ahmedabad crash involving an Air India Boeing 787-8 Dreamliner, which tragically claimed 241 lives, underscoring the system's role as a last-resort emergency power source.
- **How It Generates Power?**
  - The RAT functions like a **mini wind turbine**, using ram pressure — created by the aircraft's forward motion — to generate electricity.
  - The power produced sustains essential flight systems such as flight controls, navigation, and communication equipment.
  - In the brief window before RAT deployment, the aircraft's batteries keep critical instruments running.
  - Designed as a last line of defence, **the RAT is most effective at high speeds or cruising altitudes**, when airflow can generate enough power for emergency operation.

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- It allows pilots to maintain control and glide toward a safe landing, though it cannot replace engine power.
- According to experts, this emergency system has helped save over 2,400 lives worldwide over the past five decades, preventing several major aviation disasters by keeping aircraft operational during total power failures.

### RAT Deployment on Air India Flight to Birmingham

- During the landing of Air India flight AI117, a Boeing 787 (VT-ANO) flying from Ahmedabad to Birmingham, the aircraft's Ram Air Turbine (RAT) unexpectedly deployed at just 400 feet, despite no signs of technical abnormality.
- Following comprehensive checks and Boeing-recommended maintenance procedures, no discrepancies were found.
- Boeing confirmed the aircraft was structurally and functionally sound. The plane has since resumed regular operations.
- However, given the highly unusual nature of the **uncommanded RAT deployment**, the Directorate General of Civil Aviation (DGCA) has ordered a detailed probe.

### Fresh Concerns Over Boeing 787 Systems After Birmingham Incident

- The unexpected RAT deployment on Air India's Boeing 787 during landing at Birmingham has reignited safety concerns about the aircraft model, occurring just four months after the Ahmedabad crash that killed 260 people.
  - In that crash, the RAT had deployed moments after takeoff, when both engines shut down due to fuel control switches shifting from 'RUN' to 'CUTOFF'.
    - A detailed technical investigation is still underway.
  - The **Federation of Indian Pilots (FIP)**, representing **5,500 pilots**, suspects that an **electrical fault** may have triggered the RAT deployment in the Birmingham flight.
    - The FIP suggested the Birmingham incident could be **linked to the Ahmedabad crash**, arguing that potential **electrical system failures** were not fully investigated.
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### DELHI'S GREEN CRACKERS: PROMISE VS POLLUTION

- The firecracker litigation began in 2015, when a petition by three infants sought protection from Delhi's toxic air.
- In **October 2018**, the SC delivered a landmark ruling, banning conventional firecrackers and permitting only "green" variants developed by CSIR, with fixed time slots for bursting them.
- In **November 2020**, the **National Green Tribunal (NGT)** imposed an "**absolute ban**" on all firecrackers during the **Diwali season** in the **NCR** and other **highly polluted cities**, expanding restrictions beyond the SC's earlier framework.
- **Annual Enforcement and Year-Round Ban (2021–2023)**
  - Since 2021, the Delhi Pollution Control Committee (DPCC) has regularly banned the sale and use of firecrackers from September through winter each year.
  - In 2023, following Supreme Court directions, Delhi extended the prohibition to a year-round ban to control persistent air pollution.
- **Supreme Court's Latest Observations (2024–2025)**
  - In April 2024, the SC observed that a short-term ban around Diwali would not be effective and no relaxation for green crackers should be given without clear evidence of environmental benefit.
  - Later, in September 2025, while reviewing pleas to modify the ban, the Court allowed certified manufacturers to produce green crackers, but prohibited their sale in Delhi-NCR until further orders.

### About Green Crackers

- Green crackers are **eco-friendly fireworks** developed by the Council of Scientific & Industrial Research – National Environmental Engineering Research Institute (CSIR-NEERI) to reduce harmful emissions and air pollution.
- These crackers are made with smaller shells, reduced raw material use, elimination of ash, and dust-suppressant additives, which help **curb smoke and particulate emissions**.



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- While combustion-based fireworks can never be entirely pollution-free, **green crackers** release **30–40% fewer pollutants than traditional ones**.
- They do not contain toxic substances such as barium nitrate, arsenic, or lead, and instead use alternative formulations that reduce smoke, particulate matter, and noise levels.
- **Variants Developed by CSIR-NEERI**
  - Introduced in **2018**, CSIR-NEERI created three key variants:
    - **SWAS (Safe Water Releaser)**
    - **STAR (Safe Thermite Cracker)**
    - **SAFAL (Safe Minimal Aluminium)**
  - These versions **eliminate potassium nitrate and sulphur**, helping cut **gas and dust emissions** significantly while maintaining festive brightness and sound within safer limits.

### Concerns and Risks Surrounding Green Crackers

- According to CSIR-NEERI, green crackers emit lower levels of nitrous oxide and sulphur dioxide compared to traditional fireworks.
- However, a 2022 Delhi Technological University study found that **they still release high concentrations of ultra-fine particles** — even more harmful than PM2.5 and PM10, posing serious health risks.
- **Identification and Regulation**
  - Certified green crackers carry the **CSIR-NEERI green logo** and **encrypted QR codes for authenticity**.
  - Only companies approved by NEERI and the Petroleum and Explosives Safety Organisation (PESO) can manufacture them, and licensed vendors are authorised to sell these products.
  - Each cracker is traceable to its manufacturer through the QR code.
  - Despite the regulatory framework, Delhi lacks essential infrastructure — including testing labs, certification mechanisms, and inspection facilities — to ensure compliance.



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### RESEARCH DEVELOPMENT AND INNOVATION SCHEME



- It aims to provide long-term financing or refinancing with long tenors at low or nil interest rates to spur **private sector investment in Research Development and Innovation.**

- **Key objectives of the Research Development and Innovation Scheme:**
  - Encourage the private sector to **scale up research, development, and innovation (RDI) in sunrise domains** and in other sectors relevant for economic security, strategic purpose, and self-reliance;
  - Finance transformative projects at higher levels of **Technology Readiness Levels (TRL)**
  - Support **acquisition of technologies** which are critical or of high strategic importance;
  - Facilitate **setting up** of a Deep-Tech Fund of Funds.
- **Governance:** The Governing Board of Anusandhan National Research Foundation (ANRF), **chaired by the Prime Minister**, will provide overarching strategic direction to the RDI Scheme.
- **Funding Mechanism of Research Development and Innovation Scheme:**
  - **Total Budget:** ₹1 Lakh crore
  - **Special Purpose Fund (SPF):** It will be established within the **Anusandhan National Research Foundation (ANRF)**, which will serve as the **custodian of the ₹1 lakh crore corpus.** (The fund will not directly invest in industries and startups but will channel capital to **Second-level fund managers**).
  - **Second-level fund managers:** Who can be **Alternative Investment Funds (AIF), Development Finance Institutions (DFI), Non-banking Finance Companies (NBFCs).**
  - **Nodal Department:** The **Department of Science & Technology (DST).**



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### SUGAMYA BHARAT APP



- It was launched under the **Accessible India Campaign (Sugamya Bharat Abhiyan)**.
- It is a **flagship initiative of the Government of India** dedicated to enhancing accessibility for divyangjan and elderly citizens in India.
- **Purpose:** The app served as a **citizen-led platform** to make India's public spaces **more inclusive**.

#### **Key Features of Sugamya Bharat App:**

- **Accessibility Mapping Function:** It allows users to locate and rate public places on accessibility parameters, empowering community-led data collection.
  - **Consolidated Directory:** It provides a one-stop **platform for government schemes, scholarships, benefits, and employment opportunities**, eliminating the need to navigate multiple portals.
  - **Curated Job and Education Listings:** It also features job and education listings from government and private sectors tailored for persons with disabilities.
  - **Grievance Redressal Module:** It enables users to directly **register complaints about inaccessible infrastructure and services**, making public spaces more accountable.
  - **Inclusive Design:** It is compatible with assistive technologies, available in multiple Indian languages, and optimized for both Android and iOS platforms.
  - It is revamped to **AI-powered chatbot support** to assist users in real time.
  - It is **available in 10 languages**
  - **Launched by:** Department of Empowerment of Persons with Disabilities (DEPwD), under the Ministry of Social Justice and Empowerment.
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### WHAT IS A QUBIT?



- A qubit, or **quantum bit**, is the **basic unit of information used to encode data in quantum computing**.
  - It can be best understood as the **quantum equivalent of the traditional bit used by classical computers** to encode information in binary.
    - In **classical computing** the information is encoded in bits, where **each bit can have the value zero or one**.
    - In quantum computing the information is encoded in qubits. A **qubit** is a **two-level quantum system** where the **two basis qubit states** are usually written as  **$|0\rangle$  and  $|1\rangle$** .
    - A qubit can be in state  **$|0\rangle$ ,  $|1\rangle$ , or (unlike a classical bit) in a linear combination of both states**.
    - The **name of this phenomenon is superposition**.
  - The term “qubit” is attributed to American theoretical physicist Benjamin Schumacher.
  - Qubits are generally, although not exclusively, **created by manipulating and measuring quantum particles** (the **smallest known building blocks of the physical universe**), such as photons, electrons, trapped ions, superconducting circuits and atoms.
  - Enabled by the unique properties of quantum mechanics, **quantum computers use qubits to store more data than traditional bits, vastly improve cryptographic systems and perform very advanced computations** that would take thousands of years (or be impossible) for even classical supercomputers to complete.
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