

DAILY CURRENT AFFAIRS (DCA)

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MITOCHONDRIAL REPLACEMENT THERAPY (MRT)

Context

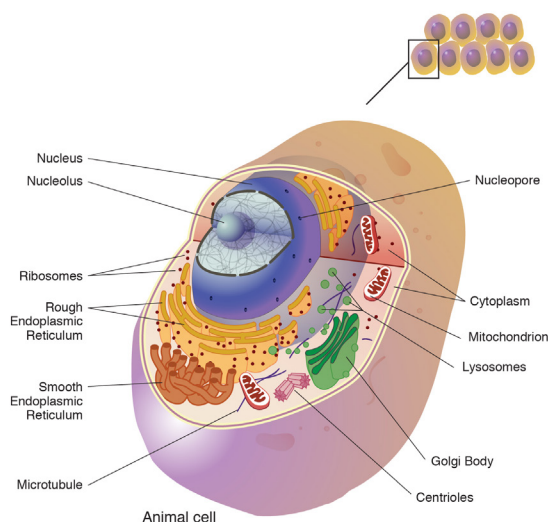
- Eight healthy babies were born in Britain with the help of an **experimental technique called Mitochondrial Replacement Therapy (MRT)**.

About

- The mothers were all at **high risk for passing on life-threatening diseases** to their babies due to **mutations in their mitochondria**.
- The four boys and four girls were born to seven women and have **no signs of the mitochondrial diseases** they were at risk of inheriting.
- The UK became the **first country** to approve the use of mitochondrial donation in 2015.
- The procedure is not yet permitted in India.**

Mitochondrial Genes

- Mitochondria:** The human genes are curled up in the **nucleus** of nearly every cell in the body.
 - The **fluid surrounding the nucleus** contains **hundreds to thousands of mitochondria** that carry their **own set of 37 genes**.
 - The mitochondria are **membrane-bound organelles** often referred to as the **"powerhouses of the cell"** because they play a crucial role in producing energy.



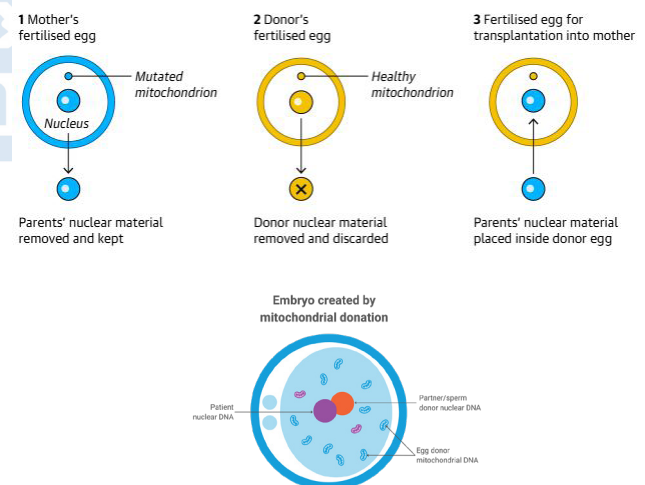
- People inherit all their mitochondria from their **biological mother**, mutations can affect all the children a woman has.
- Mutations in these genes** can impair or completely disable mitochondria with catastrophic effects.

- The first symptoms of mitochondrial disease **tend to appear in early childhood** as energy-hungry organs such as the brain, heart and muscles start to fail.
- Many affected children have developmental delays, require wheelchairs and die young. About one in 5,000 newborns are affected.

Mitochondrial Donation Treatment (MDT)

- A three-parent baby** is produced from the genetic material of one man and two women through **mitochondrial replacement therapy (MRT) and three-person in vitro fertilization (IVF)**.
- Aim:** To **prevent children from inheriting mutated mitochondria**.
- Procedure:** It involves **fertilising the mother's egg with the father's sperm** and then **transferring the genetic material** from the nucleus into a fertilised healthy donor egg that has had its own nucleus removed.
 - This creates a **fertilised egg with a full set of chromosomes** from the parents, but healthy mitochondria from the donor.
 - The egg is then implanted into the womb to establish a pregnancy.

How mitochondrial donation therapy works



- These babies carry **nuclear DNA from their biological mother and father**, and a **small portion of mitochondrial DNA** from a female donor.

Conclusion

- Scientists around the world are closely watching the UK's results.
- Many believe that with careful regulation, MDT could become a routine option for families at risk, helping to stop certain genetic diseases before they begin.

Source: LM

CONSTITUTIONAL VALIDITY OF UAPA UPHELD BY BOMBAY HIGH COURT

In News

- The Bombay High Court upheld the constitutional validity of the **Unlawful Activities (Prevention) Act (UAPA), 1967**, dismissing a petition that challenged the law as being ultra vires and violative of fundamental rights.
 - The Court underscored the objectives of **national security and public order**.

What is UAPA?

- Enactment:** Brought into force in 1967, being amended several times—most notably in 2004, 2008, 2012, and 2019—to include terror-related offences and empower the government with wider discretionary powers.
- Purpose:** To prevent unlawful activities, including terrorism, that threaten the sovereignty and integrity of India.
- Provisions:** It grants the government powers to ban organisations, designate individuals/organisations as terrorists, and prescribe enhanced investigation and detention procedures (including extended pre-charge detention and stringent bail conditions).

Arguments in Favour of UAPA

- National Security:** Advocates contend that India faces persistent threats from terrorism, and stringent laws like UAPA are essential to equip agencies to prevent and respond to such threats.
- International Obligations:** Amendments align Indian law with international conventions and UNSC resolutions against terrorism.
- Pre-emptive Powers:** Allows security agencies to act before threats escalate—by banning organizations, freezing assets, etc.

Criticisms and Arguments Against UAPA

- Vague Definitions & Overbroad Powers:** Critics argue the Act allows the executive wide discretion to designate individuals or organisations as “terrorist” or “unlawful” without adequate definition or robust judicial safeguards.
- Civil Liberties & Dissent:** The law is seen as a tool to suppress dissent, given instances where activists have faced prosecution under its provisions.

- Extended Detention & Bail:** UAPA restricts bail and allows extended pre-trial custody, drawing concern for violating rights to liberty and fair trial.

Source: TH

NATO SECONDARY SANCTIONS: INDIA CALLS OUT ‘DOUBLE STANDARDS’

Context

- India has firmly pushed back against NATO Secretary's warning of **secondary sanctions** over its continued trade with Russia.

What are Secondary Sanctions?

Secondary sanctions target third-party countries, companies, or entities that continue doing significant business with a sanctioned nation (in this case, Russia), even if they are not directly engaged in the initial conflict.

Strong stand

The ‘Sanctioning Russia Act of 2025’, expected to be introduced in U.S. Congress in August, mandates 500% duties on goods and services from countries buying Russian oil

What the NATO chief said

- India, China, and Brazil should tell Vladimir Putin to be serious about peace talks with Ukraine
- Continuing to do business with Russia will ‘slam back’ on these countries
- The secondary sanctions by U.S. will hit these countries ‘very hard’

Centre's response

- Securing energy needs is an ‘overriding priority’ for the government
- India is guided by what markets offer and global circumstances
- Maintain caution against double standards on the matter



- These could include:
 - Hefty tariffs (e.g., 100% on exports to the US from countries trading with Russia)
 - Restrictions on access to US/EU financial systems and markets.

Crude Oil Imports of India

- India is the **world's third largest crude oil importer**, it depends on imports to meet around **88% of its crude oil needs**.
 - Since the Russian invasion of Ukraine in 2022, India has ramped up the purchase of discounted Russian oil.
- India's main sources of crude oil imports are **Iraq, Saudi Arabia, Russia, United States and the United Arab Emirates**.

India's Stand

- **Energy security first:** India, with ~88% crude oil import dependence, has prioritized affordable energy supply to meet domestic economic and developmental needs.
- **Global circumstances:** India cites fluctuating oil markets and ongoing global volatility as key factors in its strategic sourcing decisions.
- **'Double standards' criticism:** India points out that even as Western countries warn others against Russian oil, European countries themselves continue buying Russian gas/LNG (though they promise to end this by 2027), and also import refined fuels made from Russian crude in third countries like India.

Implications for India

- **Trade risk:** The threat of 100% tariffs or secondary sanctions could impact India's exports to the US/EU and complicate broader trade negotiations.
- **Oil import strategy:** India can diversify imports to other suppliers, but this could lead to higher energy bills and inflationary pressures.
- **Strategic autonomy:** India's resistance underscores its commitment to a multipolar, non-aligned foreign policy, maintaining ties with both the West and Russia based on national interest.

Steps Taken by India to Manage its Crude Oil Imports

- **Diversification of Supply Sources:** India is expanding its oil import base by sourcing crude from multiple countries, including Iraq, Saudi Arabia, the UAE, U.S. and even Russia to reduce dependency on any single region.
- **Strategic Petroleum Reserves (SPR):** India has developed strategic oil reserves to ensure supply during emergencies or geopolitical disruptions.
- **Promotion of Domestic Production:** India is encouraging domestic exploration and production of oil through initiatives like the Hydrocarbon Exploration and Licensing Policy (HELP) to increase self-sufficiency.
- **Energy Efficiency and Alternatives:** India is investing in renewable energy and improving energy efficiency to reduce overall reliance on crude oil.
- **Bilateral Agreements:** India has signed long-term agreements with countries like Saudi Arabia, Iraq, and Russia to ensure stable and reliable oil supplies.

Source: TH

CARA ISSUES DIRECTIONS TO STATES FOR STRENGTHENING COUNSELLING SUPPORT

In News

- The **Central Adoption Resource Authority (CARA)** has issued directions to all State Adoption Resource Agencies (SARAs) under powers conferred by Section 70(1)(a) of the Juvenile Justice (Care and Protection of Children) Act, 2015 (as amended in 2021), and as per the Adoption Regulations, 2022.

Key Provisions of the Directives

- **Designation of Qualified Counsellors:** SARAs are mandated to designate or empanel qualified counsellors at district and state levels, ideally with backgrounds in child psychology, mental health, or social work.
- **Post-Adoption Counselling:** Psychosocial intervention to be provided under circumstances as assessed by Specialised Adoption Agencies (SAAs) or District Child Protection Units (DCPUs).
- **Counselling for Biological Parents:** Biological parents surrendering children for adoption must be counselled about the legal finality of their decision after 60 days and the child's future right to undertake a root search (Regulations 7(11) and 30(2)(c)).
- **Documentation:** All counselling sessions and psychosocial interventions must be systematically recorded and documented at both SAA and DCPU levels to ensure transparency and continuity of care.

Adoption in India is governed under two major legal regimes:

- **Hindu Adoption and Maintenance Act (HAMA), 1956:** Applies to Hindus, Buddhists, Jains, and Sikhs.
 - ♦ Does not require court involvement.
 - ♦ Governed by personal laws, but must follow certain conditions under HAMA.
- **Juvenile Justice (Care and Protection of Children) Act, 2015 (JJ Act):** Applies to all Indian citizens (irrespective of religion).
 - ♦ Covers adoption through court orders and is administered by **Central Adoption Resource Authority (CARA)** under Ministry of Women and Child Development.

- CARA is the **statutory body** that monitors and regulates adoption of orphaned, abandoned, and surrendered children through recognized adoption agencies.

Adoption Under CARA:

- Children must be:**
 - Declared legally free for adoption by a Child Welfare Committee (CWC).
 - Below 18 years of age.
 - Either abandoned, surrendered, or orphaned.
- Eligibility for a Parent Under JJ Act (via CARA):** Any Indian citizen (including NRIs, OCI cardholders).
 - Married couples (minimum 2 years of stable marriage).
 - Single individuals (unmarried, divorced, widowed).
 - The age difference between adoptive parent and child should be a minimum of 25 years.
 - Maximum composite age limits (for both spouses combined or a single parent) are up to 45 years for adopting a child below 4 years.
 - Up to 50 years for children aged 4–8 years.
 - Up to 55 years for children aged 8–18 years.
- Exception:** The age criteria for prospective adoptive parents shall not be applicable in case of **relative adoptions and adoption by step-parent**.
- Non-commercial:** Any sale or payment for adoption is illegal.
- Prohibited Categories:** Live-in couples and same-sex couples are currently not eligible under CARA guidelines.

Source: TH

SWACHH SURVEKSHAN 2024-25 RANKINGS

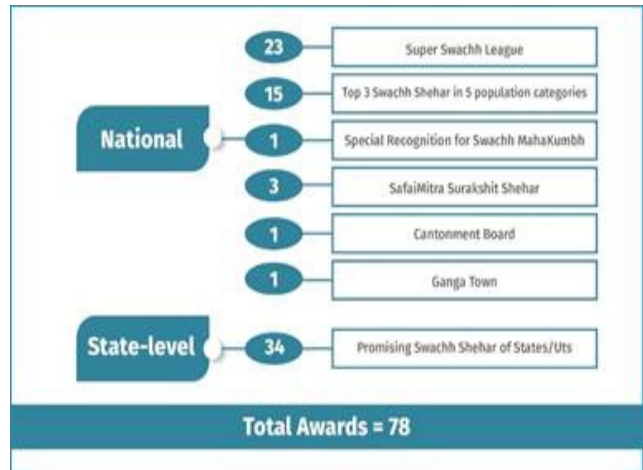
In News

- The Swachh Survekshan Awards 2024-25 were presented by President Droupadi Murmu at a ceremony organised by the Ministry of Housing and Urban Affairs (MoHUA).

Swachh Survekshan (SS)

- It is a flagship initiative under **Swachh Bharat Mission-Urban (SBM-U)** and has played a pivotal role in driving cleanliness in urban India—engaging communities, changing mindsets, and motivating action for the past nine years.

- Beginning with just 73 urban local bodies in 2016, the latest edition now covers over **4,500 cities**.
- The SS 2024-25 awards emphasize the theme of **Reduce, Reuse, Recycle**.
- In total, 78 awards were presented, recognising cities, cantonments, and institutions for their exemplary performance across a range of sanitation parameters.



- This year, Swachh Survekshan introduced a simplified, inclusive assessment framework allowing smaller cities to compete fairly with larger ones under the “One City, One Award” principle.

Major Updates

- Indore, Surat, and Navi Mumbai have once again secured the top spots in urban sanitation, **emerging as the cleanest cities in the Swachh Survekshan 2024-25 rankings**.
- The three cities were ranked first, second, and third, respectively, in the newly introduced “**Super Swachh League**,” which recognises sustained excellence in cleanliness.



- Ahmedabad, Bhopal, and Lucknow** were declared the **new generation of top clean cities, emerging as India's leading Swachh Shehars**.



- Prayagraj was honoured as the **Best Ganga Town**, while **Secunderabad Cantonment Board** was awarded for its strong sanitation efforts.
- Visakhapatnam, Jabalpur, and Gorakhpur received recognition as the **Best SafaiMitra Surakshit Shehars** for prioritising the safety, dignity, and welfare of sanitation workers.
- A special award was conferred upon the **Government of Uttar Pradesh**, the **Prayagraj Mela Adhikari**, and the **Municipal Corporation of Prayagraj** for successfully managing urban waste during the Mahakumbh, which saw a record footfall of approximately 66 crore people.

The Swachh Bharat Mission - Urban (SBM-U)

- It was launched on October 2, 2014, with the goal of eliminating open defecation and ensuring **100% scientific management** of municipal solid waste in over 4,000 towns across India.
- Its second phase, SBM-U 2.0, began on October 1, 2021, and will run until 2026, aiming to make all cities **"Garbage Free"** and promote lasting cleanliness habits among citizens.
- It is being Implemented by the Ministry of Housing and Urban Affairs through states and urban local bodies
- It supports India's commitment to the Sustainable Development Goals (SDG) 2030 by improving urban living standards and driving urban transformation.

Source :IE

CHINA'S GREEN ENERGY TRANSFORMATION

Context

- China's transformation from the world's largest polluter to a global clean energy superpower is the result of decades of strategic planning, massive state investment, and technological dominance across the renewable energy supply chain.

About the Green Energy

- It has emerged as a cornerstone of sustainable development, as the world confronts the climate crisis.
- It refers to **energy generated from natural, renewable sources** that have minimal environmental impact and produce little to no greenhouse gas emissions.
 - ♦ These sources include **solar energy, wind energy, hydropower, biomass** and geothermal energy.

Global Landscape

- Globally, renewables provided 40.9% of electricity in 2024 — the highest share since the 1940s.
 - ♦ Solar alone added 474 TWh, making it the fastest-growing source for the 20th consecutive year.
 - ♦ The US and EU are investing billions to reshore clean energy industries.
 - ♦ Brazil and Germany are expanding bioenergy and offshore wind.
 - ♦ Africa is emerging as a new frontier, with China leading nuclear and solar investments.

China's Green Energy Revolution

- China, once the world's largest emitter, has rapidly transformed into a clean energy superpower — reshaping global supply chains, investment flows, and technological leadership.
- **Policy & Legal Framework:** 11th Five-Year Plan (2006–2010); Renewable Energy Law (2005).
- **Massive Investment:** \$940 billion in renewables in 2024, up from \$10.7 billion in 2006.
- **State-Owned Enterprises (SOEs):** Entities like State Grid and Huaneng execute national plans with speed and scale.
 - ♦ China's SOEs account for 55% of global renewable energy investment, turning clean energy into a tool of statecraft.
- **Global Supply Chain Dominance:** From raw material extraction (polysilicon, lithium)

to manufacturing and exports, China has **consolidated control over every stage** of clean energy production.

- **Using Next-Gen Tech:** China is focusing on next-gen technologies like AI-powered smart grids, Green hydrogen, and Thorium-based nuclear reactors in its renewable energy push.
- **Export Strategy:** Through the Belt and Road Initiative (BRI), China builds solar parks, wind farms, and hydropower stations across 61 countries.

India's Learning From China's Green Energy Success

- **Reducing Import Dependence:** India slashed solar module imports from China by 76% in 2023.
 - ♦ Imposed 40% customs duty on solar modules and 25% on solar cells;
 - ♦ Boosted domestic manufacturing through the PLI scheme for solar and batteries;

India: Emerging Renewable Superpower

4th India ranks 4th in overall renewable energy capacity (as per IRENA).

It has become the third-largest producer of wind and solar energy, overtaking Germany in 2024

Ambitious Targets: 500 GW of non-fossil capacity by 2030 (Paris Agreement)

Rapid Solar Growth: 24 GW added in 2024 (Solar potential is more than 110 GW)

Low Per Capita Emissions 2.9 tCO_{2e} vs global average of

- **Strengthening Grid and Storage:** Recognizing China's early grid bottlenecks, India is investing in:
 - ♦ Green Energy Corridors;
 - ♦ Battery storage systems;
 - ♦ Pumped hydro projects (51 GW expected by 2032).
- **Decentralized and Inclusive Growth:** Unlike China's centralized SOE model, India is promoting:
 - ♦ Rooftop solar through PM Surya Ghar Yojana;
 - ♦ Agri-PV and PM-KUSUM for rural solar deployment;
 - ♦ Hybrid tenders combining solar, wind, and storage for grid stability.

- **Critical Minerals and Technology Independence:** India is formulating a critical minerals framework to reduce reliance on China for lithium, cobalt, and rare earths.

- ♦ Exempted 12 critical minerals and 35 capital goods from import duties to support domestic innovation.

Source: TH

NEWS IN SHORT

ESWATINI

In News

- The United States has deported five foreign nationals convicted of serious crimes to Eswatini.

About Eswatini

- It is a landlocked country bordering South Africa and Mozambique in Southern Africa.
 - ♦ It is a member of the Common Monetary Area (CMA), with Lesotho, Namibia, and South Africa.
- It is a small southern African kingdom ruled by Africa's last absolute monarch.

It was formerly known as Swaziland and it changed its name in 2018 to reflect its pre-colonial identity.



- It remains one of the few countries in the world, and the only one in Africa, governed by an absolute monarch.
 - ♦ King Mswati III, who has ruled since 1986, holds full control of government functions and rules by decree.
- The country faces major social and economic challenges, with over half the population living on less than \$4 a day and the highest global HIV rate at about 26%.

Source :IE

CABO DELGADO REGION

In News

- A new study reveals that four planned Liquefied Natural Gas (LNG) projects in the Rovuma Basin, located in the Cabo Delgado region of northern Mozambique, could have an outsized impact on the global climate if fully exploited.

About Cabo Delgado Region

- Cabo Delgado is the northernmost province of Mozambique, bordering Tanzania to the north (across the Rovuma River), the provinces of Niassa (west) and Nampula (south), and the Indian Ocean to the east.

Source: DTE

CONDUCT OF BUSINESS IN LOK SABHA

Context

- The Monsoon Session of Parliament will begin soon.

Parliament holds three Sessions in a year

- Budget Session—February-May;
- Monsoon Session—July-September; and
- Winter Session—November-December.

Rules for the Conduct of Business of Parliament

- Under **Rule 377** of the Rules of Procedure and Conduct of Business in Lok Sabha, Members are allowed to raise matters which are not Points of Order or which have not been raised during the same session under any other Rule.
- In the **Rajya Sabha**, Members are allowed to make a mention of matters of public importance under **Rule 180A-E** of the Rules of Procedure and Conduct of Business in the Council of States.
- There are four main procedures under which there could be a discussion in the **Lok Sabha** — **a debate without voting under Rule 193**, **a motion (with a vote) under Rule 184**, and **an adjournment motion or a no-confidence motion.** Except the last one, similar measures also exist in the Rajya Sabha.

Procedures

- **Question Hour:** Generally, the **first hour** of a sitting of the Lok Sabha is devoted to Questions called the Question Hour.
 - ♦ Members can ask questions on every aspect of administration and governmental activity.

- ♦ MPs raise questions during Question Hour to hold the government accountable for its policies and actions.
- **'Zero Hour':** The period of time immediately after the **Question Hour** is over and before the regular business as entered in the List of Business is taken up, is referred to as the 'Zero Hour'.
 - ♦ The Government is **under no obligation** to respond to the matters raised during the 'Zero Hour'.
- **Short Duration Discussion:** Members could raise discussion for a short duration **without a formal motion or vote.**
 - ♦ Any member may **give notice in writing specifying clearly and precisely** the matter desired to be raised.
 - ♦ It shall state the reasons for raising the discussion and supported by the signatures of at least two other members.
- **Adjournment Motion:** This motion is introduced to draw attention of the house towards a recent matter of urgent public importance.
 - ♦ If admitted, it leads to **setting aside the normal business of the House** for discussing a definite matter of urgent public importance.
- **No-Confidence Motion:** The Council of Ministers must enjoy the confidence of the House at all times to remain in power.
 - ♦ **The Opposition Parties in Lok Sabha** can move a No-confidence Motion in the Council of Ministers to express the lack of confidence of the House and such a motion, if adopted, **results in the fall of the Government.**

Source: IE

PAC CALLS FOR AADHAAR REVIEW

In News

- The Public Accounts Committee has called for a review of the functioning of the Unique Identification Authority of India (UIDAI), flagging several concerns, including the high rate of failure of Aadhaar biometric verification which can lead to many beneficiaries being excluded from social welfare schemes.

About Public Accounts Committee (PAC)

- The Committee on Public Accounts was first set up in 1921 in the wake of the **Montague-Chelmsford Reforms.**

- It is a key parliamentary committee in India, **constituted annually** to examine government expenditure and financial accounts.
- It reviews the appropriation of funds granted by Parliament, annual Finance Accounts, and other relevant accounts (except those of Public Undertakings and Government Companies which come under the purview of the Committee on Public Undertakings).
- **Composition** : The PAC has up to 22 members—**15 elected from the Lok Sabha** and up to **7 from the Rajya Sabha**—selected through proportional representation.
 - ♦ The **Chairperson**, appointed by the Lok Sabha Speaker, is traditionally from the **opposition**.
 - ♦ **Ministers cannot be members of the committee.**
 - ♦ The term of office of the members is **one year**.
- **Functions** : The PAC's functions include scrutinizing government spending to ensure funds are used legally and appropriately within the sanctioned limits. It examines cases of excess expenditure, financial irregularities, losses, and wasteful spending.
 - ♦ The committee also reviews reports by the Comptroller and Auditor-General (CAG) on both expenditure and revenue, investigating tax administration issues like under-assessment and tax evasion, and recommends measures to prevent revenue leakage.

Source :TH

MAULANA AZAD NATIONAL FELLOWSHIP (MANF)

In News

- The Union Ministry of Minority Affairs announced that the seven-month pending payments under the Maulana Azad National Fellowship (MANF) have now been released.

Maulana Azad National Fellowship (MANF) Scheme

- It is a **five-year fellowship** provided by the Centre in the form of **financial assistance to six notified minority communities** – Muslims, Buddhists, Christians, Jains, Parsis and Sikhs — to pursue M Phil and PhD.
 - ♦ It was launched in 2009-10 as a Central Sector Scheme.

- It is being implemented by the Ministry of **Minority Affairs**.
- It covers all Universities/Institutions recognized by the University Grants Commission (UGC).
- **Scope**: The Fellowship will cater to the minority community students pursuing regular and full time research studies leading to award of M.Phil/ Ph.D degree within India only.
 - ♦ This will enable them to be eligible for employment to the posts with M.Phil and Ph.D as pre- requisites, including the posts of Assistant Professors in various academic institutions.

Source :IE

INDIA SENDS 3 LAKH MEASLES-RUBELLA VACCINE DOSES TO BOLIVIA

In News

- India has sent 3 lakh doses of **Measles-Rubella vaccine to Bolivia** in response to a major measles outbreak.

About Measles

- Measles is a **highly contagious** and serious airborne viral disease.
- It is **caused by a virus in the Paramyxovirus family** and spreads mainly through respiratory droplets via coughing, sneezing, or direct contact.
- The virus initially infects the respiratory tract and then spreads throughout the body, often resulting in severe complications and, in some cases, death.
- **No specific antiviral treatment exists** for measles. However, in preventive mode, the **Measles-Rubella (MR) vaccine** is usually given in two doses to ensure immunity.

Source: AIR

AUTOMOTIVE MISSION PLAN (AMP) 2047

Context

- The government has initiated the formulation of the **Automotive Mission Plan 2047 (AMP 2047)**.

About

- **Aim**: To transform India into a global automotive leader by focusing on **innovation, sustainability, and exports**.

- **Key Objectives:**
 - ♦ **Set concrete milestones** for 2030, 2037, and 2047 for sectoral growth.
 - ♦ Increase India's share in global automotive trade through **high-quality and advanced products**.
 - ♦ **Promote an industry-led and government-supported strategy** for future growth.
 - ♦ Integrate sustainability, green mobility, and digital transformation in the automotive ecosystem.
- **Strategic Features**
 - ♦ **Emphasis on technology neutrality:** Not tied to specific companies or technologies.
 - ♦ Focus on building robust infrastructure, including charging networks for electric vehicles (EVs).
 - ♦ Ensures collaborative input from all stakeholders to frame policies based on ground realities.
- **Institutional Mechanism:** Formation of seven sub-committees comprising experts from government ministries, industry bodies, academia, testing agencies, and think tanks.
- **Role of sub-committees:**
 - ♦ Outline the objectives, framework, and sectoral targets.
 - ♦ Guide the phased development and implementation till 2047.
 - ♦ Focus on exports, innovation, digitalization, and value-chain enhancement.

Source: BS

GREEN SYNTHESIS OF HYDROGEN PEROXIDE

Context

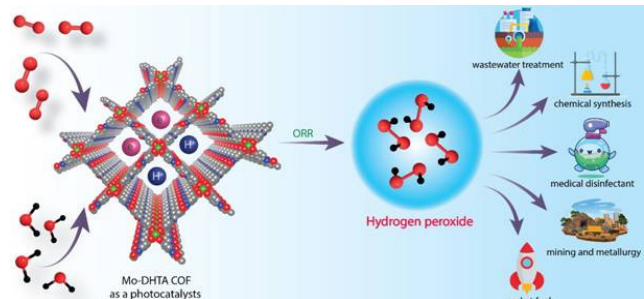
- Researchers from S. N. Bose Centre for Basic Sciences (SNBCBS) have developed a **novel approach for synthesizing H₂O₂ directly from water and sunlight**.

Hydrogen peroxide

- **Hydrogen peroxide (H₂O₂)** is a vital **oxidizing agent** with broad applications in **chemical synthesis, sterilization, wastewater treatment, and fuel cells**.
- Known for its eco-friendly nature of degrading or breaking down into only water and oxygen - H₂O₂ is a key component in **sustainable chemical processes**.

- However, its conventional production methods are **energy-intensive, environmentally hazardous, and costly**.

Photocatalytic hydrogen peroxide generation using M-COFs for various applications



- **Mo-DHTA COF**, short for dimolybdenum paddlewheel-embedded covalent organic framework for synthesizing H₂O₂ **directly from water and sunlight**.
- This innovation offers a **cleaner, more efficient, and recyclable** route for hydrogen peroxide production, potentially transforming industries such as **pharmaceuticals, green chemistry, and materials science**.

Source: PIB

PRITHVI-II AND AGNI-I

Context

- India successfully test-fired two key strategic ballistic missiles – **Prithvi-II** and **Agni-I** – from the Integrated Test Range (ITR) at Chandipur, Odisha.

About Prithvi-II

- Prithvi-II, developed by the Defence Research and Development Organisation (**DRDO**), is a liquid-fuelled, **surface-to-surface ballistic missile** known for its high accuracy and precision targeting.
- It has a range of approximately **350 km** and is capable of carrying a payload of up to **500 kg**. The missile can be equipped with both conventional and **nuclear warheads**.

About Agni-I

- Designed and developed by the DRDO, Agni-I is a **single-stage missile** powered by solid propellants.
- It has a range of **700–900 km** and is capable of carrying a **nuclear warhead** weighing up to **1,000 kg**.

- The need for Agni-I was felt in the aftermath of the **Kargil War** with Pakistan.
 - The successful trials of **Prithvi-II** and **Agni-I** came just a day after the Indian Army conducted a **high-altitude test** of the indigenous **Akash Prime** air defence system in **Ladakh**, at an altitude of approximately **15,000 feet**.
- Source: DD News

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