NEXT IAS

DAILY CURRENT AFFAIRS (DCA)

Time: 45 Min

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ATLANTIC MERIDIONAL OVERTURNING CIRCULATION (AMOC)

Context

- Recent studies show that the **AMOC could collapse between 2025 and 2095** due to the impact of anthropogenic emissions.

About the Atlantic Meridional Overturning Circulation (AMOC

- It is a **system of ocean currents** that circulates water within the Atlantic Ocean, bringing warm water north and cold water south and is **part of a complex system of global ocean currents.**
- The global conveyor belt **circulates cool subsurface water and warm surface water throughout the world.** It plays a crucial role in **moderating the climate of Europe and North America** and influences temperatures near the Equator.
- The entire circulation cycle of the AMOC, and the global conveyor belt, is quite slow.
  - It takes an estimated 1,000 years for a parcel of water to complete its journey along the belt.
- Even though the whole process is slow on its own, there is some evidence that the AMOC is slowing down further.

What if AMOC would collapse?

- AMOC is a kind of 'switch' for climate in the northern hemisphere, especially Europe.
- It would **cause widespread cooling across the northern hemisphere and less precipitation in places such as Europe, North America, China and some parts of Russia in Asia.**
  - The excess heat due to a collapsed AMOC could lead to **less rainfall over the Amazon rainforest** and make it drought prone and dry, and it could potentially transform it to a savannah state.
- A slowdown of AMOC could **hinder monsoon formation** and rainfall in different regions.
  - **Rainfall in the Sahel region** (the West African monsoon) could reduce, the summer monsoon circulation in South Asia and India could weaken; and there might be more winter storms in Europe.
  - Weakening of the land-sea thermal gradient **weakens the sea level pressure gradient and the summer monsoon circulation over the Indian region.**

Tipping elements in the Earth's climate system

- These are the **critical threshold for a system that influences the climate and ecology of the planet**, indicating the point beyond which that system begins to undergo a large-scale irreversible shift.
- Tipping elements include long-term loss of major ice sheets on Greenland and in Antarctica, large-scale ecosystem shifts for the Amazon rainforest and northern evergreen forests, species loss for coral reefs, shrinking Arctic sea-ice, and potential weakening of the AMOC etc.
  - The collapse of AMOC could have a cascading impact on the stability of other tipping elements and climate systems of the earth.

Source: DTE

FUNCTIONING OF THE 17TH LOK SABHA

In Context

- **The 17th Lok Sabha** held its sessions between **June 2019 and February 2024.**

About

- In the five years, **Lok Sabha** functioned for **88%** of its scheduled time, while **Rajya Sabha worked for 73%.**
- **Key Bills Passed Include:**
  - The Women's Reservation Bill, 2023, the J&K Reorganisation Bill, 2019, the Appointment of CEC Bill, 2023, three Labour Codes, the Digital Data Protection Bill, 2023, and three Farm laws (which were later repealed).
  - Three Bills replacing the IPC, 1860, the CrPC, 1973, and the Indian Evidence Act, 1872 were also passed.
- Over the years, the **time spent on budget discussions** in Lok Sabha has reduced.
  - The 17th Lok Sabha discussed the annual budget for 35 hours on average (in the Lower House).

Lok Sabha

- As per the provision of **Article 79** of Indian Constitution, the House of the People, the Lok Sabha is the lower House of the parliament.
- Lok Sabha is composed of **representatives of the people** chosen by direct election on the basis of the **adult suffrage.**

- The **maximum strength** of the House envisaged by the Constitution is **552.**
- At present, the Lok Sabha has **543 seats** filled by elected representatives.
- The term of the Lok Sabha, unless dissolved, is **five years** from the date appointed for its first meeting.

Functioning of Lok Sabha

- **Presiding Officer:** The Lok Sabha is presided over by the Speaker, who is elected by the members of the House.
  - The Speaker plays a crucial role in maintaining order, conducting the proceedings, and interpreting and enforcing the rules of the House
- **Legislative Functions:** The primary function of the Lok Sabha is to enact laws.
  - Bills (proposed laws) can be introduced in the Lok Sabha by ministers or private members (individual MPs who are not part of the government).
  - If a bill is passed by the Lok Sabha, it is then sent to the Rajya Sabha (upper house) for consideration.
  - If both houses agree on the bill, it is sent to the President for assent and becomes law.
- **Scrutiny of Government:** The Lok Sabha exercises control over the executive (government) by holding it accountable for its actions.
  - Members can ask questions, participate in debates, and raise issues of public importance through various parliamentary instruments such as debates, discussions, and motions.
- **Budgetary Functions:** One of the most significant functions of the Lok Sabha is the approval of the budget.
  - The annual budget, presented by the Finance Minister, is subject to debate and approval by the Lok Sabha.
- **Representation of People:** Members of the Lok Sabha represent the interests of their constituents (the people who elected them) in the Parliament.
  - They raise concerns, discuss issues, and advocate for policies that benefit their constituencies.
- **Committee System:** The Lok Sabha has various parliamentary committees that specialize in different areas such as finance, defense, and social justice.
  - These committees play a vital role in scrutinizing legislation, examining the functioning of government departments, and making recommendations for improvement.

Challenges in the Functioning of the Lok Sabha

- **Disruptions and Obstructionism:** Members often resort to disruptive tactics such as shouting slogans, creating a ruckus, or staging walkouts, which hampers the smooth functioning of the House and prevents constructive debate and discussion on important issues.
- **Low Attendance and Participation:** Many MPs may not actively engage in legislative processes, including attending sessions, contributing to debates, or participating in committee work, which undermines the effectiveness of the Lok Sabha as a representative institution.
- **Inadequate Legislative Scrutiny:** Due to the sheer volume of legislative business and limited time for scrutiny, bills may not receive adequate attention and scrutiny during the legislative process.
  - This can result in hastily drafted or poorly thought-out legislation, leading to unintended consequences or loopholes.
- **Lack of Diversity and Inclusivity:** The Lok Sabha may not always reflect the diversity of India in terms of gender, caste, religion, and regional representation.
  - This lack of diversity can impact the inclusivity of decision-making processes and the representation of marginalized communities.
- **Party Discipline and Whipping:** There's often criticism of excessive party discipline and "whipping" in the Lok Sabha, where members are expected to follow the party line rather than voting according to their conscience or the interests of their constituents.
  - This can impact independent thinking and diminish the role of individual MPs.
- **Limited Role of Opposition:** In a majority government scenario, the opposition's role in holding the government accountable may be weakened.
  - This imbalance can lead to a lack of effective checks and balances, potentially undermining democratic principles.

Impacts

- **Fall of parliamentary standards:** Opposition protests and ruling party vindictiveness have resulted in the fall of parliamentary standards.
  - Parliamentary discussion is a manifestation of a representative kind of democracy in operation, in the sense that representation of the people directly questions the government on matters of governance.
- **Reduced working hours of Parliament: T**he Parliament working hours are getting reduced day by day due to frequent disruptions.

- **Erosion of faith in Parliament:** Disruptions and ineffective functioning lead to a reduction in the trust of people in Parliament.
- **Wastage of taxpayers' money:** Parliament not functioning to its fullest potential is the blatant wastage of taxpayers' money.

Way Ahead

- Addressing these issues requires concerted efforts from all stakeholders, including MPs, political parties, the presiding officers, and the public.
- Strengthening parliamentary norms, promoting constructive debate, ensuring greater accountability, and fostering inclusivity are essential for enhancing the functioning and effectiveness of the Lok Sabha.

Source: PRS

IITS ARE OVERCOMMITTED, IN CRISIS

Context:

- **IITs** are only Indian higher education institutions that **do reasonably well in the global rankings** but in recent times the IIT "system" has expanded beyond its capacity and is in danger of sinking into quality issues.

About:

- The recent decision of the University Grants Commission to permit **select IITs under the 'Institutions of Eminence' category to set up campuses abroad** could further weaken these already stretched institutions.

Indian Institutes of Technology (IITs)

- IITs are a **network of public engineering and technology institutions** in India, renowned for their **academic excellence and research contributions.**
- **Established in 1951,** they are considered institutions of national importance and offer a coveted pathway to engineering and technology careers.
- The **original five IITs** were established in the **1950s and early 1960s** . Four had a foreign collaborator: **IIT Bombay (the Soviet Union), IIT Madras (Germany), IIT Kanpur (the United States), and IIT Delhi (the United Kingdom)**.
- Currently, **there are 23 IITs.** After setting up IIT Delhi in 1961, it took another 34 years to establish the **sixth IIT in Guwahati (1994).**
  - Since then, **17 more IITs have been established,** including several that resulted from upgrading existing institutions.
- **Focus Areas**: The IITs focused exclusively on **technology and engineering** earlier but later added the **humanities and social sciences**.

Issues/Challenges

- **Limited seats:** High demand and limited seats result in fierce competition for admission.
- **Shortage of human resource:** Most of the IITs suffer from a severe shortage of professors.
  - For example, **IIT Dhanbad is approved to hire 781** instructors but only **301 positions** were filled as of January 2021.
- **Quality gap:** While IITs have traditionally attracted high quality faculty, in recent years, **they could not attract a sufficient number of young faculty** to fill vacancies resulting from retirements.
  - The emerging IT and related industries in India offered **much more attractive salaries and exciting work opportunities,** and many were lured to **universities and industry in other countries.**
- **Mofussil locations:** The government has expanded the number of IITs in smaller towns such as **Mandi (Himachal Pradesh), Palakkad (Kerala), Dharwad (Karnataka)**, and others.
  - **Facilities and infrastructure are unlikely to be "world class"**in these locations and the quality may decline, diluting the "IIT brand".
- **Lack of correlation:** There is a lack of correlation between the local needs and IITs. Most of the IITs are 'academic enclaves' **with little connection with their regions.**
  - **Only a few State governments are effectively utilising the presence of IITs** in the local milieu through knowledge sharing networks involving universities, colleges and schools, and local industries and firms.
- **Missing community outreach:** There are few community outreach programmes, which could prevent disruption, such as that occurring in Goa, where local groups are resisting locating a new IIT in their region.

Measures/Suggestions

- **Not too many IITs:** While excellent engineering/ STEM (science, technology, engineering and mathematics) institutions are needed, they all do not have to be IITs.
  - **10 to 12 "real" IITs located near major cities** are practical for India.
- **Quality graduation courses and research:** Some of the newly established institutes can be renamed and provided with sufficient resources to produce high quality graduates and good research.

- **Maintaining world class status:** A more limited "IIT system" needs to be funded at "world class" levels and staffed by "world class" faculty, perhaps with some recruited from top universities internationally.
  - **Recent decision to liberalise the recruitment rules to attract more foreign faculty** is a good step in the right direction.
- **Internationalisation**: IITs need to pay attention to internationalisation beyond sending their brightest graduates abroad, recruiting Indians with foreign PhDs and starting overseas branches.
  - **In-depth collaboration with the best global universities, and hiring foreign faculty** as visiting scholars would further build the IITs international brand.
    - **IIT Bombay-Monash Research Academy, and University of Queensland-IIT Delhi Academy of Research** (UQIDAR), are promising examples.
- **Adequate and sustained funding:** Funding from the government and the philanthropy of successful IIT graduates at home and abroad is needed to maintain the quality.

Way Ahead:

- IITs play a vital role in shaping **India's technological landscape and fostering innovation**. Continued improvements in accessibility, faculty strength, and research infrastructure are crucial for their sustained success.
- It is time to **rethink the changing role of IIT**s in order to ensure that quality and focus are maintained, by prioritising the needs of India, but with a **21st century twist.**

Source: TH

INDUSTRIALISATION IN INDIA

Context

- **The COVID-19 pandemic** changed the course of industrialisation but a **renewed vigour has been seen** in the sector with the impact of pandemic waning.

About

- Though **India recovered relatively quickly from the pandemic,** it has entered a phase of **'premature deindustrialisation'.**
- This refers to a phenomenon wherein the **growth of an economy's manufacturing sector begins to slow down prematurely** in its path towards development.

Background

- **1950s-1990:**
  - **Five-Year Plans:** Focus on heavy industries like steel, power, and machinery and reliance on import substitution strategy.
  - **Public Sector Dominance:** The government played a significant role in establishing and managing large industrial enterprises.
- **Liberalization and Reforms (1991 onwards):**
  - **Move towards a market-driven economy**, attracting foreign investment and diversifying industries.
  - **Shift towards Services:** Service industries like IT, telecommunications, and finance gained prominence, contributing significantly to GDP.
  - **Uneven Development:** Benefits largely concentrated in urban areas and certain sectors, widening inequalities.
- **Present Scenario:**
  - **Manufacturing Revival:** Focus on initiatives like "Make in India" to boost domestic manufacturing and attract investments.
  - **Emerging Sectors:** Automobiles, pharmaceuticals, and renewable energy are showing promise for future growth.

Key Achievements

- **Economic growth:** Industrialisation contributed significantly to India's economic growth and enhancing national income.
- **Urbanization:** Growth of industries led to development of urban centers, providing infrastructure and opportunities.
- **Export diversification:** India now exports a wide range of manufactured goods, reducing dependence on primary commodities.
- **Technological advancements:** Industrial development spurred innovation and adoption of new technologies.

Challenges and concerns

- **Stagnant growth:** Manufacturing share in GDP and employment has always **been stagnant and below 20%**, except during 2003–08.
  - The manufacturing sector currently **contributes about 17 percent of the Indian GDP and share of manufacturing in employment was 11.6% in 2021-22%.**
- **Unequal distribution of benefits:** Industrial growth hasn't translated equally across regions and social groups, leading to disparities.
- **Environmental impact:** Rapid industrialization raises concerns about pollution, resource depletion, and sustainability.

- **Labor issues:** Concerns exist regarding unfair labor practices, low wages, and inadequate worker safety standards.
- **Skill gap:** The pace of industrial growth necessitates skilled workforce development to meet industry demands.
- **Under valuation of vocational skills needed for manufacturing:** Certain skills are not valued even if they command higher wages. Artisanal knowledge doesn't enjoy as much social respect as scholasticism or metaphysical abstraction.

Measures

- **Sustainable development:** Promoting greener industries and adopting eco-friendly practices.
- **Inclusive growth:** Ensuring equitable distribution of benefits from industrial development.
- **Skilling and training:** Investing in skill development programs to bridge the skill gap and empower workers.
- **Technological innovation:** Encouraging research and development of cutting-edge technologies for efficient and sustainable production.

Way Ahead

- **India's industrialisation journey is far from over.** As the nation strives to become a **leading manufacturing hub**, addressing existing challenges holds critical importance.
- **Promoting high-skilled services powered by information technology** to stimulate manufacturing is the need of hour.

Source: TH

MECHANISATION OF AGRICULTURE SECTOR IN INDIA

In Context

- A Parliamentary panel has said that **India will need another 25 years** more to achieve the farm mechanisation level already achieved by Brazil.

Growth of Agriculture Sector in India

- India is one of the major players in the agriculture sector worldwide and it is the **primary source of livelihood for ~55% of India's population.**
- The agricultural sector is the **largest employer of workforce** and accounts for **18.8% (2021- 22)** in Gross Value Added (GVA) of the country with a growth of **3.6%** in 2020-21 and **3.9%** in 2021-22.
- With the green **revolution in 1965**, India was self-sufficient in food grain production.
- In 2000s, schemes like Rashtriya Krishi Vikas Yojna, Pradhan Mantri Krishi Sinchai Yojana, Pradhan Mantri Fasal Bima Yojna, Paramparagat Krishi Vikas Yojana, and more were introduced to achieve high growth in agricultural sector.
- Government also significantly focused on **improving agricultural infrastructure** (fertilizer factories, agricultural universities and research institutions).

Mechanisation Trends

- In many countries agricultural mechanization is still in a developing state, and some have advanced.
- **Factors:** Mechanization trends globally depend on several factors such as land sizes, availability of workforce in agriculture, availability of machines, government policies and extension services.
- **In lower income countries,** farmers use traditional manual tools and equipment resulting in low productivity.
- **In higher income economies**, the proportion of machine use is much greater than labour use.
  - In these economies, even though the share of agriculture in GDP is low, their GDP per capita is very high as compared to lower income economies.
- **Global Scenario:** In the United States, Western Europe, Soviet Union, Brazil, Argentina, China, India, Africa the level of farm mechanisation is at 95%, 95%, 80%, 75%, 75%, 38%, 40% and 20% respectively.
  - The corresponding values of the population engaged in agriculture is 2.4%, 3.9%, 14.4%, 14.8%. 9.4%, 64.9%, 55% and 60% respectively.

The need for Mechanization in Indian Agriculture

- **Labour Shortage:** In 2017, the number of people employed in agriculture were 145.66 million which dropped down to 143.4 million during the pandemic.
  - The rural to urban migration trend has been observed in all parts of the country which led to situations like labour shortage in agriculture.
- **Rise in Labour Wages:** With growing demand of labour in the non-agricultural sector due to urbanization and increasing infrastructural capabilities, labour wages have been rising.
- **The transition to machines** in agriculture has attributed to area expansion under crops, timely operations and enhanced positive effects on yields.

- **Improvement in Efficiency:** There is need for technologies to improve labour efficiency and reduce drudgery for labour intensive methods of production.
- **Gap in India:** The level of agriculture mechanization in India stands at 40% which is less when compared to China (59.5%), Brazil (75%) and U.S (95%).
  - The gap has to be filled with mechanization of agriculture to ensure sustained productivity of the sector.

Overview Across States

- Across states it is found that **land preparation** operations are being done by **tractors** but other activities vary.
- **Weeding** stands out as the only activity which has less mechanized tools across all the states.
  - Even states like Tamil Nadu, Gujarat and Uttar Pradesh which have widespread use of machines, lack adoption of weeding machines.
- **Irrigation technologies** also observe high differences. Adoption is higher in Gujarat and Tamil Nadu but not in other states.
- **Assam and Odisha** are still relying on manual operations for majority of the activities.

Government Initiatives

- **Sub-Mission on Agricultural Mechanization (SMAM):** Launched under the National Mission on Agricultural Extension and Technology (NMAET), SMAM aims to promote agricultural mechanization through subsidized machinery and equipment, capacity building of farmers, and creating awareness about modern agricultural practices.
- **Custom Hiring Centers (CHCs):** The government encourages the establishment of Custom Hiring Centers where farmers can access expensive agricultural machinery on a rental basis, thereby reducing the cost burden on individual farmers.
- **Farm Machinery Training and Testing Institutes (FMTTIs):** FMTTIs provide training to farmers and technicians in the operation and maintenance of agricultural machinery.
  - They also conduct testing and certification of agricultural machinery to ensure quality and performance standards.
- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** PMKSY includes provisions for promoting mechanized irrigation systems such as sprinkler and drip irrigation, which contribute to water conservation and efficient water use in agriculture.
- **Rashtriya Krishi Vikas Yojana (RKVY):** RKVY supports the adoption of modern agricultural practices including farm mechanization through financial assistance to states for promoting agricultural growth and development.
- **Promotion of Innovation and Research:** The government encourages research and development in agricultural mechanization through institutions like the Indian Council of Agricultural Research (ICAR) and supports innovation and indigenous development of agricultural machinery.

Recommendations

- With uneven Mechanization across agriculture operations, it is imperative to understand the penetration of machines across the operations.
- Demonstration is important for technology adoption, farmers adopt when they see the technology repetitively.
- For adoption of innovative and new machines like rice transplanters, power weeder/tillers and other tools, it is important to follow the 3 As framework and focus on creating machine awareness, accessibility and affordability.

Source: BL

FARMERS DEMAND TO LEGALISE MSP

Context

- Several farmer associations, from Punjab and Haryana, are marching to Delhi, seeking a law to guarantee the minimum support price (MSP) for their produce.

What is MSP?

- **Minimum Support Price (MSP)** is a form of market intervention by the Government of India to insure agricultural producers against any sharp fall in farm prices.MSP protects the producer-farmers against distress sale during bumper production years.
- **MSPs have no statutory backing** — a farmer cannot demand MSP as a matter of right.

Crops Covered

- The Centre announces the **MSP for 22** mandated crops.These include:
  - **14 kharif crops** (paddy, jowar, bajra, maize, ragi, tur/arhar, moong, urad, groundnut, soyabean, sunflower, sesamum, niger seed, cotton),
  - **6 rabi crops** (wheat, barley, gram, masur/lentil, rapeseed and mustard,and safflower) and
  - **2 commercial crops** (jute and copra).

- In addition, **MSP for Toria and de-husked coconut** is also fixed on the basis of MSPs of rapeseed & mustard and copra respectively.

Fair and Remunerative Price (FRP)

- FRP is the minimum price at which the sugar mills purchase sugarcane from farmers.
- The Cabinet Committee of Economic Affairs announces the FRP on the recommendations of CACP.

Who decides what the MSP would be and how?

- The Cabinet Committee of Economic Affairs announces the MSP at the start of each sowing season, taking into account the recommendations of the Commission for Agricultural Costs and Prices (CACP).
- While recommending MSPs, the CACP looks at following factors:
  - the demand and supply of a commodity;
  - its cost of production;
  - the market price trends (both domestic and international);
  - inter-crop price parity;
  - the terms of trade between agriculture and non-agriculture (that is, the ratio of prices of farm inputs and farm outputs);
  - a minimum of 50 per cent as the margin over the cost of production; and
  - the likely implications of an MSP on consumers of that product.

Calculation Formula

- **The CACP** makes projections using state-wise, crop-specific production cost estimates provided by the Directorate of Economics & Statistics in the Agriculture Ministry.
  - The CACP does not do any field-based cost estimates itself.
- The CACP calculates **three** types of costs — **A2, A2+FL and C2** — for each mandated crop for different states.
  - **A2 cost:** It is the lowest and covers all paid-out costs directly incurred by the farmer — in cash and kind — on seeds, fertilizers, pesticides, hired labor, leased-in land,fuel, irrigation, etc.
    - **A2+FL cost:** It includes A2 plus an imputed value of unpaid family labor.
    - **C2 cost:** It is the highest of the three costs and defined as a more comprehensive cost that factors in rentals and interest for owned land and fixed capital assets, on top of A2+FL.
- **The National Commission for Farmers,** chaired by **MS Swaminathan**, had recommended MSP under the **C2+50 percent formula**. That is, the total cost of the crop (C2) and the profit thereon is **50 percent**.
  - However, the government announces **MSP on the basis of A2+FL.**

Benefits of Minimum Support Price (MSP)

- **Price Stability:** MSP helps stabilize the prices of agricultural products, preventing extreme fluctuations and ensuring affordable prices for consumers.
- **Encourages Production:** Minimum Support Price motivates farmers to increase their agricultural production by providing them with a fair price for their produce.
- **Food Security:** MSP promotes a steady food supply by encouraging farmers to produce staple crops, reducing dependence on imports, and enhancing domestic food security.
- **Income Security:** MSP gives farmers a guaranteed minimum price for their crops, ensuring a stable and predictable income, especially during times of market volatility.

Why is there a demand to legalize MSP?

- **Farmers Receiving Lower Prices:** Despite the government announcing MSPs for various crops, farmers often end up selling their produce at prices below the MSP due to several market factors.
  - Legalizing MSP would give farmers the legal right to sell their crops at the minimum price guaranteed by the government.
- **Limited Government Procurement:** While the government announces MSPs for a wide range of crops, the actual procurement at MSP rates is limited to a few commodities such as wheat, rice, and some pulses and oilseeds.
  - This leaves a large number of farmers without the benefit of MSP-based procurement, leading to income disparities and financial insecurity.

Issues associated with legalizing MSP

- **Distorted Crop Selection:** The MSP regime often focuses on a few crops, such as rice and wheat, leading to imbalanced crop selection. This can result in overproduction of certain crops and neglect of others, affecting the overall diversity and sustainability of agriculture.
- **Market Distortions:** MSPs create market distortions by influencing the cropping pattern

and leading to surplus production of certain crops. This surplus will lead to storage challenges, market inefficiencies, and distortions in price signals.

- **Storage and Logistics Challenges:** MSP operation will require effective storage and logistics infrastructure to handle the procurement of large quantities of crops. Inadequate facilities can lead to wastage and storage-related losses.
- **Fiscal Burden:** Procuring crops at guaranteed prices and managing surplus stocks require substantial financial resources, impacting the government's budget and fiscal health. It will cost the Centre around Rs 10 lakh crore.

Way Ahead

- **Encourage Private Sector Involvement:** The government should incentivize the private sector to develop efficient value chains for agriculture, following a cluster approach.
- **Price deficiency payments (PDP):** It entails the government not physically purchasing or stocking any crop, and simply paying farmers the difference between the market price and MSP, if the former is lower.
  - PDP was tried out in **Madhya Pradesh** and **Haryana** through **Bhavantar Bhugtan Yojana** and **Bhavantar Bharpai Yojana (BBY)** respectively.
- **Expand the scope of existing schemes:** The government disburses Rs 6,000 annually to eligible farmers through PM-KISAN. Expanding the program's scope to include more landholdings could address issues effectively.
  - Cash transfers can incentivize farmers in water-stressed regions to shift from water-intensive crops, promoting sustainability.
- **True MSP Intervention:** A genuine MSP should involve government intervention when market prices fall below a predefined level, especially in cases of excess production, oversupply, or price collapse due to international factors.

Source: IE

POTENTIAL OF STEM CELLS IN MENSTRUAL FLUID

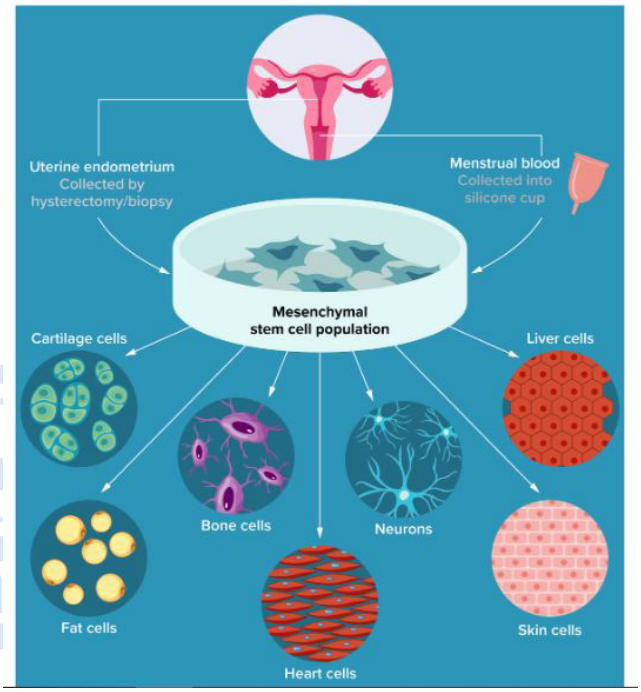
In Context

- Through more equitable investments, researchers hope **menstruation will be recognised as a new frontier in regenerative medicine.**

About

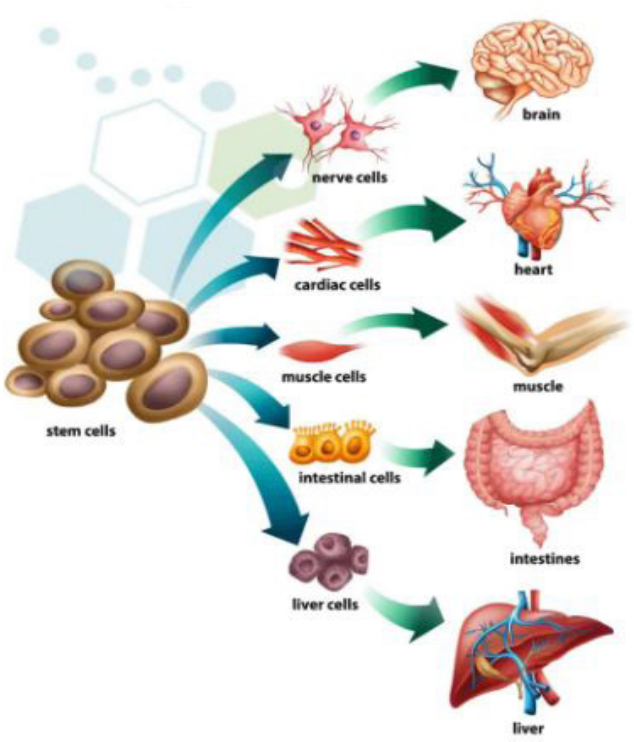
- Researchers had long hypothesised that the **endometrium contained stem cells,** given its remarkable **capacity to regrow itself each month.**
- The tissue, which provides a site for an embryo to implant during pregnancy and is shed during menstruation, undergoes roughly **400 rounds of shedding** and **regrowth** before a woman reaches menopause.
- But although scientists had isolated adult stem cells from many other **regenerating tissues** — including bone marrow, the heart, and muscle, **no one had identified adult stem cells in the endometrium.**

The diverse fates of menstrual stem cells



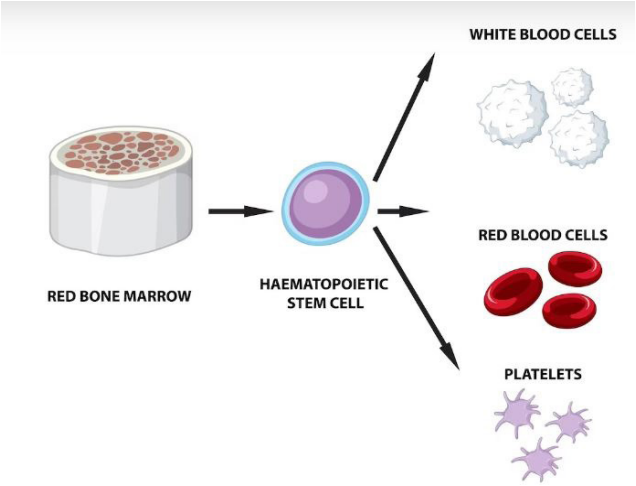
What are Stem Cells?

- A stem cell is a cell with the **potential** to form **many of the different cell types** found in the body.
- When stem cells **divide,** they can form **more stem cells** or other cells that perform **specialized functions.**
- **Somatic Stem Cells:** These are the **Adult Somatic Cells (ASCs).** They are in **bone marrow** that makes the blood.
  - These are found in the **liver** that give rise to hepatocytes and secretory cells.
  - There are stem cells in **neural tissue** that give rise to neurons and astroglial cells.
- **Embryonic Stem Cells:** These are derived in about **six- to eight-day embryos,** and these are cells with even **more potential than the adult cells,** because an embryonic stem cell derived in the proper way can give rise to neural cells, muscle cells, and liver cells.



What is Stem Cell Therapy?

- Stem cell therapy utilizes the unique properties of stem cells, including **self-renewal and differentiation,** to **regenerate damaged cells and tissues** in the human body **or replace** these cells with new, healthy and fully functional cells.
- It is also known as **regenerative medicine,** promotes the **repair response of diseased, dysfunctional or injured tissue** using stem cells or their derivatives.
  - It is the **next step in organ transplantation** and uses cells instead of donor organs, which are limited in supply.
- Stem cells are grown in the labs, these **stem cells are manipulated to specialize into specific types of cells,** such as heart muscle cells, blood cells or nerve cells.
  - The specialized cells can then be **implanted into a person.**
- For over 90 years now, **hematopoietic stem cell transplantation** has been used to treat people with conditions such as **leukaemia and lymphoma.**
- After chemotherapy or radiation therapy wrecks the patient's healthy cells (along with the cancerous ones), a donor's **healthy bone marrow reintroduces functional stem cells** to replicate inside of a patient and to produce additional normal blood cells.



Source: TH

NEWS IN SHORT

MOHAMMED QULI QUTB SHAH'S TOMB

Context

- A digital twin of the Mohammed Quli Qutb Shah's tomb was unveiled by a reality technology company, Hexagon in Hyderabad.

Qutub Shahi Tombs Complex

- The Qutub Shahi Tombs are located in the **Ibrahim Bagh,** close to the **Golconda Fort in Hyderabad**.
- The tombs belong to the rulers of the **Qutb Shahi Dynasty**, their queens and children and the nobles who faithfully served them.
- It consists of 30 tombs, mosques and a mortuary bath, spanning the 130-year period from **1543 to 1672.**

Muhammed Quli Qutb Shah's tomb

- Muhammed Quli Qutb Shah's tomb is located within the Qutb Shahi tombs complex and is considered the grandest of the Qutb Shahi tombs.
- It was built in **1602 A.D.**
- The tomb is on a terrace of **65 m square** and **4m** high.
- Inscriptions in Persian and the Naskh scripts decorate the tomb.

Muhammad Quli Qutb Shah

- Muhammad Quli Qutb Shah was the fifth sultan of the Qutb Shahi dynasty of Golkonda.
- He founded the city of Hyderabad on the banks of the **Musi river** in **1590** and built the Charminar.

- During his reign, the dynasty reached the zenith of its material and cultural life.

Source: TH

DHOKRA SHILPKALA

Context:

- Recently, an entrepreneur has taken the initiative to preserve and safeguard the cultural heritage of Dhokra Shilpkala.

About the Dhokra Shilp Kala:

- **Origin and History:** The origins of Dhokra Shilpkala can be traced back to the **tribal communities residing in the regions of Chhattisgarh, Jharkhand, West Bengal, and Odisha**, where it evolved as an integral part of their cultural and religious practices.
  - The word 'Dhokra' is believed to be derived from the **Dhokra Damar tribes,** who are the **traditional metal smiths** of Central India.
  - It is a 4,000-year-old metal casting tradition from India, blending intricate craftsmanship with cultural heritage.
  - It used the Lost-wax casting technique for creating intricate metal sculptures.

Issues:

- It faces challenges due to **urbanisation and mechanised production**.

The Lost-wax Casting Method:

- It is a time-tested technique used for creating intricate metal sculptures.
- It is also known as **'investment casting' or 'precision casting' or 'cire perdue'**

Process:

- A detailed solid wax model of the figure is created, and then a clay mould is made around the wax model.
  - The mould is heated, causing the wax to melt and drain away, hence the term 'lost-wax'.
- Molten metal (often bronze, but can also be silver, gold, brass, or copper) is poured into the now empty clay mould.
- Once the metal cools, the clay mould is broken to reveal the cast sculpture.
- This method of casting **has been used since the days of the Cholas.**

Source: ET

NATO FUNDING

In News

- Former US President Donald Trump accused NATO allies of not spending enough on defence.

About NATO

- The foundations of NATO were officially laid down in **1949** to counter the Soviet Union with Cold War tensions rising with the signing of the North Atlantic Treaty, more popularly known as the **Washington Treaty.**

Member Countries

- NATO currently has 31 members – most of them European nations, plus the United States and Canada.
- The newest member is Finland, which joined in 2023 in reaction to Russia's 2022 invasion of Ukraine.
- Sweden applied to join along with Finland but is waiting for Hungary to ratify its application as the final major step before membership.

Funding

- ATO is resourced through the **direct and indirect contributions** of its members.
- NATO's common funds are composed of direct contributions to collective budgets and programmes, which equate to only 0.3% of total Allied defence spending
- In 2006, **NATO Defence Ministers** agreed to commit a minimum of 2% of their Gross Domestic Product (GDP) to defence spending to continue to ensure the Alliance's military readiness.

Mandate :

- **NATO's purpose is to guarantee the freedom and security of its members through political and military means.**
  - **Political :** NATO promotes democratic values and enables members to consult and cooperate on defence and security-related

issues to solve problems, build trust and, in the long run, prevent conflict.

- **Military :** NATO is committed to the peaceful resolution of disputes.
  - If diplomatic efforts fail, it has the military power to undertake crisis-management operations. These are carried out under the collective defence clause of **NATO's founding treaty – Article 5 of the Washington Treaty** or under a United Nations mandate, alone or in cooperation with other countries and international organisations.
  - Enshrined in Article 5 of its founding treaty is the principle of collective defence – the idea that an attack on **one member is considered an attack on all of them.**

Do you know ?

"NATO plus" refers to a security arrangement of NATO and the five treaty allies of the U.S. — Australia, New Zealand, Japan, Israel, and South Korea as members — to enhance "global defence cooperation"

Source:IE

GOVT TO EXPAND HSN CODES FOR RICE

Context

- The Commerce and Industry Ministry is for **expanding the codes of classification (HSN codes) for rice**.

About

- It is to **separate the varieties of non-basmati rice that are not traditionally consumed** in the country from the **popular staple variety of non-basmati white rice.**
- It is also to **exclude them from export curbs** when restrictions are being contemplated on them.
- It comes after the government has **temporarily banned all categories of non-basmati white rice for exports.**

Need for the separate code

- At present, there are **just six HSN codes for non-basmati rice** while there are **30-40 varieties of such rice** grown in the country.
- **When there is a ban on non-basmati white rice, all varieties get banned,** whether it is **sona masuri, govind bhog and kala namak** or the normal non-basmati white rice.
- There is also a **demand from the industry for new HSN codes** for other varieties of rice.
- APEDA is also working on **separate HSN code**s for **GI (Geographical Indications) rice varieties** like **red rice, black rice and kalanamak rice**.

HSN codes

- HSN codes, or **Harmonized System of Nomenclature codes**, are **six-digit numerical codes** used to **classify traded goods globally.**
- It was developed by the **World Customs Organization (WCO)** and is considered the **global standard** when it comes to naming goods.

Structure of HSN codes

The **six-digit code** structure provides increasingly detailed product classifications:

- **First two digits: Chapter** (broad product category, e.g., vegetable products)
- **Next two digits: Heading** (more specific product group, e.g., fresh vegetables)
- **Last two digits: Subheading** (specific product, e.g., tomatoes)
- **Additional digits:** Some countries add additional digits to further classify products at the national level.

Key functions of HSN codes

- **Product identification:** Each code corresponds to a specific product or group of products, providing a standardized way to classify and identify goods across borders.
- **Customs clearance:** HSN codes facilitate efficient customs clearance by enabling authorities to quickly identify and assess applicable duties and taxes on imported goods.
- **Trade statistics:** By tracking trade flows based on HSN codes, governments and international organizations can gather valuable data on global trade patterns and trends.
- **Negotiating trade agreements:** HSN codes serve as a common language for countries negotiating trade agreements, ensuring accurate product coverage and tariff concessions.

Source: BL

CARBON NANOTUBES (CNTS)

In News

- Researchers at the Institute of Advanced Study in Science and Technology (IASST) have pioneered a novel method for directly synthesising **CNTs** on glass substrates at a temperature of 750 °C.

About Carbon nanotubes (CNTs)

- They are pivotal in advancing modern technology by showcasing extraordinary properties.
- **Applications:** They have found applications in diverse fields, including rechargeable batteries, flexible electronics, aerospace, transparent electrodes, touch screens, supercapacitors, and medicine.
- **Recent Developments :** The experiment is performed using the **Plasma Enhanced Chemical Vapour Deposition Technique (PECVD)**, where plasma is generated using a specially designed spiral-shaped fused hollow cathode source.
  - This innovative process circumvents the need for elevated temperatures and eliminates the necessity for a transition metal catalyst.
- **Why Needed?:** Conventional CNT synthesis methods require high temperatures (~1000 0C) and metal catalysts (Fe, Co, and Ni).
  - These catalysts pose biocompatibility concerns for potential biomedical applications.
  - The challenge of removing these catalysts from CNTs adds a significant cost, highlighting the urgent need for cleaner, more sustainable CNT synthesis methods - an exciting frontier in the realm of nanotechnology.
  - This study enables the production of clean CNTs suitable for applications in energy research, biomedical fields, and optoelectronics.

Source:PIB

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