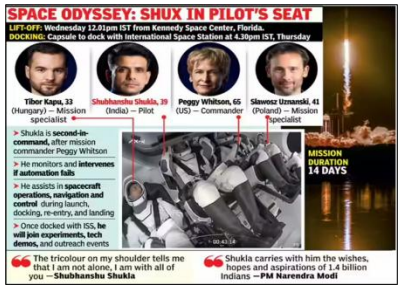
AXIOM-4 MISSION WITH INDIA'S SHUBHANSHU SHUKLA LIFTS OFF FROM FLORIDA

- In a historic moment, India's Group Captain Shubhanshu Shukla piloted the Axiom-4 mission aboard SpaceX's Dragon capsule, which lifted off from Florida's Kennedy Space Center.



- Shukla became the first Indian in 41 years to cross the Karman line after Rakesh Sharma in 1984.
    - The Kármán line is an imaginary boundary at an altitude of 100 kilometers (62 miles) above sea level, which is widely recognized as the boundary between Earth's atmosphere and outer space.
- PM Modi congratulated Shukla, calling him the first Indian en-route to the International Space Station.

India's Human Spaceflight Milestone and the Road Ahead

- Shukla's mission marks the beginning of human spaceflight becoming routine for India, similar to its satellite launches.
- **Gaganyaan and Strategic Shifts**
    - Though ISRO missed its 2022 deadline for human spaceflight, the Gaganyaan program has injected urgency and focus into the agency, positioning India for strategic advantages in space exploration.
- **Human Spaceflight as a Strategic Capability**
    - Human spaceflight is now a key tool for scientific, commercial, and geopolitical leverage.
    - As global space travel risks becoming exclusionary, India's capabilities ensure it stays in the race.
- **Equal Partnership in Axiom-4**

- ISRO played an active role in Axiom-4, not merely as a passenger partner.
- A large ISRO team, including Chairman V. Narayanan, was deeply involved in planning and troubleshooting the mission.

- **Preparing for Future Missions**
  - The knowledge gained from Axiom-4 will strengthen the Gaganyaan program, with India's first indigenous crewed mission expected by 2027.
  - ISRO also plans to establish its own space station and send astronauts to the Moon by 2040.

Leveraging Space as a Strategic and Economic Frontier

- Space is poised to be one of the most impactful technologies of the future, alongside AI, quantum computing, and clean energy, with vast economic and strategic implications.
- **India Among Global Front-Runners**
  - Unlike other tech domains where India lags, space is an area where India holds a leading position.
  - However, maintaining this edge will require competing with space giants like the U.S. and China.
- **Private Sector and Economic Potential**
  - India's space capabilities offer significant business opportunities.
  - While India is a top space power, it contributes only about 2% to the global space economy—leaving immense room for growth.
- **Inspiring Youth and Driving Innovation**
  - Human spaceflight can inspire young Indians, attract talent to the space sector, and boost innovation, employment, and economic development.
- **Capitalising on Shukla's Mission**
  - Shukla's journey must be leveraged not just as a symbolic milestone but as a springboard to accelerate India's space ambitions and build a thriving space ecosystem.

ENABLING VOTING RIGHTS FOR MIGRANTS

- As of 2021, India's migration rate stood at 28.9%, with most migrations occurring for marriage, especially among women.
- However, about 10% of migrants relocate for work, a figure notably higher in States like Bihar.
- With rising labour migration from poorer to richer regions, many citizens risk being disenfranchised unless voting mechanisms for migrants are implemented.
- Although public discussions have taken place and the Election Commission of India proposed a concrete solution in 2024, no unified system to ensure voting access for migrants has yet been adopted.
- Distinct strategies are required for different categories of migrants.

Proposed Measures for Intra-State Migrants

- Intra-State migrants—who make up around 85% of the migrant population—could potentially return home to vote if supported adequately.
- Enforce statutory holidays on polling days to allow workers to vote without wage loss.
- Arrange special bus services before and on polling days to facilitate travel to home constituencies.

Mechanisms to Enable Voting Rights for Inter-State Migrants

- **Remote Electronic Voting Machines (RVMs)**
    - **Pilot Initiative:** In 2023, the ECI introduced Remote Electronic Voting Machines (RVMs), each capable of catering to 72 constituencies.
        - RVMs, developed by BEL and ECIL, enable safe, non-networked remote voting for migrants.
        - It used dynamic ballot displays and barcode-based constituency identification for up to 72 constituencies.

- **Challenges:** Political parties raised concerns about lack of transparency, identification issues, and the model code of conduct.
- **Administrative Hurdles:** The need to pre-register migrants, assess constituency-wise presence, and deploy RVMs across cities makes scaling difficult—especially in Lok Sabha elections.
- Despite flaws, RVMs represent a significant first step. With improvements and consultations, they could eventually benefit many migrants.

- **Postal Ballots**
  - **Existing Model:** Used for armed forces personnel.
  - **Extension to Migrants:** Would require pre-registration, ballot issuance, and return mechanisms.
  - **Feasibility:** Easier to implement than RVMs but still requires major logistical coordination by the ECI.
- **Changing Voting Constituency**
  - **Target Group:** Long-term migrants with at least six months of residence.
  - **Advantages:** Empowers migrants to influence local governance and push for inclusive policies.
  - **Concerns:** May face resistance from local residents but offers long-term democratic integration of migrants.
- **Enrolment of Women Migrants**
  - **Key Demographic:** A large number of women migrate post-marriage.
  - **Recommendation:** Targeted voter registration drives should be launched to include them in electoral rolls at their new residences.

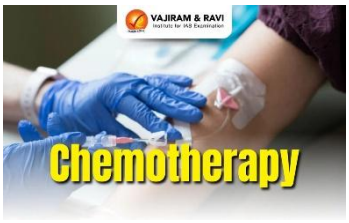
Conclusion

A combination of RVMs, postal ballots, constituency-switching, and focused enrolment drives—especially for women—can ensure greater electoral inclusion of India's vast migrant population. A mixed approach combining multiple mechanisms is essential to ensure broader participation of both inter- and intra-State migrants.

WHAT IS THE PASSPORT SEVA PORTAL?

- Established by the **Ministry of External Affairs (MEA) in partnership with Tata Consultancy Services**, the Passport Seva portal is an excellent example of a **Public-Private Partnership.**
- It simplifies the **passport application and renewal process** in India.
- Through this portal, individuals can quickly apply for a passport or its renewal from the convenience of their homes.
- It is a **user-friendly portal** providing access to various **passport services online.**
- The **MEA** has **retained sovereign functions like verification, granting, and issuance of a passport** as well as **ownership of core assets,** including data and information of the applicants.
- **Users can perform the following functions** on the Passport Seva Online Portal:
    - **Apply for a new passport.**
    - **Apply for renewal** of a passport.
    - **Apply for re-issue** of lost or damaged passport.
    - **Download** the **application form for the Police Clearance Certificate.**
    - Download the application form for the **Surrender Certificate.**
    - Download the application form for the **Identity Certificate.**
- The portal **offers complete information regarding the documents required and the process** to be followed for obtaining any of the documents mentioned above. You can complete these steps online.
- But **in some instances**, you will be **required to take a printout of the application** form, book an appointment, and then **visit your nearest Passport Seva Kendra.**
- **To be able to use the facilities** made available **under Passport Seva,** it is **mandatory to register for Passport Seva Online first.**

WHAT IS CHEMOTHERAPY?



- Chemotherapy is a **treatment that uses medicines to destroy cancer cells.**
- There are many **different types** of chemo. They don't all work exactly the same way, so different types of chemo might be used **for different types of cancer.**
- **Most are given as an infusion into a vein (IV)**, but **some are given as an injection,** taken as **pills, or applied to the skin.**
- How is Chemo Different from Other Cancer treatments?
  - Chemo is a s**ystemic treatment.**
  - It **travels through the bloodstream** to **reach all parts of your body.**
  - It can **kill cancer cells that have spread** (metastasized) to parts of the body far **away from the original** (primary) **tumor** or cancer cells in blood cancers, such as leukemia, that have spread throughout the body.
  - This makes chemo **different from local treatments like surgery and radiation,** which only affect one part of the body.
- How Does Chemotherapy Work?
  - Chemotherapy works by **affecting cells when they are growing and dividing** to make new cells. During this **process (called the cell cycle), cells:**
  - Grow in size.
  - Make copies of their genetic material (DNA).
  - Divide to form new cells.
  - **Some cells, such as skin cells**, are **fast-growing,** meaning they move through this process quickly. Other cells, such as muscle cells, complete it more slowly.
  - **Cancer cells tend to be faster growing**, moving through the **cell cycle very quickly.**

Side Effects:

- **Chemo interrupts the cell cycles of normal cells, too–especially** cells **that grow faster.**
- **Blood cells and the cells in your skin, hair follicles, and digestive tract** are examples of cells that **grow and multiply quickly.**
- That's why some **common side effects** of chemotherapy **occur in these areas,** including:

Anemia	**Bleeding**	**Hair loss.**
Loss of appetite	Nausea and vomiting	Diarrhea.
Fatigue.		

INTEGRATED BIODIVERSITY ASSESSMENT TOOL ALLIANCE

- It was **founded in 2008** as collaboration between **four** of the world's largest and most influential conservation organizations.
- The four organisations that form part of the Alliance are:
  - **BirdLife International**, **Conservation International**, the **International Union for Conservation of Nature** and the **United Nations Environment Programme World Conservation Monitoring Centre**.
- IBAT has been a trusted resource for organizations worldwide, supporting the private sector, governments, not-for-profits, and research institutions in making **informed biodiversity decisions for nearly two decades.**
- It **licences commercial access to the IBAT platform** - the world's most authoritative biodiversity data platform, providing trusted data to assess biodiversity risks and align with global frameworks to support nature-positive goals.
- It **provides datasets** which are the **World Database of Protected Areas** (WDPAs), **World database of Key Biodiversity Areas (WDKBA) and the IUCN Red list of Threatened Species**.

- It also **provides derived datasets** - the Rarity-Weighted Richness layer and **Species Threat Abatement and Restoration or STAR metric**.
- The IBAT platform provides unique access to these datasets and layers helping to inform your world-leading biodiversity decisions.
- It is supported by a **network of conservation and scientific expertise**. This collaboration ensures IBAT provides the gold standard in biodiversity data, helping organizations navigate sustainability challenges with confidence.
- It is headquartered in **Cambridge, UK.**

INTERNATIONAL POTATO CENTRE

- It was founded in 1971 as a **research-for-development organization** with a focus on **potato, sweet potato and Andean roots and tubers.**
- It delivers innovative science-based solutions to enhance access to affordable nutritious food, foster inclusive sustainable business and employment growth, and drive the climate resilience of **root and tuber agri-food systems.**
- CIP is a **CGIAR research center, a global research partnership** for a food-secure future. CGIAR science is dedicated to transforming food, land and water systems in a climate crisis.
- **Headquarter:** It is in **Lima, Peru** and it has a **research presence** in more than 20 countries in **Africa, Asia and Latin America.**
- The India centre will not only serve domestic farmers, but those in other South Asian countries as well.

Potato Production in India

- **India** is the world's **second top producer and consumer** of potato
- **Major potato growing States:** Uttar Pradesh, West Bengal, Bihar, Gujarat, Madhya Pradesh and Punjab.

- As of now, at least two different centres of Indian Council of Agricultural Research (ICAR) work on tuber crops.
- While the Shimla-based **ICAR-CPRI** (Central Potato Research Institute) is working on potato, the **Thiruvananthapuram-based ICAR-CTCRI** (Central Tuber Crops Research Institute is working on sweetpotato.

BLACK MASS RECOVERY TECHNOLOGY

- It is designed to **extract battery-grade lithium, cobalt, nickel** and manganese from end-of-life lithium-ion batteries.
- Its **dual-mode (wet and dry) black mass recovery technology** ensures high separation efficiency and **recovery rates of up to 97–99%.**
- The end-to-end process, including collection, shredding, metal leaching, and downstream purification, is indigenously developed and patented, significantly reducing reliance on imported recycling equipment.
- **Significance:** It seeks to minimize import of critical minerals by recycling already available ones within the country.
- The recovered battery-grade compounds—such as lithium carbonate and cobalt sulphate—meet global specifications and will cater to both domestic consumption and exports.

What is Black Mass?

- It is the term used to describe the **dark, granular material** that remains after lithium-ion batteries are shredded during recycling.
- It contains a valuable mix of metals, including: **Lithium, Cobalt, Nickel, Manganese and Graphite**
- These materials are essential to the production of new batteries, especially for electric vehicles, energy storage systems, and electronics.
