DAILY CURRENT AFFAIRS 14-03-2025

GS-2

1. **Bills of Lading Bill, 2025**

GS-3

2. **AAHAR 2025**
3. **Soil Fertility Mapping**
4. **Gene edited Bananas**
5. **NASA SPHEREx**

Bills of Lading Bill, 2025

Syllabus: GS-2: Legislation in Parliament – Bills and Acts

Context:

- The **Lok Sabha passed the Bills of Lading Bill, 2025**, on **March 10, 2025**.
- It replaces the **Indian Bills of Lading Act, 1856**, a colonial-era law.
- Aims to align with **global shipping practices** and improve documentation efficiency.

Understanding the Bill of Lading

- A **bill of lading** is a key document in shipping that records the **type, quantity, and condition** of transported goods.
- Serves as:
  - **Receipt of goods** from the shipper.
  - **Title of ownership** for goods in transit.
  - **Contract of carriage** between parties in international trade.
- Ensures **legal protection** and enhances transparency in shipping transactions.

Key Features of the Bills of Lading Bill, 2025

- **Simplifies Legal Language** – Makes provisions easier to understand and implement.
- **Reorganizes Existing Provisions** – Ensures clarity while maintaining the original intent.
- **Empowers the Central Government** – Allows the **issuance of directions** for smooth implementation.
- **Removes Colonial-Era Elements** – Updates laws to reflect **modern trade practices**.
- **Aligns with International Maritime Norms** – Facilitates compliance with **global shipping standards**.

Expected Benefits

- **Efficient Shipping Operations** – Reduces bureaucratic delays and enhances trade logistics.
- **Reduced Legal Disputes** – Clear documentation minimizes litigation risks.
- **Competitive Global Shipping Sector** – Strengthens India's position in international trade.
- **Enhances Ease of Doing Business** – Simplified laws support business-friendly policies.

Criticism & Challenges

- **Impact on State Maritime Boards** – Potential centralization raises concerns over states' autonomy.
- **Federal vs. State Responsibilities** – Requires clarity on **maritime governance** at different levels.
- **Implementation Concerns** – Effectiveness depends on how well **shipping companies and regulators** adapt to changes.

Conclusion

- The **Bills of Lading Bill, 2025** is a **progressive step** toward modernizing India's maritime laws.
- It enhances **transparency, efficiency, and international competitiveness** in the shipping sector.
- However, concerns regarding **state roles and implementation** must be addressed for **effective execution**.

AAHAR 2025

Syllabus: GS-3: Indian Agriculture – Food Processing.

Context:

- AAHAR-2025 inaugurated by Union Minister of Food Processing Industries (FPI), Shri Chirag Paswan, on 4th March 2025 at Bharat Mandapam, New Delhi.
- **Vision Statement:** Minister emphasized that every dining table globally should have at least one "Made-in-India" food product.
- **Global Food Summit:** The event marks the beginning of the journey towards **World Food India 2025**, to be hosted from **September 25-28, 2025**, by MoFPI.

Key Outcomes of AAHAR-2025

- **Strengthened regulatory standards** in alignment with global best practices.
- Focus on **farmer education and sustainable agricultural practices**.
- Integration of **Blockchain, AI, and IoT** for real-time compliance and traceability.
- Development of **indigenous rapid food testing solutions**, reducing reliance on imports.
- Enhanced **industry-regulatory collaborations** to elevate food safety benchmarks.

Conclusion

- **AAHAR-2025 reaffirms MoFPI and NIFTEM-K's commitment** to:
    - Driving **innovation in food processing**.

- Ensuring **food authenticity and safety**.
- Strengthening **India's position as a global leader in sustainable food systems**.

Soil Fertility Mapping

Syllabus: GS-3: Indian Agriculture – Soil & GS-1: Resource Geography – Soil.

Context:

- Soil & Land Use Survey of India (SLUSI), is generating of district/village-wise digital soil fertility maps through geo-spatial techniques using Soil Health Card (SHC) data.

Introduction

- Soil & Land Use Survey of India (SLUSI) operates under the Department of Agriculture & Farmers' Welfare.
- It generates district/village-wise **digital soil fertility maps** using geo-spatial techniques based on **Soil Health Card (SHC) data**.
- **Soil Health Cards (SHCs)** are issued under the **Soil Health & Fertility Scheme** to promote soil health and productivity.

Objectives of Soil Health & Fertility Scheme

- Promotes **Integrated Nutrient Management (INM)**.
- Encourages judicious use of **chemical fertilizers (including secondary & micro-nutrients)**.
- Advocates the use of **organic manures & bio-fertilizers** to improve soil health.

Soil Testing and Analysis

- Soil samples are collected, processed, and analyzed for:
  - **Chemical properties:** pH, Electrical Conductivity (EC), Organic Carbon
  - **Macronutrients:** Nitrogen (N), Phosphorus (P), Potassium (K), Sulphur (S)
  - **Micronutrients:** Zinc (Zn), Copper (Cu), Iron (Fe), Manganese (Mn), Boron (B)
- SHC categorizes soil nutrient status as **Low, Medium, or High** and provides **recommendations for nutrient application**.

Soil Fertility Mapping in Maharashtra

- **351 villages across 34 districts** have been mapped.

- Soil Fertility Maps provide **detailed spatial information** about soil health.
- Benefits:
  - Helps in **precise fertilizer application** to avoid overuse or underuse.
  - Enhances **economic returns** by **optimizing input costs**.

Use of Geo-Spatial Techniques & AI

- **Remote sensing & AI-based tools** aid in soil fertility mapping.
- SHC soil sampling points are **geo-coded using GPS**.
- **Unique QR Codes** are assigned to samples for tracking during analysis.

Farmer Access to SHC Data

- Farmers can **download SHCs from the portal** using their **registered mobile number**.
- Provides direct access to **soil fertility data and nutrient recommendations**.

Challenges in Soil Fertility Mapping

- **Logistical and technical barriers** in remote & hilly areas.
- **Lack of physical infrastructure** for soil testing.
- **Solutions:**
  - Setting up **Village-Level Soil Testing Labs & Mini Labs** in remote areas.

Impact of Soil Fertility Mapping

- **Identifies soil degradation and nutrient deficiencies**.
- Encourages **balanced fertilizer use** based on SHC recommendations.
- **Prevents indiscriminate fertilizer use**, ensuring sustainable soil health management.
- Helps farmers make **data-driven decisions** for **higher productivity and profitability**.

Conclusion

- Soil fertility mapping is a **crucial tool for precision agriculture**.
- The scheme is **available to all States & UTs** to promote sustainable soil management.
- The initiative supports **agricultural productivity enhancement** while ensuring **environmental sustainability**.

Practice Qs:

Q. Discuss the role of Soil Health Card (SHC) and Soil Fertility Mapping in promoting sustainable agriculture in India. Highlight the challenges and possible solutions. (10 marks, 150 words)

Gene edited Bananas

Syllabus: GS-3: Science and Technology –Biotechnology

Context:

Tropic, the UK-based biotech company which has developed these bananas, claims that their fruit remains fresh and yellow for 12 hours after being peeled.

Gene-Edited Banana: A Breakthrough in Agriculture

- **Developed by**: UK-based biotech company Tropic.
- **Key Feature**: The banana remains fresh and yellow for **12 hours after peeling**.
- **Significance**:
    - Reduces **food waste** and **post-harvest losses**.
    - Helps in **curbing carbon emissions**.
    - Contributes to **sustainability in agriculture**.

Recent Advancements in Gene-Editing Technology

CRISPR-Cas9 Breakthroughs

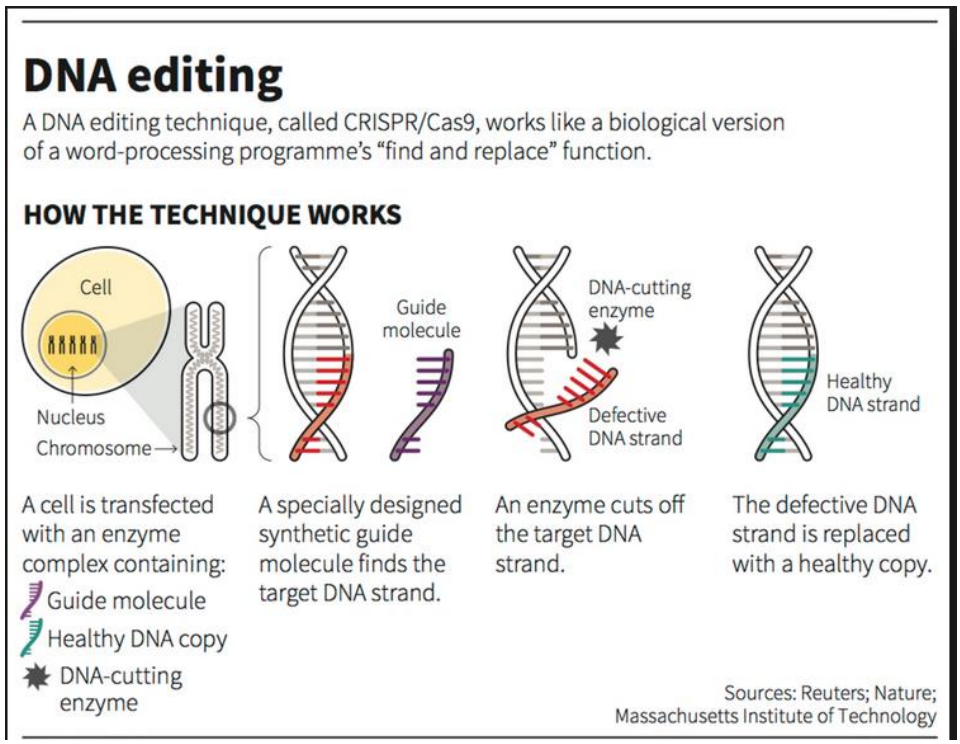
- Most widely used **gene-editing tool**.
- Enables **precise modifications** to DNA.
- **Base Editing**: Allows **single-nucleotide changes** without breaking DNA strands, improving accuracy.

Prime Editing

- An advanced version of **CRISPR**.
- Can **directly write new genetic sequences** without cutting DNA completely.
- **Benefits**:
    - **Safer and more precise** modifications.
    - Reduces risks of **unintended mutations**.

Gene-Edited Crops in Agriculture

- **Non-browning fruits**:
  - **Bananas (Tropic) & Arctic apples (Okanagan Specialty Fruits)** – Extend shelf life, reducing food waste.
- **Climate-resilient crops**:
  - **Drought-resistant wheat** – Ensures food security in water-scarce regions.
  - **Pest-resistant rice** – Reduces dependency on chemical pesticides.
  - **Vitamin-enhanced tomatoes** – Improve nutritional intake.



Therapeutic Applications of Gene Editing

- **Cancer treatment**:
  - **CAR-T cell therapy** enhances immune system response against cancer.
- **Curing genetic disorders**:
  - Ongoing trials for **sickle cell anemia, cystic fibrosis**, and other hereditary diseases.

Gene Editing: Overview

What is Gene Editing?

- A **biotechnological technique** that allows modification of an organism's **DNA**.

- Used to **enhance traits, eliminate defects**, and develop **disease resistance**.
- More **precise and controlled** than traditional breeding.

Methods Used in Gene Editing

- **CRISPR-Cas9**:
  - Most widely used technique.
  - Cuts DNA at specific sites for targeted modifications.
- **Zinc Finger Nucleases (ZFNs)**:
  - Custom-designed **DNA-binding proteins** to alter genes.
- **TALENs (Transcription Activator-Like Effector Nucleases)**:
  - Allows **precise cutting** and editing of genetic sequences.

Regulatory Provisions in India

Governing Bodies

- **Genetic Engineering Appraisal Committee (GEAC)** under **MoEFCC**:
  - Oversees gene-editing approvals.
- **Food Safety and Standards Authority of India (FSSAI)**:
  - Regulates genetically modified (GM) foods.

Status of Gene-Edited Crops in India

- **GM Mustard** approved for **commercial cultivation**.
- **Gene-edited crops** (CRISPR-based) face stricter regulations.
- **No commercial approval yet** for CRISPR-based crops.

Current Research and Developments

- **Ongoing research on gene-edited crops**:
  - Rice, wheat, and bananas in **developmental stages**.
- **Indian Council of Agricultural Research (ICAR)**:
  - Exploring gene-editing for **climate resilience and pest resistance** in crops.

Conclusion

- **Gene-editing technology** offers **tremendous potential** in agriculture, healthcare, and sustainability.
- **India's cautious regulatory approach** ensures safety but may slow adoption.

- **Future Prospects**: If approved, **CRISPR-based crops** can improve food security and **reduce dependency on pesticides and fertilizers**.

NASA SPHEREx

Syllabus: GS-3: Science and Technology – Space Science.

Context:

A NASA telescope was launched into space from California on Tuesday 11th March 2025, for a mission to explore the origins of the universe and to scour the Milky Way galaxy for hidden reservoirs of water, a key ingredient for life.

NASA's SPHEREx Mission

Overview

- **Objective**: Explore the origins of the universe and search for hidden reservoirs of water in the Milky Way galaxy.
- **Launch Details**:
  - Launched on a SpaceX Falcon 9 rocket.
  - Took off from Vandenberg Space Force Base, California.
- **Mission Duration**: Planned for 2 years.

Key Features of SPHEREx

- **Full Form**: Spectro-Photometer for the History of the Universe, Epoch of Reionization, and Ices Explorer.
- **Shape**: Megaphone-shaped telescope.
- **Data Collection**:
  - Over 450 million galaxies.
  - Over 100 million stars in the Milky Way.
- **Output**:
  - Create a 3D map of the cosmos in 102 colours (individual wavelengths of light).
  - Study the history and evolution of galaxies.

Scientific Goals

- **Cosmic Inflation**:

- Study the rapid expansion of the universe after the Big Bang (~13.8 billion years ago).
- Investigate the theory of inflation, which suggests the universe expanded trillion-trillion-fold in a fraction of a second.

- **Origins of the Universe**:
  - Examine the first few instants after the Big Bang.
  - Search for "reverberations" or echoes from the Big Bang.
- **Water and Molecular Reservoirs**:
  - Search for water and molecules (e.g., carbon dioxide, carbon monoxide) frozen on interstellar dust grains.
  - Focus on molecular clouds (dense regions of gas and dust) where stars and planets form.
  - Study how water forms and resides in these regions.

Technological Capabilities

- **Imaging**:
  - Take pictures in all directions around Earth.
  - Split light from cosmic sources (stars, galaxies) into component wavelengths to determine composition and distance.

NASA's PUNCH Mission

Overview

- **Full Form**: Polarimeter to Unify the Corona and Heliosphere.
- **Objective**: Study the solar wind and its effects on space weather.
- **Launch**: Accompanied SPHEREx on the same rocket.

Key Features

- **Satellites**: Four suitcase-sized satellites.
- **Focus Areas**:
  - Transition of the sun's atmosphere (corona) into the solar wind.
  - Formation of structures in the solar wind.
  - Influence of solar wind on Earth and the solar system.

Scientific Goals

- **Solar Wind**:

- Understand the continuous flow of charged particles from the sun.

- **Space Weather Effects**:
  - Study how solar wind and solar events disrupt human technology (e.g., satellites, power grids).
- **3D Global View**:
  - Create a 3D view of the solar corona as it transitions into the solar wind.

Significance of the Missions

- **SPHEREx**:
  - Deepens understanding of cosmic inflation and the origins of the universe.
  - Provides insights into the formation of water and life-supporting molecules in the galaxy.
- **PUNCH**:
  - Enhances knowledge of solar wind and its impact on space weather.
  - Helps mitigate risks to satellites and power systems caused by solar activity.