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Blue Economy 2.0

Why in News?

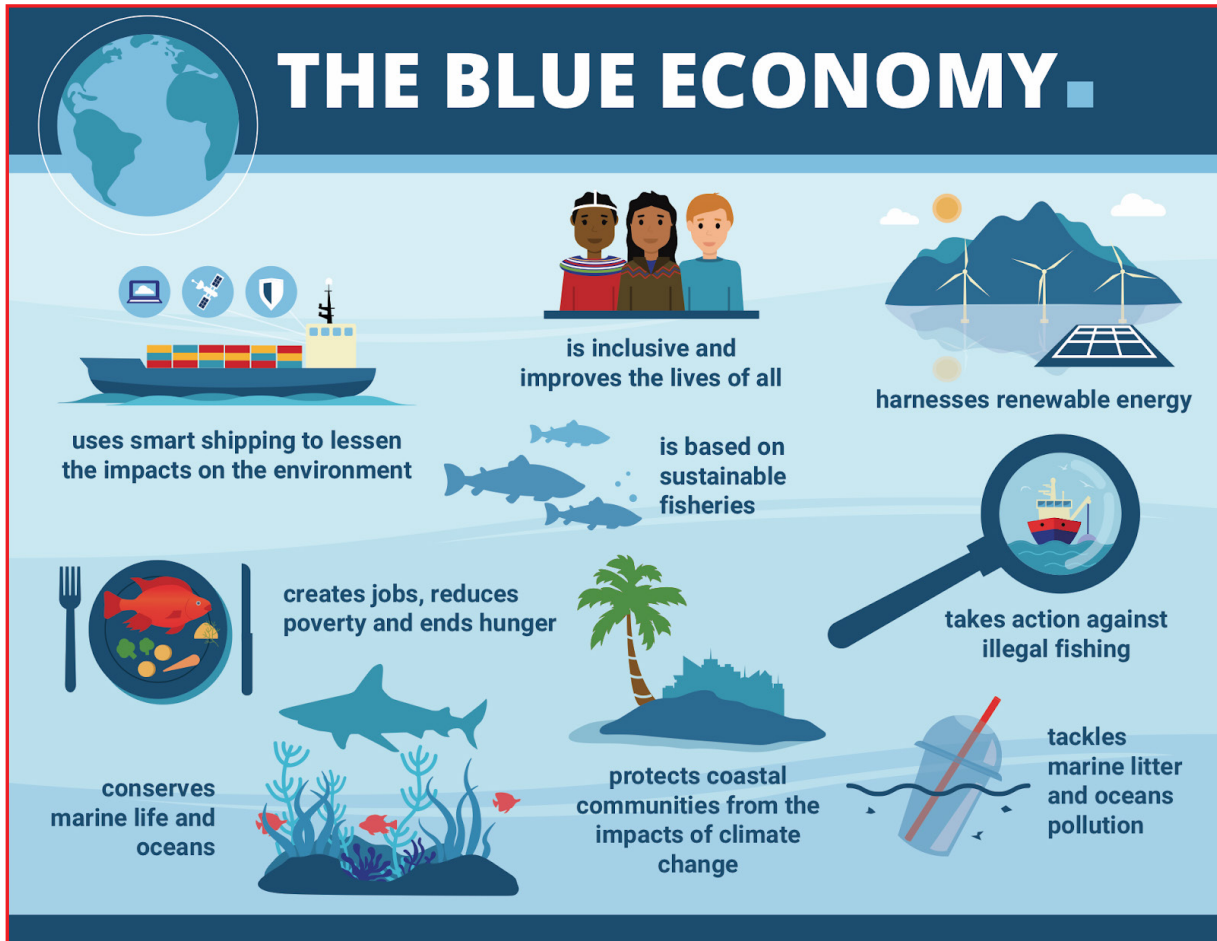
The recent presentation of the [Interim Budget](#) included a significant emphasis on advancing [Blue Economy 2.0](#) through the introduction of a novel scheme focused on restoration, adaptation measures, coastal

aquaculture, and mariculture, employing an integrated and multi-sectoral strategy.

What is the Blue Economy?

➤ About:

- Blue economy refers to the **sustainable use of marine resources** for exploration, economic growth, improved livelihoods, and transport while **preserving the health of marine and coastal ecosystems**.



What is Blue Economy 2.0?

➤ About:

- This is aimed at **promoting climate-resilient activities and sustainable development in coastal areas**.
- With marine ecosystems facing unprecedented threats from [climate change](#), pollution, and overexploitation, there is an **urgent need for coordinated action to safeguard the health and resilience of ocean resources**.

Journey of Spices in India

Why in News?

The history of spices in India reflects a fascinating journey of **cultural exchange, economic prosperity**, and the integration of Indian flavours into the global culinary landscape.

Note:



What is the History of Indian Spices?

➤ Ancient Origins:

- The use of spices in India can be traced back to ancient times, with evidence dating as far back as the **Indus Valley Civilization**.
- Spices were used for culinary and medicinal purposes even in these early civilizations.

➤ Trade Routes:

- India's strategic location on ancient trade routes, including the **Silk Road**, facilitated the exchange of spices with other civilizations.
- Spices like black pepper, cardamom, and cinnamon were highly **sought after, contributing to India's economic prosperity**.

➤ Ayurvedic Influence:

- Spices have been integral to **traditional Indian medicine, Ayurveda**, for centuries. Many spices were believed to **possess medicinal properties** and were used to treat various ailments.

➤ Arab and Persian Influence:

- During the mediaeval period, Arab and Persian traders played a crucial role in further disseminating Indian spices to the West.
- The spice trade flourished, and **spices became luxury commodities in Europe**.

➤ European Spice Trade:

- In the **15th century, European powers**, particularly the Portuguese, Dutch, and later the British, sought direct access to India's spice-producing regions.
- This led to the exploration and establishment of maritime trade routes, contributing to the **Age of Exploration**.

➤ Colonial Control:

- **European colonial powers** aimed to control the spice trade, leading to the establishment of trading posts and colonies in India. Competition for dominance in spice-producing regions, especially in Kerala, was fierce among the Portuguese, Dutch, and British.

Note:

- **Monopoly of the British East India Company:**
 - The **British East India Company** played a significant role in monopolising the spice trade during the colonial period.
 - They controlled spice production, distribution, and trade routes, impacting the livelihoods of local spice farmers.

- **Spice Plantations:**

- The British introduced large-scale **spice plantations in India**, particularly in regions like Kerala and Karnataka, focusing on spices like black pepper, cardamom, and cinnamon for export.

What is the Scenario of the Indian Spice Market?

- **Production:**

- India is the **world's largest spice producer**. It is also the largest consumer and exporter of spices.
 - During **2021-22, the single largest spice exported from India was chilli** followed by spice oils and oleoresins, mint products, cumin, and turmeric.

- **Exports:**

- India is the largest exporter of spice and spice items. During 2022-23, the country exported spices worth USD 3.73 billion.

- **Varieties:**

- India produces about **75 of the 109 varieties** which are listed by the **International Organization for Standardization (ISO)**.
- The most **produced and exported spices** are pepper, cardamom, chilli, ginger, turmeric, coriander, cumin, celery, fennel, fenugreek, garlic, nutmeg & mace, curry powder, spice oils and oleoresins. Out of these spices, **chilli, cumin, turmeric, ginger and coriander make up about 76% of the total production**.
 - The largest spice-producing states in India are Madhya Pradesh, Rajasthan, Gujarat, Andhra Pradesh, Telangana, Karnataka, Maharashtra, Assam, Orissa, Uttar Pradesh, West Bengal, Tamil Nadu and Kerala.

What are the Government Initiatives to Promote Spices?

- **Export Development and Promotion of Spices:**

- This initiative by the **Spices Board of India** aims to support the exporter to adopt high-tech processing

technologies and upgrade the existing level of technology for the development of industry and to meet the changing food safety standards of the importing countries.

- The **Spices Board of India** is set up for the development and global promotion of Indian spices.

- **Spices Parks:**

- Spices Board has **launched eight crop-specific Spices Parks** in key production/market centres intending to facilitate the farmers to get an improved price realisation and wider reach for their produce.

- **Spice Complex Sikkim:**

- The Spices Board submitted a project proposal to the state's cell for setting up a **Spice Complex in Sikkim** seeking financial assistance for facilitating and demonstrating common processing and value addition in spices to help farmers and other stakeholders in the state.

- **Codex Committee on Spices and Culinary Herbs (CCSCH):**

- The CCSCH is a subsidiary body of the Codex Alimentarius Commission, which is a joint initiative of the **Food and Agriculture Organization (FAO)** and the **World Health Organization (WHO)**.
 - The **Codex Alimentarius Commission** is responsible for setting international food standards to ensure the safety, quality, and fairness of food trade. **India is its member since 1964.**

Economics of the Food System Transformation

Why in News?

Recently, the Food System Economics Commission has published a report titled-" **The Economics of the Food System Transformation**", highlighting that a sustainable transformation of existing food systems is urgently required at an estimated total cost of USD 500 billion per year.

- The Food System Economics Commission (FSEC) is a **private consortium of scientists** across nationalities and academic fields, aimed at identifying the challenges to food system security and the policy changes required to overcome them.

Note:



What are the Food Systems?

- According to the **Food and Agriculture Organisation (FAO)**, food systems encompass the entire range of actors involved in:
 - **Production, aggregation, processing, distribution, consumption** and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded.

Horticulture Sector in India

Why in News?

In recent years, India has witnessed a significant shift in dietary preferences, with a growing emphasis on **nutrition security** rather than mere **calorie intake**.

- To meet the evolving dietary needs of a burgeoning population, **horticulture farming** is experiencing a notable upsurge across the nation.

What is Horticulture Farming?

- **Horticulture** is the branch of agriculture concerned with intensively cultured plants directly used by humans for **food, medicinal purposes** and **aesthetic gratification**.
- It is the cultivation, production and sale of **vegetables, fruits, flowers, herbs, ornamental** or **exotic plants**.

What is the State of Horticulture Sector in India?

- India is the **2nd largest producer** of **fruits and vegetables**.
- The Indian horticulture sector contributes about **33%** to the agriculture **Gross Value Added (GVA)** making a very significant contribution to the Indian economy.
- According to the **Food and Agricultural Organisation (FAO)**, India leads in the production of certain vegetables (ginger and okra) and fruits (banana, mangoes and papaya).
- In terms of export, **India is ranked 14th in vegetables** and **23rd in fruits**, and its share in the **global horticultural market is a mere 1%**.
 - Around **15-20% of the fruits and vegetables in India are wasted** along the supply chain or at consumer level, contributing to **greenhouse gas emissions (GHGs)**.

What are the Government Initiatives to Improve Horticulture?

➤ **Mission for Integrated Development of Horticulture (MIDH):**

○ **About:**

- **MIDH** is a Centrally Sponsored Scheme for the holistic growth of the horticulture sector covering fruits, vegetables, root & tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew, cocoa and bamboo.

- **Nodal Ministry:** The Ministry of Agriculture and Farmers Welfare is implementing MIDH (since 2014-15) under **Green Revolution - Krishonnati Yojana**.

- **Funding Pattern:** **60%/40%** contribution of Union and states (except states in **North East and Himalayas**)

- For **North Eastern States and Himalayan States**, the Union government contributes **90%**.

○ **MIDH Sub-Schemes:**

- **National Horticulture Mission (NHM):** It is being implemented by State Horticulture Missions (SHM) in selected districts of 18 States and 6 Union Territories.

- **Horticulture Mission for North East & Himalayan States (HMNEH):** HMNEH is being implemented for the overall development of Horticulture in North East and Himalayan states.

- **Central Institute for Horticulture (CIH):** CIH was established at Medi Zip Hima, Nagaland in 2006-07 for providing technical backstopping through capacity building and training of farmers and Field functionaries in the North Eastern Region.

➤ **Horticulture Cluster Development Programme:**

○ **About:**

- It is a **central sector programme** aimed at growing and developing identified horticulture clusters to make them globally competitive.

- Horticulture cluster is a regional/geographical concentration of targeted horticulture crops.

- **Implementation:** By the **National Horticulture Board (NHB)** of the Ministry of Agriculture and Farmers' Welfare. The ministry has identified **55 horticulture clusters**.

Note:

Scheme for Sustainable & Inclusive Development of Natural Rubber Sector

Why in News?

The financial assistance for the Rubber sector under the 'Sustainable & Inclusive Development of Natural Rubber Sector (SIDNRS)' has been increased by 23% from Rs 576.41 crore to Rs 708.69 crore for the next 2 financial years (2024-25 and 2025-26).

- The government has also announced plans to set up three nodal **Rubber Training Institutes** in the Northeast to promote the development of rubber-based industries in the region.
- It will also promote the formation of **Rubber Producers Societies (RPS)** for the empowerment of rubber growers.

What is Sustainable & Inclusive Development of Natural Rubber Sector (SIDNRS) Scheme?

➤ About:

- The SIDNRS scheme is an initiative by the Government of India to promote the sustainable and inclusive development of the natural rubber sector in India.
 - The SIDNRS scheme was launched in the **FY 2017-18**.
- It is implemented by the **Rubber Board**, a statutory body under the **Ministry of Commerce and Industry**.

What are the Key Facts Related to Natural Rubber?

➤ About Natural Rubber:

- Natural rubber is a versatile and essential raw material derived from the latex or milky sap of certain plant species, primarily the rubber tree, scientifically known as ***Hevea brasiliensis***.
 - This latex contains a complex mixture of organic compounds, with the primary component being a polymer called **polyisoprene**.
- It was introduced to tropical Asia and Africa by the British Government during the **later part of the 19th century**.

➤ Growing Conditions:

- Tropical climate with annual rainfall of 200 – 450 cm is suited for cultivation.

- It requires deep and lateritic fertile soil with an acidic pH of 4.5 to 6.0 and highly deficient in available phosphorus.
- Minimum and maximum temperature should range from **25°C to 34°C** and **80% relative humidity** is ideal for cultivation.
 - Regions prone to heavy winds should be avoided.
- Bright sunshine amounts to about 2000 hours per annum at the rate of 6 hours per day through all the months.

➤ Rubber Production and Consumption:

- India is currently the **world's 6th largest producer of natural rubber** while it also remains the second biggest consumer of the material globally (**after China**).
 - **Thailand is the world's leading natural rubber producing country** (accounting for approximately 35% of global natural rubber production in 2022).
- In South Asia, India holds the **4th-largest position** following Thailand, Indonesia and Vietnam.
- About 40% of India's total natural rubber consumption is currently met through imports.

➤ Rubber Distribution:

- As of now, India has approximately 8.5 lakh hectares of rubber plantations.
- Major rubber producing states include: **Kerala, Tamil Nadu, Tripura, Assam**.
 - The lion's share of this rubber farming, nearly 5 lakh hectares, is concentrated in the southern states of Kerala and the Kanyakumari district of Tamil Nadu.

What is the Rubber Board?

- The Rubber Board is a **statutory organisation** constituted under Section (4) of the **Rubber Act, 1947** and functions under the administrative control of the **Ministry of Commerce and Industry**.
- The Board is headed by a Chairman appointed by the Central Government and has 28 members representing various interests of the natural rubber industry.
 - The Board's **headquarters** is located at **Kottayam in Kerala**.
 - Additionally, Tripura contributes around 1 lakh hectares to the rubber production landscape.

Note:

Global Pulses Conference

Why in News?

The recent **Global Pulses Conference**, an annual gathering of pulses producers, processors, and traders, was recently jointly organised by the **Global Pulse Confederation** and the **National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED)**.

- India is aiming to **achieve self-sufficiency in pulses by 2027**, focusing on expanding cultivation and supplying new varieties of seeds.

What is the Global Pulses Conference?

- The **Global Pulses Conference** is the industry's largest global event, bringing together key players from more than 50 countries.
 - Global Pulses Conference also known as **Global Pulse Confederation (GPC) Pulse Conference**.
 - Its membership includes **24 national associations** and **over 500 private sector members**.
- It is based in **Dubai** and licensed by the **Dubai Multi Commodity Centre (DMCC)**.

What is the Status of Pulse Production in India?

- **About:** India is the **largest producer (25% of global production), consumer (27% of world consumption) and importer (14%)** of pulses in the world.
 - Pulses account for around 20% of the area under food grains and contribute around 7-10% of the total foodgrains production in the country.
- **Top Pulses Producing States:** Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and Karnataka.
- **Main Varieties:** Pulses are grown throughout the agricultural year.
 - **Rabi Pulses (contribute over 60%):** Gram (chickpea), Chana (Bengal gram), Masoor (lentil), Arhar (pigeon pea).
 - **Kharif Pulses:** Moong (green gram), Urad (black gram), Tur (arhar dal).
 - Rabi crops require **mild cold climate during sowing period**, during vegetative to pod development- cold climate and during maturity/ harvesting - warm climate.
 - Kharif pulse crops require a warm climate throughout their life from sowing to harvesting.
- **Major Export Destinations (2022-23):** Bangladesh, China, United Arab Emirates, USA and Nepal.

Related Government Initiatives:

- **National Food Security Mission (NFSM)-Pulses**
- **Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA) Scheme**
- **Price Stabilization Fund**
- **Dedicated Portal for Tur Dal Procurement:** Through which farmers can register and sell their produce to NAFED and National Cooperative Consumers' Federation of India Ltd. (NCCF) at a minimum support price or market price.

What is NAFED?

- **National Agricultural Cooperative Marketing Federation of India Ltd.** was established on the auspicious day of Gandhi Jayanti on **2nd October 1958**.
 - It is registered under the **Multi State Co-operative Societies Act**.
- It is an apex organisation of marketing cooperatives for agricultural produce in India.
 - It is currently one of the largest procurers of agricultural products like **onions, pulses, and oilseeds**.

Rashtriya Gokul Mission

Why in News?

With almost a decade into **Rashtriya Gokul Mission**, it is found that instead of improving the quality of all the indigenous breeds, as envisioned under the scheme, it has ended up promoting only one indigenous variety, the **Gir cow**, across the country.

What is Rashtriya Gokul Mission?

- **About:**
 - It is being implemented for **development and conservation of indigenous bovine breeds since December 2014**.
 - The scheme is also continued **under umbrella scheme Rashtriya Pashudhan Vikas Yojna** from **2021 to 2026** with a budget outlay of Rs.2400 crore.
- **Nodal Ministry:**
 - Ministry of Fisheries, Animal Husbandry and Dairying
- **Objectives:**
 - To enhance productivity of bovines and increase milk production in a sustainable manner using advanced technologies.

Note:



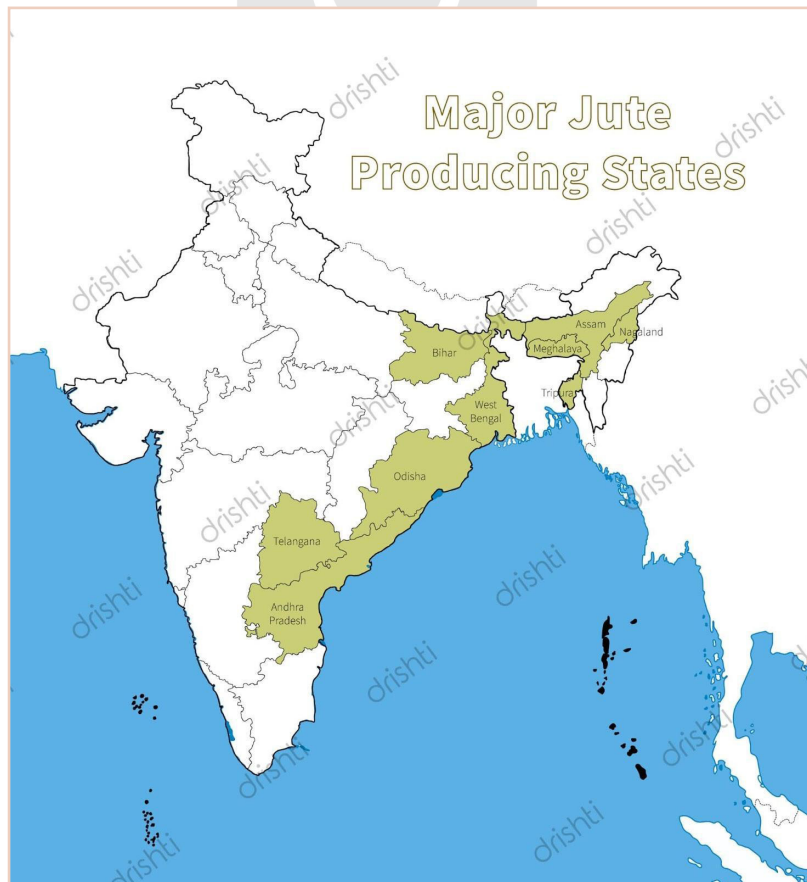
Development and Promotion of Jute Industry

Why in News?

Recently, the Standing Committee on Labour, Textiles and Skill Development has presented the Fifty-Third Report on 'Development and Promotion of **Jute Industry**'.

What are the Key Facts About Jute?

- **Conditions Required for Cultivation:**
 - **Temperature:** Between 25-35°C
 - **Rainfall:** Around 150-250 cm
 - **Soil Type:** Well drained alluvial soil.
- **Production:**
 - **India is the largest producer of jute** followed by Bangladesh and China.
 - However, in terms of acreage and trade, Bangladesh takes the lead accounting for three-fourths of the global jute exports in comparison to India's 7%.
 - Jute crop cultivation is concentrated in three States, namely, **West Bengal, Assam and Bihar accounting for 99% of the production.**
 - It is mainly concentrated in eastern India because of the rich alluvial soil of the Ganga-Brahmaputra delta.
- **Uses:**
 - **It is known as the golden fibre.** It is used in making gunny bags, mats, ropes, yarn, carpets and other artefacts.



Note:

What are the Government Schemes Related to Jute Industry?

- **Export Market Development Assistance (EMDA) Scheme:**
 - The EMDA program, initiated by the **National Jute Board (NJB)**, encourages manufacturers and exporters of jute products to **participate in international fairs worldwide**. It aims to **promote the export of lifestyle and other Jute Diversified Products (JDPs)**.
- **Jute Packaging Materials (Compulsory Use in Packing Commodities) Act 1987:**
 - The act was enacted to ensure the mandatory use of jute packaging material in the supply and distribution of certain commodities.
 - The Cabinet Committee on Economic Affairs has extended mandatory packaging of **100% food grains and 20% sugar** in diversified jute bags for the Jute Year 2023-24.
- **Jute Geotextiles (JGT):**
 - The **Cabinet Committee on Economic Affairs (CCEA)** has approved a **Technical Textiles Mission** which includes Jute **Geo-Textiles**.
 - JGT is one of the most important **diversified jute products**. It can be applied in many fields like civil engineering, soil erosion control, road pavement construction and protection of river banks.
- **Minimum Support Price for Jute:**
 - **Jute Corporation of India (JCI)** is the Price Support Agency of the Govt. of India for jute, to protect the interest of the Jute Growers through procurement of Raw Jute under the **MSP** fixed by the government from time to time and also to stabilise the raw jute market for the benefit of the jute farmers and the jute economy as a whole.
- **Golden Fibre Revolution and Technology Mission on Jute and Mesta:**
 - They are two of the government initiatives to boost jute production in India.
 - Due to its high cost, it is losing the market to synthetic fibres and packing materials, particularly nylon.
- **Jute SMART:**
 - It is an **e-government initiative** which was launched in December 2016 to promote transparency in the jute sector.

- It provides an integrated platform for procurement of sacking by Government agencies.

Farmers Protest 2.0 and MSP

Why in News?

Farmers from Punjab, Haryana, and Uttar Pradesh are marching towards Delhi in the 'Delhi Chalo' protest, demanding legal guarantees for the **Minimum Support Price (MSP)**.

- In **2020, farmers protested** against three farm laws passed by the government, at Delhi borders, leading to their repeal in 2021.
- These laws were -- **The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, The Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Act, and The Essential Commodities (Amendment) Act.**

What are the Key Demands of Farmers?

- The headline demand in the farmers' **12-point agenda** is for a law to guarantee **Minimum Support Price (MSP)** for all crops, and the determination of crop prices in accordance with the **Dr M S Swaminathan Commission's report**.
 - The Swaminathan Commission Report states that the **government should raise the MSP to at least 50% more** than the weighted average cost of production. It is also known as the **C2+ 50% formula**.
 - It includes the **imputed cost of capital** and the rent on the land (called 'C2') to **give farmers 50% returns**.
 - **Imputed cost** is used to account for the opportunity cost of using resources like land, labour, and capital.
 - **The imputed cost of capital** accounts for the interest or returns that could have been earned if the capital invested in farming **were instead invested elsewhere**.
- **The other demands are:**
 - Full debt waiver for farmers and labourers;
 - Implementation of the **Land Acquisition Act of 2013**, with provisions for written consent from farmers before acquisition, and compensation at **four times the collector rate**.

Note:



- A **collector rate** is the minimum value at which a property can be registered when buying or selling it. They serve as a reference point to **prevent the undervaluation of properties and tax evasion**.
- Punishment for the perpetrators of the October 2021 Lakhimpur Kheri killings;
- India should withdraw from the **World Trade Organization (WTO)** and freeze all **free trade agreements (FTAs)**.
- Pensions for farmers and farm labourers.
- Compensation for farmers who died during the Delhi protest in 2020, including a job for one family member.
- **The Electricity Amendment Bill 2020** should be scrapped.
- 200 (instead of 100) days' employment under **MGNREGA** per year, the daily wage of Rs 700, and the scheme should be linked with farming;
- Strict penalties and fines on companies producing fake seeds, pesticides, fertilisers; improvements in seed quality;
- National commission for spices such as chilli and turmeric.
- Ensure **the rights of indigenous peoples** over water, forests, and land.

What are the Concerns of Farmers Related to WTO and FTAs?

- **Market Access:**
 - Farmers are concerned that the FTAs and WTO regulations lead to increased competition **from cheaper agricultural imports**, which can undercut domestic prices and harm local producers.
 - Farmers perceive these agreements as favouring multinational corporations and **large-scale agribusinesses over small and medium-sized farmers**.
- **Imported Goods:**
 - These agreements lead to the **influx of subsidised agricultural products** from other countries, which can flood the domestic market and depress prices for locally produced crops.
 - This can make it difficult for **Indian farmers to compete and sustain their livelihoods**.

- **Impact on Farming Practices:**
 - International trade agreements also **impose regulations or standards on agricultural practices** that Indian farmers find burdensome or incompatible with their traditional farming methods.
 - This could include requirements related to pesticide use, **genetically modified organisms (GMOs)**, or environmental standards.
- **Sovereignty and Autonomy:**
 - Some farmers view withdrawal from WTO and freezing of free trade agreements as a way to regain sovereignty and control over **India's agricultural policies**.
 - They argue that such agreements limit the government's ability to implement policies that **prioritise the interests of small-scale farmers** and ensure food security for the population.

What is the Current State of MSP and Farmers Demand?

- **Current MSP vs. Farmer Demands:**
 - The MSP for wheat set by the government for the Rabi Marketing Season 2024-25 is Rs 2,275 per quintal, which is higher than the **cost demanded by farmers, i.e., C2 plus 50%**.
 - However, the MSP is based on the **formula A2+FL**, which includes only paid-out costs incurred by farmers, **resulting in a lower MSP compared to C2 plus 50%**.
- **CACP Recommendations and Methodology:**
 - The **Commission for Agricultural Costs & Prices (CACP)** recommends MSP based on the **A2+FL formula**, which considers **only paid-out costs and imputed value of family labour**.
 - This is different from **the C2 formula**, which includes **additional factors** like rental value of owned land and interest on fixed capital.
- **Return over Cost of Production:**
 - For wheat in Punjab, the cost of production (C2) is Rs 1,503 per quintal, and the Minimum Support Price (MSP) is Rs 2,275 per quintal.
 - This means farmers receive Rs 772 per quintal more than the cost of production, which is a return of 51.36% over C2.

Note:

- Similarly, for paddy, the return for Punjab farmers over C2 was 49%, and it was 152% over A2+FL

What is the Minimum Support Price?

➤ About:

- MSP is the guaranteed amount paid to farmers when the government buys their produce.
- MSP is based on the recommendations of the **Commission for Agricultural Costs and Prices (CACP)**, which considers various factors such as cost of production, demand and supply, market price trends, inter-crop price parity, etc.
 - CACP is an attached office of the Ministry of Agriculture and Farmers Welfare. It came into existence in January 1965.

- The **Cabinet Committee on Economic Affairs (CCEA)** chaired by the Prime Minister of India takes the final decision (approve) on the level of MSPs.

- The MSP is aimed at ensuring remunerative prices to growers for their produce and encouraging **Crop Diversification**.

➤ Crops Under MSP:

- The CACP recommends MSPs for **22 mandated crops and fair and remunerative price (FRP)** for sugarcane.
- The mandated crops include 14 crops of the kharif season, **6 rabi crops** and 2 other commercial crops.

➤ Three Kinds of Production Cost:

- The CACP projects **three kinds of production cost for every crop**, both at state and all-India average levels.
 - **'A2'**: Covers **all paid-out costs directly incurred by the farmer** in cash and kind on seeds, fertilisers, pesticides, hired labour, leased-in land, fuel, irrigation, etc.
 - **'A2+FL'**: Includes **A2 plus an imputed value of unpaid family labour**.
 - **'C2'**: It is a more comprehensive cost that factors in rentals and interest for owned land and fixed capital assets, on top of A2+FL.
- **CACP considers both A2+FL and C2 costs** while recommending MSP.
 - CACP reckons only A2+FL cost for return.

- However, C2 costs are used by CACP primarily as benchmark reference costs (opportunity costs) to see if the MSPs recommended by them at least cover these costs in some of the major producing States.

Lentil Production India

Why in News?

As per the Ministry of Consumer Affairs, India is **set to become the world's largest producer** of lentils (masoor) during the 2023-24 crop year on account of higher acreage.

What are Lentils?

➤ About:

- Lentil is a bushy **annual herbaceous plant** of the **legume family**.
- These are edible legumes, known for their lens-shaped, flat disced seed.
- Lentil plants are typically short, and bear **self-pollinated flowers**.
- Lentil grains are excellent sources of energy, carbohydrates, protein, fat, fibers, phosphorus, iron, zinc, carotene, vitamins, and antioxidants.

➤ Climatic Condition:

- Lentil is primarily grown as a rainfed crop.
- It requires **cold temperature during its vegetative growth** and warm temperature at the time of maturity.
- Lentil is grown during **rabi season**.

➤ Soil Types:

- Lentils can grow on various soil types, from sand to clay loam, growing best in deep sandy loam soils with moderate fertility.
- A soil pH around 7 would be the best. Lentils **do not tolerate flooding or water-logged conditions**.

➤ Lentil Growing Region:

- It is mainly cultivated in **Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Chhattisgarh and Jharkhand**.
- According to the **Food and Agriculture Organization (FAO)**, the world top lentil growers in 2022 were **Canada, India, Australia, Turkey, and Russia**.

Note:



What is the Status of Pulse Production in India?

- India is the **largest producer (25% of global production), consumer (27% of world consumption) and importer (14%) of pulses** in the world.
- Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and Karnataka are the top five pulses-producing states.

Decline of Saffron Production in Kashmir

Why in News

The **Saffron fields of Kashmir**, known for producing the **world's costliest spice**, are facing a severe crisis due to the **encroachment of cement factories**.

- Despite ranking as the **second-largest saffron producer globally**, with an average annual production of 11-12 tonnes, after **Iran**, the region's saffron industry is weakening, presenting economic challenges for local farmers.

What are the Key Facts About the Kashmiri Saffron?

➤ Saffron Production and Price:

- Saffron production has long been restricted to a limited geographical area in the Union territory of Jammu & Kashmir.
 - **Pampore region**, in India, commonly known as **Saffron bowl of Kashmir**, is the main contributor to saffron production.
- The saffron spice, extracted from the **stigma (male reproductive part)** of the saffron flower (***Crocus sativus L***), is known as kong in Kashmiri, zaffran in Urdu, and kesar in Hindi.
 - Kashmiri kesar is highly valued, selling at Rs 3 lakhs per kilogram.
 - A gram of kesar is obtained from approximately 160-180 flowers, requiring extensive labor.

➤ Season:

- In India, saffron Corms (seeds) are cultivated during the **months of June and July** and at some places in **August and September**.
- It starts flowering in October.

➤ Cultivation Conditions:

- **Altitude:** Saffron grows well at an **altitude of 2000 meters above sea level**. It needs a photoperiod (**sunlight**) of **12 hours**.
- **Soil:** It grows in many different soil types but thrives best in **calcareous** (soil that has calcium carbonate in abundance), **humus-rich and well-drained soil** with a pH between 6 and 8.
- **Climate:** For saffron cultivation, we need an explicit **climatological summer and winter** with temperatures ranging from no **more than 35 or 40°C** in summer to **about -15 or -20°C** in winter.
- **Rainfall:** It also requires adequate rainfall that is **1000-1500 mm per annum**.

➤ Crocin Content and Color:

- **Kashmiri kesar contains 8% of crocin**, while the rest of the varieties contain 5-6% of the element.

➤ Benefits of Kashmiri Saffron:

- It is known for **medicinal properties** such as lowering blood pressure, treating anemia, migraines, and aiding insomnia.
- Possesses **cosmetic benefits**, enhancing skin quality, reducing pigmentation, and minimizing spots.
- Integral part of **traditional dishes** and it is widely used in beverages, confectionery, dairy products, and food coloring.

➤ Recognition:

- In 2020, the central government granted a **Geographical Indication (GI) certification** to saffron grown in the Kashmir Valley.
- Saffron Heritage of Kashmir is one of the **Globally Important Agricultural Heritage systems (GIAHS)**.
 - GIAHS are agroecosystems where communities maintain a close relationship with their territories. These resilient sites, marked by **agrobiodiversity, traditional knowledge, and sustainable management**, involve farmers, herders, fisherfolk, and forest people, contributing to livelihoods and food security.
 - The **Food and Agriculture Organization** of the **United Nations** has recognized over 60 such sites worldwide through its GIAHS Programme.

Note:

Initiatives in India to Promote Saffron Production

- National Saffron Mission:
 - The NSM was launched in 2010-11 to support the cultivation of saffron in Jammu and Kashmir. The mission was part of the [Rashtriya Krishi Vikas Yojana \(RKVY\)](#) and aimed to improve the socio-economic status of the people living in Kashmir.
- North East Centre For Technology Application and Reach (NECTAR):
 - It is an autonomous body under the Department of Science & Technology, Government of India supported a pilot project to explore the feasibility of growing saffron in the North East region of India, with the same quality and higher quantity.

Curb on Sugar Diversion for Ethanol

Why in News?

Recently, The Ministry of Consumer Affairs, Food and Public Distribution directed to restricting the use of sugarcane juice/syrup for ethanol production, a key component in **Ethanol Blended Petrol (EBP)**.

- The Indian government has implemented stringent measures to fortify domestic sugar availability. Initially, it imposed a ban on sugar exports.

What is Ethanol Blending?

- **Ethanol:**
 - It is one of the principal **Biofuels**, which is naturally produced by the fermentation of **sugars by yeasts** or **via petrochemical processes** such as ethylene hydration.
 - Ethanol is 99.9% pure alcohol that can be blended with petrol.
- **Ethanol Blending Programme (EBP):**
 - It is aimed at reducing the country's dependence on **Crude Oil Imports**, cutting carbon emissions and **Boosting Farmers' Incomes**.
 - The Government of India has advanced the target for 20% ethanol blending in petrol (also called E20) to 2025 from 2030.
 - The all-India average blending of ethanol with petrol has risen from **1.6% in 2013-14 to 11.8% in 2022-23**.

What are the Other Sources of Ethanol Production?

- **Grains:** Corn (maize), barley, wheat, and other cereal grains contain starch, which can be converted into **fermentable sugars for ethanol production**.
- **Cellulosic Biomass:** Agricultural residues (corn stover, wheat straw), forestry residues, dedicated energy crops (switchgrass, miscanthus), and municipal solid waste contain cellulose and hemicellulose that **can be broken down into sugars for ethanol fermentation**.
- **Rice:** Surplus rice, including broken or damaged grains, can also serve as a source for ethanol production. The starch content in **rice can be converted into sugars for fermentation**.
- **Fruits and Vegetables:** Certain fruits and vegetables with high sugar content, like grapes and potatoes, can be utilized for ethanol production.

India Imposes Onion Export Ban

Why in News?

Recently, the Director General of Foreign Trade (DGFT) has announced a **ban on onion exports** until March 2024, issuing a **notification converting the export policy of onions** from 'Free' to 'Prohibited'.

- The current supply shortage, caused by early depletion of 2022-23 rabi season stocks and anticipated lower **kharif** 2023 output, along with increased festive demand, has led to a significant rise in onion prices.
- The government has also **revised the stock limit for wheat**, the stock limit has been halved to 1,000 tonnes for wholesalers, and for retailers to 5 tonnes.

What are the Key Facts About Onion?

- Onion is an important horticultural commodities grown worldwide for their culinary purposes and medicinal values.
- India is the **second largest producer** of onion after China.
- Maharashtra, Karnataka, Orissa, Uttar Pradesh, Gujarat, Andhra Pradesh and Tamil Nadu are the major onion producing states.
- Maharashtra **ranks first in Onion production** with a share of **42.53%** followed by **Madhya Pradesh** with a share of 15.16% in 2021-22 (3rd Advance Estimate).

Note:



What is the Current Scenario of Wheat Distribution Across the Country?

- India is the world's **second-biggest wheat producer after China**. But it accounts for less than 1% of the global wheat trade. It keeps a lot of it to provide subsidised food for the poor.
- Major wheat-growing states in India are **Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Rajasthan, Bihar and Gujarat**.
- **Major Export Destinations (2022-23)**: Bangladesh, Indonesia, Korea Rep., United Arab Emirates and Yemen Republic.

Primary Agricultural Credit Societies

Why in News?

Recently, the Ministry of Cooperation has introduced **Model Bye laws** aimed at revitalizing **Primary Agricultural Credit Societies (PACS)**.

- The Model Byelaws refer to a set of guidelines or regulations formulated by the Ministry of Cooperation to govern the functioning and operations of **PACS** at the grassroots level.

What is the Purpose of these Bye-Laws?

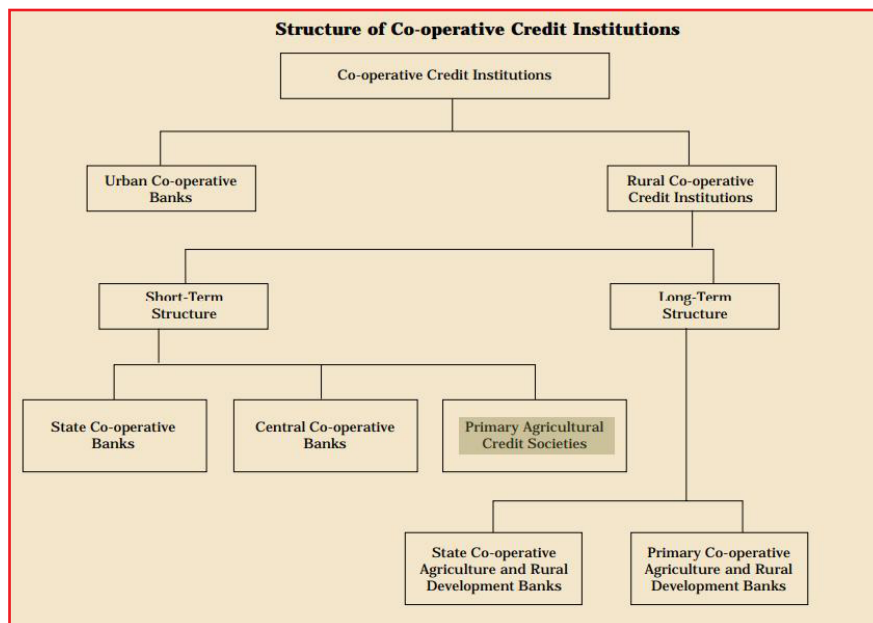
- These Byelaws are designed to **outline the structure, activities, and functioning of PACS, aiming to**

enhance their economic viability and expand their role in rural areas.

- The Model Byelaws will enable PACS to diversify their business activities by undertaking more than 25 business activities, including dairy, fishery, floriculture, setting up godowns, procurement of foodgrains, fertilizers, seeds, short-term & long-term credit, custom hiring centers, **Fair Price Shops (FPS)**, community irrigation, Business Correspondent activities, etc.
- Provisions have been made to **make the membership of PACS more inclusive and broad-based**, giving adequate representation to women and **Scheduled Castes/Scheduled Tribes**.

What are Primary Agricultural Credit Societies?

- **About:**
 - PACS are **village level cooperative credit societies** that serve as the last link in a three-tier cooperative credit structure headed by the **State Cooperative Banks (SCB)** at the state level.
 - Credit from the SCBs is transferred to the **District Central Cooperative Banks (DCCBs)**, which operate at the district level. The DCCBs work with PACS, which deal directly with farmers.
 - PACS provide **short-term, and medium-term agricultural loans** to the farmers for the various agricultural and farming activities.
 - The first **PACS was formed in 1904**.



Note:

➤ Status:

- According to a December 2022 report by the Reserve Bank of India, there were 1.02 lakh PACS in the country. However, **only 47,297 of them made a profit by the end of March 2021.**

Sugar's Pressmud for Green Energy Production

Why in News?

India is viewing **Pressmud**, a residual byproduct of **Sugar**, as a valuable resource for green energy production by creating **Compressed Biogas (CBG)**.

- India holds a key position in the worldwide sugar economy, emerging as the **foremost sugar producer** since 2021-22, surpassing Brazil. Additionally, it stands as the **second-largest sugar exporter** globally.

What is Compressed Bio-Gas (CBG)?

- CBG is a **Renewable, environmentally friendly gaseous fuel** derived from the anaerobic decomposition of organic materials. It is produced through a process called **Biomethanation** or **anaerobic digestion**, where various organic sources such as agricultural waste, animal manure, food waste, sewage sludge, and other biomass materials are **broken down by bacteria in the absence of oxygen**.

What is Pressmud?

➤ About:

- Pressmud, also known as filter cake or press cake, is a **residual byproduct in the sugar industry** that has gained recognition as a valuable resource for green energy production.
- This byproduct offers Indian sugar mills an **opportunity to generate additional revenue by utilizing it as a feedstock for biogas production through anaerobic digestion**, leading to the creation of **Compressed Biogas (CBG)**.
 - Anaerobic digestion is a process through which bacteria break down organic matter—**such as animal manure, wastewater biosolids, and food wastes**—in the absence of oxygen.
- Typically, the yield of pressmud ranges from 3-4 % by weight with the **input sugarcane processed in a unit**.

Note: Pressmud has the potential to yield approximately 460,000 tonnes of CBG, valued at Rs 2,484 crore, considering the minimum guaranteed price set by the central government's **Sustainable Alternative Towards Affordable Transportation scheme (SATA)**.

The State of Food and Agriculture 2023

Why in News?

A new report titled '**The State of Food and Agriculture 2023**', by the **Food and Agriculture Organization (FAO)** reveals the staggering hidden costs of unhealthy diets and **ultra-processed foods**, impacting both our health and the environment.

- These costs reach over USD 7 trillion annually and have far-reaching consequences.

Note:

- Hidden costs in the context of agrifood systems include **environmental expenses** from emissions and land use, **health costs related to dietary patterns, undernourishment** and **social costs associated with poverty** among agrifood workers.

What are the Government Initiatives to Promote Healthy Lifestyle?

- **The National Food Security Act (NFSA), 2013.**
- **PM-POSHAN Scheme.**
- **Fit India Movement.**
- **Eat Right Movement.**
 - **Eat Right Station Certification.**
 - **Eat Right Mela**

What is the Food and Agriculture Organization?

➤ About:

- FAO is a specialised agency of the **United Nations** that leads international efforts to defeat hunger.
- **World Food Day** is celebrated every year around the world on 16th October. The day is celebrated to mark the anniversary of the founding of the FAO in 1945.
- With 194 member countries and the **European Union** including India, FAO works in over 130 countries worldwide.

Note:



- It is one of the UN food aid organisations based in Rome (Italy). Its sister bodies are the [World Food Programme](#) and the International Fund for Agricultural Development (IFAD).
- **Flagship Publications:**
 - The State of World Fisheries and Aquaculture (SOFIA).
 - The State of the World's Forests (SOFO).
 - [The State of Food Security and Nutrition in the World \(SOFI\)](#).
 - The State of Food and Agriculture (SOFA).
 - The State of Agricultural Commodity Markets (SOCO).

Aquaculture Crop Insurance

Why in the News?

Recently, the Ministry of Fisheries, Animal Husbandry & Dairying has discussed the technical challenges in the implementation of the **Aquaculture Crop Insurance scheme for Shrimp and Fish** farming under the [Pradhan Mantri Matsya Sampada Yojana \(PMMSY\) scheme](#).

- To mitigate the risks faced by aqua farmers, [NFDB \(National Fisheries Development Board\)](#), which is the nodal agency for implementation of PMMSY, proposed to implement the Aquaculture Crop Insurance scheme.
- The Scheme aims to provide basic cover for brackish water shrimp and fish on pilot basis for one year in the selected **States of Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh and Odisha**.

What is Aquaculture?

- **About:**
 - The term aquaculture **broadly refers to the cultivation of aquatic organisms** in controlled aquatic environments for any commercial, recreational or public purpose.
 - The breeding, rearing and harvesting of plants and animals takes place in all **types of water environments** including ponds, rivers, lakes, the ocean and man-made "closed" systems on land.

Note: Shrimp farming is an aquaculture-based activity in marine or freshwater environments to produce **shrimp for human consumption**.

- The estimated brackish water area suitable for undertaking shrimp cultivation in India is around 11.91 lakhs hectare (ha) spread over 10 states and union territories viz; West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Pondicherry, Kerala, Karnataka, Goa, Maharashtra and Gujarat.
- Of this only around 1.2 lakhs ha are under shrimp farming now and hence a lot of scope exists for entrepreneurs to venture into this field of activity.

What are the Government Initiatives Related to Aquaculture?

- **Fisheries and Aquaculture Infrastructure Development Fund (FIDF)**
- **Blue Revolution**
- **Extension of [Kisan Credit Card \(KCC\)](#)**
- **Marine Products Export Development Authority.**
- **Seaweed Park**

World Food India 2023

Why in News ?

The second edition of 'World Food India 2023' was inaugurated recently in New Delhi, where the Prime Minister of India provided **Seed Capital Assistance** to over **one lakh Self Help Group (SHG)** members.

- The Ministry of Food Processing Industries launched the first edition of World Food India in 2017.

What is World Food India 2023?

- **About:**
 - World Food India 2023 is a gateway to the [Indian food economy](#), facilitating partnerships between Indian and foreign investors.
 - It will be a one-of-a-kind gathering of manufacturers, producers, food processors, investors, policymakers, and organisations **from across the global food ecosystem**.
- **Mascot:**
 - MillInd (a probot) is the Mascot for World Food India 2023.

Note:

➤ **Focus Pillars:**

○ **Shree Anna (Millets): Leveraging India's Super Food for the World**

- Millets can enhance **food security, nutrition security, and sustainability** in the face of global challenges such as climate change, population growth, and malnutrition.
- The **United Nations** has declared 2023 as the **International Year of Millets (IYM 2023)**.

○ **Exponential Food Processing: Positioning India as the Global Hub**

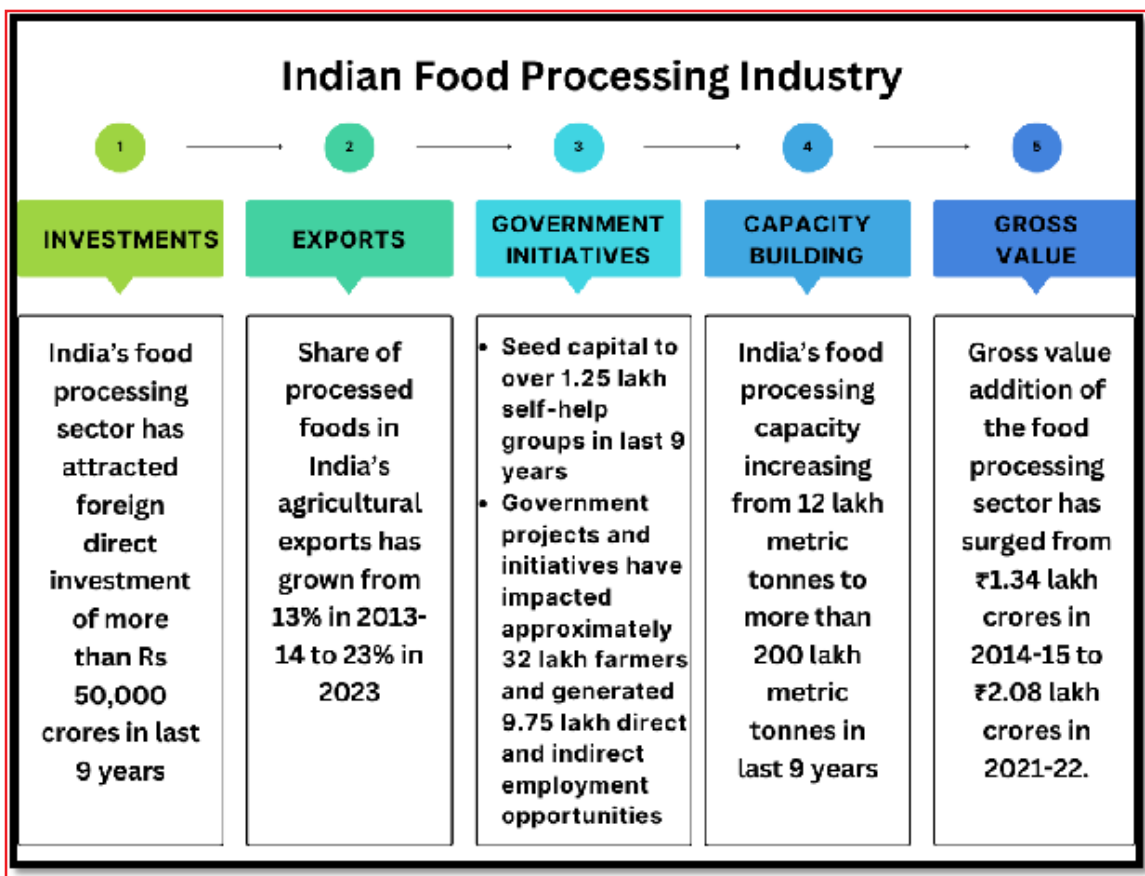
- To achieve this vision, India intends to boost its enablers that can **support and accelerate its food processing industry**.

- One of the key enablers is Financing Agri Food Value Chains and also Providing adequate and affordable credit to the food processing sector, especially to the **micro, small and medium enterprises (MSMEs)**.

What is the Current Status of the Food Processing Sector?

➤ **Sunrise Sector:**

- The Food Processing Sector received recognition, owing to the outcomes of World Food India, often referred to as the **'sunrise sector'**.
- In the past nine years, the sector has attracted foreign direct investments exceeding **Rs 50,000 crores**, thanks to the government's industry-friendly and farmer-centric policies.



➤ **Production Linked Incentive:**

- The progress made under the **Production-Linked Incentive (PLI)** scheme in the food processing sector, has opened other dimensions.
 - Different ongoing projects under the **Agri-Infra Fund**, focusing on post-harvest infrastructure,

with an investment exceeding Rs 50,000 crores, also hold massive potential for the sector.

- Investments in **processing infrastructure** in the **fisheries and animal husbandry sector**, amounting to thousands of crores, are encouraged.

Note:



- **Other Government Initiatives:**
 - Creation of the **Agri-Export Policy**
 - Development of **nationwide logistics and infrastructure**
 - Establishment of **district-level hubs**
 - Expansion of **Mega Food Parks**
 - **Pradhan Mantri Kisan Sampada Yojana**
 - **Pradhan Mantri Formalisation of Micro Food Processing Enterprises Scheme**

Impact of Export Restriction of Rice

Why in News ?

In July 2023, India banned the export of non-basmati white rice amid depleting public stock in the Central pool, elevated cereal prices, and the looming threat of the uneven **Monsoon**, which has impacted prices globally and domestically.

What are the Key Facts About Rice?

- Rice is a **staple food for most of the population** in India.
- It is a **kharif crop** which requires high temperature (above 25°C) and high humidity with annual rainfall above 100 cm.
 - In the areas of less rainfall, it is grown with the help of irrigation.
- In southern states and West Bengal, the climatic conditions allow the cultivation of two or three crops of rice in an agricultural year.
 - In West Bengal farmers grow three crops of rice called 'aus', 'aman' and 'boro'.
- About one-fourth of the total cropped area in India is under rice cultivation.
 - **Leading Producer States:** West Bengal, Uttar Pradesh, and Punjab.
 - **High Yielding States:** Punjab, Tamil Nadu, Haryana, Andhra Pradesh, Telangana, West Bengal and Kerala.
- India is **the second-largest producer of rice after China**.

How Does India Export Rice?

- India is the biggest exporter of rice in the world. As per the United States Department of Agriculture

(USDA), India accounted for about 40% of the total rice exports (56 million tonnes) in the world during 2022.

- India's rice exports are broadly categorised into **Basmati and Non-basmati rice**.
 - **Basmati Rice:** In 2022-23, India exported 45.61 lakh metric tonnes of basmati rice.
 - Top destinations for Indian basmati rice included **Iran, Saudi Arabia, Iraq, UAE, and Yemen**.
 - **Non-Basmati Rice:** In the 2022-23 fiscal year, India exported 177.91 lakh metric tonnes of non-basmati rice.
 - The non-basmati rice includes varieties like Sona Masuri and Jeera rice.
- **Top Destination of Non-basmati White Rice:** Benin, Madagascar, Kenya, Cote D' Ivoire, Mozambique, Vietnam.
 - The non-basmati rice category includes **6 sub-categories**— rice in husk of seed quality; other rice in husk; husked (brown) rice; rice parboiled; non-basmati white rice; and broken rice.

India to Chair International Sugar Organisation in 2024

Why in News?

The recent announcement at the **63rd council meeting of the International Sugar Organisation (ISO)**, headquartered in London, heralded a significant moment for India.

- **India is set to chair the organization in 2024**, marking a pivotal milestone in its global stature within the **sugar industry**.

What is the International Sugar Organization?

- The **International Sugar Organization** serves as a vital intergovernmental body dedicated to enhancing the global sugar market. It represents:
 - **87%** of world sugar production
 - **64%** of world sugar consumption
- With a membership of around **88 nations, India being among them**, the organization encompasses a diverse range of countries.

Note:



What is the Status of the Sugar Industry in India?

- **About:**
 - India is the **largest consumer and second-largest producer of sugar globally**. With a substantial **15% share in global sugar consumption** and a robust **20% production rate**, India's strategies significantly impact the international sugar market.
 - India stands as the **Eastern Hemisphere's market leader in sugar**, complementing **Brazil's stronghold in the Western Hemisphere**.
- **Geographical Conditions for the Growth of Sugar:**
 - **Temperature:** Between 21-27°C with hot and humid climate.
 - **Rainfall:** Around 75-100 cm.
 - **Soil Type:** Deep rich loamy soil.
- **Distribution:** The sugar industry is predominantly located across two primary production regions: the northern belt encompassing **Uttar Pradesh, Bihar, Haryana, Punjab and Bihar** and the southern belt comprising **Maharashtra, Karnataka, Tamil Nadu, and Andhra Pradesh**.
 - The **southern region benefits from a tropical climate, which is conducive to higher sucrose content in crops**, resulting in increased yields per unit area compared to northern India.
- **Related Indian Government Initiatives:**
 - **Fair and Remunerative Price (FRP):** The government has set the FRP for the 2023-2024 sugar season at **Rs. 315 per quintal**.
 - FRP is the minimum price that sugar mills must pay sugarcane farmers. It is announced annually by the Centre.
 - The government fixes the FRP based on recommendations from the **Commission for Agricultural Costs and Prices (CACP)**.
 - Under the FRP system, the price paid to farmers for sugarcane is not linked to the profits generated by sugar mills.
 - **Ethanol Blended Petrol Programme**
 - **Ethanol is an agricultural by-product** primarily sourced from the **processing of sugarcane for sugar**, and can also be derived from alternative sources like rice husk or maize.
 - When ethanol is mixed with petrol to reduce the consumption of fossil fuels in vehicle operation, **it is termed Ethanol Blending**.

- India aims to achieve a **20% ethanol-blended petrol target by the year 2025**.

World Cotton Day 2023

Why in News?

Recently, the **Ministry of Textiles** hosted a conference for **World Cotton Day (7th October, 2023)** in collaboration with **Cotton Corporation of India (CCI)** and EU-Resource Efficiency Initiative which discussed best practices and sustainable methods in the cotton value chain.

- Conference led to the Introduction of the "**Bale Identification and Traceability System**" (BITS) using **Blockchain Technology**.
- It also led to the launch of the **Kasturi Cotton program** for quality cotton with traceability.

Note:

- On October 7, 2019, the **World Trade Organisation (WTO)** organized the first World Cotton Day, initiated by the Cotton-4 nations, which are Benin, Burkina Faso, Chad, and Mali.

What is Bale Identification and Traceability System (BITS) and Kasturi Cotton Program?

- **Bale Identification and Traceability System (BITS):**
 - The BITS is a technological initiative in the cotton industry that utilizes **Blockchain Technology** to assign **unique QR codes to cotton bales**.
 - **Objective:**
 - BITS was introduced to ensure that key information about cotton bales, such as their quality, variety, origin, and processing details, is transparent and easily accessible to both domestic and international buyers.
 - **Implementation:**
 - BITS is implemented by the **Cotton Corporation of India (CCI)** in collaboration with other relevant stakeholders such as **State Governments**.
- **Kasturi Cotton Program:**
 - The **Kasturi Cotton Program** is an initiative introduced by the **Ministry of Textiles** in India to promote the production and availability of premium quality cotton with traceability.
 - **TEXPROCIL**, in collaboration with CCI on behalf of the Ministry of Textiles, is overseeing the implementation of this program.

Note:

- **Certified Quality:**
 - **Kasturi Cotton is not just any cotton;** it is certified to meet certain quality standards, which may include **fiber length, strength, color, and other characteristics** that make it suitable for premium textile products.

What are the Key Facts about Cotton?

- **About:** Kharif Crop which requires 6 to 8 months to mature.
 - Drought – resistant crops which are ideal for arid climates.
 - **Occupies 2.1% of the world's arable land,** meets 27% of the world's textiles needs.
- **Temperature:** Between 21-30°C.
- **Rainfall:** Around 50-100 cm.
- **Soil Type:** Well-drained **black cotton soil (Regur Soil)** (E.g. Soil of Deccan Plateau)
- **Products:** fiber, oil and animal feed.
- **Top Cotton Producing Countries:** India > China > US
- **Top Cotton Producing States in India:** Gujarat > Maharashtra > Telangana > Andhra Pradesh > Rajasthan.
- **Four cultivated species of cotton:** *Gossypium arboreum*, *G. herbaceum*, *G. hirsutum* and *G. barbadense*.
 - **Gossypium arboreum and G. herbaceum** are known as old-world cotton or Asiatic cotton.
 - **G. hirsutum** is also known as American cotton or upland cotton and *G. barbadense* as Egyptian cotton. These are both new world cotton species.
- **Hybrid Cotton:** Cotton made by **crossing two parent strains** that have different genetic characters. Hybrids are often spontaneously and randomly created in nature when open-pollinated plants naturally cross-pollinate with other related varieties.
- **Bt Cotton:** It is a **genetically modified organism** or genetically modified pest-resistant variety of cotton.

Blueprint for Transforming the Blue Economy

Why in News?

Recently, Indian Prime Minister unveiled 'Amrit Kaal Vision 2047', the long-term blueprint for the Indian

maritime **blue economy** while inaugurating **Global Maritime India Summit 2023** in Mumbai.

- It includes initiatives like **Advanced Mega Ports**, an **International Container Trans-shipment Port**, island development, **Expanded inland waterways**, and **multi-modal hubs** for efficient trade.
- The Prime Minister also highlighted the government's vision for the maritime sector, encapsulated in the phrase '**Ports for Prosperity**' and '**Ports for Progress**.'

What is the Global Maritime India Summit 2023?

- **About:**
 - **Global Maritime India Summit (GMIS) 2023** is a flagship event aimed at propelling the Indian maritime economy by promoting global and regional partnerships and facilitating investments.
 - It is an annual meet of the Indian and international maritime community to address key industry issues and exchange ideas to bring the sector forward.
- **Organisers**
 - **Ministry of Ports, Shipping and Waterways**
 - **Indian Ports Association**
 - **Federation of Indian Chambers of Commerce and Industry (FICCI)**

Crop Switching for Sustainable Agriculture

Why in News?

A recent study, featured in the *journal Nature Water*, was conducted by a team of researchers from the Indian Institute of Technology Bombay, the University of Delaware, Columbia University, and Yale School of the Environment.

- This study focuses on addressing **water consumption and sustainable agriculture** in India's northern plains, particularly the **Indo-Gangetic region**.
- The study focused on 124 districts in Uttar Pradesh, Bihar, and West Bengal, covering the upper, middle, and lower **Ganga** basin in India.

Note:

North Indian Plains

➤ About:

- They are a large flat landmass that lies south of the Himalayas and north of the Peninsular India.
- They are formed by the alluvial deposits of three major river systems: the Indus, the Ganga, and the Brahmaputra, along with their tributaries.
 - They are the largest alluvial tract of the world.

➤ Geographical Overview:

- The Indo-Gangetic region has a **subtropical climate** with hot summers and cool winters.
- The northern plains can be divided into **four physiographic regions** based on the nature of the alluvium and the relief features.
 - **Bhabar:** It is a narrow belt of coarse gravel and pebbles along the foothills of the Himalayas. It is about 8 to 16 km wide and has a porous surface that allows water to seep through it.
 - **Terai:** It is a marshy and swampy region south of the Bhabar. It is about 20 to 30 km wide and has a rich soil and dense vegetation. It is also home to many wildlife sanctuaries and national parks
 - **Bhanger:** It is the **older and higher alluvial plain** that lies above the flood level of the rivers. It is composed of clay, silt, and sand.
 - The soil in this region contains calcareous deposits, locally known as kankar.
 - **Khadar:** It is the newer and lower alluvial plain that lies along the river banks. It is composed of fine silt and clay. It has a light color and is very fertile. It is renewed every year by the floods.

➤ Agricultural Significance:

- The IGP plays a pivotal role in Indian agriculture, **contributing 30% of the country's total food production**.
 - It serves as a primary source of food, including staple cereals like rice and wheat.

➤ Demographic Significance:

- This region is one of the most densely populated areas globally, with an estimated **400 million inhabitants**. The population density, especially along the **banks of the Ganges, is exceptionally high**.

Fostering Sustainable Agrifood System

Why in News?

Recently, the Ministry of Agriculture & Farmers Welfare has inaugurated the 16th Agricultural Science Congress (ASC) in Kochi, Kerala in order to promote **Sustainability in the Agri-Food System**.

- Organized by the National Academy of Agricultural Sciences (NAAS), the ASC will come out with recommendations that facilitate the agriculture sector for moving towards a path of greater sustainability.

Note:

- **Agricultural Science Congress (ASC):** The ASC serves as a platform for experts, researchers, practitioners, and stakeholders in the **agricultural and allied sectors** to come together and discuss various critical areas related to agriculture, sustainability, and related subjects.
- **National Academy of Agricultural Sciences (NAAS):** NAAS is a **prestigious organization based in India**, established with the aim of promoting agricultural science and research. The primary objective of NAAS is to provide a forum for agricultural scientists to deliberate on significant issues and advancements in the field of agriculture and related sciences.

What are Sustainable Agri Food Systems?

➤ About:

- Sustainable agri-food systems encompass a **holistic approach to agricultural production, distribution, consumption, and waste management** that is environmentally sound, socially equitable, and economically viable.
- These systems aim to **meet current food needs** while ensuring long-term sustainability, minimizing **negative impacts on the environment**, improving livelihoods, and promoting social well-being.
 - In 2020, global agrifood systems **emissions were 16 billion tonnes of carbon dioxide equivalent**, an increase of 9 % since 2000.

Note:

What are the Government Initiatives to Promote Agrifood Systems?

- **Indian Initiatives:**
 - India has created a dedicated **Agriculture Infrastructure Fund** which aims to create farm gate and agriculture marketing infrastructure in rural areas by providing interest subsidies and credit guarantee to entrepreneurs which will greatly help in **reducing the post-harvest losses**.
 - To conserve precious water resources, the Government has launched a scheme to increase water use efficiency at the farm level by using **micro-irrigation technologies for which a dedicated micro-irrigation fund** has been set up.
 - India has developed 262 abiotic stress-tolerant varieties of different crops.
 - To address the issues of under-nutrition and malnutrition, India is running the world's largest food-based safety net programmes which include the **Targeted Public Distribution System (TPDS)** that will serve about 800 million people in 2020.
 - The UN recognised India's proposal of celebrating the year **2023 as the 'International Year of Millets'**.

Minimum Export Price for Rice

Why in News?

India's production of both rice and wheat hit all-time highs in 2022, according to the Ministry of Agriculture and Farmers Welfare, yet the agricultural landscape has seen a wave of supply-side actions in the form of **export restrictions and trade controls**.

- The government set a **Minimum Export Price (MEP)** of USD 1,200 a tonne on basmati rice shipments in a move aimed at reining in domestic prices.

What Recent Measures has the Government taken to Curb the Export of Rice and Wheat?

- In May 2022, the government imposed a ban on the export of wheat.
- Prohibited the **exports of broken rice** and imposed a **20% duty** on all white (non-parboiled) non-basmati grain shipments in September, 2022.
- In July 2023, the **government banned exports of white non-basmati rice**, allowing only parboiled non-basmati and basmati rice exports.

- In August 2023, a 20% duty was introduced on all parboiled non-basmati rice exports "with immediate effect." This duty was implemented to curb the export of this type of rice.
- In August, 2023, the government directed the **Agricultural & Processed Food Products Exports Development Authority (APEDA)** not to issue registration-cum-allocation certificates for any basmati rice consignments contracted at a price of USD 1,200 per tonne.
 - This MEP was imposed to prevent **illegal exports of white non-basmati rice disguised as basmati rice**.

What is the Production of Rice and Wheat?

- **Rice Production:**
 - Rice production escalated from 124.37 million tonnes (mt) in 2020-21 to 129.47 mt in 2021-22, further reaching 135.54 mt in 2022-23.
 - However, counterintuitively, the **government undertook Export curbs** on rice.
 - These measures included the **prohibition of broken rice exports and the imposition of a 20% duty** on white non-basmati grain shipments.
- **Varied Wheat Production:**
 - Wheat production initially fell from 109.59 mt to 107.74 mt, rebounded to 112.74 mt in 2022-23.
 - The government introduced bans on wheat exports, reflecting its intention to manage domestic availability.

Palm-Oil Production

Why in News?

The **European Union (EU)** has taken significant steps in recent years to address deforestation and environmental concerns **through the EU Deforestation-Free Regulation (EUDR)** related to **palm oil** production and made massive efforts to phase out palm oil-based biofuels by 2030.

- Malaysia's signing of a deal to double palm oil exports to China annually is a **move to offset potential revenue losses from the EU's ban** on commodities that are linked to deforestation.

Note:

What is the EU Deforestation-Free Regulation (EUDR) and Malaysia and Indonesia's Reactions?

➤ EUDR:

- This aims at removing deforestation from supply chains of everyday items in the EU. Legislation adopted in Brussels in 2023 with **2030 as the target and Imposes administrative burdens on palm oil exporters** wanting to sell in the EU.
- Apart from this, Biofuels, palm oil, and deforestation are the core focus areas of Palm Oil Policy and Deforestation Legislation.
- The regulation requires firms **to ensure that the product exported to the EU has been grown on land which has not been deforested after December 31, 2020.**
- The regulation is not **WTO (World Trade Organization)** compatible and a non-tariff barrier.

➤ Malaysia and Indonesia's Response:

- Widespread opposition to perceived European protectionism through this legislation.
- It would promote **dependency on China for exports**, which could nullify environmental benefits.
- Implications for the EU are immense and Chinese markets can benefit from it tremendously.

What is Palm Oil & Its Use?

➤ About:

- Palm oil is an edible vegetable oil derived from the **mesocarp (reddish pulp) of the fruit of the oil palms.**
- It is used as cooking oil, and in everything from **cosmetics, processed foods, cakes, chocolates, spreads, soaps, shampoo**, and cleaning products to biofuel.
 - The use of crude palm oil in making **biodiesel** is being branded as 'green diesel'.

➤ Production:

- Indonesia and Malaysia together account for almost **90% of the global palm oil production**, with Indonesia producing the largest quantity at over **45 million tonnes in 2021.**

➤ Issues with Oil Palm Industry:

- The oil palm industry has come under criticism for what are reportedly unsustainable production practices leading to **deforestation**, and

exploitative labor practices carried forward from the colonial era.

- However, **palm oil** is preferred by many as it is **inexpensive**, oil palms produce more oil per hectare than some other vegetable oil plants like **soybean.**

➤ Status of India in Palm Oil Import:

- India is the biggest importer of palm oil, which makes up **40% of its vegetable oil consumption.** India meets **half of its annual need for 8.3 MT of palm oil from Indonesia.**
- In 2021, India unveiled the National **Mission on Edible Oil-Oil Palm** to boost India's domestic palm oil production.

Boosting Rubber Cultivation in Northeastern India

Why in News?

The **Rubber Board**, in partnership with the **Central government and the Automotive Tyre Manufacturers' Association**, is spearheading a project to **increase the area dedicated to natural rubber in the Northeastern States**, excluding Sikkim but including West Bengal.

- Tyre manufacturers, the primary consumers of rubber, have committed **₹1,000 crore to this five-year project that started in 2021.**

Urea Gold

Why in News?

Recently, Indian Prime Minister officially launched '**Urea Gold**' fertiliser'. It is developed by **Rashtriya Chemicals and Fertilizers Ltd (RCF)**, a leading fertilizer and chemical manufacturing company in India in the Public Sector.

What is Urea Gold?

- **About:** Urea Gold is created by **infusing urea with sulfur**, creating a composite fertilizer with **37% nitrogen (N) and 17% sulfur (S).**
- This nutrient blend serves two primary objectives: **fulfilling sulfur requirements in Indian soils and enhancing nitrogen use efficiency (NUE).**

Note:



Note:

- Normal **urea** contains 46% of a single plant nutrient: Nitrogen or N.

What is the Status of Urea Consumption in India?

- **About Urea:**
 - Urea is a **white crystalline compound** commonly used as a **synthetic fertilizers** in agriculture.
 - When applied to the soil or crops, **urea is broken down by enzymes into ammonia and carbon dioxide.**
 - The **ammonia then gets converted into ammonium ions**, which can be taken up by plant roots and used for growth and development.
- **Status of Consumption in India:**
 - Urea is India's most widely used fertiliser, with its consumption/sales rising from **26.7 million tonnes (mt) to 35.7 mt between 2009-10 and 2022-23.**
- **Interventions Similar to Urea Gold:**
 - **Neem Coated Urea:** This is a modified form of urea that is **coated with neem oil.**
 - It **reduces the leaching and volatilization losses of nitrogen**, has insecticidal and nematicidal properties, and improves the soil texture and water holding capacity.
 - **Liquid Nano Urea:** This is a **nanotechnology-based fertilizer that is sprayed on leaves** and is assimilated by the plant cells.
 - It **enhances the nutritional quality and productivity of the crop**, reduces the fertilizer consumption, improves the nitrogen use efficiency, and saves the input costs.

Pulses Production India

Why in News?

Recently, the Union Minister of Agriculture and Farmers Welfare provided valuable insights in a written reply in **Rajya Sabha** regarding the comprehensive strategies being employed to enhance pulses production in India.

- The **National Food Security Mission (NFSM)-Pulses**, aimed at increasing productivity and ensuring sustainable practices in the agriculture sector was highlighted.

What are India's Initiatives to Boost Pulses Production?

- **National Food Security Mission (NFSM)-Pulses:**
 - The NFSM-Pulses initiative, led by the Department of Agriculture & Farmers Welfare, operates in 28 States and 2 Union Territories including Jammu & Kashmir and Ladakh.
- **ICAR's Role in Research and Variety Development:**
 - The **Indian Council of Agricultural Research (ICAR)** plays a pivotal role in enhancing the productivity potential of pulse crops through research and development efforts. The ICAR focuses on:
 - Basic and strategic research on pulses. Collaborative applied research with State Agricultural Universities.
 - Development of location-specific high-yielding varieties and production packages.
 - During the period from **2014 to 2023, an impressive 343 high-yielding varieties and hybrids of pulses have been officially recognized** for commercial cultivation across the country.
- **Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA) Scheme:**
 - This comprehensive umbrella scheme (launched in 2018) comprises three components:
 - **Price Support Scheme (PSS):** Procurement from pre-registered farmers at **Minimum Support Price (MSP).**
 - **2021-22:** Around 30.31 lakh tonnes of pulses procured, benefiting over 13 lakh farmers.
 - **2022-23 (as of July 2023):** Approximately 28.33 lakh tonnes of pulses procured, benefitting over 12 lakh farmers.
 - **Price Deficiency Payment Scheme (PDPS):** Compensates farmers for price differences.
 - **Private Procurement Stockist Scheme (PPSS):** Encourages private sector participation in procurement.

Open Market Sale Scheme for Wheat and Rice

Why in News?

Recently, in response to the **Food Corporation of India's (FCI)** imposition of quantity restrictions and denial

Note:

of states' participation in the [Open Market Sale Scheme \(OMSS\)](#), states have been exploring alternative methods to procure [wheat](#) and [rice](#).

What is the Open Market Sale Scheme?

- **About:**
- The OMSS is a program implemented by the FCI to facilitate the **sale of surplus food grains, primarily wheat, and rice, from the central pool** in the open market.
- **Purpose and Objectives:**
- Enhance **food grain supply during lean seasons**.
- **Moderate open market prices** and control inflation.
- Ensure [food security](#) and availability of grains in deficit regions.
- Facilitate the **sale of surplus food grains** from the central pool.
- **Implementation and Process:**
- Conduct e-auctions by the FCI for traders, bulk consumers, and retail chains to purchase specified quantities of food grains at pre-determined prices.
- Allow states to procure additional food grains through OMSS for distribution under the [National Food Security Act, 2013 \(NFSA\)](#).
- FCI conducts weekly auctions for the OMSS for wheat on the platform of the [National Commodity and Derivatives Exchange Limited \(NCDEX\)](#).
- NCDEX is a **commodity exchange platform in India** that provides a platform for trading in various agricultural and other commodities.

What are the Recent Revised OMSS Restrictions?

- **Revised OMSS Restrictions:**
- The OMSS underwent a recent revision with a focus on **limiting the quantity** that a single bidder can purchase in a single bid.
- Previously, the **maximum allowed quantity per bid was 3,000 metric tonnes**. However, it has now been **reduced to a range of 10-100 metric tonnes**.
- The aim of this change is to **promote wider participation by accommodating small and marginal buyers**.
- By encouraging competitive bids from smaller buyers, the revised OMSS seeks to **curb retail prices and create a more level playing field**.

- **Discontinuation of OMSS Sales to States:**
- The Centre decided to discontinue the sale of rice and wheat from the central pool to state governments under the OMSS.
- Additionally, private bidders are **no longer allowed to sell their OMSS supplies to states**.
- The rationale behind this decision is to **control inflationary trends and maintain adequate stock levels** in the central pool.
- By ensuring that food security obligations are met, the discontinuation of OMSS sales to states aims to streamline the distribution and allocation of food grains.

What is the Food Corporation of India?

- FCI is a **statutory body** set up in 1965 under the **Food Corporations Act of 1964**. It was established against the backdrop of a major shortage of grains, especially wheat.
- The FCI manages the [food security system in India](#).
- The **FCI also maintains buffer stocks** of food grains to ensure food security during times of scarcity or crisis.
- The FCI is also responsible for distributing food grains throughout the country for [the public distribution system](#).
- **FCI also conducts e-auction** as one of the methods to **dispose of its surplus food grains**.

Credit Guarantee Scheme for Livestock Sector

Why in News?

The Ministry of Fisheries, Animal Husbandry and Dairying has launched the **first ever "Credit Guarantee Scheme"** under Animal Husbandry Infrastructure Development Fund (AHIDF) to facilitate collateral-free credit for MSMEs in the [livestock sector](#).

What are the Key Features of the Credit Guarantee Scheme?

- **Objective:**
 - **Strengthen credit delivery system** and facilitate smooth flow of credit to [Micro, Small & Medium Enterprises \(MSMEs\)](#) engaged in the Livestock sector.

Note:

- Increase access to finance for un-served and under-served livestock sector, with a focus on first-generation entrepreneurs and underprivileged sections of society.
- **Credit Guarantee Fund Trust:**
 - A Credit Guarantee Fund Trust of Rs. 750.00 crores have been established to provide credit guarantee coverage up to 25% of the credit facilities extended to eligible MSMEs by lending institutions.
- **Interest Subvention:**
 - The scheme offers an [interest subvention of 3%](#) on loans obtained from Scheduled Banks or [National Cooperative Development Corporation \(NCDC\)](#).
 - Borrowers can avail up to 90% of the total project cost as a loan.

What is Animal Husbandry Infrastructure Development Fund?

- The AHIDF has been set up as **MSMEs and Private companies also need to be promoted and incentivized** for their involvement in processing and value addition infrastructure.
- The AHIDF is a **Central Sector Scheme** under the **Prime Minister's Atma Nirbhar Bharat Abhiyan stimulus package** of Rs.15000 crores for incentivizing investments in:
 - Dairy processing and value addition infrastructure.
 - Meat processing and value addition infrastructure.
 - Animal Feed Plant.
 - Breed Improvement technology and Breed Multiplication Farm.
 - Animal Waste to Wealth Management (Agri Waste Management).
 - Setting up of Veterinary Vaccine and Drugs Manufacturing facilities.
- Individual entrepreneurs, private companies, MSMEs, [Farmers Producers Organizations \(FPOs\)](#), and Section 8 companies are encouraged to invest in the Livestock sector through this fund.

Bhoomi Samman 2023

Why in News?

Recently, the [President of India](#) presented the **"Bhoomi Samman" 2023** at a function organised by the **Union Ministry of Rural Development**.

What is "Bhoomi Samman"?

- The **"Bhoomi Samman"** is a prestigious award scheme launched by the **Union Ministry of Rural Development** to recognize and incentivize the achievements of states and districts in the implementation of the [Digital India Land Records Modernization Programme \(DILRMP\)](#).
- The award is presented by the President of India to **the state secretaries and district collectors** along with their teams who have excelled in **achieving saturation of the core components of DILRMP**, such as:
 - Computerization of land records
 - Digitization of cadastral maps
 - Integration of textual and spatial data
 - Survey/re-survey using modern technology
 - Computerization of registration
 - Interoperability between registration and land records

Note:

- **Digital India Land Records Modernization Programme** (erstwhile National Land Record Modernization Programme) under the Ministry of Rural Development was revamped and converted as a **Central Sector Scheme with effect from 1st April, 2016** with 100% funding by the Centre.

Inclusion of Urea in Nutrient-Based Subsidy Regime

Why in News?

In its non-price policy recommendations for the [Kharif crops 2023-2024](#) season, the [Commission for Agricultural Costs and Prices \(CACP\)](#) has recommended that [Urea](#) should be brought under the [Nutrient-Based Subsidy \(NBS\) regime](#) to address the problem of **imbalanced nutrient usage in agriculture**.

- Currently, urea is excluded from the NBS scheme, which has led to disproportionate use and deteriorating soil health.

Note:



Commission for Agricultural Costs and Prices

- The CACP is a statutory body of the **Ministry of Agriculture and Farmers Welfare, formed in 1965**.
- Currently, the Commission comprises a Chairman, Member Secretary, one Member (Official) and two Members (Non-Official).
 - The non-official members are representatives of the farming community and usually have an active association with the farming community.
- It is mandated to recommend Minimum Support Prices (MSPs) to incentivize the cultivators to adopt modern technology and raise productivity and overall grain production.
- CACP submits separate reports recommending prices for Kharif and Rabi seasons.

What is the NBS Regime?

- **About:**
- Under the NBS regime – fertilizers are provided to the farmers at subsidized rates based on the **Nutrients (N, P, K & S) contained** in these fertilizers.
- Also, the fertilizers which are fortified with secondary and micronutrients such as molybdenum (Mo) and zinc **are given additional subsidy**.
 - The subsidy on P&K fertilizers is announced by the Government on an annual basis for **each nutrient on a per kg basis** – which are determined taking into account the international and domestic prices of P&K fertilizers, **exchange rate, inventory level in the country etc.**
 - NBS policy intends **to increase the consumption of P&K fertilizers** so that optimum **balance (N:P:K= 4:2:1) of NPK fertilization** is achieved.
- **Significance:**
- This will improve **soil health and as a result the yield from the crops** would increase, resulting in enhanced income to the farmers.
- It will make rational use of fertilizers; this would also ease **off the burden of fertilizer subsidy**.

Direct-Seeding Method

Why in News?

Farmers in leading rice-growing states are adopting the **direct-seeding method** as a solution to **delayed rains and labor shortages**.

What is Direct-Seeding Method?

- **About:**
 - Direct Seeded Rice (DSR), also known as the **'broadcasting seed technique,' is a water-saving method of sowing paddy**.
- In this method, **seeds are directly drilled into the fields**, eliminating the **need for nursery preparation and transplantation**.
- **Benefits:**
 - **Reduction in Labor:**
 - With the use of drum seeders, only two laborers are required to sow seeds on one acre, compared to 25-30 laborers needed in traditional methods.
 - This significantly **reduces labor costs and eases the burden on farmers**.
 - **Time and Resource Savings:**
 - By eliminating the need for nursery cultivation, farmers save **approximately 30 days in the crop cycle**.
 - This allows them to start the rabi season early and avoid untimely rains during the harvesting phase.
- **Water Conservation:**
 - The direct-seeding method reduces water requirements by around 15% as water logging occurs only after a month. This is especially beneficial in areas where rainfall is delayed.
- **Increase in Yield:**
 - According to the results from research trials and farmers' field survey, after this technique the **yield is one to two quintals per acre higher than puddled transplanted rice**.
- **Challenges:**
 - **Weed Growth:**
 - Weed growth becomes a challenge as **seeds are sown directly into the fields**.
- **Extreme climate:**
 - High temperatures and deficient rainfall can **affect seed germination and crop growth**.
- **Operational challenges:**
 - Closed canals, erratic electricity supply, and issues with weed control and pest management.
- **Successful Implementations:**
- The direct-seeding method has gained traction in various regions, including **Punjab, Telangana, and Andhra Pradesh**.

Note:



- In Andhra Pradesh alone, an NGO has implemented this method on approximately 4,000 hectares, resulting in significant cost savings.

Food Supply Situation in India Ahead of Monsoon 2023

Why in News?

As the monsoon season approaches, the **food supply situation in India** is being closely monitored. While there are currently no shortages, the **spatial and temporal distribution of the monsoon** rainfall plays a crucial role.

- The [India Meteorological Department \(IMD\)](#) has forecasted just-about-normal rainfall during the [southwest monsoon season \(June-September\)](#).
- The implications of the monsoon on food supply will have a significant impact on the [Reserve Bank of India's monetary policy](#).

What is the Current Status of the Food Supply?

- **Fine Balance in Wheat:**
 - Unseasonal rain and gusty winds in March and early April in 2023 **affected standing wheat crops**.
 - However, the yield losses were not as severe as initially feared.
 - Government agencies have **procured about 26.2 million tonnes** of wheat during the current marketing season, **ensuring sufficient stocks**.
 - Although wheat stocks appear low, the combined stocks of **wheat and rice are ample to meet the requirements** of the [public distribution system](#) and other **welfare schemes**.
- **Tightrope Walk in Sugar:**
 - The closing stocks of sugar for the current sugar year (October-September 2023) are projected to be 5.7 million tonnes.
 - This level of stocks can meet the domestic requirement for 2.5 months, including the peak festival season demand.
 - The main concern is the **monsoon's impact on sugarcane**, which requires **significant water during the growth phase**.

- **Sugar** production for the next year depends on a normal monsoon.
- **Edible Oil and Pulses:**
 - The supply position for edible oils seems comfortable due to viable imports covering domestic crop shortfalls.
 - **Global price crashes** have made imported **crude palm, soybean, and sunflower oil** affordable.

Ample stocks of [chickpeas](#) and imports of masoor red lentils contribute to a comfortable supply of pulses.

What is the Global Standing of India's Agricultural Sector in 2022-23?

- **Milk Production:**
- India takes the lead as the **world's largest producer of milk**.
- **Wheat Production:**
 - Following China, India is the **second-largest producer** of wheat globally.
- **Rice Production:**
 - India is the **second largest producer** of rice, and at **Number One in exports**.
- **Sugar Production:**
 - India has emerged as the largest producer and consumer of sugar, while also being the **second-largest exporter**.
- **Pulses Production:**
 - India stands as the **largest producer of pulses globally**.

Animal Husbandry and Dairying

Why in News?

The Union Minister of Animal Husbandry and Dairying, Government of India recently **highlighted the achievements and initiatives** of the Department, emphasizing the **importance of animal husbandry** in boosting rural incomes and supporting agricultural diversification.

- The Department has undertaken significant initiatives in the past nine years to enhance productivity.

Note:



What are the Achievements in Animal Husbandry and Dairy?

➤ Livestock Sector:

- **Livestock sector** contributes significantly to the Indian economy, with a **compound annual growth rate (CAGR) of 7.93% from 2014-15 to 2020-21**.
- The livestock sector's contribution to the total agriculture and allied sector **Gross Value Added (GVA)** has increased from **24.38% in 2014-15 to 30.87% in 2020-21**.
- Livestock population in India includes 303.76 million bovines, 74.26 million sheep, 148.88 million goats, 9.06 million pigs, and 851.81 million poultry as per 20th Livestock Census.

➤ Dairy Sector:

- **Dairy** is the **largest agricultural commodity in India**, contributing **5% to the national economy** and employing over 8 crore farmers directly.
- India ranks **1st in milk production**, accounting for 23% of global milk production.
- Milk production has increased by 51.05% in the past eight years, reaching 221.06 million tonnes in 2021-22.
- Milk production is growing at an annual growth rate of **6.1% over the past 8 years** whereas world milk production is growing at 1.2% per annum.
- **Per capita milk availability in India is 444 grams per day**, surpassing the world average of 394 grams per day.

➤ Egg and Meat Production:

- India ranks **3rd in egg production and 8th in meat production globally**.
- Egg production has increased from 78.48 billion in 2014-15 to 129.60 billion in 2021-22, growing at a rate of **7.4% per annum**.
- Meat production has risen from 6.69 million tonnes in 2014-15 to 9.29 million tonnes in 2021-22.

What are the Key Initiatives Taken to Enhance the Livestock Sector?

➤ **Rashtriya Gokul Mission:**

- **Nationwide Artificial Insemination Programme:** Over 5.71 crore animals covered, benefiting 3.74 crore farmers.
 - Artificial insemination is a novel method of bringing about impregnation in female breeds.

- **Promotion of IVF Technology:** Production of viable embryos and birth of calves.
- **Sex Sorted Semen Production:** Introduction of sex sorted semen with up to 90% accuracy for producing female calves.
 - Only female calves can be produced (with more than 90% accuracy) which will help double the growth rate of milk production in the country.
- **DNA-based Genomic Selection:** Genotyping of animals for selection of elite indigenous breeds.
- **Animal Identification and Traceability:** Identification and registration of 53.5 crore animals using **unique identification label (UID) tags**.
- **Progeny Testing and Pedigree Selection:** Implemented for specific cattle and buffalo breeds.
- **National Digital Livestock Mission:** Enhance livestock productivity, control diseases, and ensure quality for domestic and export markets.
- **Breed Multiplication Farms:** Subsidy of 50% (up to Rs 2 crore per farm) on capital cost (excluding land cost) is provided to private entrepreneurs under this scheme for the establishment of breed multiplication farms.
- **Supporting Dairy Cooperatives and Farmer Producer Organizations:** Soft working capital loans are provided to assist dairy cooperative societies during **adverse market conditions or natural calamities**.
- **Dairy Processing & Infrastructure Development Fund (DIDF):** Creation and **modernization of milk processing, chilling, and value addition infrastructure**.
- **National Livestock Mission: Direct subsidies** to individuals, FPOs, and others to establish poultry farms, sheep and goat breed multiplication farms, piggery farms, and feed and fodder units.
- **Animal Husbandry Infrastructure Development Fund:** Incentivizing investments for dairy and meat processing, animal feed plants, and breed improvement technology.
- **Livestock Health and Disease Control Programme:**
 - **Animals ear tagged:** Approximately 25.04 crores.
 - **Foot and Mouth Disease (FMD) vaccination:** 24.18 crore animals vaccinated in the second round, ongoing vaccination for Round III with 4.66 crore animals vaccinated.
 - **Brucella vaccination:** 2.19 crore animals vaccinated.

Note:



- **Mobile Veterinary Units (MVUs):** 1960 MVUs flagged off in 16 States/UTs, with 1181 operational in 10 States.
- **Livestock Census & Integrated Sample Survey Scheme:**
 - **Integrated Sample Survey:** Provides estimates of **major livestock products (Milk, Egg, Meat, Wool)** published in the Annual Publication of Basic Animal Husbandry Statistics (BAHS).
 - **Livestock Census:** Provides species-wise and breed-wise livestock population data at the household level in rural and urban areas.
 - **20th Livestock Census completed in 2019**, with the publication of the “20th Livestock Census-2019” report containing species-wise and state-wise the population of livestock. Breed-wise reports on Livestock and Poultry were also published.
- **Kisan Credit Cards (KCC) for Dairy Farmers:** More than 27.65 lakh fresh KCCs sanctioned for AHD farmers in milk cooperatives and milk producer companies.

Unprecedented Rise in Jeera Prices

Why in News?

Over the past few months, **Jeera (Cumin)** prices have experienced an unprecedented surge.

- The primary reason for the price surge is the **significant imbalance between the supply of jeera and its demand**. The arrivals of jeera in the market have been considerably **lower than the demand**, leading to a scarcity of the spice.

What are the Key points Related to Jeera?

- **About:**
 - Jeera is an **aromatic seed that enhances** the flavor of Indian dishes. It is one of the important **spices & condiments, widely used** for culinary as well as medicinal purposes.
 - Jeera is reported to have originated from the Mediterranean to India. Cumin was known to the **Egyptians 5,000 years ago and it was found in the pyramids**.

- **Climate and Cultivation:**
 - Jeera grows well in both **tropical and sub-tropical climate** and it comes up well in all types of soils, but well drained sandy loam soils are best suited.
- Jeera cultivation is highly **sensitive to weather conditions**. It requires a moderately **cool and dry climate** without humidity, which limits cultivation to **specific regions in Gujarat and Rajasthan**.
 - Unjha, situated in the heart of **India’s jeera cultivation belt in Gujarat**, has emerged as the primary market setting the prices for the crop.
 - Gujarat is the largest producer of jeera in the country.
- It is **Rabi Crop**, sown in October to November and **harvested in February and March**.
- **Major Producers:**
 - India dominates global jeera production, accounting for **approximately 70% of the world’s output**.
 - Other countries such as **Syria, Turkey, UAE, and Iran** make up the remaining 30%.
 - Production disruptions caused by civil war and natural disasters in these countries have further highlighted **India’s significance as a major producer**.

Sugarcane Production in India

Why in News?

Recently, Madras High court in its judgment observed that **Fair and Remunerative Price (FRP)** of Sugarcane is not the fair market price and that Marginal farmers can survive only if the State governments paid them the much higher **State Advised Price (SAP)**.

How are the Prices of Sugarcane Determined?

- The Prices of Sugarcane are Determined by the **Central Government and the State Governments**.
- **Central Government:** Fair and Remunerative Price (FRP)
 - The Central Government announces FRP which are determined on the recommendation of the **Commission for Agricultural Costs and Prices (CACP)** and announced by the Cabinet Committee on Economic Affairs (CCEA).
 - CCEA is chaired by the Prime Minister of India.

Note:

- The FRP is based on the [Rangarajan Committee](#) report on reorganising the [sugarcane industry](#).
- **State Government:** State Advised Prices (SAP)
 - The SAP is announced by the Governments of key sugarcane producing states.
 - SAP is generally higher than FRP.
 - The price is calculated by the experts, who calculate the **entire economics of the crop by taking input cost** and then suggest to the government, which may agree or not.

What is the Status of India's Sugarcane Sector?

- **About:**
 - Sugar industry is an important agro-based industry that impacts the rural livelihood of about 50 million sugarcane farmers and around 5 lakh workers directly employed in sugar mills.
 - The sugar industry is the second largest agro-based industry in India after cotton.
- **Geographical Conditions for the Growth of Sugar:**
 - **Temperature:** Between 21-27°C with hot and humid climate.
 - **Rainfall:** Around 75-100 cm.
 - **Soil Type:** Deep rich loamy soil.
 - **Top Sugarcane Producing States:** Maharashtra > Uttar Pradesh > Karnataka
- **Status of Sugarcane Sector:**
 - India is the world's top **Producer, User, and Second-largest Exporter** of sugar.
 - According to the **Indian Sugar Mills Association (ISMA)**, the sugar production of India rose by 3.69% to 12.07 million tonnes during the October-December quarter of 2022.
 - In the same period last year, it stood at 11.64 million tonnes.
 - Total sugar production, after diversion for ethanol manufacturing, has increased to **193.5 lakh tonnes till January 2023** from 187.1 lakh tonnes in the year-ago period.

India's Latest Farm Exports Data

Why in News?

Provisional data released recently by the Department of Commerce has shown that **both agricultural exports**

from and imports into India have scaled new highs in the fiscal year that ended March 31, 2023.

- The data shows that **total farm exports were at USD 53.15 billion and imports at USD 35.69 billion during 2022-23**, surpassing their previous year's records.
- The resultant **agricultural trade surplus has marginally dipped** from USD17.82 billion to USD 17.46 billion.

What are the Key Drivers behind this Increase in Exports?

- Between 2013-14 and 2015-16, **India's agricultural exports sharply fell** from USD 43.25 billion to USD32.81 billion, **primarily due to the crash in global prices**, as reflected the [UN Food and Agriculture Organization's Food Price Index \(FFPI\)](#).
 - However, imports continued to rise, leading to a decline in the farm trade surplus.
- In recent years, **the FFPI has recovered, making India's agricultural commodities more globally price competitive**, resulting in a surge in exports during 2020-2023.

What is FAO's Food Price Index?

- The **FFPI** is a measure of the monthly change in international prices of a basket of food commodities. It measures changes for a basket of cereals, oilseeds, dairy products, meat and sugar.
- Base Period: 2014-16.
- FFPI increases when international food prices rise.

What are the Major Exports Contributors?

- In recent times, **marine products, rice, and sugar have been the driving forces** behind India's agricultural exports.
 - **Marine Products:** Marine product exports have grown steadily from USD5.02 billion in 2013-14 to USD8.08 billion in 2022-23.
 - **Rice:** **Rice exports have also gone up during this period**, from USD7.79 billion to USD11.14 billion.
 - It's been **driven by non-basmati rice, which has more than doubled**. On the other hand, premium priced basmati rice has witnessed a decline.
 - **Basmati exports are mainly to the Persian Gulf countries** and, to some extent, the US and UK. Non-basmati shipments are more diversified.

Note:



- It's **non-basmati that has made India the biggest rice exporter**, ahead of Thailand.
- **Sugar:** The recent boom in sugar exports has been the third largest contributor – from a mere USD 810.90 mn in 2017-18 to USD 5.77 bn in 2022-23 – the sugar exports have grown many folds during these years.
 - India has, in the process, emerged **as the world's No. 2 exporter after Brazil**.

What are the other Laggards and Losers in the Export Basket?

- **Spices:** Spices exports, which saw a jump during 2013-2021, **have stagnated** since then.
- **Buffalo:** Buffalo meat exports, too, **have gone down and never regained their peak** of USD 4.78 billion reached in 2014-15.
- **Raw Cotton, Guar-Gum and Oil Meals:** The **drop has been even more** for raw cotton, guar-gum and oil meals. Exports of the three in 2022-23 were a pale shadow of their highs of 2011-12.
 - Cultivation of **genetically modified Bt cotton** and high global prices had enabled **India to become the world's top producer (ahead of China) and No. 2 exporter (after the US) of the natural fibre**.
 - But with the yield gains from Bt tapering off and the regulatory regime not permitting new gene technologies, **the country has turned from a net exporter to an importer of cotton**.
 - **Guar-gum** (a thickening agent used in extraction of shale oil and gas) and oil meal exports rode the global commodity price boom from 2003-04 to 2013-14.
 - They **haven't shown the same buoyancy in the more recent post-Covid boom**, partly due to **domestic crop shortages – especially in cotton and soyabean** – not generating adequate surpluses for exports.

What have been the Major Contributors to the Import basket?

- India's **basket of imported farm produce is less dominated by agricultural products** compared to its exports.
 - Among these imports, the **most significant is vegetable oils, whose imports have more than doubled** in value terms between 2019-20 and 2022-23.

- **Imports meet roughly 60% of India's vegetable oil requirements** while the dependence on pulses imports is hardly 10% now.
 - The **value of pulses imports has also come down – halved** - from USD 4.2 billion in 2016-17 to USD 1.9 in 2022-23.
- **Imports of spices, cashew, and cotton** – commodities where India has traditionally been a net exporter – **have shown a rising trend**.
 - **Spice imports going up are a reflection of reduced-price competitiveness**, while cotton imports have risen as an outcome of stagnant or falling domestic production.

India's Coffee

Why in News?

Recently, the Statista site stated that India is the **sixth largest producer of coffee in the world**, after **Brazil (largest producer of coffee)**, Vietnam, Colombia, Indonesia, Ethiopia and Honduras.

- In recent times, there has been increasing attention on the **health benefits of South Indian coffee blend**, particularly highlighting the **role of chicory and coffee with milk**.

What is South Indian Coffee Blend?

- **About:**
 - It Includes an **admixture of coffee and chicory powders**.
 - Gives the blend a **unique flavor and characteristics**.
- **Chicory:**
 - Herb native to **Europe and Asia**.
 - Contains **inulin**, a starchy substance beneficial for health which is found in a **wide variety of fruits, vegetables, and herbs, including wheat, onions, bananas, leeks, artichokes, and asparagus**.
 - Possesses **mild laxative properties and it decreases swelling** and is rich in **beta-carotene, providing superior protection against oxidative damage**.
 - **Absence of caffeine in chicory** makes it a suitable complement to coffee, which contains caffeine.

Note:

What are the Key Points about Coffee?

- **History and Commercialization:**
 - Coffee was introduced to India during the late seventeenth century.
 - The **smuggling of seven coffee beans from Yemen to India** by an Indian pilgrim in 1670 marked its initial arrival.
 - The **Dutch**, who occupied parts of India during the 17th century, **played a role in spreading coffee cultivation.**
 - However, it was during the British Raj in the mid-nineteenth century that commercial coffee farming fully flourished, particularly from the Mysore region.
- **Cultivation and Biodiversity:**
 - Coffee Plantation Practices in India:
 - Predominantly grown under **thick natural shade.**
 - Ecologically sensitive regions of the **Western and Eastern Ghats.**
- **Biodiversity Hotspots:**
 - Coffee plantations located in these regions are recognized as **biodiversity hotspots.**
 - Contribute significantly to **India's unique biodiversity.**
- **Export and Domestic Consumption:**
 - Approximately **65% to 70% of the coffee produced in India is exported** and remaining coffee is consumed domestically.
- **Role in Sustainability and Socio-economic Development:**
 - Coffee cultivation plays a vital role in **sustaining biodiversity.**
 - Fosters socio-economic development in remote hilly areas.
- **Climatic Conditions and Soil Types:**
 - **Climate Conditions:**
 - Hot and humid climate, Temperature 15°C to 28°C, and Rainfall 150 to 250 cm.
 - **Harmful Conditions:**
 - Frost, Snowfall, High temperatures above 30°C, and Strong sunlight.
 - **Ideal Soil Conditions:**
 - Well-drained loamy soils, Presence of humus and minerals (iron, calcium), Fertile volcanic red earth, and Deep sandy loam soils.

- **Less Suitable Soil Conditions:**
 - Heavy clay soils, Sandy soils.
- **Geographical Distribution and Varieties:**
 - **Coffee Plantation Locations in India:**
 - Karnataka, Kerala, Tamil Nadu, Andhra Pradesh (Araku Valley), Odisha, Manipur, Mizoram, and Other northeastern states.
- **Major Coffee Producer:**
 - Karnataka accounts for approximately 70% of India's total coffee production.
- **Coffee Varieties in India:**
 - Arabica and Robusta.
 - Characteristics of Arabica:
 - Grown at higher altitudes and it has Higher market value due to its aroma.
 - **Characteristics of Robusta:**
 - Known for its strength and used in various blends.

The Coffee Board of India

- It is a **statutory organization that was constituted under Section (4) of the Coffee Act, 1942.**
- It functions under the administrative control of the **Ministry of Commerce and Industry, Government of India.**
- The Board comprises 33 Members including the Chairperson, who is the Chief Executive and it **functions from Bangalore.**
- The Board mainly focuses its activities in the areas of research, extension, development, market intelligence, external & internal promotion for coffee.

Edible Oil Prices and Significance for India

Why in News?

- Edible oils have experienced significant **Price volatility** over the past 2-3 years.
- The global vegetable oils price index of the **UN Food and Agriculture Organization** experienced a significant drop to **77.8 points** (2014-16 base period value = 100) in **May 2020 during the peak of global Covid lockdowns.** However, it reached an all-time high of **251.8 points in March 2022 following Russia's invasion of Ukraine.**

Note:

What are the Factors for Volatility in Edible Oil Price?

- The war between Ukraine and Russia disrupted the world's supply of this oilseed, as the [Black Sea](#) ports were shut off.
 - Ukraine and Russia accounted for nearly **58% of global production in 2021-22**, causing prices to skyrocket.
- The situation changed with the [Black Sea Grain Initiative](#) agreement between Russia and Ukraine, brokered by the UN and Turkey. The agreement facilitated the safe navigation of vessels carrying grain and foodstuffs from designated Ukrainian ports.
- This led to the shipping out of accumulated sunflower oil, meal, and seed from Ukraine, resulting in **international vegetable oil prices falling below pre-war levels**.

What is the Scenario of Consumption of Cooking Oil in India?

- India consumes **23.5-24 million tonnes (mt) of cooking oil annually**, out of which 13.5-14 mt is imported and the balance 9.5-10 mt produced from domestically cultivated seed.
 - Sunflower is the **fourth largest consumed oil (2-2.5 mt)**, behind mustard (3-3.5 mt), soyabean (4.5-5 mt) and palm (8-8.5 mt).
- Both sunflower and palm oil are **almost wholly imported**, with their domestic production at hardly 50,000 tonnes and 0.3 mt respectively.
- This is unlike **mustard and soyabean**, where the share of domestic output is close to 100% and 30-32% respectively.

India's Fisheries Sector

Why in News?

Government's [Sagar Parikrama](#) is an evolutionary journey envisaged in the sea across the coastal belt aiming to resolve the issues of the fishermen and other stakeholders and facilitate their economic upliftment through various government schemes and programs, including [PMMSY \(Pradhan Mantri Matsya Sampada Yojana\)](#) and [KCC \(Kisan Credit Card\)](#).

What is the Sagar Parikrama Initiative?

- **About:**
 - **Sagar Parikrama'** program envisages to cover the maritime States/UTs in a phased manner. **The journey began on March 5th, 2022**, from **Mandvi, Gujarat**.
 - The journey focuses on bridging the gaps in the expectations of fisher communities, developing **fishing villages**, and **upgrading infrastructure such as [fishing harbors](#)** and fish landing centers.
- **Phases of Sagar Parikrama:**
 - **Phase I:** The journey covered three locations in **Gujarat - Mandavi, Okha-Dwarka, and Porbandar**.
 - **Phase II:** Seven locations were covered in **Mangrol, Veraval, Diu, Jafraabad, Surat, Daman, and Valsad**.
 - **Phase III:** Coastal areas of northern **Maharashtra**, including **Satpati, Vasai, Versova, New Ferry Wharf (Bhaucha Dhakka), and Sasson Dock in Mumbai**, were part of this phase.
 - **Phase IV:** **Udupi and Dakshina Kannada** districts in Karnataka were covered during this phase.
- **Upcoming Phase V:** Phase V of Sagar Parikrama will cover six locations: **Raigad, Ratnagiri, and Sindhudurg Districts in Maharashtra, and Vasco, Maorugoa, and Canacona in Goa**.
 - Maharashtra, with its extensive coastline of **720 km**, has immense **untapped potential in the [fisheries sector](#)**.
 - The state ranks **7th in fish production in the country**, with marine fisheries contributing **82% and inland fisheries 18%**.
 - **Goa, with a coastline of 104 km**, also plays a vital role in the marine fishery sector, providing livelihoods to many.

What is the Status of the Fisheries Sector in India?

- **About:**
 - As the **third-largest fish producer** and the **second-largest aquaculture producer** globally, India recognizes the significance of the fisheries and aquaculture industry.
 - The [Indian Blue Revolution](#) has led to a major improvement in the fishing and aquaculture industries. The industries are regarded as **sunrise sectors** and are anticipated to have a big impact on the Indian economy.

Note:



- In the recent past, Indian fisheries has witnessed a paradigm shift **from marine dominated fisheries to inland fisheries**, with the latter emerging as a major contributor of fish production from **36% in the mid-1980 to 70% in the recent past**.
- The fish production reached an **all-time high of 16.25 MMT during FY 2021-22** with **marine exports** touching Rs. 57,586 Crores.
- **Top Producing States:**
 - **Andhra Pradesh is the largest producer of fish in India** followed by West Bengal.

National Mission on Natural Farming

Why in News?

The Government of India has launched the **National Mission on Natural Farming (NMNF)** as a separate and independent scheme to promote **chemical-free and climate-smart agriculture**.

What is the National Mission on Natural Farming?

- **About:**
 - The **National Mission on Natural Farming (NMNF)** has been formulated by upscaling the **Bhartiya Prakritik Krishi Paddhati (BPKP)** to promote natural farming across the country.
- **Coverage:**
 - NMNF will cover a **7.5 lakh hectare area by developing 15,000 clusters**. The farmers willing to implement natural farming on their field will be **registered as cluster members**, each cluster shall comprise **50 farmers or more with 50-hectare land**.
 - Also, **each cluster can fall into one village** or spread across 2-3 nearby villages under the same gram panchayat.
- **Financial Assistance:**
 - Under NMNF, farmers will receive a **financial assistance of ₹15,000 per hectare per year for three years** for the creation of on-farm input production infrastructure.
 - However, the **incentives would be provided to farmers only when they commit to natural farming** and have actually taken it up.

- If a farmer defaults or does not continue with natural farming, subsequent instalments shall **not be disbursed**.
- **Web Portal for Implementation Progress:**
 - A **Web portal** has also been launched for the **promotion of natural farming with information on the implementation framework**, resources, implementation progress, farmer's registration, blog, and so on.
- **Master Trainers:**
 - The agriculture ministry is undertaking large-scale training of **master trainers, 'champion' farmers and practising farmers** in the techniques of natural farming through the **National Institute of Agricultural Extension Management (MANAGE)** and **National Centre of Organic and Natural Farming (NCONF)**.
- **Establishment of BRCs:**
 - The Centre intends to set up **15,000 Bhartiya Prakritik Kheti Bio-inputs Resources Centres (BRCs)** to provide easy access to bio-resources wherein cow dung and urine, neem and bioculture play an important role.
 - These **bio-input resource centres** would be set up alongside the proposed **15,000 model clusters of natural farming**.

What is Natural Farming?

- **About:**
 - **Natural farming** is a **chemical-free farming method** based on locally available resources.
 - It promotes **traditional indigenous practices**, which give freedom to farmers from externally purchased inputs.
 - The major stress of natural farming is **on-farm biomass recycling with biomass mulching**, use of **on-farm desi cow dung-urine formulation**, managing pests through diversity, on-farm botanical concoctions, and exclusion of all **synthetic chemical inputs directly or indirectly**.

Biotech-KISAN Scheme

Why in News?

The **Biotech-Krishi Innovation Science Application Network (KISAN) scheme** has been successful in providing benefits to over 1 lakh 60 thousand farmers in the last one year.

Note:

What is Biotech-KISAN Scheme?

- **About:** Biotech-KISAN scheme is a **farmer-centric scheme for farmers**, launched in 2017, developed by and with farmers under the **Department of Biotechnology, Ministry of Science and Technology**.
 - It is a pan-India program, following a **hub-and-spoke model and stimulates entrepreneurship and innovation** in farmers and empowers women farmers.
 - It has a unique feature to identify and promote local farm leadership in both genders.
 - Such leadership helps to develop science-based farming besides facilitating the transfer of knowledge.
 - Biotech-KISAN Hubs have been established **covering all 15 agroclimatic zones and Aspirational Districts in the country**.
- **Aim:** The programme links available **science and technology** to the farm by first understanding the problem of the local farmer and then providing scientific solutions to those problems.
 - The Biotech-KISAN hubs are expected to fulfill the technology required to generate agriculture and bio-resource related jobs and better livelihood ensuring biotechnological benefits to small and marginal farmers.
- **Counseling and Demonstrations:**
 - Under the scheme farmers are provided counseling and demonstrations on improved **seed, planting stock of vegetable**, interventions for use of plant growth-promoting **rhizobacteria** (PGPR's)/ bio-fertilizers, **irrigation** & protected cultivation technologies.
 - **Improved livestock** (goat, pig), **poultry and fishery** as well as health management of livestock/poultry are also covered under it.

Open-Source Seeds Movement

Why in News?

With declining public sector breeding and rising dominance of private sector in seed sector, the concept of **Open-Source Seeds becomes increasingly relevant**.

- 'Open-Source seeds' was **first suggested by a Canadian plant-breeder - T.E. Michaels** in 1999 based on the principles of Open-Source Software.
- Farmers have been sharing and innovating on seeds for centuries without claiming exclusive rights or **intellectual property**, similar to how programmers have been sharing and innovating on software.

What is Open-Source Software?

- OSS is software whose **source code is made available to the public** for anyone to view, modify, and distribute under an open source license. This license typically allows **users to access and modify the source code**, as well as to redistribute the software without any restriction on the use or distribution.
 - The concept of OSS originated in the 1980s, but gained wider recognition and popularity in the 1990s, thanks to the efforts of the Free Software Foundation (FSF) and the Open Source Initiative (OSI).
- The benefits of OSS include the ability to **customize the software to meet specific needs**, a reduced cost of ownership, and the potential for greater security due to the increased transparency of the source code. In addition, OSS can foster innovation by allowing developers to build on existing software and improve it.

What are Plant Breeders' Rights?

- The growth of the commercial seed industry, scientific plant-breeding, and the advent of hybrid seeds led to the establishment of **Plant Breeders' Rights (PBR) in many countries**.
- Under the PBR regime, plant breeders and developers of new varieties have the **exclusive right to demand royalties on seeds** and legally enforce PBRs.
- This limited the rights of farmers to use and reuse seeds and restricted their ability to innovate.
- The establishment of the **World Trade Organization (WTO) in 1994** and the **Trade-Related IPR Agreement (TRIPS)** cast a global IPR regime over plant varieties.
 - TRIPS required countries to provide at **least one form of IP protection for plant varieties**, which raised concerns about the freedom to innovate.
- The **Green Revolution** was spearheaded by public-sector breeding institutions and seeds were available

Note:

as 'open pollinated varieties', or as reasonably priced hybrids with no restrictions on farmers to cultivate, reuse and share.

- But the genetic revolution in agriculture was led by the private sector, with seeds mostly made available as hybrids **and/or protected by strong IPRs**.

What are Open-Source Seeds?

- **Need:**
 - The high prices of genetically modified seeds and IP claims triggered many problems, including the **State's intervention on Bt cotton seeds in India**. As public sector breeding declined and the private sector began to dominate the seed sector, the **need for alternatives became keenly felt**.
 - This is when the success of open-source software inspired a solution
- **Open-Source Model:**
 - An open-source model was proposed in 2002 by scientists for seeds and plant varieties, calling it the "**BioLinux model**", and scholars and civil-society members alike discussed and built on it.
 - In 2012, Jack Kloppenburg launched the **Open Source Seeds Initiative (OSSI)** in Wisconsin.
 - It can be used in farmer-led seed conservation and distribution systems. There are many traditional-variety conservation and sharing initiatives in India, including those involving farmers.
 - It can also be used to **promote farmer-led participatory plant-breeding exercises**.
 - Traditional varieties often lack uniformity and aren't of excellent quality. Open source principles can help overcome these **two challenges by facilitating testing**, improvisation, and adoption – all of which will ultimately be beneficial to India's food security and climate resilience.

Ornamental Fish Aquaculture

Why in News?

National Bureau of Fish Genetic Resources (NBFGR) under **Indian Council of Agricultural Research (ICAR)** is providing technical support to provide intensive training to islanders of Lakshadweep for Ornamental Fish Aquaculture.

What is Ornamental Fish Aquaculture?

- Ornamental fish culture is the **culture of attractive, colourful fishes** of various characteristics, which are **reared in a confined aquatic system**.
- Farmers and hobbyists mainly grow it and these fish are also known as **living jewels**.

What is this Initiative About?

- **About:**
 - A total of 82 islanders, including 77 women, underwent training for an **experimental initiative aimed at promoting self-reliance** through community aquaculture.
 - The NBFGR provided support and supplies for capacity building, including **culture devices and shrimp/clownfish seeds**.
 - **Four community aquaculture units** involving 46 women were created and have successfully **raised ornamental shrimps to marketable size**.
 - NBFGR also **maintains a germplasm resource center** on Agatti Island for marine ornamental organism conservation and as a livelihood source for islanders.
- **Significance:**
 - **Limited resources** on the island, mostly in the form of **coconut and tuna fish** make it important.
 - **During the monsoon season, fishing virtually comes to a halt**, shutting out a key economic activity.
 - However, ornamental fish aquaculture is expected to sustain the rhythm of economic life in the islands.

What is ICAR-NBFGR?

- ICAR-National Bureau of Fish Genetic Resources (ICAR-NBFGR) was established in December 1983 at Allahabad.
 - Currently, the office is located in Lucknow, Uttar Pradesh, India.
- It was established **under the aegis of Indian Council of Agricultural Research (ICAR)**.
- It aims to **undertake research related to the conservation of fish germplasm resources** of the country.

Note:



Genetic Improvement Program for Indigenous Fish Species

Why in News?

Union Minister of Fisheries, Animal Husbandry and Dairying, launched three national flagship programmes at [Indian Council of Agricultural Research-CIBA Campus, Chennai](#).

What are the Three National Flagship Programmes Launched?

- **Genetic Improvement Programme of Indian White Shrimp:**
 - The farmed shrimp sector contributes about **70% of India's seafood exports worth Rs. 42000 crores**, but it mostly depends on **one exotic Specific Pathogen-Free stock of Pacific white shrimp species (*Penaeus vannamei*)**.
 - To break this dependence on one species and to promote indigenous species, **ICAR-CIBA has taken up the genetic improvement program** of Indian white shrimp, *P. indicus*, as a national priority under the [Make in India](#) flagship program.
- **Shrimp Crop Insurance:**
 - ICAR-CIBA developed a **Shrimp Crop Insurance** product where the product charges differential premium based on location and requirements of the individual farmer from **3.7 to 7.7 %** of input costs and farmer will be compensated to the tune of **80 %** loss of input cost in the event of total crop loss. i.e., more than 70% crop loss.
- **National Surveillance Programme for Aquatic Animal Diseases (NSPAAD):** **Government of India is implemented** the NSPAAD since 2013 with a major emphasis on strengthening farmer-based disease surveillance system. The results of the first phase proved **the reduction in revenue losses due to diseases, increased farmers' income and exports**.
 - **Phase II:** Government of India has sanctioned the NSPAAD: Phase-II under the [Pradhan Mantri Matsya Sampada Yojana](#) programme of the Govt. of India. It will be implemented at pan-India.

Blue Food

Why in News?

A new study suggests that **blue food** sourced from **aquatic environments** can help **reduce nutritional deficiencies** and contribute to employment and **export revenue in India**.

What is Blue Food?

- **About:**
 - Blue food is food derived from **aquatic animals, plants or algae** that are **caught or cultivated in freshwater and marine environments**.
- **Significance:**
 - **Key Source of Nutrient:**
 - **Blue foods** are important for the **economies, livelihoods, nutritional security, and cultures of people in many countries**.
 - They supply protein to over **3.2 billion people**, are a key source of nutrients in many **coastal, rural and indigenous communities**, and support the livelihoods of over **800 million people**, the majority of whom work in **small-scale systems**.
 - **Low Emission and Tackle Deficiencies:**
 - They **generate lower emissions** compared to terrestrial meat.
 - **Aquatic foods** can also be used to address **B12 and omega-3 deficiencies in India**.
 - Over **91% of countries with vitamin B12 deficiencies** also show high levels of omega-3 deficiency
 - **Reduce Cardiovascular Diseases:**
 - Promoting blue foods over red meat overconsumption could address health and environmental concerns for about 82% of the 22 countries suffering from a high **cardiovascular disease** risk.
 - **Revenue Potential for Global South:**
 - Blue foods can help **improve nutrition, livelihoods or national revenue** for the **global south and indigenous communities** in the global north.

Note:

International Year of Millets

Why in News?

India has shared the vision to make **International Year of Millets 2023** a 'People's Movement' alongside positioning **India as the 'Global Hub for Millets'**.

What is International Year of Millets?

➤ About:

- India's proposal to observe an International Year of Millets in 2023 was approved by the **Food and Agriculture Organisation (FAO)** in 2018 and the **United Nations General Assembly** has declared the year 2023 as the International Year of Millets.
- This was adopted by a United Nations Resolution for which India took the lead and was supported by over 70 nations.

➤ Objectives:

- Awareness of the contribution of millet to **Food Security** and nutrition.
- Inspire stakeholders to improve sustainable production and quality of millets.
- Focus on enhanced investment in research and development and extension services to achieve the other two aims.

What is Millet?

➤ About:

- Millet is a **collective term referring to a number of small-seeded annual grasses** that are cultivated as grain crops, primarily on marginal lands in dry areas in temperate, **subtropical and tropical regions**.
- Some of the common millets available in India are Ragi (Finger millet), Jowar (Sorghum), Sama (Little millet), Bajra (Pearl millet), and Variga (Proso millet).
 - The earliest evidence for these grains has been found in **Indus civilization** and was one of the first plants domesticated for food.
- It is **grown in about 131 countries** and is the traditional food for around 60 crore people in Asia & Africa.
- India is the largest producer of millet in the world.
 - It **accounts for 20 % of global production** and 80% of Asia's production.

➤ Global Distribution:

- **India, Nigeria and China are the largest producers of millets** in the world, accounting for more than **55% of the global production**.
- For many years, **India was a major producer of millets**. However, in recent years, millet production has increased dramatically in Africa.

Note:



Key Points

Details

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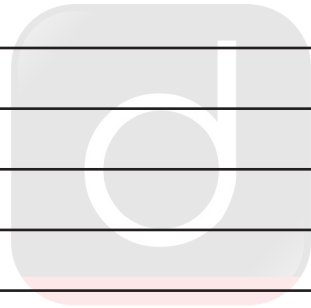
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Summary

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Key Points

Details



Summary