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100 YEARS OF DISCOVERY OF THE INDUS VALLEY CIVILIZATION

Context

• **September 20, 2024** marks the centenary of the announcement of the discovery of the Indus Valley civilisation.

Harappan Civilization

- The Harappan civilization is believed to be one of the oldest world civilizations together with Egypt and Mesopotamia.
- It was developed along the river Indus and for that reason it is also known as the Indus Valley Civilization.
- The Harappan civilization is identified as a Bronze-age civilization because many objects have been found that are made up of copper based alloys.
- Daya Ram Sahni first excavated Harappa in 1921-22, and Rakhal Das Banerji in 1922 started excavating Mohenjo-daro.

Vast civilisation

- The Harappan civilisation can be divided into an;
 - Early phase (3200 BCE to 2600 BCE),
 - The mature period (2600 BCE to 1900 BCE), and
 - The late phase (1900 BCE to 1500 BCE), when it decayed and collapsed.
- Today it spans 2,000 sites across 1.5 million sq. km in India, Pakistan, and Afghanistan.
 - There are about 1,500 sites in northwestern India, including in Gujarat, Haryana, Jammu and Kashmir, Maharashtra, Rajasthan, and Uttar Pradesh.
 - There are about 500 sites in Pakistan, and a few in Afghanistan.
- Mohenjo-daro, Harappa, Ganweriwala (all now in Pakistan), Rakhigarhi, and Dholavira (both in India) are the five biggest Harappan sites.

Significance of discovery

- Most historians were of the opinion that settled life in this part first occurred around the sixth century BCE, leaving a gap in South Asian history.
 - The discovery of the Harappan civilisation filled the so-called gap.
- Also the discovery added one more ancient civilisation in Asia, besides the Egyptian and the Mesopotamian, and unravelled the Harappan civilisation's maritime contacts with West Asia from 3000 BCE.

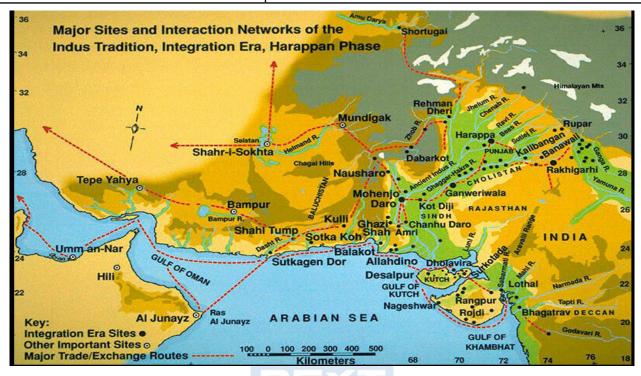
Major Features of Civilization

- Urban Planning: Their towns were well planned and they had brick houses which were situated along the roads.
 - Every house was equipped with a staircase, a kitchen and several rooms.
 - Their courtyards had wells, bathrooms and they had proper drainage systems.
- Ornaments: The Harappans wore ornaments made of gold, silver, ivory, shell, clay, semiprecious stones and others.
- Trade and Commerce: The civilization had extensive trade networks, reaching as far as Mesopotamia, Afghanistan, and the Arabian Peninsula.
- Religion and Iconography: Harappan artifacts depict various symbols and motifs believed to be related to religious beliefs.
 - These include figures such as the "Priest King" and images of animals like bulls, suggesting possible reverence for certain animals.
- Craftsmanship and Artistry: The Harappans produced intricate pottery, including the famous red pottery with black painted motifs.
 - They also created jewelry, sculptures, and seals made of steatite, terracotta, and other materials.
- Agriculture: They cultivated crops such as wheat, barley, peas, and cotton.
- Social Organization: The society was likely stratified, with evidence suggesting a hierarchical structure. This is indicated by variations in housing sizes and the presence of public buildings.
- Decline and Disappearance: The reasons for the decline of the Harappan Civilization are still debated among historians and archaeologists.
 - Possible factors include ecological changes, such as shifts in river courses, as well as invasions and internal conflicts.

Major Harappan Sites

Site	Present Day
Harappa	Punjab, Pakistan
Mohenjo-Daro	Sindh, Pakistan
Dholavira	Kutch district of Gujarat,
Kalibangan	Rajasthan
• Lothal	Gujarat
Rakhigarhi	Haryana

•	Chanhudaro	•	Sindh, Pakistan
•	Ganweriwala	•	Punjab, Pakistan
•	Sutkagendor	•	Baluchistan Province, Pakistan
•	Alamgirpur	•	Uttar Pradesh



Concluding remarks

- For the past 100 years, the Harappan civilisation has mesmerized and baffled town planners, epigraphists, metallurgists, astronomers, and others. Its enigmas have intrigued them.
- At the apogee of its prosperity, it was a "technological powerhouse" that excelled in town planning, harvesting water, building reservoirs, warehouses, underground sullage systems, massive fortification walls and building seafaring boats etc.

Source: TH

FOOD PROCESSING SECTOR IN INDIA

Context

 At the third edition of World Food India 2024, the Prime Minister said that India has introduced "wide-ranging" reforms to transform the foodprocessing sector in the last 10 years.

World Food India

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

- Key sectors being showcased include fresh fruits and vegetables, processed foods and value-added products, basmati rice, animal products, cashew nuts, geographical indication (GI) products, organic products, and alcoholic beverages.
- Agricultural and Processed Food Products Export Development Authority (APEDA) has invited prominent international buyers from approximately 80+ countries.
- It is providing a **platform for Indian exporters** to interact directly with buyers, importers, and international trade representatives.

What is Food Processing?

- Food processing can be defined as the **use of methods and techniques** involving equipment, energy, and tools to **transform agricultural products** such as grains, meats, vegetables, fruits, and milk into **food ingredients or processed food products.**
- This can include a wide range of activities, such as: Preparation, Cooking, Preservation, Packaging and Fortification.
- Formulations and processing techniques are scientifically developed to deliver food that is

safe, eliminating the presence of any harmful chemical contaminants and micro-organisms that could cause food-borne illnesses.

Food Processing Industry in India

- The market size of the food processing sector in India is estimated to reach US\$ 1,274 billion in 2027 from US\$ 866 billion in 2022.
- The growing consumption of food is expected to reach US\$ 1.2 trillion by 2025-26, owing to urbanization and changing consumption patterns.
- The Indian food and beverage packaged industry is experiencing substantial growth with market size projected to increase from US\$ 33.7 billion in 2023 to US\$ 46.3 billion by 2028.
- Reasons for the Growth of Sector: India is the largest producer of milk and spices and one of the leading producers of fruits and vegetables, poultry, and meat.
 - India has access to several natural resources that provides it with a competitive advantage in the food processing sector.
 - Due to its diverse agro-climatic conditions, it has a wide-ranging and large raw material base suitable for food processing industries.

Challenges

- Cold Chain Logistics: Lack of adequate cold storage facilities leads to significant food wastage, especially for perishable items.
- **Transportation:** Poor road and transport infrastructure delay the movement of goods, affecting freshness and quality.
- Complex Compliance: Navigating various regulations and standards set by agencies like FSSAI can be challenging, particularly for small and medium enterprises (SMEs).
- **Bureaucratic Delays:** Obtaining licenses and approvals can be time-consuming, affecting business operations.
- Limited Adoption of Modern Techniques: Many small processors lack access to advanced processing technologies and machinery, which limit efficiency and scalability.
- Price Sensitivity: Consumers are often price-sensitive, which pressures margins for processors.
- Inconsistent Supply: Fluctuations in agricultural production due to weather conditions disrupt the supply chain, leading to shortages and price volatility.

- Health Consciousness: Increasing demand for healthier and organic options requires processors to adapt their offerings, which can be resourceintensive.
- Changing Tastes: Rapid shifts in consumer preferences necessitate constant innovation and product development.
- Waste Management: Efficient waste management systems are needed to minimize the environmental impact of food processing operations.

Government Initiatives

- Initiatives for attracting Investment: Exempting all the processed food items from the purview of licensing under the Industries (Development and Regulation) Act, 1951.
 - 100% Foreign Direct Investment (FDI)
 permitted through automatic route for the
 food processing sector subject to sectoral
 regulations.
 - 100% Foreign Direct Investment, under Government approval route, for trading including through e-commerce, in respect of food products manufactured or produced in India.
 - **Lower GST for raw and processed products;** more than 71.7% food products under various chapter heads/sub-heads are covered in lower tax slab of 0% & 5%.
- MoFPI is also implementing a Centrally Sponsored Scheme- PM Formalisation of Micro Food Processing Enterprises Scheme (PMFME) for providing technical, financial and business support for setting up/upgradation of 2 lakh Micro Food Processing Enterprises.
- MoFPI has also launched the Production Linked Incentive scheme (PLIS) for the period 2021-22 to 2026-27 to create global food champions and improving the visibility of Indian food brands abroad.
- Pradhan Mantri Kisan Sampada Yojana (PMKSY): Launched in 2016, this scheme aims to create modern food processing infrastructure and promote the development of food processing units.
- National Food Processing Policy: This policy aims to enhance food processing capacity and encourage innovation in the sector.
- Market Access: Efforts are being made to improve market access for processed food products through various platforms, including e-commerce and direct selling.

Conclusion

- India's food ecosystem offers enormous investment opportunities with stimulating growth in the food retail sector encouraging economic policies, and attractive fiscal incentives.
- Through the Ministry of Food Processing Industries (MoFPI), Government of India is taking all necessary measures to boost investments in the food processing industry in India.

Source: IE

WHITE REVOLUTION 2.0

Context

 Union Home and Cooperation Minister Amit Shah launched the standard operating procedure for 'White Revolution 2.0'.

About

- Government also launched an action plan on the formation and strengthening of two lakh new Multipurpose Primary Agriculture Cooperative Societies, dairy and fishery cooperatives.
- The White Revolution 2.0 focuses on four key areas - empowering women farmers, enhancing local milk production, strengthening dairy infrastructure and boosting dairy exports.
- White Revolution 2.0 aims to increase milk procurement by dairy cooperative societies by 50 percent over the next five years.
 - The dairy cooperatives will procure one thousand lakh litre of milk daily by the end of the fifth year significantly enhancing the livelihoods of rural producers.
- The plan involves setting up and strengthening 100,000 new and existing district cooperative societies, multi-purpose district cooperative societies, and multi-purpose PACS, which will be linked to milk routes with necessary infrastructure.

White Revolution

- The White Revolution in India, also known as Operation Flood, was a significant dairy development program implemented to enhance milk production and address the country's milk scarcity issues.
- It was launched in 1970 by the National Dairy
 Development Board (NDDB) under the
 leadership of Dr. Verghese Kurien, often referred
 to as the "Father of the White Revolution."

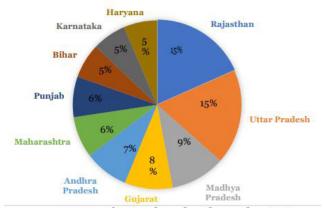
Key features and Achievements of the White Revolution:

- Cooperative Model: It introduced the cooperative model in the dairy industry, encouraging farmers to form dairy cooperatives.
- Amul: The most prominent outcome of the White Revolution was the success of the Gujarat Cooperative Milk Marketing Federation (GCMMF), which marketed its products under the brand name Amul.
- Increased Milk Production: The program led to a substantial increase in milk production across the country by improving the quality of livestock.
- Infrastructure Development: Infrastructure such as milk processing plants, cold storage facilities, and transportation networks were developed to support the growing dairy industry.
- **Economic Impact:** It boosted the income of farmers involved in dairy farming, contributing to the overall economic development of rural areas.
- Replication in Other States: The success of Operation Flood in Gujarat led to its replication in other states, further expanding the reach and impact of the White Revolution across India.

Dairy Sector in India

- **Production:** India is the largest producer of milk in the world, contributing **24% of global milk production in 2021-22.**
 - The top 5 milk-producing states are: Rajasthan, Uttar Pradesh, Madhya Pradesh, Gujarat and Andhra Pradesh. They together contribute 53.11% of total Milk production in the country.

Figure 2: Top 10 Milk Producing States



 Value-Added Products: The dairy sector in India has diversified beyond liquid milk to produce various value-added products such as butter, ghee, cheese, yogurt, and ice cream.

- Economy: The industry contributes 5% to the national economy and directly supports more than 8 crore farmers.
 - The sector is an important job provider, especially for women, and plays a leading role in women's empowerment.

Challenges of Dairy Sector in India

- Low Productivity: The quality of animals is critical in determining its milk productivity and hence overall production.
 - Despite being the world's largest milk producer, India's productivity per animal is very low, compared with the global average.
- Animal health and breeding services provision: Issues such as diseases, lack of proper breeding practices, and insufficient healthcare facilities affect the overall health and quality of livestock.
- Scarcity of fodder resources: There is a lack of regulations to ensure quality. In the absence of a coherent policy, all kinds of substandard feeds are available in the market.
- Infrastructure Constraints: Inadequate infrastructure such as the lack of a robust cold chain result in spoilage of milk and dairy products, especially in regions with inconsistent power supply.
- **Technology Adoption:** Lack of awareness, education, and training among farmers impede the implementation of advanced practices such as artificial insemination, efficient feeding methods, and disease management.
- Market Fluctuations and Price Volatility: The lack of stable and remunerative prices for milk affect the income of dairy farmers, making it challenging for them to plan and invest in their operations.
- **Quality Standards:** Ensuring that products meet both domestic and international quality standards requires investments in quality control measures and adherence to hygiene practices.

Government Initiatives for the Promotion of Dairy Sector

- Rashtriya Gokul Mission: It was launched in 2014, to conserve and develop indigenous cattle breeds.
 - **Aim:** To enhance the productivity and genetic improvement of indigenous cattle.
- National Programme for Dairy Development (NPDD): NPDD has been in place since 2014 and aims to build or strengthen infrastructure for the

- production of high-quality milk as well as for the procurement, processing, and marketing of milk and milk products through the State Cooperative Dairy Federation.
- Dairy Entrepreneurship Development Scheme (DEDS): DEDS is being implemented by the Department of Animal Husbandry, Dairying, and Fisheries to create self-employment opportunities in the dairy industry.
 - It provides financial assistance to individuals for setting up small to medium-scale dairy ventures.
 - The National Bank for Agriculture and Rural Development is carrying out the programme.
- National Animal Disease Control Programme (NADCP): It is a flagship scheme launched in 2019 for control of Foot & Mouth Disease and Brucellosis by vaccinating 100% cattle, buffalo, sheep, goat and pig population.
- National Livestock Mission (NLM): The NLM, launched by the Ministry of Agriculture, aims to ensure sustainable development of the livestock sector, including dairy farming.
 - It focuses on increasing the productivity of livestock, improving their health, and providing support for fodder and feed resources.

Way Ahead

- Faster vaccination drives to overcome situations like Lumpy skin disease death.
- Robust and effective value chain to overcome the supply chain disruption to maintain the demand for milk and milk products.
- By implementing strategies in a coordinated manner, it's possible to reduce the cost of milk production in India while improving the livelihoods of dairy farmers and ensuring a sustainable and thriving dairy industry.

Source: TH

MODIFIED PM-JI-VAN YOJANA

Context

 The government has approved the modified Pradhan Mantri Jaiv Indhan Vatavaran Anukool Fasal Awashesh Nivaran (PM-JI-VAN) Yojana.

About

• The modified scheme extends the implementation timeline by five years, i.e., until 2028-29.

- It now includes advanced biofuels produced from lignocellulosic feedstocks—such as agricultural and forestry residues, industrial waste, synthesis (syn) gas, algae, etc.—within its scope.
- To promote multiple technologies and multiple feedstocks, preference would now be given to project proposals with new technologies and innovations in the sector.
- Significance: The scheme aims to provide remunerative income to farmers for their agricultural residue and address environmental pollution.
 - The scheme also helps create local employment opportunities and contributes to India's energy security and self-reliance.
 - It also supports the development of advanced biofuel technologies and promotes the Make in India Mission.
 - It also helps in achieving India's ambitious target for net-zero GHG emissions by 2070.

About Pradhan Mantri JI-VAN scheme:

- In 2019, Government had notified the "Pradhan Mantri JI-VAN (Jaiv Indhan- Vatavaran Anukool fasal awashesh Nivaran) Yojana".
- It aimed at providing financial support to integrated bio-ethanol projects for setting up Second Generation (2G) ethanol projects in the country using lignocellulosic biomass and other renewable feedstocks.

What are Biofuels?

- Biomass can be converted directly into liquid fuels, called biofuels.
- The two most common types of biofuels in use today are ethanol and biodiesel, both of which represent the first generation of biofuel technology.
- **Ethanol:** Ethanol (CH3CH2OH) is a renewable fuel that can be made from various **plant materials**, collectively known as "biomass."
- Biodiesel: It is a liquid fuel produced from renewable sources, such as new and used vegetable oils and animal fats and is a cleanerburning replacement for petroleum-based diesel fuel.
 - It is nontoxic and biodegradable and is produced by combining alcohol with vegetable oil, animal fat, or recycled cooking grease.

Source: AIR

NEWS IN SHORT

AMAZON RIVER AT RECORD LOW FROM DROUGHT

Context

 The Amazon River basin is experiencing an unprecedented drought, with water levels plummeting to historic lows across the region.

About

- In Tabatinga, a Brazilian town bordering Colombia, the Solimoes River, a major tributary of the Amazon, has reached its lowest level on record.
- The nearby Lake Tefé, where more than 200 freshwater dolphins died in last year's drought, has also dried up, depriving the endangered pink mammals of a favorite habitat.

Amazon River

- It is the **largest river by volume** of water and **second longest river** after the Nile river of Africa in the world. It represents 20% of the global riverine discharge into oceans.
- **Source:** River has its source in the **Peruvian Andes**, at an elevation of 5,598 m.
- **Length:** 6400 km.
- Basin: The basin includes the greater part of Brazil and Peru, some parts of Colombia, Ecuador and Bolivia and a small area of Venezuela.
- Tributaries: Japurá, Juruá, Madeira, Negro, Purus, and Xingu rivers.
- **Mouth:** Atlantic Ocean on the northeastern coast of Brazil.

Source: IT

CONTEMPT OF COURT

In News

 The Jharkhand government has filed a Contempt of Court petition against the Union government, alleging an undue delay in the appointment of the Chief Justice of the Jharkhand High Court.

Contempt of Court

 It refers to actions or behavior that disobey or disrespect the authority, justice, and dignity of a court.

- It is governed by the Contempt of Courts Act, 1971. Article 129 and Article 215 give power to the SC and HCs to punish contempt.
- Types of Contempt of Court:
 - Civil Contempt: Refers to the willful disobedience of any judgment, decree, direction, order, writ, or other processes of a court, or the willful breach of an undertaking given to a court.
 - Criminal Contempt: Involves actions that scandalize or lower the authority of the court, prejudice judicial proceedings, or interfere with the administration of justice. It includes publication of material that undermines the dignity of the judiciary or obstructs justice.
- **Punishment for Contempt of Court:** The punishment can include a fine, imprisonment, or both, depending on the severity of the contempt.

Source: TH

HOW US FED RATE CUT COULD IMPACT THE INDIAN MARKET?

Context

 The United States Federal Reserve announced that it will cut the benchmark interest rate, the Federal Funds Rate, by 50 basis points, or half a percentage point.

About

- A cut in interest rate typically incentivises economic activity, promotes growth, and increases job creation by making it cheaper for people to borrow money.
- Conversely, a hike in interest rates or persistently high interest rates tend to drag down economic growth and employment generation.

Impact on Indian economy

- India is a capital-scarce economy, and lower interest rates in the US will likely incentivise global investors to borrow in the US and invest in India, in stocks, debt, or in the form of foreign direct investment (FDI).
- Repeated lowering of interest rates in the US will also lead to some weakening in the US dollar's exchange rate with other currencies such as the Indian rupee.
 - This, in turn, will impact India's exporters (adversely) and importers (positively).

Source: IE

UNION CABINET APPROVED BHARATIYA ANTARIKSH STATION (BAS)

Context

 The union cabinet chaired by Prime Minister Narendra Modi has approved the building of the first unit of the Bharatiya Antariksh Station (BAS) by extending the scope of Gaganyaan program.

About

- The first module of BAS will be launched in 2028 and by 2035 the fully operational indigenous space station will be created.
- The BAS will be placed in **low earth orbit**, at 400 km above the earth's surface.
- The **revised Gaganyaan Programme** to include the scope of development and precursor missions for BAS, and factoring one additional uncrewed mission and additional hardware requirement for the developments of ongoing Gaganyaan Programme. Now the human spaceflight program of technology development and demonstration is through eight missions to be completed by December 2028 by launching the first unit of BAS-1.
- The **52-tonne space station** will serve as a research platform for Indian astronauts and scientists to conduct experiments in microgravity, astronomy and Earth observation, and will allow astronauts to stay in orbit for **15-20 days**.

Do you know?

Currently, there are **only two operational space stations** – the **International Space Station** (ISS), developed in cooperation by the United States, Russia, Japan, Europe and Canada; and **China's Tiangong Space Station (TSS).**

Source: PIB

TRADEMARK SEARCH TECHNOLOGY

In News

- The Union Minister of Commerce and Industry unveiled the Artificial Intelligence (AI) and Machine Learning (ML) based Trademark Search Technology and IP Saarthi Chatbot.
 - Saarthi Chatbot is a digital assistant to offer instant support for users in navigating the IP registration process.



Trademark Search Technology

- Advanced AI and ML algorithms for precise trademark identification.
- Streamlined search processes for domestic and international businesses.
- Enhanced protection capabilities for trademarks.

Importance

- The initiative supports India's commitment to advancing intellectual property (IP) services and positions India as a leader in IP system innovation.
- The technology aims to speed up trademark application clearance with improved accuracy and efficiency, potentially resolving trademark conflicts.

Source: Pib

CIRCUMNUTATIONS

In News

- The study reveals the role circumnutations could play in plant growth patterns.
 - In this study, researchers found that sunflowers grown in a dense row naturally formed a near-perfect zigzag pattern, with each plant leaning away from the row in alternating directions.

About Circumnutation

- It refers to the slow, repetitive, and often spiral movement observed in the growing tips of plants, such as shoots, tendrils, and roots.
- This movement is caused by differential growth rates in different parts of the plant, particularly in the apical meristem, leading to a helical or circular motion.

Examples:

- Tendrils of climbing plants exhibit circumnutation to locate and coil around supports.
- Roots may use circumnutation to navigate through soil, finding the best path for growth.

Source: theconversation

AMOEBIC MENINGOENCEPHALITIS

In News

Kerala has initiated research on amoebic meningoencephalitis through a One Health platform to study environmental factors and improve diagnostic methods.

About Amoebic Meningoencephalitis

- It is a rare but lethal central nervous system infection caused by free-living amoebae (FLA) found in freshwater, lakes, and rivers.
- Types of Amoebic Encephalitis:
- There are two types—Primary Amoebic Meningoencephalitis (PAM) caused by Naegleria fowleri, and Granulomatous Amoebic Encephalitis (GAE).
- Both have high fatality rates, with PAM primarily affecting children and young adults.
- PAM often occurs in warm climates and during the summer months. Swimming in warm, stagnant freshwater, or using unsterilized water for nasal irrigation, are major risk factors.
- Amoeba Growth and Climate Change: Rising water temperatures due to climate change are expected to increase encounters with N. fowleri, which thrives in warm, stagnant water bodies.
- Symptoms and Diagnosis Challenges: PAM presents with symptoms similar to bacterial meningitis, making early diagnosis difficult.
 Delays in diagnosis often lead to rapid brain damage and death.
- Introduction of Miltefosine: Miltefosine, an antiparasitic drug, was a key addition to the treatment protocol, alongside Amphotericin B, contributing to better outcomes in patients

Source:TH

AMUR FALCONS

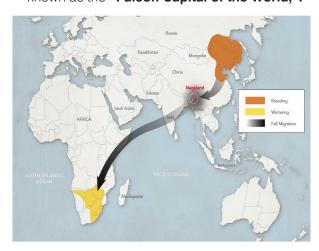
In News

 Manipur's Tamenglong district has imposed a ban on the hunting of Amur Falcons.

About Amur Falcons

- They are small raptors of the falcon family with the scientific name Falco amurensis.
- They are the world's longest travelling raptors and start their travelling routine with the onset of winters, the longest amongst all avian species.
- They are named after the **Amur River** that forms the border between Russia and China.
- They breed in southeastern Siberia and northern China, and migrate across India and then over the Indian Ocean to southern Africa before returning to Mongolia and Siberia.

 Doyang Lake in Nagaland is famous as a stopover for the Amur falcons during their annual migration from their breeding grounds to warmer South Africa. Thus, Nagaland is also known as the "Falcon Capital of the World,".



Conservation Status:

- IUCN: Least Concerned
- Indian Wildlife Protection Act, 1972: Protected
- The Convention on Migratory Species (CMS): Protected

Source: TH

EXERCISE AIKYA

In News

 The National Disaster Management Authority (NDMA) and the Southern Command of the Indian Army are set to host Exercise AIKYA in Chennai.

About Exercise AIKYA

- **Objective:** To foster collaboration, enhance preparedness, and integrate various stakeholders involved in disaster management across India.
- Participation: Representatives from six southern states/UTs (Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Telangana, and Puducherry) participated.
- Key agencies involved: NDMA, Indian Army, Navy, Air Force, NDRF, IMD, INCOIS, and various research institutions including IIT Madras and NIOT.
- **Disaster Scenarios:** The exercise simulated emergency situations such as tsunamis, landslides, floods, cyclones, industrial incidents, and forest fires to test response strategies and improve coordination among agencies.

Source: PIB

