

WEEKLY CURRENT AFFAIRS MAGAZINE for



U.P.S.C.-C.S.E.

JUNE-VOL-IV-2023

23 June to 30 June



-
- UPSC/MPSC/NDA/CDS/CAPF/AFCAT
 - PUNE/THANE/DADAR/ANDHERI/KALYAN/
PCMC/NERUL/BORIVALI/SATARA
 - Offline/Online batches/Video course
 - www.pioneeracademypace.com/.in
 - IVR No. – 75060 10635
-

Topic no	Topic Covered	Page No
ENVIRONMENT		
1.	A NEW STUDY REVEALS CRITICAL GAPS IN STORK RESEARCH; CALLS FOR SCRUTINY OF THE IUCN RED LIST DATA	5-7
2.	UNION ENVIRONMENT MINISTRY GRANTS FINAL APPROVAL FOR KALAINAR PEN MONUMENT IN THE BAY OF BENGAL	7-8
3.	COP28 UAE PRESIDENCY WHY ARE WESTERN LAWMAKERS OPPOSING SULTAN AHMED AL-JABER'S APPOINTMENT?	8-10
4.	BAN ON MORE DRUGS HARMFUL FOR VULTURES WELCOME MOVE, BUT MORE STRINGENT STEPS NEEDED	10-11
5.	TRANSLOCATING JUMBOS A TIGHTROPE WALK FOR ELEPHANTS AND HUMANS	11
6.	KALAKKAD MUNDANTHURAI WLS	12
7.	BANDIPUR TIGER RESERVE	13
8.	SATHYAMANGALAM TIGER RESERVE	14
9.	NILGIRI BIOSPHERE RESERVE	15-16
10.	FAILURE TO FIND ADEQUATE FUNDS MAY HAMPER KUNMING-MONTREAL BIODIVERSITY TARGETS	16-17
11.	SESHACHALAM HILLS	17-18
GEOGRAPHY		
12.	SHIPWRECKS CAN TEACH US A LOT. BUT THE SUBMERSIBLE INCIDENT IS A WARNING	18-19
13.	SEE MAPS OF WHERE THE TITANIC SANK AND HOW DEEP THE WRECKAGE IS AMID THE SEARCH FOR MISSING SUB	20
14.	BRINGING THE ARAVALLIS BACK TO LIFE	21-22
15.	COFFEE	22-23
16.	ARAKU VALLEY	23
17.	FRENCH SHIPPING MAJOR RESUMES SERVICE FOR CASHEW EXPORT FROM GUINEA-BISSAU TO INDIA AND VIETNAM	24-25
18.	HUNDREDS STRANDED AS A FLASH FLOOD, LANDSLIPS DISRUPT HIMACHAL HIGHWAYS	26-29

19.	CONGO: WORLD'S 2ND-LARGEST RAINFOREST CONTINUES TO VANISH WITH HALF A MILLION HECTARES LOST IN 2022, SAYS REPORT	29-31
20.	CENTRE IDENTIFIES 30 CRITICAL MINERALS: WHY, HOW, AND IMPORTANCE OF THE EXERCISE	32-35
21.	INDIA TO SECURE LITHIUM BLOCKS IN ARGENTINA	36
ECONOMY		
22.	RUSSIAN OIL: PAYMENT ISSUES	37-38
23.	SEBI AMENDS REGULATIONS FOR REIT AND INVIT	38-39
24.	STARTUPS LOSE UNICORN STATUS OWING TO FUNDING SQUEEZE	39-40
25.	U.S. AND EU SLOWDOWN TO HURT 1/5TH OF MSMES: CRISIL REPORT	40-41
26.	WORLD ECONOMY AT CRITICAL JUNCTURE IN INFLATION FIGHT: BIS WARMS	41-42
27.	ADVERSE CLIMATE EVENTS CAN INCREASE INFLATION	42-43
28.	ARTEMIS ACCORDS	44-47
29.	WHAT IS INTEREST RATE RISK AND WHY DOES IT MATTER?	47-48
SCIENCE AND TECHNOLOGY		
30.	AFRICA'S LARGEST POLIO VACCINATION DRIVE SINCE 2020 TARGETS 21 MILLION CHILDREN	48-50
31.	ASSAM'S KOKRAJHAR DISTRICT FEASTS ON MUSHROOMS FOR HEALTH AND WEALTH	50-51
32.	THE ROLE OF THE Y CHROMOSOME IN CANCER OUTCOMES STUDIED	52-53
33.	MOSQUITO SURVEILLANCE MUST INCLUDE NON-RESIDENTIAL URBAN ENVIRONMENTS	54-55
34.	HOW PROKARYOTES LED TO EUKARYOTES	55-57
35.	WHAT IS LAB-GROWN MEAT AND WHAT DID THE U.S. RECENTLY APPROVE?	57-58
INTERNATIONAL RELATIONS		
36.	MINERALS SECURITY PARTNERSHIP: INDIA JOINS THE CRITICAL MINERALS CLUB. HERE'S WHY THIS IS IMPORTANT	58-60
37.	INDIA-MONGOLIA TO SET SHIPPING ROUTE FOR COKING COAL SUPPLY	60-61

38.	PARIS FINANCE MEET: MOMENTUM BUILDS FOR POLLUTER TAXES TO FUND GREEN TRANSITION	61-63
SCHEMES		
39.	FACE AUTHENTICATION NOW IN PM-KISAN MOBILE APP, A FIRST FOR GOVT SCHEMES	63-64
HISTORY		
40.	AN EMPEROR'S DREAM, A SAINT'S CURSE: THE LEGEND OF DELHI'S THIRD CITY	65-66

Topic 1. A NEW STUDY REVEALS CRITICAL GAPS IN STORK RESEARCH; CALLS FOR SCRUTINY OF THE IUCN RED LIST DATA

Important for the subject: Environment

A new study examining research on storks worldwide uncovered biases in species coverage and geographical focus, with more focus on Europe and North America as compared to Asia and Africa.

- Study authors find several gaps in the **IUCN Red List classification process**, including a **lack of knowledge on habitat changes and anthropogenic pressures, inaccurate population counts** and so on.
- While all **20 stork species** are included in the **IUCN Red List**, an analysis of studies published between **1950 and 2022** revealed a **concentration of research on only three**.
- Research in **Asia** shows that **storks are not limited to protected areas and are increasingly utilising farmlands and semi-urban areas**. However, colonial presumptions about ideal bird habitats hinder research in anthropogenic landscapes.

Geographical and species unevenness:

- Agricultural and unprotected landscapes are largely ignored by researchers in Africa, as there is a preference for conducting research in national parks, where abundant wildlife and picturesque environments are found.
- The majority of the stork population exists outside the protected areas, so there is limited knowledge about this significant portion of the country's stork population.
- The **IUCN** generally relies on **robust processes, population metrics, regional variations and habitat relationships to classify species**. However, in the case of storks, the rules and processes defining the IUCN's approach to classifying species' status are not being followed.

IUCN Red List for birds:

- The **IUCN Red List for birds** is compiled and managed by **BirdLife International**, which analyses data from published reports to categorise more than 10,000 species of land birds, migratory birds, seabirds and waterbirds into critically endangered (CR), endangered (EN), vulnerable (VU), near threatened (NT), least concern (LC), and data

deficient (DD).

- The **Bombay Natural History Society (BNHS)** is **Bird dLife International's** partner organization for data on **Indian birds**. The **Red List is updated annually** after high-quality population assessments and population trend data is compiled and analyzed by **IUCN Red List** to determine the appropriate categorization for each species.

Why IUCN Red List data needs to be strengthened:

- IUCN Red List is a crucial metric that guides conservationists, governments, as well as donor organizations.

It would help in finding some questions like:

- Why do agricultural fields in India provide more favourable conditions for storks compared to those in the U.S. or U.K.?
- This could help allocate funds to species that actually need the aid. Better management of the population of these birds.

About Stork:

Scientific Name: Leptoptilos dubius

Genus:

- The greater adjutant is a member of the stork family, Ciconiidae.
- There are about **20 species** in the family.
- They are long-necked large birds.

Habitat:

- Once found across South and Southeast Asia, the Greater Adjutant is one of the most threatened stork species in the world. There are **only three known breeding grounds** – one in **Cambodia** and **two in India (Assam and Bihar)**.

Threat:

- The widespread destruction and degradation of the wetlands that this scavenger bird needs to forage (i.e. search for food) and the loss of its nesting trees, led to a decline.

Protection Status:

IUCN Red List: Endangered

Wildlife (Protection) Act 1972: Schedule IV

Significance:**Religious Icon:**

- They are considered the mount of Vishnu, one of Hinduism's prime deities. Some worship the bird and call it "Garuda Maharaj" (Lord Garuda) or "Guru Garuda" (Great Teacher Garuda).

Helpful for Farmers:

- They help farmers by killing rats and other farm pests.

Topic 2. UNION ENVIRONMENT MINISTRY GRANTS FINAL APPROVAL FOR KALAINAR PEN MONUMENT IN THE BAY OF BENGAL*Important for the subject: Environment*

The Union Ministry of Environment has given **Coastal Regulation Zone (CRZ) clearance** for the **Tamil Nadu** government's proposal to construct the **Muthamizh Arignar Dr. Kalaingar pen monument in Bay of Bengal**, off the **Marina beach** in Chennai, with **15 conditions**.

- The **CRZ clearance** was provided based on the recommendations of the **Expert Appraisal Committee (CRZ)** and **Tamil Nadu Coastal Zone Management Authority**.
- It has also noted that the **Ministry may revoke or suspend the clearance if the implementation of the conditions were not found satisfactory**. The **environment statement** would have to be submitted to the **Tamil Nadu Pollution Control Board every year** and the compliance of conditions need to be uploaded on PWD website.

The structure:

- The Pen Memorial pays tribute to **M. Karunanidhi**. The idea of a monument on water derives from the metaphorical catamaran to which Karunanidhi compared himself.



- The pen monument will be **30 meters high** and it would be spread over **8,551 sq.m.** This would include a **pen pedestal, a lattice bridge above the beach** and a **land and pedestrian pathway above the sea.**
- The **7-metre wide bridge** would be **290-metre long** over the land and **360-metre** long over the sea. **Chennai-based Hubert Enviro Care Systems** was the **infrastructure and environmental consultant** for the project.
- The **PWD** would prepare a detailed project report for executing the project based on the Ministry's approval.

Conditions:

- No objection certificate from **INS Adyar** that is situated **800 metres** away from the project site before the construction; Monitoring of **erosion and accretion studies** should be done; Reports on **crowd management and emergency evacuation plans** executed must be provided to the regional environment office.

Features:

- The design of the monument is based on the **Veena**, a **traditional Carnatic musical instrument** that is handmade in **Tamil Nadu** with extreme precision.
- The **Thumba** is used to represent the **pen pedestal**, the neck portion of the long bridges, the music hole a pen statue, and the peg the tensile canopy seating on the bridge.
- The frets are used to represent the distance between the bridge's columns, and the strings are used to represent the Meru or Kudira
- The design for the landscaped garden on the memorial pedestal is inspired by **Sikku Kolam**, a traditional drawing made by Tamil women in their homes, in which a geometric shape is created using dots and circles. Locally procured granite will be used for the memorial.

Topic 3. COP28 UAE PRESIDENCY WHY ARE WESTERN LAWMAKERS OPPOSING SULTAN AHMED AL-JABER'S APPOINTMENT?

Important for the subject: Environment

The **UAE** announced **Mr. al-Jaber**, the State oil company CEO, as its pick in January, a move that has faced backlash from Western lawmakers, leaders of some countries, as well as

civil society groups.

- More than 130 lawmakers from the United States and the European Parliament last month wrote a letter to European Commission chief Ursula von der Leyen and U.S. President Joe Biden asking them to urge the **UAE to withdraw its appointment of Mr. al-Jaber as the COP28 President.**
- They argued that the move could **risk undermining the climate negotiations** and asked the world leaders to help restore “**public faith in the COP process severely jeopardised by having an oil company executive at the helm.**”

Who is Sultan al-Jaber?

- He is the **CEO of the Abu Dhabi National Oil Company (ADNOC) since 2016.** He was appointed as **UAE’s Minister of Industry and Advanced Technology in 2020**, a new department established that year. He has a chemical engineering and economics background, and was serving as a **Minister of State in the UAE government since 2013.**
- Also in **2020**, he was for the **second time appointed as the UAE’s special envoy for climate change**, a role previously held by him from 2010 to 2016. He is also **servicing in a contrasting role**, as the **Chairman of Masdar, a renewable energy firm in Abu Dhabi**, which he helped start in 2006.
- The Guardian reported late last month that Mr. al-Jaber’s team was being accused of attempting to “**greenwash**” his image.

Why has Mr. al-Jaber’s advocacy of carbon capture been criticised?

- Mr. al-Jaber insists on oil and gas continuing to play a role in the future, provided their emissions are somehow curbed. Climate campaigners and scientists have expressed caution that technologies proposed so far to capture fossil fuel emissions have not been tested at scale.
- While taking the immediate phase out of fossil fuels off the table, Mr. al-Jaber has reiterated the need to double down on renewables.

Post of COP president: Their role and responsibilities:

- The government of the host country holds the **presidency for one year.** It usually names one of its ministers as the president.

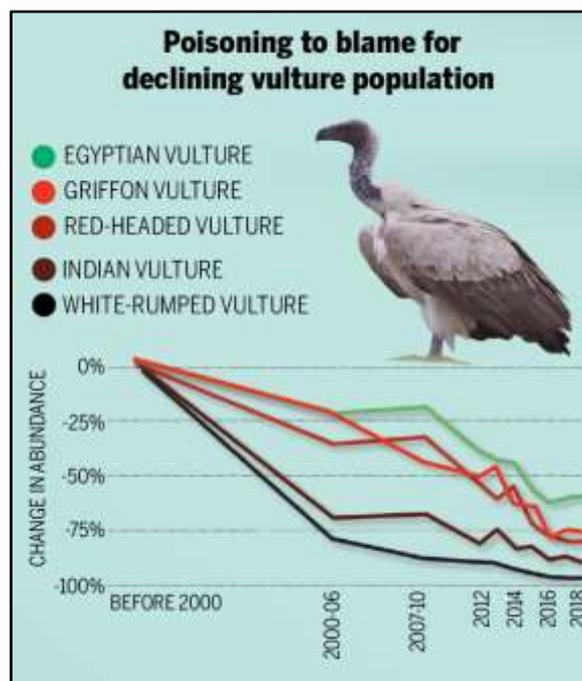
- The role of the COP president is to facilitate and guide the negotiations. The President does not have any special powers but does play a key role in prioritizing the agenda of discussions and helping forge a consensus on important issues.
- They are usually extremely active behind the scenes, brokering deals and compromises, mediating conflicts, and acting as crisis managers.

However, the final decisions are always taken by consensus. Extended role of COP presidents:

- For the past few years, COP presidents have engaged in pre-conference diplomacy, travelling all over the world to hold discussions with governments in order to understand their priorities and to get a sense of the kind of agreement that could be realistically achieved at the conference.
- There have been several instances when a single country– and not one from among the most powerful- has stood up and disagreed with the rest of the world, and the conference had to accommodate its concerns.

Topic 4. BAN ON MORE DRUGS HARMFUL FOR VULTURES WELCOME MOVE, BUT MORE STRINGENT STEPS NEEDED

Important for the subject: Environment



Vulture conservationists and experts have welcomed the central government's move to ban veterinary drugs **aceclofenac** and **ketoprofen** which are fatal for vultures, but suggest more needs to be done for creating a safe environment for the bird.

- Ban on three drugs —**aceclofenac, nimesulide and ketoprofen**— had been requested.
- The decision taken on the ban by the **Drugs Technical Advisory Board** in May is the second big step towards vulture conservation since the **banning of Diclofenac in 2006**.
- **Nimesulide** continues to possess a threat and should be banned soon **Ketoprofen** and **aceclofenac** in cattle are equally toxic as **Diclofenac** and can kill vultures. Studies showed that **aceclofenac was rapidly metabolised into diclofenac** and **ketoprofen is toxic to Gyps vultures**.

Vultures:

- The vulture is a **critically endangered species**, according to the **International Union for Conservation of Nature**. Three Gyps species namely **long-billed vulture (Gyps indicus)**, **oriental whitebacked vulture (Gyps bengalensis)** and **slender-billed**

Topic 5. TRANSLOCATING JUMBOS | A TIGHTROPE WALK FOR ELEPHANTS AND HUMANS

Important for the subject: Environment

The recent translocation of **Arikompan**, an elephant from Kerala, to the **Kalakkad Mundanthurai Wildlife Sanctuary** in **Tamil Nadu** has brought back into focus the variables that dictate the success of such operations.

The attempt is two-fold:

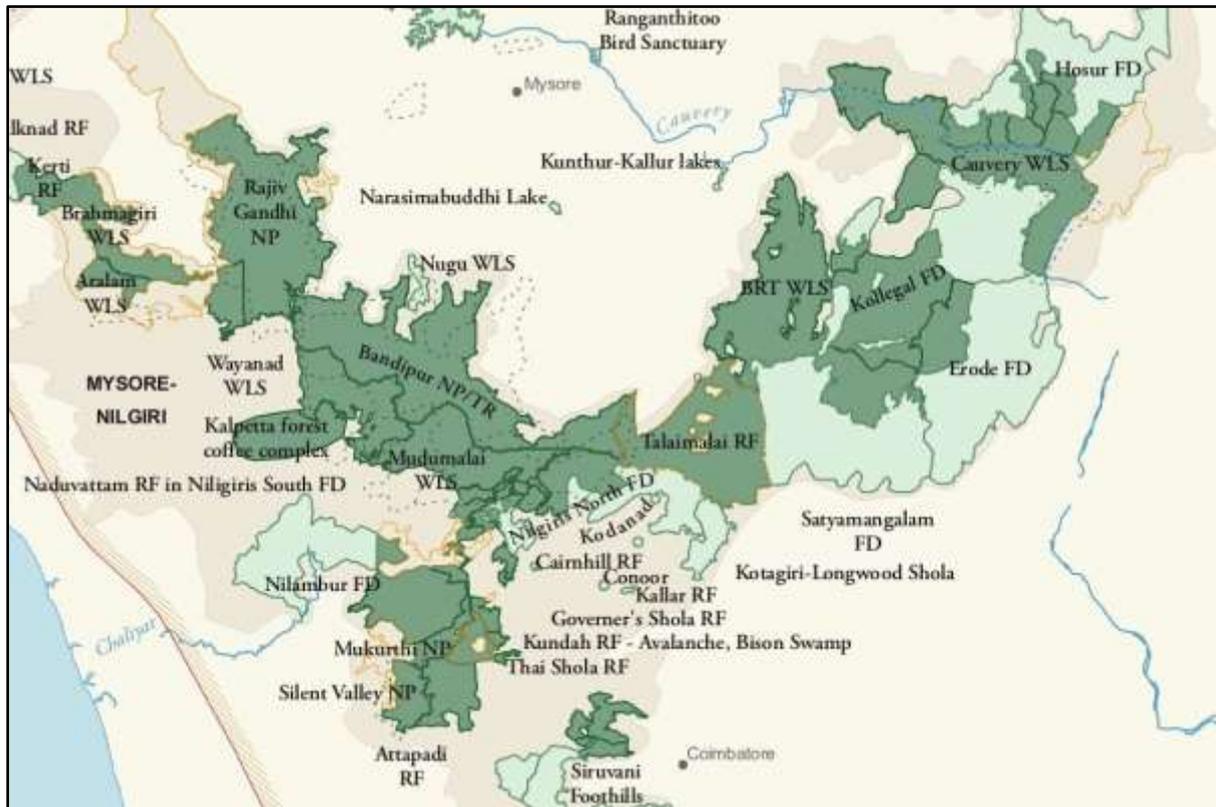
- To give the elephant a second chance at a life in the wild, and To provide villagers peace of mind from the threat of attacks for food.
- According to experts, **four of the last five elephants** released inside the reserve or in the surrounding areas after being captured have either been **recaptured or have died**.

Protected areas:

- **Protected areas in News Description**

Topic 6. KALAKKAD MUNDANTHURAI WLS

Important for the subject: Environment



Kalakkad Mundanthurai Tiger Reserve (KMTR) located in the **South Western Ghats montane rain forests** in Tirunelveli district and Kanyakumari district in the South Indian state of **Tamil Nadu**, is the **second-largest protected area in Tamil Nadu**.

It is part of the **Agasthyamala Biosphere Reserve**.

- Included in “Project Tiger” in fiscal year 2010-11. The reserve forms the catchment area for **14 rivers and streams**. Among these rivers and streams are the Ganga, Tambraparani, Ramanadi, Karayar, Servalar, Manimuthar, Pachayar, Kodaiyar, Gadanathi River, and Kallar.

Topic 7. BANDIPUR TIGER RESERVE

Important for the subject: Environment



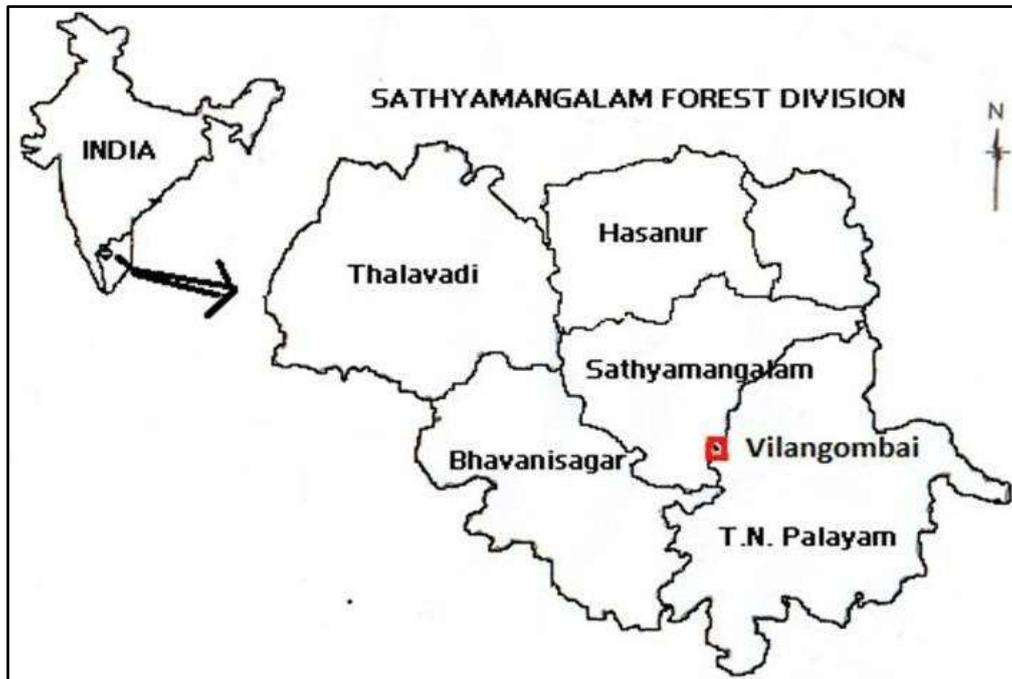
Located in Karnataka

This National Park was formed by including most of the forest areas of the then **Venugopala Wildlife Park** and named as Bandipur National Park. Brought under Project Tiger in 1973.

- The reserve lies in one of the **richest biodiversity areas** of our country representing the “**Western Ghats Mountains**
- **Biogeography Zone**”, surrounded by **Mudumalai Tiger Reserve (Tamil Nadu)** in the **South**, **Wayanad Wildlife Sanctuary (Kerala)** in the **Southwest** & on the **North West Side** the **Kabini Reservoir** separates the **Bandipur and Nagarhole Tiger Reserve**.
- The reserve is recognized as one of the **Mega Biodiversity Areas** in the country and is home to rich floral and faunal diversity.

Topic 8. SATHYAMANGALAM TIGER RESERVE

Important for the subject: Environment

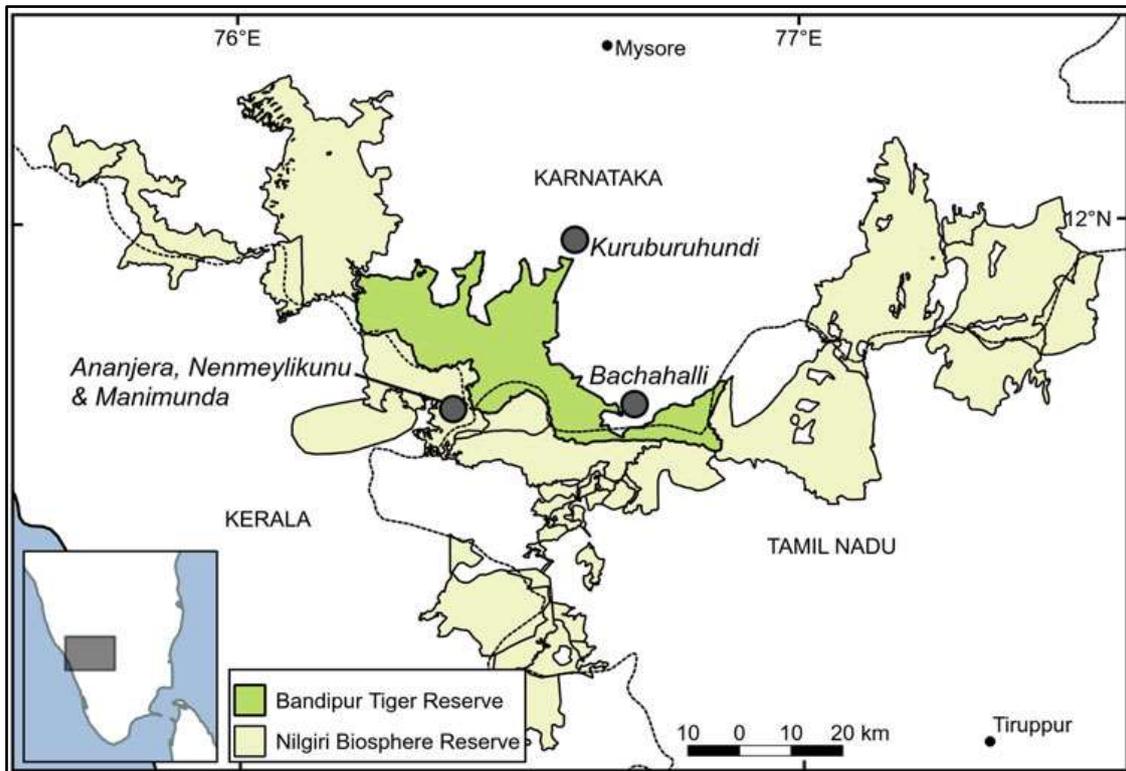


It is a protected area and tiger reserve in the **Eastern Ghats** in the Erode District of the Indian state of **Tamil Nadu**.

- **Sathyamangalam Tiger Reserve**, the **Gateway to Eastern Ghats**, is a significant ecosystem and a wildlife corridor in the **Nilgiri Biosphere Reserve** between the **Western Ghats** and the rest of the **Eastern Ghats**.
- It is a **genetic link** between the **five other protected areas** which it adjoins, including the Billigiriranga Swamy Temple Wildlife Sanctuary, Sigur Plateau, Mudumalai National Park, Bandipur National Park and the Cauvery Wildlife Sanctuary.

Topic 9. NILGIRI BIOSPHERE RESERVE

Important for the subject: Environment



It harbours a wide spectrum of ecosystem types such as **tropical evergreen forests**, **Montane sholas** and **grasslands**, **semi-evergreen forests**, **moist deciduous forests**, **dry deciduous forests** and **thorn forests**.

The major part of the core areas spread over **Kerala and Tamil Nadu States**.

- This range of ecosystem occurs from **hilly terrain** to the **meadows** extending from **300 to 2670 m** constituting an excellent habitat for the flora, fauna and other microbial forms.
- The varied habitats of the NBR house a sizeable number of species of animals and plants including a **large number of endemics having special relevance to conservation**.
- **Fauna:** Animals like Nilgiri tahr, Nilgiri langur, slender loris, blackbuck, tiger, gaur, Indian elephant and marten are found here.
- **Tribal Population:** Tribal groups like the Todas, Kotas, Irullas, Kurumbas, Paniyas, Adiyans, Edanadan Chettis, Cholanaickens, Allar, Malayan, etc., are native to the reserve.

Protected Areas within the Nilgiri Biosphere Reserve are:

- The Mudumalai Wildlife Sanctuary, Wayanad Wildlife Sanctuary, Bandipur National Park, Nagarhole National Park, Mukurthi National Park and Silent Valley.

Topic 10. FAILURE TO FIND ADEQUATE FUNDS MAY HAMPER KUNMING-MONTREAL BIODIVERSITY TARGETS

Important for the subject: Environment

Global Environment Facility (GEF) Council meeting is being held on 26 June 2023 in Brazil.

- GEF was tasked to find funds for the implementation of the **Global Diversity framework** adopted last December at the **15th Conference of the Parties (COP15)** to the **Convention on Biological Diversity (CBD)**.
- At COP15, it was decided that a **new trust fund**, the **Global Biodiversity Framework Fund (GBF)**, would be put in place to run the projects under the framework. Under **Target 19 of the GBF**, members have to generate **at least \$200 billion per year by 2030** for biodiversity.
- Financial assistance to developing countries and countries with economies in transition has to reach at least \$20 billion per year by 2025 and at least \$30 billion per year by 2030.
- GEF hopes that the initial contributions to the fund would reach **\$200 million** from at least three donors by December 2023.
- The **Global Biodiversity Framework Fund** would separate biodiversity from the remaining financing by GEF, which at present manages **six multilateral environmental agreements**.
- Other than the **Convention on Biological Diversity**, GEF also funds the United Nations Convention to Combat Desertification, the United Nations Framework Convention on Climate Change, the Stockholm Convention on Persistent Organic Pollutants, the Minamata Convention on Mercury and the Montreal Protocol on Substances that Deplete the Ozone Layer.
- A **seventh — United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of Areas Beyond National Jurisdiction** — is likely to be added to this list at the Brazil meeting.

About Global Environment Facility (GEF) Council:

- The **Global Environment Facility** has a unique governing structure organized around an

Assembly, the Council, the Secretariat, 18 agencies, a Scientific and Technical Advisory Panel, and the Evaluation Office.

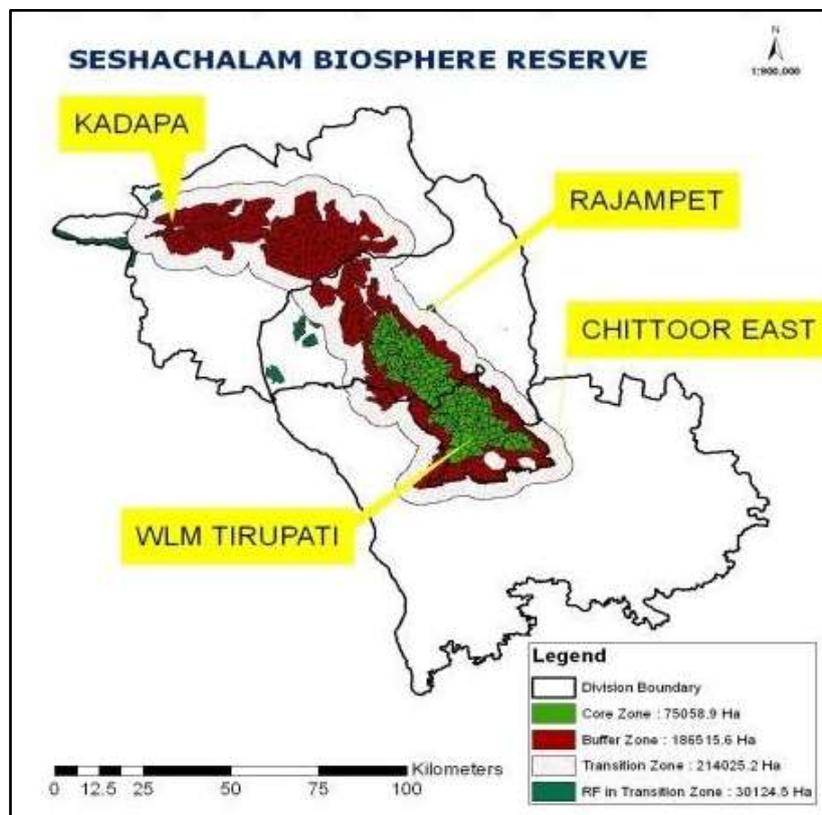
- The GEF serves as a financial mechanism for several environmental conventions.

The Council:

- The Council, the **GEF's main governing body**, comprises **32 members** appointed by constituencies of **GEF member countries** (14 from developed countries, 16 from developing countries, and two from economies in transition).
- Council members rotate at different intervals determined by each constituency. The Council, which meets twice annually, develops, adopts and evaluates the operational policies and programs for GEF-financed activities.
- It also reviews and approves the work program (projects submitted for approval), making decisions by consensus.

Topic 11. SESHACHALAM HILLS

Important for the subject: Environment



About Seshachalam Hills:

The Seshachalam Hills are a part of **the Eastern Ghats in Andhra Pradesh**. They are a **group of seven hills** namely, Seshadri, Neeladri, Garudadri, Anjanadri, Vrishabhadri, Narayanadri and Venkatadri.

- The ranges were formed during the Precambrian era (3.8 billion to 540 million years ago)
- The Seshachalam hills **consist of sandstone and shale along with limestone**. Tirupati which is considered as one of the major Hindu pilgrimage towns in India is located in the hills.
- The **Srivenkateshwara National Park** is also located in this mountain range. Seshachalam was designated as a **Biosphere Reserve in the year 2010** It has large **reserves of red sandalwood**.

Tribes of Yanadis are the native population of the reserve.

Nagarjunasagar Srisailem Tiger Reserve

- The Nagarjunasagar-Srisailem Tiger Sanctuary was declared officially in 1978 and has been recognized by the Project Tiger in 1983. Nagarjunasagar-Srisailem Tiger Reserve is **the largest tiger reserve in India**.
- In 1992, it was **retitled as Rajiv Gandhi Wildlife Sanctuary**. The Tiger reserve is **spread over 5 districts in Andhra Pradesh and Telangana**.
- The area consists **mostly of the Nallamala Hills**. The multipurpose reservoirs- Srisailem and Nagarjunasagar are located in the reserve. The **Krishna River cuts the basin** of this reserve.

Topic 12. SHIPWRECKS CAN TEACH US A LOT. BUT THE SUBMERSIBLE INCIDENT IS A WARNING

Important for the subject: Geography

The **Titan**, belonging to the private company **Ocean Gate Expeditions**, had taken the tourists to the wreck of the **RMS Titanic** in the waters of the **North Atlantic**. Contact with the **Titan** was lost one hour and 45 minutes into its dive on the afternoon of June 18, 2023, according to the US Coast Guard.

Wreck tourism in India:

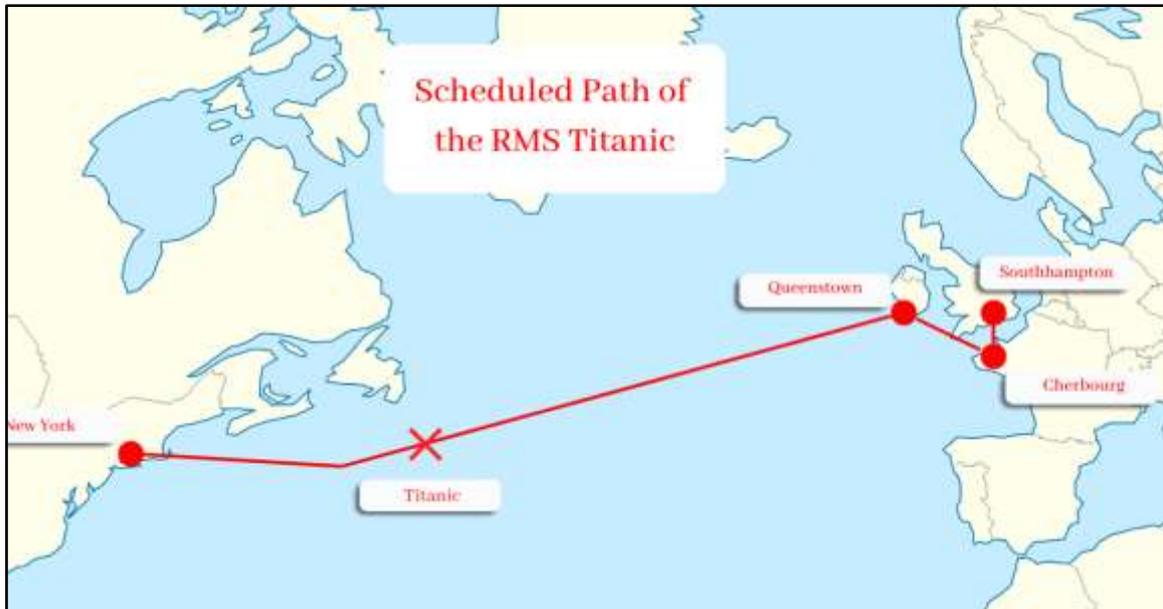
- Wreck tourism in India mostly took place in the **Andaman & Nicobar Islands, Goa, off Visakhapatnam and Lakshadweep.**
- India's maritime history was 5,000 years-old and details on ancient or historical period shipwrecks were very inadequate. The **recorded shipwreck history of India** starts from the **European period onwards.**
- Since the initiation of shipwreck studies in Indian waters shipwrecks have been explored in (**Sunchi Reef, St George's Reef, Ameer Shoals, SailRock, Grande Island**) off Goa, (four in **Minicoy Island** and one in **Suheli Par**) off **Lakshadweep Islands**, and one each off **Poompuhar** and **Konark** in **Tamil Nadu** and **Odisha** waters respectively.
- There are plenty of references in the literature about shipwrecks. But their exact locations are not known. **Most shipwrecks are discovered globally by fishers** who usually come across items from a wreck in their nets.
- The other way can be if **industrial organisations carry out a survey of the seafloor** and may stumble across a wreck sometimes.
- Medieval shipwrecks may help in the understanding of history and the actual mechanics of trade. There is a very strong case for systematic archaeology along the entirety of India's coast.

Limitations:

- Shipwreck tourism is very limited in India because **India is a tropical country.** Because of the **monsoon and wind currents**, such tourism usually happens **only for 2-3 months.**
- The **cost is very high** so only a few can afford it. Very limited research on shipwrecks. No dedicated organisation for shipwreck studies.

Topic 13. SEE MAPS OF WHERE THE TITANIC SANK AND HOW DEEP THE WRECKAGE IS AMID THE SEARCH FOR MISSING SUB

Important for the subject: Geography



Titanic’s planned path:

The voyage started in 1912. It took off from **Southampton, England**, for **New York City**. It first made stops in **Cherbourg, France**, and **Queenstown, Ireland**, before heading across the Atlantic. It was supposed to return via **Plymouth, England**, and **Cherbourg** — but never made it to New York. On **April 15, 1912** it hit an iceberg in the Atlantic Ocean. The massive ship broke into two parts and sank to the bottom of the ocean, killing about 1,500 people.

Where is the Titanic wreckage?

- The ship was near **Newfoundland, Canada**, when it sank. It was just about **400 miles off the coast**.
- Most of the **Titanic wreckage** remains **about 350 miles** off the coast of **Newfoundland**, according to NOAA. The wreckage was first located in **1985** by marine explorer **Robert Ballard**.
- The Titanic is sitting on the ocean floor, about **12,500 feet below sea level**. The two broken parts of the ship – the bow and the stern — are more than **2,600 feet apart** and are surrounded by debris.

Topic 14. BRINGING THE ARAVALLIS BACK TO LIFE

Important for the subject: Geography

Tree species like Sheesham, babool and others planted over 75 hectares of land that was previously mined illegally are helping restore greenery and bring back wildlife.

Mining activities in Aravallis:

- The **Aravallis** spanning **Delhi, Haryana** and **Rajasthan** have been **infamous for stone mining** to fuel the construction boom in the **National Capital Region**.

Impact of indiscriminate mining include:

- Widespread reduction in hill ranges Formation of deep crater-like lakes filled with rainwater Brown and rugged pyramid-like structures formation **Increased pollution:** Air, water and soil pollution

Steps taken to protect the Aravallis from mining:

- Rajasthan forest department joined forces with the police to stop the mining activities in these areas.
- Plantation activity started in 2019-2020 and the local residents were involved in the plantation process.
- The area was covered with **locally available moonj grass** to provide livelihood options to the local residents.

The grass is useful for:

- Binding the soil Thatching roofs Making brooms, handicrafts and furniture items

Outcome of the efforts:

- A few months after the plantation, a **baya weaver bird** was spotted. Antelope and Nilgai were also spotted. Women started to growing and harvesting the **Jau (Barley) crop**.

About Aravallis:

- The **Aravalli Range** (also spelled Aravali) is a mountain range in Northwestern India.
- It runs approximately **670 km (430 mi)** in a **southwest direction**, starting near **Delhi**,



passing through **southern Haryana and Rajasthan**, and ending in **Gujarat**. The **highest peak** is **Guru Shikhar** at **1,722 meters (5,650 ft)**. **Guru Shikhar** is a peak in the **Arbuda Mountains** of **Rajasthan**. It is 15 km from **Mount Abu**.

- Three major rivers and their tributaries flow from the Aravalli, namely **Banas** and **Sahibi Rivers** which are tributaries of **Yamuna**, as well as **the Luni River** which flows into the **Rann of Kutch**.
- The Aravalli Range is arguably the **oldest geological feature on Earth**, having its origin in the **Proterozoic era**. The **Aravalli Range** is rich in **natural resources** and serves as a check to the **growth of the western desert**.

Topic 15. COFFEE

Important for the subject: Geography

Andhra Pradesh's **Araku Valley Coffee** gets organic certificate.

Geographical Conditions

Coffee plant requires hot and humid climate with temperatures ranging between 15°C and 28 °C and rainfall from 150 to 250 cm. Frost, snowfall, high temperature above 30°C and strong sun shine is not good for coffee crop and is generally grown under shady trees.

Dry weather is necessary at the time of ripening of the berries. Stagnant water is harmful and the crop is grown on hill slopes at elevations from 600 to 1,600 meters above sea level. Well drained, loams containing good deal of humus and minerals like iron and calcium are ideal for coffee cultivation.

Geographical Distribution

- In India, coffee is cultivated in about 4.54 lakh hectares by 3.66 lakh coffee farmers of which 98% are small farmers.

The cultivation is mainly done in the Southern States of India:

1. Karnataka – 54%
 2. Kerala – 19%
 3. Tamil Nadu – 8%
- It is also grown in non-traditional areas like Andhra Pradesh and Odisha (17.2%) and

North East States (1.8%).

- India is the only country in the world where the entire coffee cultivation is grown under shade, hand-picked and sun dried.
- India produces some of the best coffee in the world, grown by tribal farmers in the Western and Eastern Ghats, which are the two major biodiversity hotspots in the world.
- Indian coffee is highly valued in the world market and is sold as premium coffee in Europe. India ranks 6th among the world's 80 coffee producing countries, with some of the finest robusta and some top-notch arabica cultivated.
- Nearly 70% of India's coffee is exported, largely to European and Asian markets. Coffee in India is traditionally grown in the rainforests of the Western Ghats in South India, covering Chikmagalur, Kodagu (Coorg), Wayanad, the Shevaroy Hills and the Nilgiris.

Topic 16. ARAKU VALLEY

Important for the subject: Geography

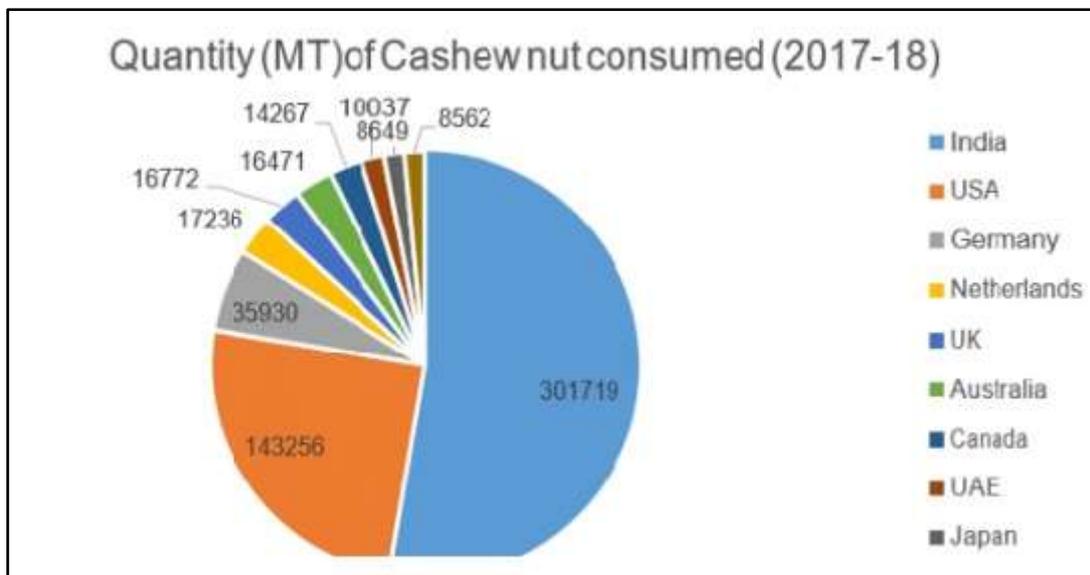
Araku Valley is a hill station in Eastern Ghats

Araku Valley, home to the Araku tribes, is approximately 114 km from the popular coastal city of Visakhapatnam. It home to the Araku tribes, is approximately 114 km from the popular coastal city of Visakhapatnam.

- Araku Valley is home to the biodiversity hotspots – **Anantagiri and Sunkarimetta Reserved Forest**. Araku Valley is also home to two of the highest peaks in the Eastern Ghats – **Jindhagada Peak and Gallikonda Peak**.
- The **Ananthagiri Hills** is also home to **Borra Caves**, one of the largest caves systems in India. The limestone formations (**stalactites and stalagmites**) are millions of years old. A lot of these structures have been given religious interpretations by the locals, due to which the site has become a popular place for religious gatherings.

Topic 17. FRENCH SHIPPING MAJOR RESUMES SERVICE FOR CASHEW EXPORT FROM GUINEA-BISSAU TO INDIA AND VIETNAM

Important for the subject: Geography



Every June, French shipping major CMA CGM resumes its fortnightly **Bijagos Shuttle container service** (for three to four months), **connecting by sea the small West African tropical country of Guinea-Bissau with Spain’s Algeciras (about 3,500 km).**

- This dedicated sea container service **exports huge quantities of cashew from Guinea-Bissau to India and Vietnam.**
- In 2022, **Guinea-Bissau exported 2, 31, 000 tonnes of raw cashew nuts.** The line said it has dedicated hubs in **Mundra, Port Klang and Singapore.** Other major shipping lines like **Maersk and MSC** also provide various transportation modes, including multimodal, to **export cashew from GuineaBissau to India.**

Cashew production and export:

- Cashew is by far the **most important cash crop in Guinea-Bissau,** representing **60 per cent of the country’s exports.** It is the **main source of income** in rural areas.
- The **estimated area under cashew cultivation is 223,000 hectares** with an **annual production of 230,000 tonnes,** making **Guinea-Bissau the fifth largest producer in the world.**
- Almost all (98%) of the cashew nuts produced in **Guinea-Bissau are exported to India**

for processing.

- **Beta Group**, the **Kerala-based food company**, which owns the **Nut King brand**, will set up an **industrial unit** in the **West African country of Guinea-Bissau** for the cashew business.

Cashew production in India:

- **India** is the **second-largest cashew producer** in the world after **Vietnam**. Cashew cultivation is undertaken in India in around **10.11 lakh hectares**, the **highest among all the cashew-growing countries**.

Maharastra is **India's largest** Cashew nut-producing state.

- Cashew requires an **average temperature of 16-25OC** and **rainfall of 50-400 cm**. It flourishes well on poor and rocky soils. Besides the vast scale of cashew production, **India is also known for pioneering cashew processing and exporting cashew kernels across the globe**.
- The **cashew processing industry** was earlier concentrated in **Kollam (Kerala)**, **Mangalore (Karnataka)**, **Goa**, and **Vettapalam (Andhra Pradesh)**, but now it is spread across many states of India.
- Over the years, **India has emerged as the global processing hub** for the cashew industry. India is the **largest cashew exporter**, with more than **15%** of the world's export share.
- India exports cashews to over **60 countries** spread across different parts of the world. The **key export destinations** for India are **UAE (the largest imported from India)**, **Japan**, **Netherlands**, Saudi Arabia, the USA, the UK, Canada, France, Israel, and Italy.

The Cashew Export Promotion Council of India (CEPCI):

- The Government of India established the **CEPCI in 1955** with the **objective** of promoting cashew kernels and cashew nut shell liquid in India.
- The council provides **trade information and statistics** to its members and is operating the government's **five-year plan scheme** for providing financial assistance to the member exporters.

Topic 18. HUNDREDS STRANDED AS A FLASH FLOOD, LANDSLIPS DISRUPT HIMACHAL HIGHWAYS

Important for the subject: Geography

Chandigarh-Manali National Highway was blocked following flash floods and landslips. The alternative Mandi-Kullu route, via Katola, blocked after landslips, was opened again.

About Flash Floods

- Flash Floods are **highly localized events** of short duration with a **very high peak** and usually have **less than six hours** between the occurrence of the rainfall and peak flood.
- The **flood situation worsens in the presence of choked drainage lines** or encroachments obstructing the natural flow of water.
- **Flash floods** have a different character than river floods, notably **short time scales** and occurring in **small spatial scales**, which make forecasting flash floods quite a different challenge than traditional flood forecasting approaches.
- **Urban areas** are more likely to experience this type of “**surface water**” flooding because they have a lot of hard surfaces. When rain hits them it can’t soak into the ground as it would do in the countryside.

Consequences of flash flood:

- Frequently, flash floods are accompanied by **landslides**, which are sudden movements of rock, boulders, earth or debris down a slope.
- It is **common** in **mountainous terrains**, where there are conditions created for it in terms of the **soil, rock, geology and slope**. Natural causes that trigger landslides include **heavy rainfall, earthquakes, snowmelting and undercutting of slopes** due to flooding.
- Landslides can also be caused by human activities, such as excavation, cutting of hills and trees, excessive infrastructure development, and overgrazing by cattle.
- India is one of the countries most likely to face landslides. For a statewide analysis of this phenomenon, do read our previous explainer.

Flash flood-prone area:

- Flash flooding commonly happens more where rivers are narrow and steep, so they flow more quickly.
- They can **occur in hilly regions and in urban areas located near small rivers** since hard surfaces such as roads and concrete do not allow the water to absorb into the ground. **India is the worst flood-affected country** in the world, after **Bangladesh**, and **accounts for one-fifth of the global death count** due to floods.
- **Flash floods** have been commonly witnessed in cities like **Chennai** and **Mumbai**. Depression and cyclonic storms in the coastal areas of **Orissa, West Bengal, Andhra Pradesh**, and others also cause **flash floods**.
- As per the NDMA, nearly **75 per cent** of the **total Indian rainfall** is concentrated over a short monsoon season of four months (June to September).

NDMA Guidelines for Flash Floods: Do's & Don'ts Before floods

- Do not litter waste, plastic bags, plastic bottles in drains Try to be at home if high tide and heavy rains occur simultaneously
- Listen to the weather forecast at All India Radio, Doordarshan. Also, messages by Municipal bodies from time to time and act accordingly. Evacuate low-lying areas and shift to safer places.
- Make sure that each person has a lantern, torch, some edibles, drinking water, dry clothes and necessary documents while evacuating or shifting. Make sure that each family member has identity card. Put all valuables at a higher place in the house.

In the Flood Situation

- Obey orders by government and shift to a safer place. Be at safe place and they try to collect correct information. Switch of electrical supply and don't touch open wires. Don't get carried away by rumors and don not spread rumors.

After Floods

- Drink chlorinated or boiled water. Take clean and safe food Sprinkle insecticides in the water ponds/ stagnant water. Please cooperate with disaster survey team by giving correct information.

DO's

- Switch off electrical and gas appliances, and turn off services off at the mains. Carry your emergency kit and let your friends and family know where you are going.
- Avoid contact with flood water it may be contaminated with sewage, oil, chemicals or other substances.
- If you have to walk in standing water, use a pole or stick to ensure that you do not step into deep water, open manholes or ditches. Stay away from power lines electrical current can travel through water, Report power lines that are down to the power company.
- Look before you step-after a flood, the ground and floors are covered with debris, which may include broken bottles, sharp objects, nails etc. Floors and stairs covered with mud and debris can be slippery.
- Listen to the radio or television for updates and information. If the ceiling is wet shut off electricity. Place a bucket underneath the spot and poke a small hole into the ceiling to relieve the pressure. Use buckets, clean towels and mops to remove as much of the water from the afflicted rooms as possible. Place sheets of aluminium foil between furniture and wet carpet.

Don't's

- Don't walk through flowing water – currents can be deceptive, and shallow, fast-moving water can knock you off your feet. Don't swim through fast-flowing water – you may get swept away or struck by an object in the water.
- Don't drive through a flooded area – You may not be able to see abrupt drop offs and only half a meter of flood water can carry a car away. Driving through flood water can also cause additional damage to nearby property.
- Don't eat any food that has come into contact with flood water. Don't reconnect your power supply until a qualified engineer has checked it. Be alert for gas leaks – do not smoke or use candles, lanterns, or open flames. Don't scrub or brush mud and other deposits from materials, This may cause further damage.
- Never turn on ceiling fixtures if the ceiling is wet. Stay away from ceilings that are sagging. Never use TVs, VCRS, CRT terminals or other electrical equipment while standing on wet floors, especially concrete.
- Don't attempt to remove standing water using your vacuum cleaner. Don't remove

standing water in a basement too fast. If the pressure is relieved too quickly it may put undue stress on the walls.

Topic 19. CONGO: WORLD'S 2ND-LARGEST RAINFOREST CONTINUES TO VANISH WITH HALF A MILLION HECTARES LOST IN 2022, SAYS REPORT

Important for the subject: Geography



The Congo, the world’s second-largest rainforest after the Amazon, continues to retreat. The rainforest is spread across six African countries, the largest of which lost half a million hectares (mha) of forest last year, according to a new report.

Report findings:

- The **Democratic Republic of Congo (DRC)** lost over **500,000 hectares** in 2022, according to the report made available by the **World Resources Institute (WRI)** and the University of Maryland on **Global Forest Watch**, an open-source web application to monitor global forests in near real-time.
- The rate of primary forest loss in the DRC remains persistently high. It noted that **4.1 mha of primary tropical forest** were lost worldwide last year, an area the **size of Switzerland**. This is equivalent to the **loss of 11 football pitches per minute**, stated the

WRI.

- Of this, **Brazil** accounted for **43 per cent of the total tropical primary forest loss**, at **1.8 million ha**, followed by **DRC (12.1 per cent)** and **Bolivia**.

Emission due to loss of forest:

- This destruction in natural forests generated **2.7 billion tonnes of CO₂** — roughly **equivalent to India's annual emissions** — of **43 billion tonnes** emitted worldwide each year.

The Congo rainforests:

- The **Congo rainforest** is known for its **high levels of biodiversity**, including more than **600 tree species** and **10,000 animal species**.
- Some of its most famous residents include forest **elephants, gorillas, chimpanzees, okapi, leopards, hippos, and lions**. Some of these species have a **significant role in shaping the character of their forest home**.
- For example, researchers have found that **Central African forests** generally have taller trees but lower density of small trees than forests in the Amazon or
- Borneo because the elephants, gorillas, and large herbivores keep the density of small trees very low through predation, reducing competition for large trees. But in areas where these animals have been depleted by hunting, forests tend to be shorter and denser with small trees.
- Therefore the **old-growth forests in Central Africa store huge volumes of carbon** in their vegetation and tree trunks (39 billion tons, according to a 2012 study), serving as an important buffer against climate change.
- The **Congo rainforest** is spread across **Cameroon, Central African Republic, Republic of Congo, Democratic Republic of Congo (DRC), Equatorial Guinea, and Gabon**. **Sixty per cent** of the rainforest lies in the **DRC**.

Loss of Primary forests in DRC:

- **Primary forests** are **forests of native tree species**, where there are **no clearly visible indications of human activities**. These provide numerous ecosystem services, but are under continuing threat.
- From **2002 to 2022, DRC lost 6.33 mha of humid primary forest**, making up **35 per**

cent of its **total tree cover loss** in the same time period. The total area of humid primary forest in DRC decreased by **6.1 per cent** during this period.

Key drivers of loss of Congo rainforests:

- Prevalence of Slash-and-Burn technique of agriculture. Increase in the demand for food has led to shorter fallow periods and the expansion of agriculture into primary forest.
- Around 96 per cent of the population uses polluting cooking fuel. These fuel or wood mainly come from primary forests. Uncontrolled bushfires, charcoal production for local and regional markets, cattle ranching, and illegal (artisanal) logging.

Failure of forest governance in the DRC.

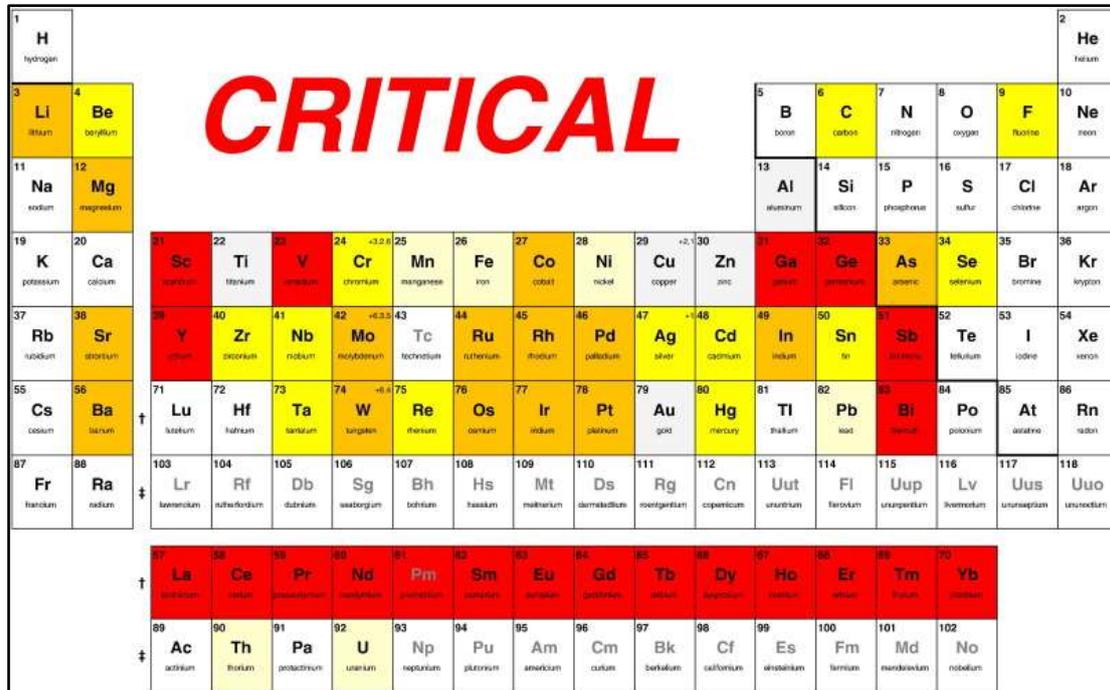
- The **DRC government** in **Kinshasa**, instead of reducing dependence on fossil fuels, announced its decision to **auction oil and gas permits** in **critically endangered gorilla habitat** and the **world's largest tropical peatlands**.

Economic condition of DRC:

- DRC is among the **world's five poorest nations** according to the **World Bank**. In **2022**, nearly **62 per cent** of the population or **around 60 million people**, lived on less than **\$2.15 a day**.

Topic 20. CENTRE IDENTIFIES 30 CRITICAL MINERALS: WHY, HOW, AND IMPORTANCE OF THE EXERCISE

Important for the subject: Geography



CRITICAL

1 H hydrogen																	2 He helium						
3 Li lithium	4 Be beryllium																	5 B boron	6 C carbon	7 N nitrogen	8 O oxygen	9 F fluorine	10 Ne neon
11 Na sodium	12 Mg magnesium																	13 Al aluminium	14 Si silicon	15 P phosphorus	16 S sulfur	17 Cl chlorine	18 Ar argon
19 K potassium	20 Ca calcium	21 Sc scandium	22 Ti titanium	23 V vanadium	24 Cr chromium	25 Mn manganese	26 Fe iron	27 Co cobalt	28 Ni nickel	29 Cu copper	30 Zn zinc	31 Ga gallium	32 Ge germanium	33 As arsenic	34 Se selenium	35 Br bromine	36 Kr krypton						
37 Rb rubidium	38 Sr strontium	39 Y yttrium	40 Zr zirconium	41 Nb niobium	42 Mo molybdenum	43 Tc technetium	44 Ru ruthenium	45 Rh rhodium	46 Pd palladium	47 Ag silver	48 Cd cadmium	49 In indium	50 Sn tin	51 Sb antimony	52 Te tellurium	53 I iodine	54 Xe xenon						
55 Cs caesium	56 Ba barium	† Lu lutetium	71 Hf hafnium	72 Ta tantalum	73 W tungsten	74 Re rhenium	75 Os osmium	76 Ir iridium	77 Pt platinum	78 Au gold	79 Hg mercury	80 Tl thallium	81 Pb lead	82 Bi bismuth	83 Po polonium	84 At astatine	85 Rn radon						
87 Fr francium	88 Ra radium	† 103 Lr lawrencium	104 Rf rutherfordium	105 Db dubnium	106 Sg seaborgium	107 Bh bohrium	108 Hs hassium	109 Mt meitnerium	110 Ds darmstadtium	111 Rg roentgenium	112 Cn copernicium	113 Uut ununtrium	114 Fl flerovium	115 Uup ununpentium	116 Lv livermorium	117 Uus ununseptium	118 Uuo ununoctium						
		† 89 La lanthanum	90 Ce cerium	91 Pr praseodymium	92 Nd neodymium	93 Pm promethium	94 Sm samarium	95 Eu europium	96 Gd gadolinium	97 Tb terbium	98 Dy dysprosium	99 Ho holmium	100 Er erbium	101 Tm thulium	102 Yb ytterbium								
		† 89 Ac actinium	90 Th thorium	91 Pa protactinium	92 U uranium	93 Np neptunium	94 Pu plutonium	95 Am americium	96 Cm curium	97 Bk berkelium	98 Cf californium	99 Es einsteinium	100 Fm fermium	101 Md mendelevium	102 No nobelium								

The Centre has identified **30 critical minerals**, including **lithium, cobalt, nickel, graphite, tin and copper**, which are essential for the country's economic development and national security. Earlier in **2011, Planning Commission** initiated some efforts to identify the critical minerals.

Critical minerals:

- As per the report, a mineral is critical when the risk of supply shortage and associated impact on the economy is (relatively) higher than other raw materials.
- The **European Union** also carried out a **similar exercise** and **categorised critical minerals** on the basis of **two prerequisites: supply risk and economic importance**.
- **Australia** refers to **critical minerals** as: “metals, non-metals and minerals that are considered vital for the economic well-being of the world's major and emerging economies, yet whose supply may be at risk due to geological scarcity, geopolitical issues, trade policy or other factors”.

The exercise:

- The **identification** of these minerals was done on the basis of a **report on critical minerals** prepared by an **expert team** constituted by the **Ministry of Mines** in November 2022. The ministry will revisit the list periodically.
- In **November 2022**, the **Ministry of Mines** constituted a **seven-member Committee** under the chairmanship of the **Joint Secretary (Policy), Ministry of Mines** to identify a list of minerals critical to our country and the panel decided to have a **three-stage assessment** to arrive at a list of critical minerals.
- The specific trigger for the latest exercise is **India's international commitments towards reducing carbon emissions**, which require the country to urgently relook at its **mineral requirements for energy transition** and **net-zero commitments**.
- That report analyzed **11 groups** of minerals under categories such as **metallic, nonmetallic, precious stones and metals**, and **strategic minerals**.

Three-stage process:

- In the **first stage** the panel looked at the strategies of various countries to classifying the mineral as critical. Accordingly **69 elements/minerals** are segregated for further examination.
- In the **second stage of assessment**, an inter-ministerial consultation was carried out with different ministries to identify minerals critical to their sectors.
- The **third stage assessment** was to **derive an empirical formula for evaluating minerals criticality**, taking cognizance of the **EU methodology** that considers **two major factors** — **economic importance** and **supply risk**.

Final list of critical minerals:

- Based on this process, a total of **30 minerals** were found to be most critical for India, out of which **two are critical as fertilizer minerals**: Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, **Phosphorous, Potash**, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium.

Specialised agency:

- The committee also called for a need for establishing a **National Institute or Centre of Excellence on critical minerals** on the lines of **Australia's CSIRO**, which is the **largest minerals research and development organisation in Australia** and **one of the largest in the world**.
- This proposed Centre will **periodically update the list of critical minerals for India** and **notify the critical mineral strategy from time to time** and will **execute a range of functions for the development of an effective value chain of critical minerals** in the country.
- A wing in the **Ministry of Mines** can be established as a **Centre of Excellence for Critical Minerals**.

Domestic and global outreach:

- The **Geological Survey of India**, an attached office of the **Ministry of Mines**, has carried out a **G3 stage mineral exploration** (fairly advanced) during **Field Season 2020-21** and **2021-22** in **Salal-Haimna areas of Reasi district, Jammu & Kashmir**, and estimated an inferred resource of **5.9 million tonnes of lithium ore**.
- A **joint venture company** namely **KhanijBidesh India Ltd. (KABIL)** has been incorporated with **equity contributions from three Central Public Sector Enterprises**.
- It is **mandated to identify and acquire overseas mineral assets of critical and strategic nature** such as **lithium, cobalt** and others so as to ensure **supply-side assurance**.
- India has recently been inducted into the **Mineral Security Partnership (MSP)**, a **US-led collaboration of 14 countries** that aims to **catalyse public and private investment in critical mineral supply chains globally**.

Global practices:**The USA:**

- The **US** adopted a **two-stage screening methodology** to arrive at the **list of critical minerals**. An **early warning screening tool** assesses a mineral's potential criticality using **three fundamental indicators**: **supply risk, production growth, and market dynamics**.

- This was followed by an **in-depth supply chain analyses** and **inter-agency collaboration**, wherein a detailed analysis of the underlying factors was carried out.

The UK:

- In the **UK**, the **criticality to the British economy** was determined in terms of their **global supply risks** and the **economic vulnerability** to such a disruption.
- **Three indicators** were used to estimate the production concentration, companion metal fraction and recycling rate. A total of **18 minerals** were identified as critical to the UK economy.

The European Commission:

- The **European Commission** has been issuing a **list of critical raw minerals** since **2011** that is updated every **three years**. The main parameters used to determine the criticality of the mineral for the EU are the **economic importance** and **supply risk**.
- A total of **34 raw materials** are identified as **Critical Raw Materials for 2023**.

Japan:

- **Japan's first list of critical minerals** was prepared by the country's **Advisory Committee on Mining Industry** in **1984**, under the direction of the **Ministry of International Trade and Industry (current METI)**. **Japan** has identified a set of **31 minerals** as critical for its economy.

Australia:

- The **Australian Government**, in **2019**, released its **inaugural Critical Minerals List** and associated **national strategy** and a list of **24 critical minerals** was first identified. **Two** more elements were added to the latest critical mineral strategy.

Topic 21. INDIA TO SECURE LITHIUM BLOCKS IN ARGENTINA

Important for the subject: Geography



India is in advanced talks to secure lithium blocks in Argentina. KABIL (Khanij Bidesh India Ltd) to soon sign a pact with Argentina to secure a few lithium blocks.

- KABIL is also exploring tie-ups and acquisition opportunities for lithium across other LATAM nations like Chile and Brazil. India, currently, imports all major components that go into lithium-ion cell manufacturing.
- **Argentina**, together with **Chile** and **Bolivia**, forms the so-called “**Lithium Triangle**” and is currently the fourth largest producer and has the **third largest** world reserve of lithium.
- KABIL is said to have entered into MOUs for exploration of two lithium blocks and three cobalt blocks in Australia.

Khanij Bidesh India Ltd (KABIL)

- KABIL is a joint venture between National Aluminium Company (NALCO), Mineral Exploration Corporation Ltd (MECL) and Hindustan Copper Ltd (HCL).
- It was formed in 2019 for identifying, acquisition, development and processing of strategic minerals overseas for use in India. It has been concentrating on securing **copper, cobalt and lithium** and in some cases **nickel** supplies among the critical minerals identified.

Topic 22. RUSSIAN OIL: PAYMENT ISSUES

Important for the subject: Economy

Russian oil trade is under **sanction** of the **G-7** countries because of the Ukraine conflict, as per which a price cap of **\$60 per barrel** was decided for Russian crude.

- The measure was taken in an effort intended to reduce Russia’s ability to finance its war on Ukraine.
- Till now India was importing Russian oil at rates below the sanction limit, and was making payments in dollars. This is likely to be a problem as the price of Russian oil is set to exceed the sanction limit of \$60 per barrel.
- The reason for the price rise is, firstly Russia is reducing the discount at which it was selling its oil driven by increased demand from China, and secondly a reduction in the supply of cheaper varieties of crude oil.
- The only viable option in the present situation is to make payments in Rupee, but already Russia is struggling with rising levels of Rupee deposits (at over **\$2 billion**), received due to India’s imports of defence equipment.
- As India emerged as a reliable buyer for Russian oil with the country facing sanctions due to its attack on Ukraine, imports to India have reached a record level of **\$31 billion** in 2022-23 from just \$2.5 billion in 2021-22 (increased 13 times).

The Group of Seven (G7)

- It is an intergovernmental political forum consisting of **Canada, France, Germany, Italy, Japan, the United Kingdom and the United States**; additionally, the European Union (EU) is a “non-enumerated member.”
- It is organized around shared values of pluralism, liberal democracy, and representative government.
- It originated from an **ad hoc gathering of finance ministers** in **1973** to address the ‘oil crisis’, the G7 has since become a formal, high-profile venue for discussing and coordinating solutions to major global issues, especially in the areas of **trade, security, economics, and climate change**. Russia was a formal member (as part of the G8) from 1997 to 2014.

Price Cap Coalition (PCC)

- The members of the Price Cap Coalition (PCC), composed of Australia, Canada, the EU, Japan, the UK, and the US
- They have introduced **three different price caps**, which are currently in force and Important for the subject to periodic revision. The mechanism agreed by PCC are: one price cap for Russian oil Price caps for petroleum products shipped to third countries prohibition the provision of financial and other services.
- This mechanism helps address inflation and keep energy costs stable. The price caps prohibit operators from members of the PCC to trade, broker or transport petroleum products that originate in or that have been exported from Russia to third countries, unless they are sold at or below the price caps.
- They also prohibit the provision of services (e.g. insurance) or financial assistance related to this trading, brokering or transporting, unless the petroleum products are sold at or below the price caps.

Topic 23. SEBI AMENDS REGULATIONS FOR REIT AND INVIT

Important for the subject: Economy

SEBI has brought some **changes in regulations** of Real estate investment trusts (**REITs**) and Infrastructure Investment Trusts (**InvIT**) regarding the **lock-in period of sponsors** (Sponsor is the party who sets up the REIT/InvIT).

- SEBI has amended the **minimum unit holding requirement for sponsors**. As per the approved changes, sponsors of REITs and InvITs would be required to hold a certain minimum stake in the investment vehicles on a **reducing scale for perpetuity**. These units will be **locked-in** and will also be **unencumbered** (not have any debt against them).

Motivation for the changes:

- The intention is to **ensure skin in the game** and that the sponsor's interests are aligned with that of the unit holders.
- The rider of the lock-in units being unencumbered means that the sponsors cannot use the units for leverage. This will ensure that sponsors are not able to indirectly transfer the ownership by pledging these in any way.

- Currently, there is a 15 % unit holding lock-in for at least three years. Under the amended regulations, it starts at **15 % for up to three years**, then reduces over time with the lower of **1 %** of unit capital or ₹1,000 crore after 20 years.

Implications:

- The changes will increase retail investor confidence knowing that the sponsor is there to stay.
- Sponsors will likely find it difficult to undertake mergers and acquisitions or get new sponsors on board owing to the lock-in restrictions.

Real Estate Investment Trust (REIT) and Infrastructure Investment Trust (InvITs)

- A Real Estate Investment Trust (REIT) is an investment instrument that offers proportionate ownership of an income-generating real estate asset to retail investors.
- They pool money from multiple investors and use that to buy income-generating real estate properties. REITs manage these assets so that they can earn from capital appreciation and rental income.
- The REIT is designed as a tiered structure with Sponsor setting up the REIT which in turn invests into the eligible infrastructure/real estate projects either directly or via special purpose vehicles (SPVs).
- An Infrastructure Investment Trust (InvITs) is also a collective investment scheme similar to a mutual fund, which enables direct investment of money from individual and institutional investors in **infrastructure projects** to earn a small portion of the income as return.

REIT are more retail friendly owing to lesser unit price and higher liquidity.

Topic 24. STARTUPS LOSE UNICORN STATUS OWING TO FUNDING SQUEEZE

Important for the subject: Economy

ASK Private Wealth releases Hurun India Future Unicorn Index 2022

The index lists the present unicorns as well as companies that are on path to become unicorns.

- 19 startups fell out of the unicorn list. Unicorn is the term used for startups valued over \$1 billion. The number of unicorns stand at 84 right now as against 51 in the year-ago period

There are 122 others valued at over USD 200 million which can achieve the unicorn status in the next 2-4 years.

- The falling out of startups from unicorn club is attributed to several factors, prime being a ‘funding winter’, which is result of: liquidity conditions are getting tighter all across the world. Recessionary conditions in Europe, also reduce investment sentiment
- Elevated interest rate, a cycle of hikes to counter inflation that started last year is still on. Rising interest rates and global uncertainties have dramatically reduced the appetite of investors to put money into startups.
- Geopolitical headwinds have combined to make it harder for startups to raise capital Late-stage funding and mega deals in the Indian startup ecosystem have been hit hard by the funding winter.
- Despite the ongoing ‘funding winter’ which can impact start-up valuations, the number of unicorns or startups valued at over USD 1 billion will grow by 122 to cross the 200 companies mark in the next four years

The index uses terms:

- **Gazelle:** startup worth atleast \$200 billion and likely to become a unicorn in next 2 years.
- **Cheetah:** startup worth at least \$200 billion and likely to become a unicorn in next 4 years.

Topic 25. U.S. AND EU SLOWDOWN TO HURT 1/5TH OF MSMEs: CRISIL REPORT

Important for the subject: Economy

CRISIL analysis shows that around 20% of small businesses across sectors are to be adversely affected by economic slowdown in advanced countries, particularly the U.S. and Eurozone. The most immediate impact is in the form of increased working capital needs.

- The debt requirement of MSMEs is estimated at over ₹100 lakh crore, of which 70% is working capital only and only a fourth of this is sourced formally.
- Working capital requirement is directly linked to the receivable turnover, i.e. speed with which the cycle of order and final payment is completed. The shorter the duration of the receivable cycle, the less is the working capital needed.
- The study found adverse effects on working capital requirement for three sectors—dyes

and pigment, gems and jewellery, and construction. Dyes and pigments, pesticides and pharmaceuticals: The rise in working capital days is for three reasons—inventory pile-up following dumping by Chinese producers; the recent earthquake in Turkey, and a slowdown in the US.

- **Diamond exports:** The substantial decline in demand from the US—the largest export market—is having a major impact. That, in turn, is having a bearing on receivable days, leading to an increase in working capital days from 140 before the pandemic to over 200 now.
- **Construction & roads sector:** Reduced budgeted capex of last fiscal along with high commodity prices has added to the challenges in meeting working capital demand.
- This has led to an increase of over 100 days in their working capital cycle this fiscal compared to the pre-pandemic levels.

Slowdown Recession

- A slowdown, on the other hand, means that the pace of the GDP growth has decreased. Countries like India and China are currently faced with an economic slowdown. It means the production and earnings of these economies are not growing at the same pace as, say, last year.
- The GDP is the total value of all the goods and services produced or created in a country in a year. When this value falls, the country's economy is said to be in recession. It means that the country is producing and earning less than what it did. A common rule of thumb for recessions is two quarters of negative GDP growth.

Topic 26. WORLD ECONOMY AT CRITICAL JUNCTURE IN INFLATION FIGHT: BIS WARMS

Important for the subject: economy

Swiss-based Bank for International Settlements (BIS) has stressed the need for more interest rate hikes, warning the world economy is at a critical juncture as countries struggle to rein in inflation. It noted that for the first time, across much of the world, **high inflation** is present along with widespread **financial vulnerabilities**. A 'soft landing' is still possible but may be difficult.

BIS highlighted three related risks and challenges:

- **Inflation Control:** Even with continuous rate hike over the last 18 months, inflation in many top economies remains stubbornly high. BIS recommends that countries should stop short term focus on growth. Instead monetary policy must now restore price stability along with fiscal consolidation.
- **Banking Stress:** BIS has pointed out that increased borrowing costs as a result of the higher rates, also poses a threat to the banking sector, as the failure of the Silicon Valley Bank and collapse of Credit Suisse bank shows. It further pointed out, that the more delay in tightening of monetary policy, the longer will be the period of elevated rates.
- **High public Debt:** High interest rates for a longer period will also significantly increase the debt service burden of countries. Already the debt levels are on the higher side. If interest rates get to mid-1990s levels the overall debt service burden for top economies would, all else being equal, be the highest in history.

Bank for International Settlements

- Established in 1930, the BIS is owned by 60 central banks, representing countries from around the world that together account for about 95% of world GDP.
- Its head office is in Basel, Switzerland. The Bank for International Settlements is often called the “central bank for central banks” because it provides banking services to institutions such as the European Central Bank and Federal Reserve.
- Its mission is to serve central banks in their pursuit of monetary and financial stability, to foster international cooperation in those areas and to act as a bank for central banks.
- The Basel Committee for Banking Supervision (BCBS), while technically separate from the BIS, is a closely associated international forum for financial regulation that is housed in the BIS’ offices in Basel, Switzerland.
- The BCBS is responsible for the Basel Accords, which recommend capital requirements and other banking regulations that are widely implemented by national governments. The BIS also conducts research into economic issues and publishes reports.

Topic 27. ADVERSE CLIMATE EVENTS CAN INCREASE INFLATION

Important for the subject: Economy

RBI Governor noted in the MPC minutes that adverse climate events can change inflation

trajectory.

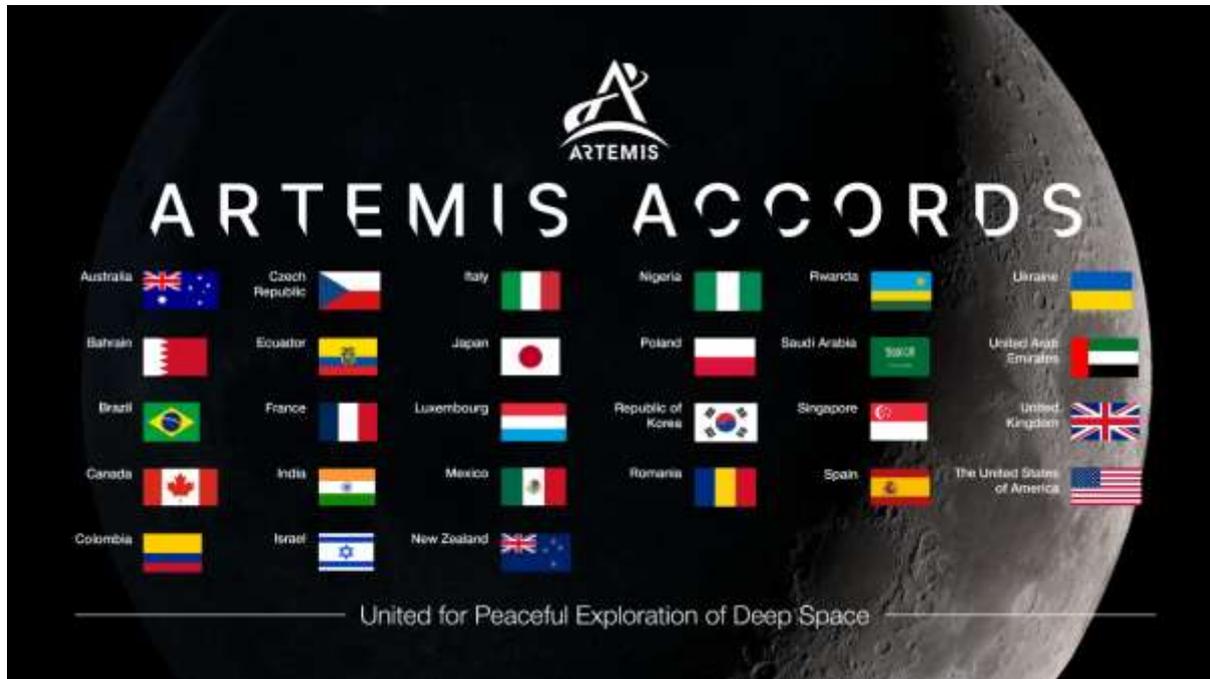
- The **MPC panel** has revised the CPI projection to 5.1 per cent and the real GDP growth target at 6.5 per cent.
- While inflation has reduced, RBI is committed to bringing it down to target of 4% and thus will stick to “withdrawal of accommodation” stance. (meaning likely to increase rate again in effort to reduce liquidity).
- The RBI has been mandated by the government to keep consumer price index based inflation (CPI) at 4 per cent with a band of +/- 2 per cent.

Some of the factors that may keep inflation elevated (putting upside risk on inflation) are:

- **Geo-political tensions:** Tensions and conflicts between countries disrupt both supply of key resources and sea/land routes of transport. This has a great impact on prices of key essentials. For example, the Ukraine war led to reduced supply of wheat and edible oil in the international market. Further sanctions on oil producing nations like Russia or Iran often impact the price of crude oil.
- **Uncertainty on crude price trajectory:** Fuel prices have a significant impact on inflation both directly through fuel used for transport and indirectly through increased costs of transportation of all the goods in the economy.
- **Volatile financial markets:** Disruption in the financial markets also pose further upside risks to price. This is because any turbulence in the financial markets has a direct impact on the FDI and FPI flows which as part of the capital account are essential to balance the current account deficit. Any imbalance can damage the value of Rupee and thus increase inflation. (Note: a weaker rupee is good for exports but bad for importers and vice versa)
- **Adverse climate events:** With around 50% of India’s net sown area being rain-fed, any deficiency caused by El-Nino occurrence that seems likely, will through a lower output result in higher food inflation (will impact kharif yields and rabi sowing). This is even more important as already international prices for key food items like rice and sugar are at elevated levels

Topic 28. ARTEMIS ACCORDS

Important for the subject: Economy



During his state visit to the United States this week, Prime Minister Narendra Modi signed the Artemis Accords with the nation's national space administration, as confirmed by the White House. This agreement holds significant importance for India to establish itself as a global space power.

Furthermore, the National Aeronautics and Space Administration (NASA) and the Indian Space Research Organization (ISRO) have also agreed to launch a joint mission to the International Space Station (ISS) in 2024.

What are Artemis Accords?

- The Artemis accord outlines the **“principles for cooperation in space exploration and the use of the moon, mars, comets, and asteroids for peaceful purposes.”**
- These principles are non-binding multilateral arrangements between the US government and other governments that wish to participate in NASA's Artemis program.

What is the Artemis program?

- Nasa's Artemis program focuses on **making new scientific discoveries** and expanding

the exploration of the lunar surface. By studying the Moon, scientists hope to gain valuable insights and make discoveries that can contribute to advancements in various fields, including technology, medicine, and a better understanding of the workings of the entire universe.

- One of its key goals is to land the first woman and the first person of color on the Moon. This historic event will pave the way for greater diversity and inclusivity in space exploration.
- Furthermore, the program aims to land the first astronauts on Mars and eventually on other planets and celestial bodies.

When were Artemis Accords established?

- Nasa, in collaboration with the US Department of State, established the Artemis Accords in 2020. The accords are agreements between the United States and seven other founding member nations. They reinforce the commitment to international space treaties and agreements, such as the Registration Convention and the Rescue and Return Agreement.
- Additionally, the accords emphasize best practices and norms that promote responsible behavior, including the sharing of scientific data with the public.

What are the guiding principles of the accords?

- The Artemis Accords also aims to create a foundation for peaceful and cooperative space exploration. These agreements facilitate progress, ensuring that humanity can explore space while upholding ethical and responsible practices.
- Given that multiple countries and private companies are actively involved in lunar missions and operations, the accord lays out a set of shared principles to govern civil exploration and the use of outer space.
- According to Nasa, the principles include conducting all activities in space peacefully and with full transparency; this includes sharing findings, registering space objects, and releasing scientific data.
- For safety purposes, the accord calls for interoperability and emergency assistance when needed by whichever organisation or nation has the resources and ability to help in respective situations. Furthermore, communication and coordination with countries during exploration are important.
- The Accord calls for the protection of sites and artefacts preservation as well as the

mindful use of resources during space exploration and development. Finally, Nasa and its partner nations must agree on the efficient disposal of spacecraft and plan to mitigate orbital debris.

What is the budget of Artemis program, and who is funding it?

- The US has allocated \$7.9 billion toward deep space exploration programs in the financial year 2024. Out of this, approximately \$3.2 billion will go towards the Artemis program.
- According to Ars Technical, around \$41.5 billion will be spent on the Artemis program between the financial years 2024 and 2028, although it may not be sufficient due to the rising costs of equipment.

Why joining the Artemis Accords is an important step for India?

- India's decision to join the Artemis Accords highlights its dedication to global space cooperation and a keen interest in participating in lunar exploration missions. By becoming a signatory, India can collaborate with other nations, including the United States, in future Moon missions. This collaboration enables the sharing of knowledge and expertise, contributing to the advancement of scientific research, technological development, and the expansion of humanity's presence in space.
- Furthermore, as part of Prime Minister Modi's state visit, several US companies will partner with India to establish a semiconductor ecosystem that promotes diversification in the supply chain. Micron Technology, with the support of the Indian National Semiconductor Mission, recently announced a significant investment of over \$800 million.
- Alongside additional financial backing from Indian authorities, this investment will create a \$2.75 billion semiconductor assembly and test facility in India. These developments highlight the growing collaboration between India and the United States in the field of technology and innovation.

Which other nations are a part of the Artemis Accords?

- While Nasa is leading the Artemis program, the accords were signed by the directors of the national space agencies of the US, Australia, Canada, Japan, Luxembourg, Italy, the United Kingdom, and the United Arab Emirates in October 2020. Ukraine signed the accord a month later.

- The accords were extended to **South Korea, New Zealand, Brazil, Poland, the Isle of Man, and Mexico in 2021**. In the following year, 2022, **Israel, Romania, Bahrain, Singapore, Colombia, France, Saudi Arabia, Rwanda, Nigeria, and the Czech Republic** also joined the accords. **Spain, Ecuador, and now India** have also signed on, making a total of 28 nations so far.
- Collaborating with other countries is essential to the accord in order to establish a sustainable and long-lasting presence on the Moon. This presence is crucial to Nasa's goal of sending astronauts to Mars, marking humanity's first mission to the red planet.

Topic 29. WHAT IS INTEREST RATE RISK AND WHY DOES IT MATTER?

Important for the subject: Economy

Interest rate risk is the possibility of loss to an investor who owns any **debt based instrument**, such as bond or debenture resulting from an **increase in the current interest rate** offered for a **similar new debt instrument**.

- The reason for the possibility of loss can be understood by understanding the concept of present value of an investment. When a bond is bought, the price is representative of the present value of the future cash returns it will give. The below illustration explains, the interest rate risk in action:
- Suppose a bond offering 7% interest and having 1 year maturity will give Rs 107 return on maturity, then its current price will be Rs. 100. Now suppose the market interest rate rises to 9%, then the owner is naturally in loss as, had he waited he could have invested at the higher rate. This loss is seen in the price decline of the old bonds, here the price of the Rs. 100 bond will drop to Rs. 98.16.
- The above amount Rs. 98.16 is the investment that with the new rate provides the same return as the old Rs. 100 investment at the rate of 7%.
- Loan involves one party (lender) transferring a set amount of money (principal) to the borrower (debtor) at an agreed rate. The agreement stays between the two parties till the term of the loan.
- Bond or debenture on the other hand is just a loan that is tradable in the secondary market, just like a share is traded. Its price varies with the movement of prevailing interest rate and with a change in evaluation of the risk associated with it. The lesser the risk

associated, the lower is the interest rate of the bond.

Because bonds are traded, they can earn a negative return for the investor, unlike a loan.

Interest Rate risk in Banking:

- Bank's face significant interest rate risk, as the 'banking book', mainly comprises debt assets. ('Banking Book' is the term used for assets on a bank's balance sheet)
- Interest rate risk may impact the capital base and future earnings of the banks. RBI has issued guidelines on **Interest Rate Risk in Banking Book (IRRBB)**, that requires banks to measure, monitor, and disclose their exposure to IRRBB. The guidelines are in sync with the framework issued by the Basel Committee on banking Supervision (BCBS)

Topic 30. AFRICA'S LARGEST POLIO VACCINATION DRIVE SINCE 2020 TARGETS 21 MILLION CHILDREN

Important for the subject: Science and technology

Africa's largest polio vaccination campaign since 2020 kicks off today in three West and Central African countries viz. **Cameroon, Chad and Niger**. It will be extended to the **Central African Republic** next week.

Type-2 Poliovirus is detected in these countries.

- No case of poliovirus is detected in Cameroon, but it has joined the vaccination campaign to avoid any future outbreak.
- The initiative is supported by the **World Health Organization (WHO)**, through the **Global Polio Eradication Initiative (GPEI)**, and comprises synchronized vaccinations and joint plans in border communities to halt polio transmission.
- Synchronizing the campaign will ensure that a large cohort of children across the four countries receives the vaccine at the same time to enhance polio immunity in a broad geographic area.

Efforts made by these countries:

- **All four countries** have made huge efforts to **bolster polio detection, curb the spread of the virus and protect children from the risk of infection and lifelong paralysis**.
- Despite all being **certified free of indigenous wild poliovirus** (the naturally circulating

strain), the ongoing circulating variant **poliovirus type 2**, the most prevalent form of polio, persists.

- The **Lake Chad region**, which includes **three of the four target countries**, is grappling with **one of the world’s most protracted incidents of armed violence**. It is also home to one of the highest proportions of so-called “**zero dose**” **children** globally, who are either unvaccinated or under-vaccinated.
- Governments have continued to improve the quality of immunization activities, bolstered by the **broad implementation of supplementary immunization campaigns**.
- **Door-to-door implementation**, and with the help of WHO, health workers are now administering the vaccines at home.
- The use of **Geographic Information Systems tools**, including **Open Data Kit**, is also accelerating the response to alerts of potential polio cases, helping curb the spread of the virus.

International support:

- **WHO**, Rotary International, the United Nations Children’s Fund (UNICEF), Gavi, the Vaccine Alliance, the Bill & Melinda Gates Foundation, along with the US Centers for Disease Control and Prevention, have also joined the initiative.

What is Polio Virus?

- **Poliomyelitis**, also known as **polio**, is an infection caused by a **virus (poliovirus)**. It is a serious, **highly contagious disease** that can affect a **person’s nervous system**.

There are three types of wild poliovirus:

- **WPV 1**: still exists but efforts are going on to eradicate it.
- **WPV 2**: eradicated.
- **WPV 3**: eradicated.
- Polio typically **affects children aged 5 years or younger**. It can result in muscle weakness, permanent disability, and even death.
- **One in 200 infections leads to irreversible paralysis**. Among those paralysed, **5– 10% die** when their breathing muscles become immobilized. There is **no cure for polio**, but there are **safe, effective vaccines** that, given multiple times, protect a child for life.

- As an unintended consequence, **type 2 vaccine virus variants** (circulating vaccine derived polioviruses) that mimic wild viruses' contagiousness and neuro virulence, **have been emerging and spreading.**

Topic 31. ASSAM'S KOKRAJHAR DISTRICT FEASTS ON MUSHROOMS FOR HEALTH AND WEALTH

Important for the subject: Science and technology

Nutrient-loaded mushrooms introduced into the **midday meals** in **western Assam's Kokrajhar district**, as soups, biscuits, fortified noodles, or mixed with regular food in powdered form, appear to have had a **positive nutritional effect on children in schools.**

- Mushrooms were one of the major ingredients introduced for children and mothers, in addition to vitamin and mineral supplementation.

Metric

- **Statistical improvement in Kokrajhar district (as per the Data from district authorities Number of Underweight children (upto 6 years) Reduced by 56%**

Number of Wasted children

- Reduced by 55%

Number of Anaemic children

- Reduced by 76%

Maternal Mortality Rate

- Decreased by 72.37% to stand at 89.79 per lakh live births (Assam's MMR is 205)

Infant Mortality rate

- Decreased by 30.56% to 15.97 per 1000 live births (Assam's IMR is 36)

Origin of the initiative:

- Initiated by the Bodoland University's Department of Biotechnology in 2012. Its experiments on making **23 species of mushrooms** such as **oyster, shitake, and cord**

yceps economically viable and affordable, made many farmers start cultivation in their backyards, sometimes even under beds.

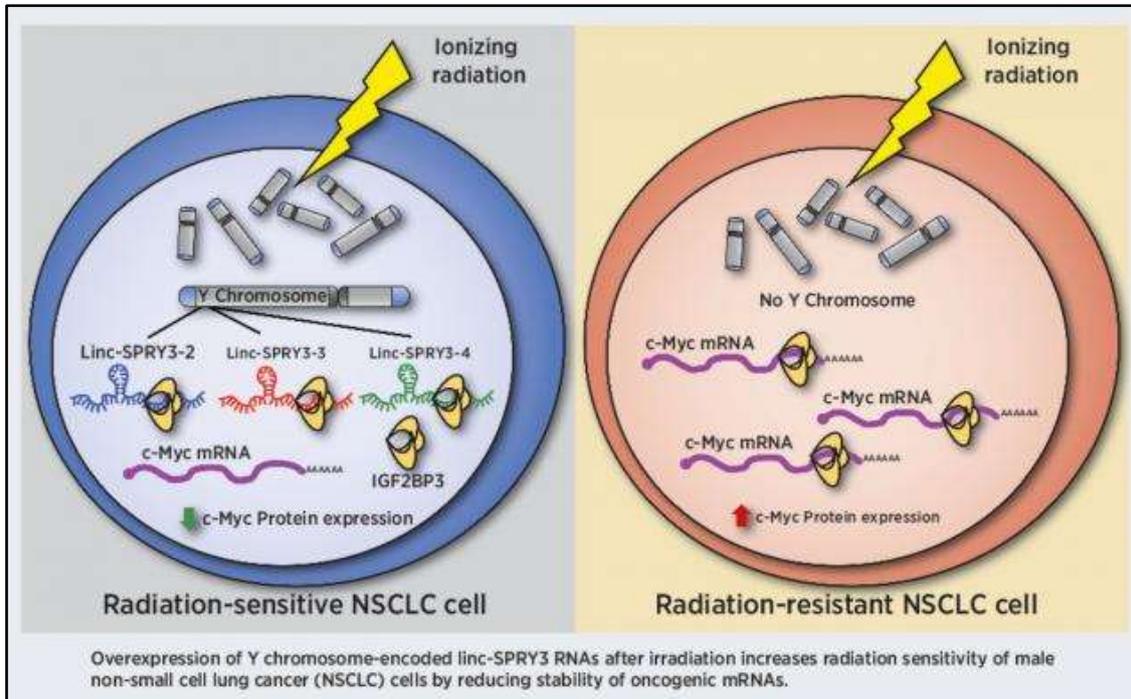
- **Bodoland Territorial Council (BTC)** launched the **Mushroom Mission in 2021**. In **2021**, Kokrajhar changed its product from **Eri silk** to **mushroom** under the **One District One Product (ODOP) initiative**.
- More than **21,500 mushroom cultivators**, including members of **503 self-help groups**, are **women**.

Tackling farm waste:

- Women were attracted because of high returns on low investments. they earn up to ₹400 per bag of moistened hay for an input cost of ₹35. Growing mushroom is also not labour-intensive.
 - The “**mushroom movement**” has also helped people deal with **0.16 million tonnes of farm waste** (rice, wheat, and maize residue) **compressed into layered bags** for growing the mushrooms. After these bags stop producing, they are turned into **vermicompost**.
 - The district administration facilitated the export of **220 kg mushrooms**, sourced from individual farmers, to **Bhutan** where the demand is high but conditions are not suitable for growing them unlike in Kokrajhar.
 - **ODOP** has seen **16 schools** in the district taking up mushroom farming in their nutrigardens along with an array of vegetables.
 - It has also helped revive the mushroom spawn labs in **11 government-run senior secondary schools** across the **Bodoland Territorial Region** that were set up under a three-year **Department of Biotechnology** scheme in **2015**.
- Mushroom:**
- A mushroom or toadstool is the fleshy, spore-bearing fruiting body of a **fungus**, typically produced above ground, on soil, or on its food source. A toadstool generally denotes one **poisonous to humans**.

Topic 32. THE ROLE OF THE Y CHROMOSOME IN CANCER OUTCOMES STUDIED

Important for the subject: Science and Technology



Two studies have shed light on the role of the Y chromosome in cancer outcomes, in which males are often more adversely affected than females. The results of the studies were published in Nature.

Study findings:

- One paper identified an **up regulated gene** on the **Y chromosome** that contributes to **colorectal cancer** in mice by driving **tumour** invasion and aiding immune escape in males.
- The other study demonstrated how the loss of the **Y chromosome** in **bladder cancer** generates a more **immunosuppressive tumour microenvironment** and contributes to worse outcomes.

Role of Y chromosome:

- Sex is known to affect cancer incidence, with most cancers causing worse outcomes in males than in females. Some studies have suggested that the function of the Y

chromosome may have a role.

Colorectal cancer:

- Colorectal cancer is the **growth of cells that forms in the lower end of the digestive tract**. Most of these cancers start as non-cancerous growths called **polyps**. Removing polyps can prevent cancer, so healthcare providers recommend screenings for those at high risk or over the age of 45.
- Colorectal cancer is the second most common cause of cancer-related deaths, which is more frequent, aggressive and metastatic in males. Researchers have assessed sex differences in colorectal cancer in a mouse model of the disease.
- The model is a specific form of the disease, driven by a known **oncogene** called **KRAS**. The researchers observed a **higher frequency of metastasis and worse survival in male mice**, mirroring the outcomes seen in humans.
- An **oncogene** is a gene which in certain circumstances can transform a cell into a tumour cell. Analyses reveal the **upregulation of a gene** for an enzyme which drives tumour invasion and immune escape. This **gene** is expressed on the **Y chromosome**, thereby providing a potential basis for **sex-specific differences in the progression of KRAS-driven colorectal cancer**.

Loss of Y chromosome:

- Researchers have also investigated how the loss of the Y chromosome might affect cancer outcomes. Loss of the Y chromosome is a feature observed in multiple cancer types. Tumours lacking the **Y chromosome** were more aggressive and had a dampened **T cell-mediated immune response** compared with tumours which had the **Y chromosomes** intact.
- The study also noted that the **loss of the Y chromosome is associated with an increased response to a specific type of immunotherapy called antiPD1 checkpoint blockade therapy** in both mice and humans, suggesting a **potential line of treatment for this subset of bladder cancers**.

Topic 33. MOSQUITO SURVEILLANCE MUST INCLUDE NON-RESIDENTIAL URBAN ENVIRONMENTS

Important for the subject: Science and technology

A longitudinal study in Bengaluru city has found how urbanisation affects mosquito ecology and how mosquito species diversity and abundance change across macro and microhabitats.

Study findings:

- The study found that the **quality of breeding sites determines the abundance and distribution of mosquito species**, specifically the ones that cause **dengue**.
- The way mosquitoes interact with larval habitats in different macro habitats did play an important role in determining mosquito diversity and abundance.

Six macro habitats were studied:

- Barren lands, lakes and their surroundings, plantations, and high dense, medium dense, and low dense urban areas. Whereas **plantations**, owing to diverse habitat types, proved to have **high mosquito species diversity and richness** compared with **high-density populated areas in the city**, even **barren lands did have microhabitats conducive for breeding**.

Aedes aegypti was the most dominant species (**55%**), followed by **Aedes albopictus** (**28%**).

- Habitat preference by the two Aedes species appeared to be driven at the microhabitat level.
- Man-made artificial containers accounted for over **90%** of larval habitats. **Water storage containers** came out as the most common breeding habitat for **Ae. aegypti**.
- **Discarded grinding stones** showed a **high prevalence of Ae. aegypti** and **Ae. albopictus larvae**. But the **prevalence in stagnant water** was less as these are open water bodies and more polluted.
- The body size of these mosquitoes varies according to the microhabitat. The wing length varies. The study found that when both **Aedes species** co-existed in a microhabitat, **Ae. albopictus** always ended up with reduced wing length.

Preventive steps: Neighbourhood surveillance:

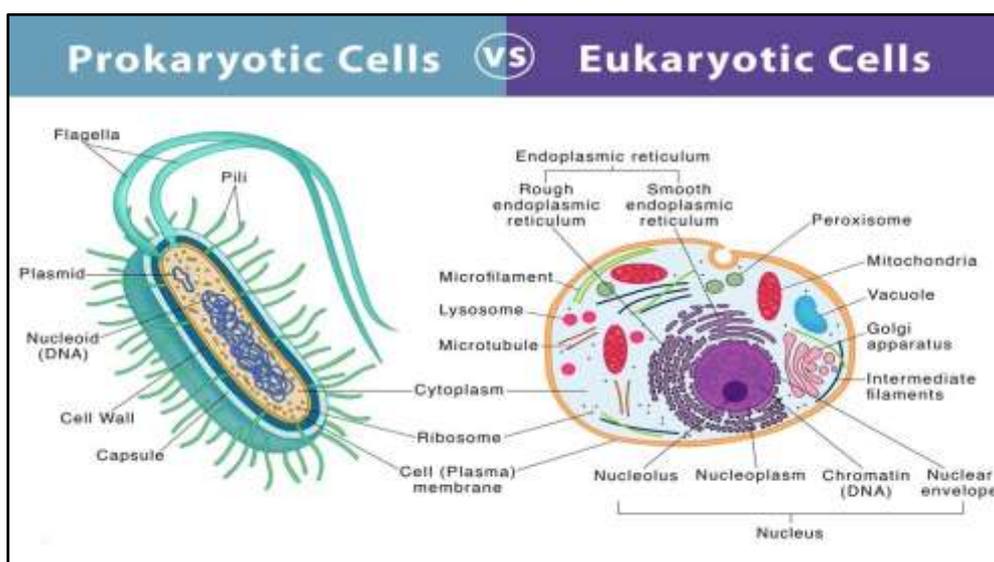
- **WHO** protocols are restricted to door-to-door larval surveillance and looking for mosquito larvae in containers.
- The study has demonstrated that **urban environments with non-residential locations** too harbour **ideal breeding sites**.
- Any program aimed at **reducing dengue transmission** should also factor in neighbourhood surveillance to prevent and control the rising threat of *Aedes* species.

Wolbachia method:

- The **World Mosquito Program's** innovative **Wolbachia method** is helping communities around the world prevent the spread of mosquito-borne disease. **Wolbachia** are **extremely common bacteria** that occur naturally in **50 percent of insect species**, including some mosquitoes, fruit flies, moths, dragonflies and butterflies.
- ***Aedes aegypti* mosquitoes don't normally carry Wolbachia**, however many other mosquitoes do.
- When ***Aedes aegypti* mosquitoes carry Wolbachia (by gene-editing)**, the bacteria compete with viruses like **dengue, Zika, chikungunya and yellow fever**.
- This makes it harder for viruses to reproduce inside the mosquitoes. And the mosquitoes are much less likely to spread viruses from person to person.

Topic 34. HOW PROKARYOTES LED TO EUKARYOTES

Important for the subject: Science and technology



Classification of organisms:

Organisms on planet Earth are broadly divided into **prokaryotes** and **eukaryotes**. **Prokaryotes are unicellular**, do not have any organelles such as **mitochondria**, and their **DNA is not packaged into a nucleus**. **Eukaryotes have mitochondria**, their **DNA is packaged into a nucleus**, and most eukaryotes are complex, multicellular beings.

Archaea:

- But a subset of **unicellular organisms** known as **Archaea** have a different line of descent as compared to **bacteria**.
- The **two differ** in the **composition of their cell walls** and in the **sequence of some of their genes**.
- The term **Archaea**, suggesting ancient, was used because the **first members of this domain were found living in extreme environments of very high temperatures or very high salt**.
- One group of **archaea** were shown to have **proteins** that closely resembled **eukaryotic proteins (multicellular organism)**. These organisms are found in a **geological formation where geothermally heated water is forced out of a ridge in the Atlantic Ocean floor at a depth of 2400 meters below sea level**.
- Many other related members were later found in unusual ecosystems and came to be collectively called the **Asgard**, which is the home of the Gods in Norse mythology.

Mitochondria as end osymbionts:

- The **mitochondria in eukaryotic cells** and **photosynthesizing chloroplasts in plant cells** have **evolved from free-living bacteria**. The ancestor of mitochondria was a **proteo bacterium** that was engulfed by an **Asgard archaean organism**.
- Descendants of this **end osymbiotic union** gave rise to **animals, fungi and plants**. In **plants**, the **Asgard-mitochondrial union** was followed by the intake of a **photosynthesizing cyano bacterium**, which became the **chloroplast**.

Plants do it differently:

- Researchers have found that plants adopt different strategies from animals and fungi.
- **Proteins are made up of amino acids**. Nature uses only left-handed amino acids; the

right-handed ones can be poisonous. The mechanism for discriminating ‘good’ from ‘bad’ is different for Asgards and bacteria.

- The paper shows that animals and fungi work their way around this discrepancy by forcing the mitochondria to change.
- Plants segregate the two policing machineries in the cytoplasm and in mitochondria.

Topic 35. WHAT IS LAB-GROWN MEAT AND WHAT DID THE U.S. RECENTLY APPROVE?

Important for the subject: Science and technology

The two companies, Good Meat and Upside Foods have received the U.S. government’s approval to make and sell their cell-cultivated chicken.

- The **U.S. Food and Drug Administration** was involved in the **regulatory process** but **didn’t technically approve the products** because the **process doesn’t require approval**.
- The step is being hailed by stakeholders in the concept as a major step forward for **reducing the carbon emissions** associated with the **food industry worldwide**.
- The first country to approve the sale of alternative meat was **Singapore in 2020**.

Cell-cultivated chicken:

- **“Cell-cultivated chicken”** – that’s the official name of chicken meat that is grown in a laboratory for human consumption.

Process of cultivation:

- First, isolate the cells that make up this meat (the meat that we consume), and put them in a setting where they have all the resources they need to grow and make more copies of themselves. These resources are typically **nutrients, fats, carbohydrates, amino acids, the right temperature, etc.**
- The ‘**setting**’ in which this process transpires is often a **bioreactor** (also known as a ‘**cultivator**’), a **sensor-fit device** – like a container – that has been designed to support a particular biological environment.
- Because of the techniques involved, producing meat in this way is also called **cellular agriculture**.
- Once these cells have become sufficiently large in number, which takes around two to

three weeks in Upside's process, they resemble a mass of minced meat.

- They are collected and then processed, with additives to improve their texture and/or appearance, and are destined for various recipes. Researchers are also developing cell-cultivated versions of sea bass, tuna, shrimp, and pork.

Why was cell-cultivated meat created?

- **Reasons include** reduced emissions, land use, prevention of animal slaughter, food security, and customisation.
- **Global livestock** is responsible for **14.5% of all anthropogenic greenhouse-gas emissions**.
- The **lab-cultivated meat** would use **63% less land** in the case of chicken and **72%** in the case of pork.

Challenges include:

- Perfectly substituting animal meat with alternative meat requires the latter to match the former's taste, texture, and appearance, and cost. The **cost of cell-cultivated meat is expected to remain high** in the near future.
- For the cellular cultivation process, researchers **require high-quality cells** to begin with (plus information about how different cell types contribute to the 'meat'), **a suitable growth medium** in which the cells can be cultured, plus other resources required to maintain the quality of the final product.
- The research found that if cell cultivation requires a "highly refined growth medium", akin to that used in the pharmaceutical industry, then the **"environmental impact of near-term [cell-cultivated meat] production is likely to be orders of magnitude higher than median beef production."**

Topic 36. MINERALS SECURITY PARTNERSHIP: INDIA JOINS THE CRITICAL MINERALS CLUB. HERE'S WHY THIS IS IMPORTANT

Important for the subject: International Relations

India became a part of the coveted critical minerals club — the **Mineral Security Partnership (MSP)** — headed by the **United States**.

Other initiatives include:

- Recently, **the US and the UK** signed the **Atlantic Declaration** to begin negotiations on a **critical minerals agreement**, which would allow some UK firms to access tax credits available under the US Inflation Reduction Act.

Mineral Security Partnership (MSP):

Initiated by the USA in 2022.

- It is also known as the **critical minerals alliance**. **MSP** is a strategic grouping of **13 member states** including Australia, Canada, Finland, France, Germany, Japan, the Republic of Korea, Sweden, the United Kingdom, US, the European Union, Italy and now **India**.
- It **aims** to catalyse public and private investment in critical mineral supply chains globally.
- Countries like Indonesia, Vietnam, the Democratic Republic of Congo, which have abundant reserves of critical minerals are not part of this strategic grouping formed by US.
- India's inclusion can create space for other countries to be part of the partnership and **reduce their dependence on China** by building a **robust and reliable supply chain of raw materials** needed for the **clean energy transition**. **Cobalt, graphite, lithium, manganese, nickel** and **rare earth elements** are these common strategic mineral resources that are demand-intensive due to their **strategic uses in wind turbines, batteries of electric vehicles** and other critical emerging technologies for green transition.

Objectives of the MSP include:

- Strengthened information sharing between partner countries
Increased investment in secure critical minerals supply chains
Developed recycling technologies

Significance for India:

- India's inclusion in the club is vital for **India to fulfill its ambition of shifting towards sustainable mobility** through **large, reliable fleets of electric public and private transport**.
- Securing the supply chain of critical minerals will also provide the country with the necessary push towards a concerted **indigenous electronics and semiconductor manufacturing**.

- The inclusion will pave the way for equitable sharing of resources across the globe.

India's involvement in other mineral partnership forums/agreements:

- **India** is already a member of the **Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development**, which supports the advancement of good mining governance.
- **India** and **Australia** have already signed the **Critical Minerals Investment Partnership** with the aim towards investment in critical minerals projects to develop supply chains between the two countries.

Topic 37. INDIA-MONGOLIA TO SET SHIPPING ROUTE FOR COKING COAL SUPPLY

Important for the subject: International Relations

Discussions are ongoing between the two countries to decide on a shipping route for coking coal import from Mongolia. Coking coal is a key feedstock material for steel-making.

The two probable shipping routes for the transport are:

- **Far East corridor** that uses the Vladivostok – Chennai shipping path **International North South Transport Corridor (INSTC)** through use of Chabahar port. A third route, which uses the Russia -Mongolia-China economic corridor, was dropped from consideration. The trade arrangement is significant considering that Mongolia is a **landlocked country** bordered by just two countries, Russia to the north and China to the south.

Coking coal:

- Coking Coal is being imported by Steel Authority of India Limited (SAIL) and other Steel manufacturing units mainly to bridge the gap between the requirement and indigenous availability and to improve the quality. Coal based power plants, cement plants, captive power plants, sponge iron plants, industrial consumers and coal traders are importing non-coking coal.
- Coke is imported mainly by Pig-Iron manufacturers and Iron & Steel sector consumers using mini-blast furnace.

- According to National Steel Policy 2017, to achieve steel making capacity of 300 MTPA (including 180 MTPA through Blast Furnace route) by 2030, ~170 MT coking coal will be required by 2030.
- Government has launched Coking Coal Mission to meet the demand of domestic coking coal as projected by the Ministry of Steel and has set target for raw coking Coal production by 2030

International North-South Transport Corridor (INSTC)

- The International North-South Transport Corridor (INSTC) is a **multi-modal transport project** that spans over **7,200 km** and aims at easing cargo movement among **Afghanistan, Armenia, Azerbaijan, Russia, Central Asia, Europe, India and Iran**.
- In December 2016, India agreed to use the INSTC which was established in 2000 and ratified in 2002 (by India, Iran and Russia).

Far East corridor

- India and Russia are both keen to operationalize the Vladivostok-Chennai shipping route of 10,500 km.
- This will substantially cut the distance/time taken compared to the existing route from St. Petersburg to Mumbai, that passes through the Mediterranean.
- The Chennai-Vladivostok maritime trade corridor is expected to cover the Sea of Japan, East and the South China Sea through Malacca Strait to reach the Bay of Bengal.

Topic 38. PARIS FINANCE MEET: MOMENTUM BUILDS FOR POLLUTER TAXES TO FUND GREEN TRANSITION

Important for the subject: International Relations

The Summit for a **New Global Financial Pact** was held in **Paris** to discuss the **transformation of global financial architecture**. The overarching **aim** of the summit is to identify financial system reforms for climate and development.

- At a side event titled **How to make polluters pay: Climate finance to support global equity**, discussions focused on using the ‘**polluter pays principle**’ to raise more climate finance for global equity.
- The **principle** essentially says that **those who pollute should also be liable to bear the**

costs of managing the pollution and compensate affected parties for the damage caused to the environment and human health.

- An estimated \$2.4 trillion (Rs 1,96,85,160 crore) per year until 2030 is needed by the developing countries to achieve the tasks set by the Paris climate summit. Panellists discussed instruments such as **shipping levies, financial transaction taxes, fossil fuel taxes, levies on the export of oil, gas and coal and airline levies.**
- The **shipping industry emits 2.9 per cent of the total global GHG emissions** currently. However, the **industry has managed to escape taxation** as the **high seas do not fall under the jurisdiction** of any single country's government.
- There is a high chance that the **IMO will introduce a shipping levy of \$100 per tonne of carbon dioxide**, which will raise approximately **\$60-70 billion per year**, a part of these revenues must go towards the loss and damage fund.

Airline levy can be applied also.

- It would be similar to the **airline levy that France instituted in 2006**, which raised proceeds for an HIV/AIDS fund.
- Fossil fuel companies should be taxed as part of the polluter pays principle. Research estimates that climate damage caused by fossil fuel companies is around **\$209 billion.**

Climate financing by Multilateral Development Bank (MDB):

- Multilateral development banks like the World Bank are expected to find \$200 billion in extra firepower for low-income economies by taking on more risk.
- **China** – the world's largest bilateral creditor – has been pushing for lenders like the **World Bank** or the **IMF** to absorb some of the losses, which the institutions and Western countries oppose.

Bridgetown initiative:

- The **Bridgetown Initiative** is a **proposal to reform the world of development finance**, particularly how rich countries help poor countries cope with and adapt to climate change.

Barbados sets out three key steps in the Bridgetown Initiative.

- The **first** involves changing some of the terms around how funding is loaned and repaid. The aim is to stop developing nations from spiralling into a debt crisis when their

borrowing is forced up by successive disasters like floods, droughts and storms. Secondly, Barbados asks for development banks to lend an **additional \$1 trillion** to developing nations for climate resilience.

- The **third step** is to set up a new mechanism – with private-sector backing – to fund climate mitigation and reconstruction after a climate disaster.

Topic 39. FACE AUTHENTICATION NOW IN PM-KISAN MOBILE APP, A FIRST FOR GOVT SCHEMES

Important for the subject: Schemes

In a **first** for any **central welfare scheme**, the government rolled out a **face authentication feature** in the **PM-Kisan app**, which will enable beneficiary farmers to complete their **e-KYC** process by just scanning their faces on mobile phones instead of using one-time passwords or fingerprints.

- **The PM-Kisan scheme has become the first scheme** of the government to do **eKYC through facial authentication** mobile app. This app is very much useful for farmers who are aged and also their mobile number is not linked with their Aadhaar.
- Until now, **e-KYC** of the **PM-Kisan beneficiaries** used to be done through either **biometrics at a designated centre** or **one-time passwords** sent to mobile phone numbers linked with Aadhaar.
- The face authentication feature uses the **iris data of a person having an Aadhaar number**. The **PM-Kisan scheme** is also **integrating with Bhashini** to provide farmers with information in their **native language**.
- **Bhashini** is the government's **National Public Digital Platform for languages** to develop services and products for citizens by leveraging the power of artificial intelligence and other emerging technologies.

About PM-Kisan scheme:

- Central Sector Scheme with 100% funding from central government. Became operational on 1 December 2018.
- The **Pradhan Mantri Kisan Samman Nidhi** or **PM-Kisan scheme** gives beneficiaries **financial assistance of Rs 6,000 per year in three equal instalments every four months**.

- The amount is transferred to the bank accounts of eligible farmers' families across the country through **Direct Benefit Transfer (DBT) mode**. Till now, more than **11 crore farmers** have availed the scheme and an amount of **Rs 2.42 lakh crore** has been transferred to their accounts.

SCHEME EXCLUSION

- The following categories of beneficiaries of higher economic status **shall not be eligible for benefits under the scheme**.

All Institutional Landholders.

Farmer families which belong to one or more of the following categories:

- Former and present holders of constitutional posts Former and present Ministers/ State Ministers and former/present Members of Lok Sabha/ Rajya Sabha/ State Legislative Assemblies/ State Legislative Councils, former and present Mayors of Municipal Corporations, former and present Chairpersons of District Panchayats.
- All serving or retired officers and employees of Central/ State Government Ministries /Offices/Departments and its field units Central or State PSEs and Attached offices /Autonomous Institutions under Government as well as regular employees of the Local Bodies (Excluding Multi Tasking Staff /Class IV/Group D employees) All superannuated/retired pensioners whose monthly pension is Rs.10, 000/-or more (Excluding Multi Tasking Staff / Class IV/Group D employees) of above category
- All Persons who paid Income Tax in the last assessment year Professionals like Doctors, Engineers, Lawyers, Chartered Accountants, and Architects registered with Professional bodies and carry out profession by undertaking practices.

How will the beneficiaries be identified?

- The entire responsibility of identifying the eligible farmers' families for benefit under the scheme is of the **State/UT Governments**.
- The prevailing land-ownership system/record of land in different States/Union Territories will be used to identify the intended beneficiaries for the transfer of scheme benefits.

Topic 40. AN EMPEROR'S DREAM, A SAINT'S CURSE: THE LEGEND OF DELHI'S THIRD CITY

Important for the subject: History

Tughlaqabad Fort:

Tughlaqabad Fort is built in **1321** by **Ghiyasuddin Tughlaq**— the first ruler of the Tughlaq dynasty that ruled in Delhi for nearly a century.

- The **fortress of Tughlaqabad** stands on a **rocky hill**, about 8 kilometres from the **Qutub Minar**, and is the **third of the seven cities of Delhi**. Roughly **octagonal on plan** with a **perimeter of 6.5km**, its **10 -15 m high rubblebuilt walls** are provided with bastions and gates at intervals.
- On its **south** was a **vast reservoir** created by erecting bunds between hills to its east, a causeway connected it with **Ghiyathuddin's tomb**, standing amidst waters, while a wide embankment near its south-eastern corner gave access to the **fortress of Adilabad**, built later opposite it on another hill.
- Adilabad fort was the personal residence of Mohammad Bin Tughlaq — Ghiyasuddin's successor.

The fort was part of a larger city divided into three portions:

- A rectangular area with high walls and bastions served as a citadel, A wider area immediately to its west housed the palaces and houses, and Beyond this to the north lay the city, remnants of which can be traced even now.

Ghiyasuddin Tughlaq:

- His original name was **Ghazi Malik**. He was a **governor** under the rule of **Alauddin Khalji**. The idea to built a fortified city was given by him to Mubarak Khilji, the son and successor of **Alauddin Khilji**.
- In **1320 A.D.** when Tughlaq sat on the throne, he began work on his ambitious plan of fortified city. He died in **1325 A.D.**

Muhammad bin Tughlaq (1325-51):

- He was a **learned, cultured and talented prince** but gained a reputation of being

merciless, cruel and unjust. He was **very tolerant in religious matters**.

- His innovative reforms brought him a bad name, as they were not executed properly. During the time of **Muhammad bin Tughlaq Vijaynagar (1336) and Bahamani (1347) emerged**.
- **Ibn Batuta**, a **Moroccan traveller** visited **Tughlaq**. He recorded his observation in his book **Qitab-ul-Rihla**. Later he was sent to China as an ambassador of Tughlaq. He added **jahanpanah city** to Delhi. His innovative (and failed) experiments include:
- Introduction of **Token currency** (Copper coins instead of Silver coins) **Transfer of capital** from Delhi to Devagiri (or Daulatabad) **Increase in taxes** in the Ganga-Yamuna doab area.
- **Introduction of Takkavi loans** (a form of Agriculture loan) and establishment of **Diwan-e-Kohii**. e. Department of Agriculture. To curb the rebellion of Taghi, Tughlaq entered into the **Sindh desert** and **died due to sunstroke** at **Thatta** in **1351 AD**.

Nizamuddin Auliya:

- **Syed Muhammad Nizamuddin Auliya** was one of the most famous Sufi saints from the Indian subcontinent region.
- Also known as **Hazrat Nizamuddin**, and **Mahbub-e-Ilahi (Beloved of God)**, he was a Sunni Muslim scholar and Sufi saint of the Chishti Order. He believed the love of God implied a love of humanity. He had a major influence on the Muslims of Delhi and the world over.
- **Nizamuddin Auliya** was born in **1238 AD in Badaun, Uttar Pradesh** to **Syed Abdullah bin Ahmad Al Hussaini Badayuni** and **Bibi Zulekha**.
- His father died when Nizamuddin was just five years old. At the age of 21, Nizamuddin went to **Ajodhan** (present Pakpattan Sharif in Pakistan) to become a disciple of the Sufi saint **Fariduddin Ganjshakar**, also known as **Baba Farid**.
- He built his **Khanqah** (place of worship and holding Sufi rituals) which was thronged with all kinds of people, rich and poor alike.
- **Some of the famous disciples of Nizamuddin include** – Shaikh Nasiruddin Chirag Delhavi, Amir Khusro, and the royal poet of the Delhi Sultanate. He died on **April 3, 1325**. His dargah (shrine) '**Hazrat Nizamuddin Aauliya Mehboob E Elahi Dargah**' was built in **1562** and is situated in the **Nizamuddin West area of Delhi**.