Prelim Bits 20-03-2024 | UPSC Daily Current Affairs

Afar Triangle

Geologists have found a fault that can create world's sixth ocean.

- East Africa is home to Africa's longest geological feature, the Great Rift Valley.
- The northernmost part of the Great Rift Valley features a large geological depression known as the Afar Triangle, located in the Horn of Africa.
- **Other names –** Afar Triangle is also known as the Afar Depression, or the Danakil Depression, or the Denakil Plain.

Danakil
• The depression in northeastern Ethiopia is one of the world's hottest places, as well as one of its lowest, at 100 metres below sea level. • The Danakil plain was formed by the evaporation of an inland water body. • All the water entering Danakil evaporates, and no streams flow out from its extreme environment. • It is covered with more than 10 lakh tonnes of salt.

- **Ethnic –** It is named after the Afar Ethnic Group who inhabit the region, while the term triangle represents the triangular shape of the geological depression when viewed on a topographical map.
- **Geologically Active –** The Afar Triangle is East Africa's most geologically active region and is made up of active volcanoes, salt lakes, and lava lakes.
- **Converging Plates –** The Afar Triangle is a geological depression where three tectonic plates, the Nubian, Somali, and Arabian plates, converge.
- The rifting process occurring here is a result of the tectonic plates slowly moving apart, a phenomenon that has been taking place for millions of years.
- **Afar formation –** In 2005, a 35-mile-long rift opened up in the Ethiopian desert, signaling the ongoing separation of the African continent.
- This rift is the surface expression of deep-seated tectonic forces at work, as the Somali plate moves away from the Nubian plate, stretching and thinning the Earth's crust.

Geologists predict that in 5 to 10 million years, the tectonic movement will eventually split the African continent into two, creating a new ocean basin.

- **New Ocean –** This new body of water would be the result of the Red Sea and the Gulf of Aden flooding over the Afar region and into the East African Rift Valley.
- Consequently, this part of East Africa would evolve into its own distinct continent.
- The formation of a new ocean is a complex and lengthy process that involves various stages of rifting, from continental breakup to the development of a mid-ocean ridge.

- **Mantle –** One of the key factors driving the rifting process is believed to be a massive plume of superheated rocks rising from the mantle beneath East Africa.
- This plume could be exerting pressure on the overlying crust, causing it to stretch and fracture.
- **Magmatism –** The magmatism in the region, particularly at the Erta Ale volcano, offers clues to the tectonic transition, with characteristics that mimic those of a mid-ocean ridge.
    - Magmatism is the formation and motion of magma under Earth's surface.

Quick Facts
Rift Valley
• A rift valley is a lowland region that forms where Earth’s tectonic plates move apart, or rift. • Rift valleys are found on land and at the bottom of the ocean, where they are created by the process of seafloor spreading. • Rift valleys differ from river valleys and glacial valleys in that they are created by tectonic activity and not the process of erosion. • Many rift valleys are part of triple junctions, a type of divergent boundary where three tectonic plates meet at about 120 degree angles.
East African Rift System
• It extends from Jordan in southwestern Asia southward through eastern Africa to Mozambique. • The system is some 4,000 miles long and averages 30–40 miles wide. • The system consists of two branches. • The main branch, the Eastern Rift Valley (often called the Great Rift Valley, or Rift Valley), extends along the entire length of the system. • The rift is less obvious through Tanzania, because the eastern rim is much eroded. • The western branch of the system, the Western Rift Valley, extends northward from the northern end of Lake Nyasa (Lake Malawi) in a great arc that includes Lakes Rukwa, Tanganyika, Kivu, Edward, and Albert. • The rift has been forming for some 30 million years (as Africa and the Arabian Peninsula separated). • The rift has been accompanied by extensive volcanism, producing such massifs as Kilimanjaro and Mount Kenya.

References

1. Times of India – Geologists found fault that can create 6th ocean
2. The Indian Express – What is the Danakil Depression?
3. National Geographic – Rift Valley
4. Britannica – East African Rift System

Vechur Cow

Dr. Sosamma Iype won the Padma Shri in 2022 for saving and resurrecting a breed of indigenous cattle, the Vechur Cow.

- The Vechur Cow is acknowledged as one of the world’s smallest cattle breeds, is indigenous to the Vechur village in Kerala.

In Kottayam, Alappuzha and Pathanamthitta districts of Kerala, there was a tradition of gifting Vechur cows as marriage gifts to daughters to address nutrition needs during their pregnancy and address staple food requirements of their newborns.

- **Characteristics –** Typically, 90 cm tall and one-metre-long, Vechur cows demand very little food and no special care.
- The milk was rich in fat, and the variety was tolerant to heat and resistant to most diseases, including the foot-and-mouth disease.
- Vechur Cow can easily survive in adverse climates.

The Vechur cows have now become icons of India's native cow conservation movement, and more than 6,000 such dwarf cows support the milk and cow dung needs of people across the country.

- **Extinct –** The milk revolution of the 1950s accompanied by a crossbreeding whip from the government, had started wiping out native cow breeds.
- In Kerala, a livestock improvement act was passed in 1961, and it declared possession of native breeds of cows as illegal.
- Across the state, Vechur cows were extensively inseminated with exotic bulls.

The Vechur experiment prompted the conservation of 28 native breeds which were on the verge of extinction, and they include Sikkim's small and short-legged Siri cow and the Tharparkar of Rajasthan's Thar Desert.

Quick Facts
Thenmala Kullan
• Thenmala Kullan, the dwarf cow comes with many distinctive features, including a small hump. • Reared by tribespeople in Arippa and Thenmala, they are less docile and basically thrive on forest-based fodder from nearby oil palm estates. • Though they produce the nutrient-rich A2 milk, the quantity is very low and they are reared mainly for calves and manure. • Kerala Animal Husbandry department plans to register 'Thenmala Kullan' as indigenous breed. *Indigenous cow breeds include Gir, Sahiwal, Rathi, Deoni, Kankrej, Tharparkar, Red Sindhi, Kangeyam, Ongole, etc and Indigenous buffalo breeds include Murrah, Jaffrabadi, Pandharpuri, Mehsana, etc.*

References

1. The Hindu – The curious case of Sosamma Iype and the Vechur cow
2. Mongabay – Sosamma Iype, the icon of native cow breed conservation
3. The Hindu – Thenmala Kullan

Star Tortoise

A new study shows that wild populations of Indian star tortoises, exist as two genetically distinct populations, one in northwestern India and the other in southern India.

- **Scientific name –** Geochelone elegans
- Star Tortoises have a distinct star-like markings on the shell.

Star Tortoises are one of the most trafficked species in the world.

- **Habitat –** It is endemic to the Indian subcontinent and inhabits two disjoined arid regions, northwestern India (including parts of Pakistan) and southern India (including parts of Sri Lanka).
- In India, they are found in six states Gujarat, Karnataka, Punjab, Tamil Nadu, Kerala and parts of Odisha.
- **IUCN Status –** According to the IUCN Red List, the Indian Star Tortoise is a vulnerable species.
- **CITES –** CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) listed it under Appendix I, the list of most endangered species.

• India has started creating a genetic database of the Indian Star Tortoise.
• Prior to this, similar genetic databases have been created and effectively used to protect tigers and rhinos in India.
• Integrating genetic information into the management of this highly trafficked species could help in evidence-based conservation and better rehabilitation decisions for seized tortoises.

Currently, seized star tortoises in India are released into wildlife sanctuaries such as the Chinnar wildlife sanctuary and Sathyamangalam wildlife sanctuary.

- **Threats –** The species is facing twin challenges of a threat to its habitat at one level and loss of its genetic diversity at the other.
- Rampant illegal trade has caused major losses of the Indian Star Tortoises.
- Unscientific translocations that have resulted in genetic mixing between different populations.

References

1. The Hindu – Indian star tortoise faces twin challenges
2. Mongabay – Rehabilitating trafficked star tortoises
3. Science Direct – Evidence-based conservation of Indian star tortoise

Euclid Satellite

Scientists are trying to de-ice Euclid satellite millions of kilometres away from Earth.

- **Mission by –** The Euclid Telescope was launched by European Space Agency from Cape Canaveral in Florida.
- **Objective –** The Euclid mission hopes to understand the evolution of the Universe by looking at the light emitted from galaxies 10 billion years ago.
- Euclid is a cosmology survey mission, optimized to determine the properties of dark energy and dark matter on universal scales.
- The telescope will also focus on gleaning more information on dark energy and dark matter and will scan more than 1/3rd of the sky.

Dark energy is the undetectable form of energy that is causing the expansion of space, about 68% of the universe is made of dark energy while dark matter makes up 27% and only 5% of the Universe is made of normal matter.

- **Named After –** It is named after the Greek mathematician Euclid of Alexandria, who lived around 300 BC and founded the subject of geometry.
- **Features –** The Euclid spacecraft is approximately 7 m tall and 3.7 m in diameter.
- **Components –** It consists of two major components: the service module and the payload module.
- **Orbit –** Its operational orbit will be a halo around a point known as the Sun-Earth Lagrange Point 2 (L2), at an average distance of 5 million km beyond Earth's orbit.
- **Lifetime –** Nominal mission lifetime is six years, with the possibility of extension (limited by the amount of cold gas used for propulsion).
- **Ice on the telescope –** The layers of ice covering Euclid's optics are the same width as a strand of DNA, but it is already impacting the spacecraft's vision.
- For most spacecraft, it would be enough to use in-built heaters to slightly raise the temperature of the entire spacecraft, which could clean the optics.
- But materials expand with heat, and they don't always return to the exact same state after cooling.
- To limit the possibility of such thermal changes affecting its sensitivity, the Euclid team will individually heating low-risk parts of the spacecraft gradually before they get the intended results.

References

1. The Indian Express – Scientists are trying to de-ice Euclid satellite
2. ESA – Euclid Satellite

Kshipra River

A performance audit conducted by the Comptroller and Auditor General of India (CAG) on the degradation of the river, covering 2016-17 to 2020-21, threw up a host of significant findings.

- The Shipra, also known as the Kshipra, is a river in the State of Madhya Pradesh.
- The river rises in the kakri bardi hills Vindhya Range north of Dhar, and flows north across the Malwa Plateau to join the Chambal River.
- The word Shipra is used as a symbol of purity (of soul, emotions, body, etc.) or chastity

or clarity.
- Shipra is a perennial river and is considered as sacred as the Ganga River by the Hindus.
- The Puranas or ancient Hindu texts also put forward that the Shipra originated from the heart of Varaha, Lord Vishnu's incarnation as a boar.

The audit was the first performance audit conducted by the CAG on a river's degradation in the entire central India.

- **Ujjain –** The holy city of Ujjain is located on the right bank of the Shipra River.
- **Kumbha Mela –** The famous Kumbha Mela takes place in the Ghats of this city, once every 12 years, a yearly celebration of the river goddess Kshipra.
- **Mentioned In –** The Shipra River finds mention not only in ancient Hindu texts, but also in Buddhist and Jain scriptures.
- **Lok Sarita –** The pious river Kshipra is often referred to as "Lok Sarita" or the river of masses since, its origin is directly out of the womb of the earth.

Reference

The New Indian Express – CAG alert on pollution of Kshipra River

Other Important Topics
Project GR00T
NVIDIA announced Project GR00T at its annual GTC developer conference held recently, along with updates to the Isaac platform and Jetson Thor. • **GR00T** stands for "**G**eneralist **R**obot **00 T**echnology" developed by ***NVIDIA Corporation,*** U.S. based multinational technology company on AI and GPUs. • Project GR00T is a foundation model for humanoid robots that helps them learn through simulation and in the real world. • It is a general-purpose model that allows robots to function as "minds". • It takes multimodal instructions and past interactions as input and produces the next action for the robot to execute.
eShram portal

The Supreme Court recently urges to implement its order to provide ration cards to migrant workers registered in the eShram portal but not covered under the National Food Security Act.

• **eShram -** To create a ***National Database of Unorganized Workers (NDUW)*** for optimum realization of their employability and extend the benefits of the social security schemes to them.

• **Ministry -** Developed by the Ministry of Labour & Employment.

• It is the ***1st-ever national database of unorganised workers*** including migrant workers, construction workers, gig and platform workers, etc.

• The portal is seeded with ***Aadhaar,*** used for enrollment, registration, collection, and identification of the required data of all the unorganized workers.

• **Eligibility -** Any worker who is unorganized and aged between ***16-59,*** is eligible to register on the eShram portal.

Valmiki Tiger Reserve (VTR)

Valmiki Tiger Reserve (VTR) is using green energy to provide adequate water to wild animals, including tigers and their prey, during the hot summer season.

• Valmiki Tiger Reserve (VTR) is the ***only tiger reserve*** situated in ***Bihar***.

• The VTR was established in 1990 and declared a Wildlife Sanctuary in 1978.

• VTR comprises of the Valmiki National Park and Valmiki Wildlife Sanctuary.

• VTR is located on the banks of the ***Gandak river***, at the ***India-Nepal border*** and the easternmost limit of the ***Himalayan Terai forests.***

• VTR boundary in the north borders ***Royal Chitwan National park (World Heritage Site) and Parsa wildlife sanctuary of Nepal.***

The Bihar government is waiting to obtain NTCA approval for declaring Kaimur Wildlife Sanctuary as the state's 2nd tiger reserve after VTR.

Asbestos

The United States' Environmental Protection Agency (EPA) announced a comprehensive ban on all forms of the deadly carcinogen asbestos.

• Asbestos is a group of ***naturally occurring*** fibrous minerals used in fire-resistant and insulating material.

• It has been used in commercial products such as insulation and fireproofing materials, automotive brakes, and wallboard materials.

• Exposure can cause health risks, including cancer.

Chrysotile asbestos

• Chrysotile asbestos is the most common type of asbestos, making up 99% of the world's current asbestos production.

• It is also the ***only serpentine form of asbestos***, made up of long, curly fibers that weave to make sheets.

• It is also known as ***"white asbestos"*** because of the color of the fibers.

• It is primarily used by the chlor-alkali industry, which produces chlorine bleach, caustic soda and other chemicals used in water treatment.

• The ***recently banned chrysotile asbestos*** was the last remaining type of asbestos legally used in the U.S.

World Cooperative Economic Forum (WCEF)

On the lines of the World Economic Forum, some co-operative sector leaders and experts have formed the World Cooperative Economic Forum (WCEF), in New Delhi recently.

• The WCEF will endeavour to promote cooperative thinking and cooperative movement.

• It will raise issues and concerns of the sector with governments and other stakeholders around the globe.

UDGAM Portal

• **UDGAM (G**ateway to **A**ccess **I**nformation for **U**nclaimed **D**eposits) is an online portal launched by the ***Reserve Bank of India.***

• It facilitates the registered users ***to search unclaimed deposits/accounts*** across multiple banks at one place in a centralised manner.

• All unclaimed deposits/accounts that are part of Depositor Education and Awareness (DEA) Fund of RBI can be searched in UDGAM portal.

• Then the unclaimed deposits can be claimed from the respective bank.

• **Unclaimed Deposit Reference Number (UDRN)** is a unique number assigned to each Unclaimed account/ deposit transferred to Depositor Education and Awareness (DEA) Fund of RBI.

Currently, 30 banks representing 90% of unclaimed deposits in India are part of UDGAM.

Sham elections

Vladimir Putin was recently elected as President for a 5th presidential term against 3 candidates with little public profile.

• Sham elections refer to elections that are held without any purpose or significance purely for show.
• Sham elections are a common event in dictatorial regimes that still feel the need to establish some element of public legitimacy.
• Ballots in a show election may contain only one "yes" option. Where there are "yes or no" questions, people who pick "no" are often prosecuted, thus making the "yes" choice the only option.
• This type of election is mainly conducted for a predetermined conclusion. Sham elections are also known as ***show elections.***

Spotter Drone

• The Spotter drone is a cutting-edge unmanned aerial vehicle (UAV) indigenous multi-copter drone developed by ***Sagar Defence*** for the Indian Navy.
• The drone can operate without issue in rough sea environments and high crosswinds.
• The Spotter drone also allows the Indian Navy to schedule inspections to detect threats and share information in real time to immobilize them.

Doctor to Population Ratio

• India surpasses World Health Organization guidelines with ***1:900*** doctor-to-population ratio recently.
• **World Health Organization recommendation-** Doctor to population ratio of ***1:1000.***

Kalpana Chawla

• Kalpana Chawla was the ***1st Indian-origin woman*** to travel to space.
• She was born in Karnal, India on 17, March 1963 and ***1st flew on the Space Shuttle Columbia*** in **1997** as a mission specialist and robotic arm operator.
• In 2003, she was one of the 7 crew members killed in the NASA's Columbia spacecraft disaster in 2003.
• NASA honoured her with the naming of an asteroid, a lunar crater, and a hill on Mars.

SHANKAR IAS PARLIAMENT
Information is Empowering