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Topic 1. UPDATE LAND RECORDS TO INCLUDE FRA TITLES ALLOTTED, MOEF&CC DIRECTS STATES

Important for subject: Environment

The Union Ministry of Environment, Forest and Climate Change has written a letter to all states in the country, asking them to register settlement rights in revenue and for forest records within three months.

- Digital information about the record of right (RoR) under the Scheduled Tribes, Other Traditional Forest Dwellers Act (Recognition of Forest Rights), 2006 or will be also integrated with the PariveSH portal and other web GIS platforms of state and central government departments.
- Geo-referencing under FRA is beneficial to the people of the States as the Forest and Tribal Welfare Departments will have the ability to initiate specific projects or schemes for improving the lives of FRA title holders.
- Parivesh (Proactive and responsive facilitation through Interactive, Virtuous, and Environmental Single-window hubs)-
- It serves as an environmental hub that provides a single point of contact for Environment, Forest, Wildlife, and CRZ clearances.
- This Single-Window Integrated Environmental Management System was developed to fulfill the spirit of Digital India', which was initiated by the Prime Minister.
- It captures the essence of Maximum Governance and Minimum Government.

Key features:

- "PARIVESH" is an workflow-based application that is based on web architecture.
- It is used to submit, monitor and manage proposals submitted by Project Proponents at the Ministry of.
- Environment, Forest and Climate Change (MOEFCC) and State Level Environmental Impact Assessment Authoritys (SEIAA) are both available.
- It will grant various types of clearances, such as. Clearances for Environment, Wildlife, and Coastal Regulation Zones from the Central, State, and District-level Authorities.
- With technical support from National Informatics Centre (NIC), the system was

designed, developed, and hosted by Ministry of Environment, Forest, and Climate Change.

- It allows single registration as well as single login to all types of clearances (i.e. It provides a unique-ID for each type of clearance required for a project.
- The proponent can also use the single interface to submit applications for all types of clearances (e.g. Environment, Forest, Wildlife, and CRZ). Environment, Forests and Wildlife, CRZ clearances

Scheduled Tribes (Recognition of Forest Rights Act) 2006 or FRA

- FRA, which was enacted in 2006, recognizes the rights to forest-dwelling tribes and other traditional forest dwellers to forest resources upon which they were dependent for a variety of needs, including livelihood, shelter, and other socio-cultural requirements.
- It recognizes and vests forest rights and occupations in Forest land in Forest Dwelling Scheduled Tribes and Traditional Forest Dwellers, who have been residing there for generations.
- It enhances the forest conservation system and ensures the livelihood and food security for the OTFD and FDST.
- The Gram Sabha is responsible for initiating the process to determine the extent and nature of Individual Forest Rights (IFR), Community Forest Rights, (CFR), or both that could be granted to FDST or OTFD.

Rights under The Forest Rights Act:

Title rights:

- It grants FDST or OTFD ownership rights to land farmed from tribals or forest dwellers. Important, but only 4 hectares.
- The family that owns the land is responsible for cultivating it. No new lands are allowed.

Use rights:

- The rights of the residents extend to extraction Minor Forest Produce, grazing area Relief and development rights:

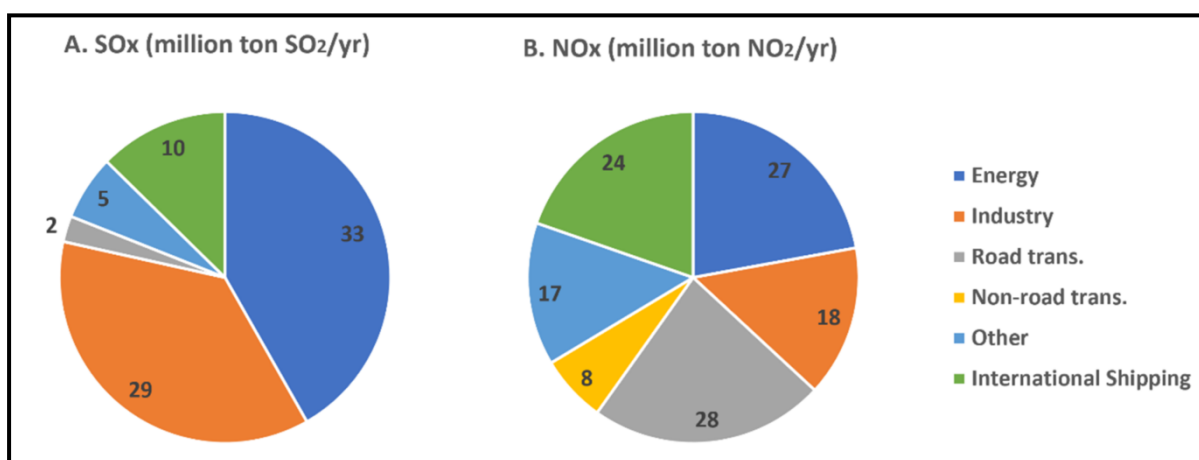
- Rehabilitating in the event of forced displacement or illegal eviction. Also, providing basic amenities.

Forest management rights:

- It also includes the right of any community forest resource that they have been previously conserving and protecting for sustainable use.

Topic 2. CAN BIO-CNG CLICK: A PRIMER ON THIS COMING OF AGE TECH THAT CAN DEAL WITH AIR POLLUTION AT 3 LEVELS

Important for subject: Environment



About Bio CNG

- BioCNG, also known as Compressed Biogas (CBG), is an improved version of the humble biogas. It's used as a cooking fuel in many villages across India.

Production process

- Pre-treatment is the first stage in the CBG procedure.
- This screen removes hard materials such as coconut shells or pieces of wood.
- The screen waste is then shredded in a mill and mixed with water to make a slurry.
- Hydrolysis is the process of keeping the slurry in an aerobic environment for at least one to two days.
- The liquid is transferred to an anaerobic digestion unit where it is kept for between 20 and 25 days.
- This is methanogenesis, where biogas can be generated.
- This gas is composed of 65 percent methane and the rest being carbon dioxide,

hydrogen sulfide, and water vapour.

- The gas is then stored in a balloon, and then transported to a gas upgrading area.
- To remove hydrogen sulphide or carbon dioxide, it is sent through a dry and wet scrubber.
- Methane is extracted here and diluted to 95%.
- Is then compressed in cylinders at high pressure and sent to filling stations.
- This highly pure methane has chemical properties similar to CNG which is derived from petroleum sources.
- It can therefore be used in automobiles.
- CBG plants can also use biodegradable waste such as agricultural residue, chicken litter, and cow dung from sugar factories, in addition to press mud and other animal waste.

CBG Need in India

- India is third in crude oil imports.
- 2020-2021 imported 54% from India to meet its natural gas requirements.
- CBG can be made at any hour of the day and is therefore a decentralised form of energy.
- CBG is superior to incineration based waste-to-energy plants which release toxic gases.
- The global warming potential for methane is 28x higher than that of CO₂.
- EROI measures the energy required to produce another source of energy relative to the actual energy produced from that source.
- Large biogas plants have an energy return on investment (EROI) score of 1.24 to 11.

Benefits

- If used correctly, municipal solid refuse (MSW), and waste energy could replace 4053.47 tons of India's diesel consumption per-day, India's most consumed transport fuel.
- CBG potential all biomass can be used to replace the diesel currently being used in transport.
- To preserve air quality, biomethane is the best option.

- CBG is an important service that manages our waste and produces organic manure. This can help to restore the bio-content of soils that have been overly fertilized with chemicals over the years.
- Bio-CNG has a higher calorific content than other fuels.

Limitations

- Maintenance costs are high.
- Potential for high global warming.
- Methane pollution Futile methane emission openly dumped refuse can also lead to landfill fires, as was the case in Delhi earlier this month.
- 20% of methane emissions come from landfill sites.

Topic 3. BETTING FOR EXOTIC MEAT, GAMBLING DENS IN MANIPUR **DESCEND FURTHER INTO ILLEGALITY**

Important for subject: Environment

After receiving reports that wild animals, dead or alive, were being offered as raffle prizes by the State's Ukhrul, police and forest officers have been scanning "gambling areas".

- Ukhrul lies approximately 80km northeast of Imphal, the State capital.
- To try their luck at winning exotic meat, people buy raffle tickets that range from Rs 100 to Rs 500.
- The ticket price will go up if the animal, bird, or body part is rarer.
- Wild boars, deer, and other animals have been discovered to be available.
- There have been other types of birds, such as the grey thrush or the tragopans (often called horned Pheasants).

Wildlife Protection Act 1972-

- Schedule of WPA states that only mice, rats and common crows are allowed to hunt.

WPA Scheduling

Schedule I

- This Schedule includes endangered species.

- These species require strict protection. Therefore, the Schedule contains the most severe penalties for violating the law.
- This Schedule prohibits hunting of certain species in India.
- This list is granted absolute protection.
- These animals are not to be traded.
- Examples include tiger, blackbuck and Himalayan Brown Bear.

Schedule II

- High protection is also given to animals on this list.
- Their trade is forbidden.
- They can't be hunted unless there is a threat to their lives.
- Examples include Kohinoor (insect), Assamese Macaque and Bengal Hanuman langur.

Schedule III & IV

- This is a list of species that aren't endangered.
- This applies to protected species, but the penalty for violating the schedule is lower than the penalties in the first two.
- Examples include hyenas, Himalayan rats, porcupine and flying foxes, as well as Malabar tree-toads.

Schedule V

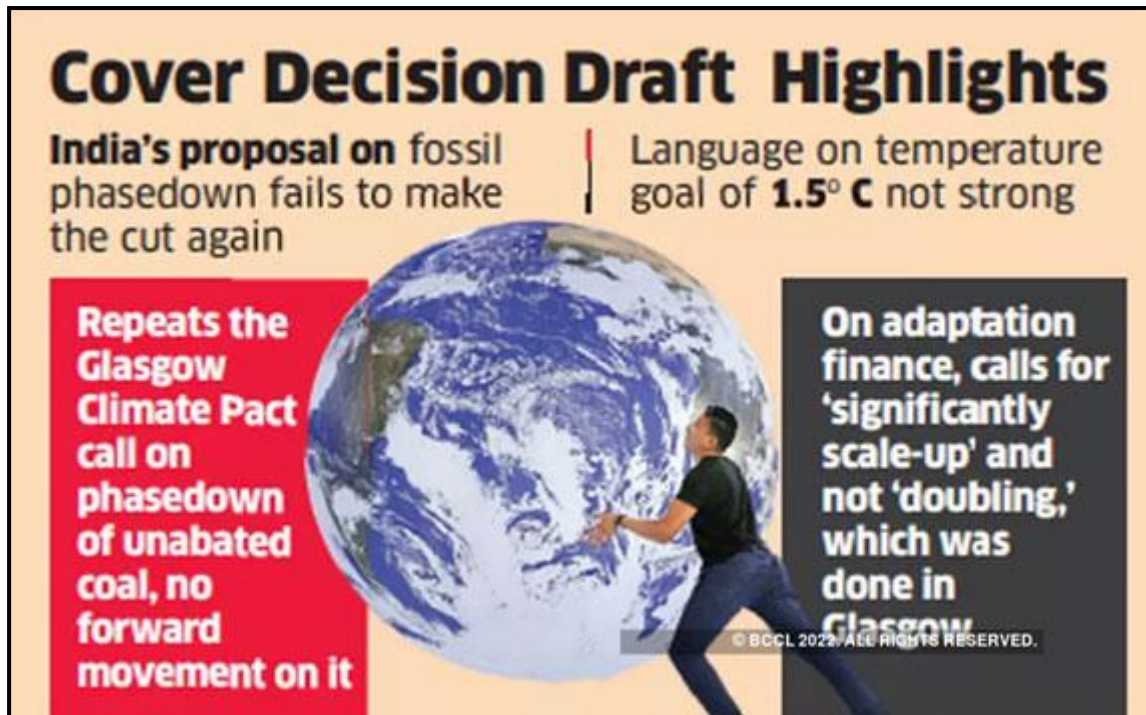
- This list includes animals that are huntable.
- Examples: mice, rat, common crow, fruit bats, etc.

Schedule VI

- This list includes plants that cannot be grown.
- Examples: pitcher plant, blue vanda, red vanda, kuth, etc.

Topic 4. LOSS AND DAMAGE DECISIONS, PITFALLS AND PROMISES

Important for subject: Environment



The decision to focus on L and D, those most vulnerable to adverse climate effects, was a major takeaway from COP27 Egypt.

Transitional Committee

- CoP27, Egypt was formed to provide the financial solutions for Loss and Damage.

Aim

- To make suggestions on how to operate both the new funding arrangements as well as the fund at COP28 next Year.
- The first meeting is scheduled to take place before March 2023.
- Common, but different responsibilities and respective abilities (CBDR - RC) -
- It recognizes that countries, also known as Parties, have different duties and capabilities to address the negative effects of climate change. However, all countries are bound to address climate change.
- The 1992 United Nations Conference on Environment and Development
- (UNCED), Rio de Janeiro The CBDR-RC was officially enshrined under the UNFCCC climate change treaty.

- The Convention, reflecting CBDR-RC, divided countries into "Annex I" and "non Annex I," with the former referring to developed nations and the latter to those in the developing world.
- Convention Annex I countries play a greater role in mitigation than countries that are not part of the Convention.

Alliance of Small Island States -

- It is an intergovernmental organization of small- and low-lying island countries. In 1990
- The purpose of the alliance to consolidate voices of Small Island Developing States to address global warming. Many AOSIS states are at risk from climate change, so AOSIS has threatened to sue.
- AOSIS is a member of 44 states
- **India is not a member**

Indian 4 states is a member:

1. Comoros
 2. Maldives
 3. Mauritius
 4. Seychelles
- Global Shield Scheme to protect against climate risks
 - It is intended to provide social protection and insurance-based financing mechanisms for loss and damage that are not covered by the UNFCCC process.
 - Least Developed Countries (LDC) and Association of Small Island States (ASIS) are arguing vigorously for the finance facility that is based on the polluter pays principle at the negotiations in COP27.
 - The initiative will provide prearranged financial support that can be quickly deployed in times of climate disasters like the devastating floods in Pakistan in August.
 - The first recipients of assistance under the Global Shield initiative will be Pakistan, Bangladesh and the Philippines.
 - The countries that support the initiative include Germany, Denmark and Ireland, Canada and the USA.

- The Global Shield is designed to increase financial protection for individuals, governments, businesses, and communities.
- Implementation will be in line with the financial and economic strategies of the vulnerable country, closing the financing gap.
- These include credit guarantees, credit protection, livelihood protection, crop and livestock insurance, social protection systems and livestock and crop insurance.
- 28/29It will Support the Integrated Development of Instruments at the Level of Governments, Humanitarian Agencies and Non-Profits to ensure that money is always available.

Topic 5. TOXIC AIR: GRADED RESPONSE ACTION PLAN ANNOUNCED FOR KOLKATA, OTHER BENGAL CITIES

Important for subject: Environment

Category	Ambient Particulate Matter (PM) Concentration	Measures
Moderate to Poor	<ul style="list-style-type: none"> PM 2.5 between 61-120 $\mu\text{g}/\text{m}^3$ PM10 between 101-350 $\mu\text{g}/\text{m}^3$ 	<ul style="list-style-type: none"> Enforce pollution control in thermal power plants Mechanized sweeping on roads Ban on firecrackers Stop garbage burning
Very Poor	<ul style="list-style-type: none"> PM2.5 between 121-250 $\mu\text{g}/\text{m}^3$ PM10 between 351-430 $\mu\text{g}/\text{m}^3$ 	<ul style="list-style-type: none"> Stop use of diesel generator sets Increase bus and metro services and increasing frequency of metro service Stop use of coal/firewood in hotels and open eateries
Severe	<ul style="list-style-type: none"> PM2.5 more than 250 $\mu\text{g}/\text{m}^3$ PM10 more than 430 $\mu\text{g}/\text{m}^3$ 	<ul style="list-style-type: none"> Increase frequency of mechanized sweeping of road and sprinkling of water on roads Close brick kilns, Hot Mix plants, Stone Crushers Shut down Badarpur power plant Introduce concessional rates to encourage off-peak travel in public transport.
Severe+ or Emergency	<ul style="list-style-type: none"> PM2.5 of or more than 300 $\mu\text{g}/\text{m}^3$ PM10 of or 500 $\mu\text{g}/\text{m}^3$ <p>(persist for 48 hours or more)</p>	<ul style="list-style-type: none"> Stop entry of diesel trucks into Delhi (except essential commodities) Stop construction activities Introduce odd and even scheme Shutting of schools

West Bengal Environment Department has launched a "Graded Response Action Plan" (GRAP) to combat rising pollution in Kolkata, and other nonattainment areas like Durgapur

and Haldia.

- Non-attainment Cities are cities that have been found to be extremely polluted or have not met the National Ambient Air Quality Standards for more than five years.
- Worsening pollution in Kolkata and other West Bengal cities Kolkata's average air quality index was higher than Delhi on two days this week, November 24th and 25th.
- Long-term exposure to poor air quality could cause "respiratory disease".

Increased air pollution

- Inversions of surface temperature, which is when cool air is trapped near the surface and has a high pollution load, are a significant factor in the winter when the inversions are strongest.
- Poor air quality is caused by pollutants from burning, vehicles and industry.

GRAP Model of West Bengal

- To counter the rise in air pollution in Kolkata and other cities in West Bengal, West Bengal has announced a 10-point "graded reaction action plan (GRAP)".
- GRAP refers to a group of emergency steps that are used to stop further degradation of the air quality once it has reached a certain level.
- GRAP Stage 1 is activated when the AQI falls below 300 (201-300). Stage 2, 3, and 4 are imposed when there is a significant improvement in air quality.
- As of now, Bengal GRAP is not being graded.

This action plan contains:

- Periodic mechanised sweep and water sprinkling of roads, especially at heavy traffic corridors or hotspots for dust suppression.
- Ensure proper disposal of garbage and dust at designated locations
- To stop open burning of garbage, strict enforcement is required.
- It is important to ensure that all demolition materials and construction waste are contained properly.
- Strenuously enforce the ban on open burning of biomass or municipal solid waste.
- Traffic flow can be smoothened by synchronisation of traffic movements.
- Monitoring the implementation of the norms at identified pollution hotspots within

the city.

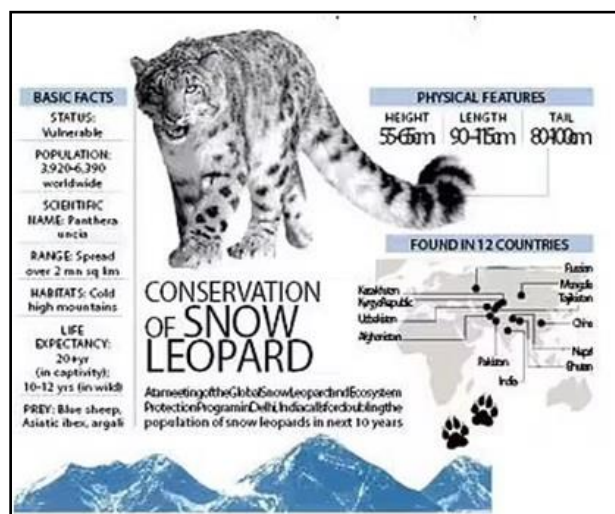
- Strenuous enforcement of PUC (pollution control) norms, and heavy penalties for visibly polluting vehicles.
- Reduction of truck traffic that is not intended and diversion of trucks, except for those transporting essential commodities or providing services.
- Strenuous action is also recommended against the use of non-compliant diesel generators and the bursting of banned fireworks.

Criticism West Bengal's GRAP Model

- The GRAP, released by West Bengal, was not graded or in tune with the forecasting base GRAP Model currently being used in Delhi.
- The AQI was found to have been 241 ('poor') from 150a previous, an astonishing 60% increase.
- The trigger for the AQI leapfrog was ultra-fine particulate PM2.5, the most harmful air pollutant.
- GRAP measures should be implemented proactively, based on weather forecasts. not retroactively implementing these measures once unacceptable levels have been breached. Steps of GRAP and the respective measures

Topic 6. INDIAN SCIENTISTS RECEIVE INTERNATIONAL AWARD ON BEHALF OF SNOW LEOPARD CONSERVATION ALLIANCE

Important for subject: Environment



Charudutt Mishra, an Indian snow leopard expert, and Koustubh Sharm, a Kyrgyzstan-based

BBVA Foundation's Worldwide Biodiversity Conservation Award, were presented to them by The Global Snow Leopard Ecosystem Protection Program, (GSLEP), which they created and managed.

The Award

- The Spain-based BBVA Foundation Awards For Biodiversity Conservation seeks to recognize and support the efforts of conservationist institutions, agencies and organizations in advancing environmental conservation policies and projects.
- Global Snow Leopard Ecosystem Protection Program (GSLEP)-
- The GSLEP is an first of its kind intergovernmental alliance to conserve the snow leopard as well as its unique ecosystem.
- GSLEP was established in 2013, by officials, politicians, and conservationists to collaborate in the conservation this species as well as its habitat.
- It is led by 12 countries Asia which form the snow leopard's home range.
- These include Afghanistan, Bhutan and China as well as India, Kazakhstan, Kyrgyzstan. Mongolia, Nepal, Pakistan and Russia.
- It covers two million square kilometers.
- The GSLEP Program secretariat has its headquarters in Bishkek, and is hosted at the
- Ministry of Natural Resources, Ecology and Technical Supervision of Kyrgyz Republic

Snow Leopard-

- Scientific name *Panthera uncia*.
- Habitat Snow leopards are found in Central Asia's mountains.
- Numbers There are between 3,920- 6,390 snow leopards remaining in the wild.
- Range stretches through twelve countries: Afghanistan (Bhutan, China), India, Kazakhstan Kyrgyzstan and Mongolia, Nepal, Pakistan, Russia, Tajikistan and Uzbekistan.
- Conservation Status: Snow leopards were once considered endangered until 2017, but their status was later changed to vulnerable.

Conservation challenges:

- Increased habitat degradation and poaching, as well as conflict with communities.

Conservation efforts at the National Level:

- According to reports, India is home for approximately 450-500 snow leopards that can be seen in the higher Himalayan regions.
- Through the Project Snow Leopard (PSL), India has been conserving snow leopards in their habitats.
- India is also a member of the Global Snow Leopard, and Ecosystem Protection (GSLEP) Programme since 2013.
- India has three major landscapes that are being conserved: Hemis Spiti in Himachal Pradesh and Ladakh; Nanda Devi – Gangotri, Uttarakhand; Khangchendzonga, Tawang across Sikkim, and Arunachal Pradesh.
- Snow Leopard has been added to the 22 list of critically endangered species in order to be included in the recovery program of the Ministry of Environment Forest & Climate Change.
- SECURE Himalaya - Global Environment Facility (GEF- United Nations
- The project on high-altitude biodiversity conservation and reducing dependency on the natural environment was funded by the Development Programme (UNDP).
- The project is currently operational in four snow leopard range state, namely Jammu and Kashmir Himachal Pradesh Uttarakhand and Sikkim.
- Community volunteer program "HimalSanrakshak" to help snow leopards.

Conservation efforts at the international level:

- The Bishkek Declaration, which set the goal to protect at least 20 snow leopard habitats and viable snow leopard populations by 2020 in 2013, led to the creation of the Global Snow Leopard and Ecosystem Protection Program.
- Since then, the International Snow Leopard Day is celebrated every year on October 23.

Topic 7. HIMALAYAN YAK GETS FOOD ANIMAL TAG; MILK AND MEAT TO BE USED

Important for subject: Environment

The Food Safety and Standard Authority of India has awarded the Himalayan yak the food animal tag.

About the Yak

- Domestic yak (*Bos Grunniens*), also known by Tartary ox, grunting cattle or Tartary ox is a long-haired breed of domesticated cattle that can be found in the Himalayan region, the Tibetan Plateau, Kachin State, Northern Myanmar, Yunnan and Sichuan. It can also be found as far north as Mongolia, Siberia, and Gilgit-Baltistan (Kashmir).
- It descends from wild yaks (*Bos muus*).
- The yak plays a multidimensional socio-cultural-economic role for the pastoral nomads who rear it for their food and livelihood due to the lack of other agricultural activities in those regions.
- Yaks are typically raised under a transhumance system.

Declining population of yak

- The country's yak population has been declining at an alarming pace.
- A census was conducted in India in 2019 and found that India had 58,000 yaks. This is a decrease of 25% over 2012's livestock census.
- The drastic drop in yak numbers could be explained by lower remuneration from , which discourages younger generations to continue nomadic yak rearing.
- This is due to yak butter and beef being not part of the traditional dairy and meat industries, so their sales are limited to local customers.
- Categorisation will help to reduce the decline of high-altitude bovine animals by making them part of the traditional milk and meat industries.

Nutrient-loaded

- Yak milk has many health benefits, is high in nutrition, and rich in fat. It also contains essential minerals, and can be used to treat diseases.
- According to nutritional analysis, yak Milk contains 78-82% Water, 7.5-8.5% Fat, 4.9-5.3% Protein, 4.5-5.0% Lactose, and 12.3-13.4% Solids-not-Fat.
- Traditional yak milk products include churkum and churpi as well as ghee, paneer, and ghee.

- Yak meat is mainly consumed locally and is lean.
- The meat has 74.8% moisture, 21.7% proteins, 1.5% crude oil, and 1.2% ash.

Topic 8. SCIENTISTS DISCOVER NEW SPECIES OF BLACK CORALS NEAR THE GREAT BARRIER REEF

Important for subject: Environment



A new species of Black Corals

- Researchers at Smithsonian Institution in Washington discovered five new species, all living below the surface of the Great Barrier Reef, Coral Sea, and the coast of Australia, using a remote-controlled submarine.
- In the past, Corals from the deep areas in this region were collected by dredging or trawling methods which would often kill the corals.

Black corals

- Antipatharians, also called black corals and thorn Corals are a group of soft deep-water corals.
- These corals can be identified by their jet-black or darker brown chitinskeletons. is surrounded by the Polyps (part of coral that's alive).

- Antipatharians can be found in almost every place and at all depths, except brackish water.
- They are found most often on continental slopes less than 50 m (164 feet) deep.
- They are used in jewellery making, but they are still being used for traditional medical treatments and rituals by Pacific Islanders.

The difference between black coral and coral

- Black Corals are different from Stony Corals , another order Hexacoral, because they have a flexible Skelets made of protein, chitin, fibrous substance, which makes up the majority of exoskeletons for arthropods or fungi cell wall walls.
- They can move in the current with this compound, unlike stony bones that are fixed to their frames.
- Black coral skeleton's compound also serves another purpose: it is a record keeper.
- Similar to tree rings, their skeletons change and catalogue changes in their environment. This allows us to see how the oceans of the past might have been formed.

Characteristics for black corals

- Black corals can grow in shallow water as well as at depths up to 26,000 feet (8,000 meters). Some corals can even live over 4,000 years.
- These corals look like feathers, fans, or bushes. Others are straight like whips.
- Black Corals are filter-feeders and consume tiny zooplankton that is abundant in deep water.
- Black corals reproduce both sexually and asexually over its entire life.
- Black corals act as important habitats for fish and invertebrates, hiding from predators on a seafloor that is otherwise barren.
- Among the many fascinating specimens were five brand new species, including one that was discovered on the shell of an nautilus greater than 2,500ft (760m) below the ocean's surface.

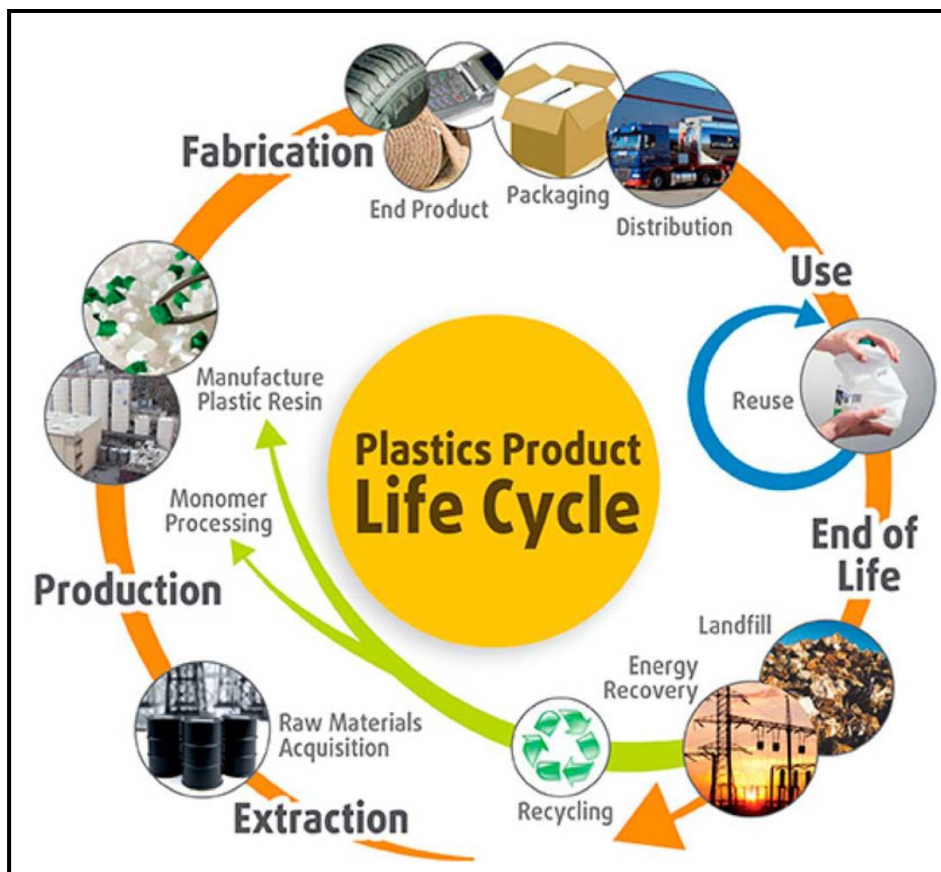
Threats

- They are not on the IUCN Red List.

- The numbers of black corals are declining and will continue to decline due to climate change, ocean acidification, and poaching.

Topic 9. LIFE OF PLASTIC: INDIA IS NOT COLLECTING AND RECYCLING ITS POLYMER WASTE PROPERLY; HERE IS HOW

Important for subject: Environment



According to a report from Centre for Science and Environment, based in Delhi, India's plastic waste problem is due to poor collection and recycling practices. This leads to plastic pollution that can lead to death.

Report findings

- The current focus is on the downstream issues of the collection, management and disposal of plastic waste.
- Two distinct steps are required to manage plastic waste: collection and end-of-life disposal or recycling.

- Local governments, producers, importers, and brand owners are responsible for collecting plastic waste.
- As much as 42-86 percent of India's plastic waste flows through the informal to material recycling facilities.
- Brand owners delegate the work of recycling to third-parties, and are exempt from any responsibility.
- According to the Indian government, 60 percent of plastic waste is being recycled. This is only true for certain types of plastics (plastics), such as PET bottles.
- India recycles (through mechanical recycling) around 12 percent its plastic waste.
- Nearly 20% of this plastic waste is used for end-of life solutions such as co-incineration and plastic-to fuel.

Is there a real problem?

Single-Use Plastic:

- Plastics are mostly made from crude oil, coal, or gas. 40% of plastics are thrown away after one use.
- Plastic bags and food wrappers have a short life span, but can last hundreds of years.

Microplastics:

- Plastic waste is broken down by the ocean, sun, wind, and waves. They can be found everywhere on the planet.
- Microplastics are being broken down into smaller and smaller pieces. They can be found in drinking water systems, and they are also seen floating through the air.

No strict adherence to plastic waste management:

- Globally, around one-fourth (or a quarter) of all plastic waste is never collected.
- Sometimes, plastic waste is burned openly in less-developed countries to release toxic chemicals into the atmosphere.

What are the 2016 Plastic Waste Management Rules?

- It requires the producers of plastic trash to take measures to reduce the production of plastic waste, to prevent littering and to ensure separate storage of plastics waste at

source.

- These rules also stipulate the responsibilities of local bodies such as gram panchayats and waste generators, street vendors, and retailers to manage plastic waste.
- These rules were modified in 2022 in order to speed up the process of plastic waste management.

Provisions Under the New Rules

- Classification of Plastics -
- Category 1 -Rigid packaging will be included in this category.
- Category 2 - Flexible plastic packaging with one or more layers (with different types of plastic), plastic sheets, covers made from plastic sheet, plastic bags and plastic sachets, or pouches, will be covered under this category.
- Category 3 - Multi-layered plastic packaging with at least one layer made of plastic and at most one layer made of another material will be accepted under this category.
- Category 4 - Plastic sheet and similar materials used in packaging, as well as for carrying bags made from compostable plastics, fall within this category.

Packaging:

- Guidelines have been established to encourage the reuse of rigid plastic packaging material in order to reduce the need for new plastic material.
- A minimum level of plastic packaging recycling collected under Extended producer's responsibility (EPR) will help reduce plastic consumption and encourage the recycling of plastic packaging.

Extended Producer Responsibility Certifications:

- The guidelines permit the sale and purchase, for the first time, of excess extended producer responsibility certificates.
- This will create a market for plastic trash management.

Centralised Online Portal:

- The government also requested the establishment of a centralised online portal by Central Pollution Control Board to allow producers, importers, brand-owners, and plastic waste processors of plastic packaging refuse to register as well as

file annual returns. This will be done by 31 March 2022.

- It would be the single data repository for all orders and guidelines related the plastic packaging implementation under the Plastic Waste Management Rule 2016.

Environmental Compensation:

- Based on the polluter-pays principle, for nonfulfillment of EPR targets by producers, importers, and brand owner, environmental compensation will be levied to protect and improve the environment as well as prevent, control, and abate environmental pollution.
- The Polluter pays Principle imposes liability to anyone who pollutes the environment in order to repair the damage done and restore the environment to its original condition, regardless of intent.

Recommendations by the Committee:

- Under the chairmanship CPCB chairman, a committee of the CPCB will recommend to the environment ministry measures for effective implementation of EPR. This includes amendments to Extended Producer Responsibilities (EPR) guidelines.

Annual Report:

- State Pollution Control Board (SPCBs) or Pollution Control Committees
- (PCCs have been given the task of submitting an annual report to the CPCB on the EPR portal regarding its fulfillment by producers, importers, brand-owners, and plastic waste processors in the State/Union Territory.
- 2 distinct properties of Stem Cells
- A stem cell can be described as an unspecialized, immature cell that has the potential to become a specialist.
- Split cells to create similar cells
- Different specialized cells can be developed that have different functions.

Different Types Of Stem Cells

- 2 main categories are used to classify stem cells -
- The formation of cells in different stages of life is the basis of classification

- Its ability to differentiate into different types of cells is what defines its classification.
- Based on Stem Cells Formation at Different Times in Human Lives

Embryonic Stem Cells

- These stem cells are only present in the earliest stages of development.

Adult Stem Cells

- These cells can be multiplied when it is necessary to repair or replace adult tissues and organs.
- These cells can be found in nearly all of the organs of our bodies.
- They are multipotent, i.e. They are multipotent, meaning they can produce a limited number mature cell types. These cells usually correspond to the tissues in their bodies. The most famous example is the stem cells that form blood (hematopoietic), which give rise to various blood cells in our bodies.
- Some stem cells that are tissue-specific can only produce one or two types of mature cells. These cells are known as unipotent and bidotent. The skin contains stem cells that can produce new skin cells. These are unipotent stem cell types.

Induced Pluripotent Stem Cells (iPSC)-

- These cells are not present in the body, but they are created in the laboratory using cells from the body.
- The properties of iPSC cells are similar to embryonic stem cell properties.
- In 2007, human iPSCs were created.
- Based on the ability of stem cells to differentiate into different specialized cells

Totipotent Stem Cells

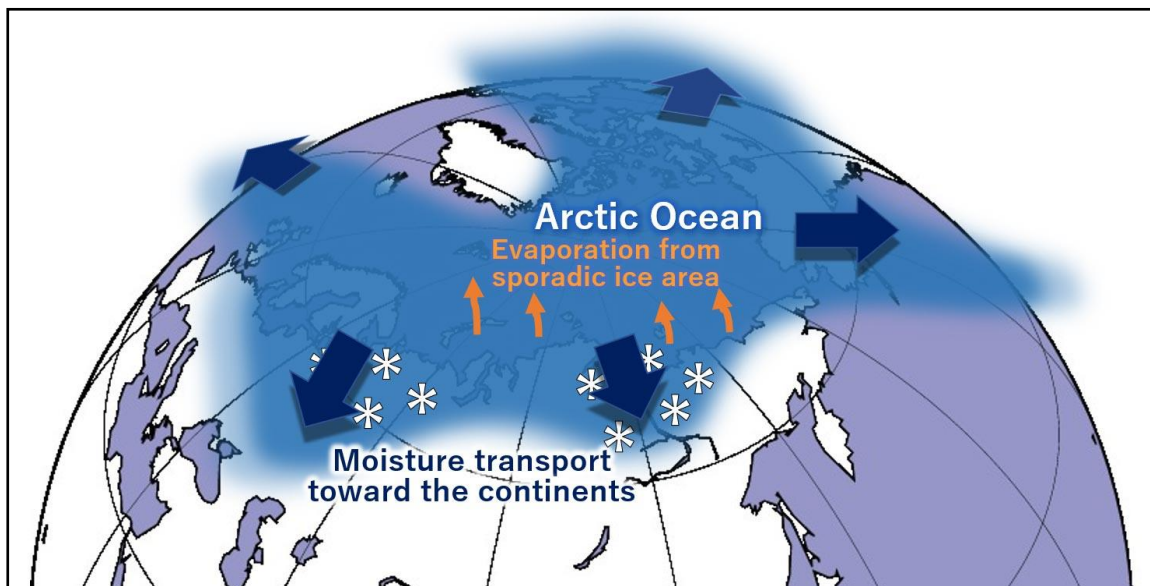
- These Stem Cells can be transformed into any type of cell in the body.
- Pluripotent Stem cells
- These stem cells can be transformed into any kind of cell in the body, except those that are necessary to develop and support a fetus from the womb.
- ESC's, iPSC's, and ESC's are pluripotent stem cell lines.

Multipotent Stem Cells

- They can only give rise to a handful of distinct types.
- Stem cells used in medicine
- Hematopoietic stem cell are the only type of stem cell currently being used to treat diseases.
- These blood cells form adult stem cells in the bone marrow.
- Research suggests stem cells could be used to treat many ailments, including
- Heart disease
- Type 1 Diabetes
- Injury to the spinal cord
- Alzheimer's disease
- Rheumatoid Arthritis

Topic 10. THE WARMING ARCTIC OCEAN IS BRINGING MORE SNOWFALL TO SIBERIA, SHOWS STUDY

Important for subject: Environment



Some areas of northern Eurasia have seen an increase in snow cover over recent decades, even though rising air temperatures are melting glaciers.

Research analysis

- Climate change-induced melting ice in the Arctic Ocean may be responsible for an

increase of snow cover in Siberia.

- Increased evaporation adds more moisture to the Arctic atmosphere
- Over the past 43 year, the Arctic has warmed almost four times faster than the rest of the globe.
- The most affected were Barents and Kara, Chukchi, and East Siberian Seas.
- These areas have experienced sea ice losses in the recent past.
- Researchers found a high level of Arctic moisture in August, which was especially significant given the years of strong southward-moving moisture.
- These weather events transport unusually large amounts of moisture to Siberia.

Significance Study

- This study will help to improve forecasts of unusual weather events, such as heatwaves. These increase the likelihood of forest fires.
- The risk of heat waves in Europe or Northeast Asia was increased by the increase in snow cover in Western Russia.

Barent Sea

- The Barents Sea borders on the Greenland Sea and Norway Sea in the west, and the Arctic Sea and Kara Sea in east.
- According to the United Nations Convention on the Law of the Sea, (UNCLOS), the Barents Sea is split between Russia and Norway.

What is Atlantification?

- Scientists discovered "hotspots" in the Barents Sea that resemble the Atlantic.
- The north-flowing ocean currents transport warm waters from the Atlantic Ocean into the Arctic Ocean via the Barents Sea.
- The Eurasian Arctic Ocean's upper waters are warmer than the Pacific and Atlantic, but they get deeper.
- Sea ice is usually found at the top of oceans. Below that is a layer with cool freshwater. Then comes a layer of warmer, more salty water, which is delivered from the Atlantic to the Arctic by ocean currents.
- NASA data shows that the area of sea ice has decreased by nearly half since satellite

records were first created in the 1980s.

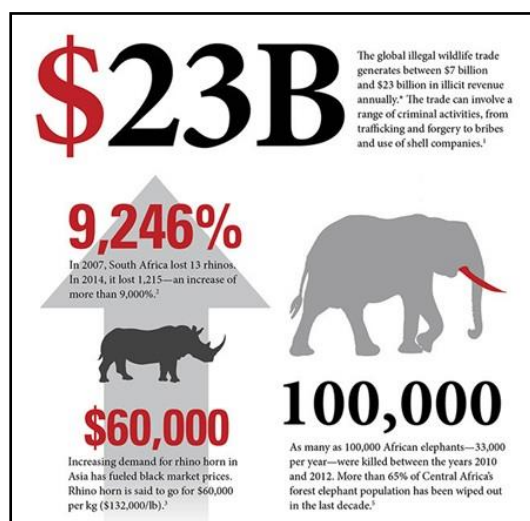
- This could be because sea ice melts during the summer and replenishes the freshwater layer above the Atlantic layer.
- The amount of freshwater in the sea is decreasing as there is less sea ice. This causes the ocean to become more mixed and draws more Atlantic heat towards the surface.
- This "Atlantification " can cause more ice melt from below.
- Global climate change caused by humans has been increasing the Atlantification process, which will have a significant impact on the weather patterns, ocean circulations and Arctic ecosystem.

What are the consequences of global warming?

1. Extreme weather more:
2. The melting of more ice:
3. Summit Station Greenland:
4. Lightning strikes increase:
5. Impact on the Marine Ecosystem
6. Extreme Snowfall:
7. Extreme Weather Events
8. The Arctic jet stream is less powerful and more subtle.

Topic 11. MYANMAR, A COUNTRY IN TURMOIL, EMERGING AS A KEY TRANSIT HUB FOR WILDLIFE TRADE: REPORT

Important for subject: Environment



According to a new report, Myanmar (HTM0_), a country located at the crossroads between the south, southeast, and east Asia, and for many years rocked by political chaos, could be emerging as a major transit hub for illegal wildlife trading (IWT).

Wildlife Justice Commission report

- The WJC was established in 2015. The Hague published a study "To Skin a Cat": How organised crime exploits captive Tiger facilities.
- This document mainly deals with illegal tiger farm in southeast Asia.
- A small portion of the article focuses on the situation in Myanmar, and its implications for Illegal Wildlife Trading (IWT).
- Exotic animals from India are being smuggled to India's Northeast for supply to the "growing, thriving exotic pet trade".
- Manipur, in India's Northeast, "had been the entry point to almost all land-based commerce between India and Myanmar. This included illegal goods and contraband that were entered through strategically placed towns like Moreh, Kamjong, and But, traffickers are now using this route.
- Private zoos in Myanmar were allowed to apply for captive breeding licences. These could be applied to 90 species including elephants, pangolins and tigers.
- almost one-quarter (20 species), of these are either critically endangered or endangered in the wild .
- It is clear that tigers in southeast Asia's Greater Mekong area, Thailand and Vietnam are at risk.

Implications for IWT

- Security of countries is compromised
- Profits can be used for financing civil wars and terrorist-related activities.
- Sustainable economic and social development is possible
- This reduces the effectiveness government
- Deter civil engagement
- Eliminate the rule of law
- Negates the trust and reputation of the state
- Local communities' growth is affected

- Natural wealth is destroyed

Most wildlife trafficking by country

- Rhinoceros
 - Elephant
 - Tiger
1. China
 2. Mozambique
 3. HongKong
 4. India
 5. South Africa
 6. Kenya
 7. Laos
 8. Thailand
 9. Thailand
 10. Myanmar
 11. United Kingdom United States South Africa
 12. Vietnam
 13. Vietnam
 14. Thailand
 15. Greater Mekong Region
- The Greater Mekong Subregion (GMS) is a transnational region within the Mekong river basin in Southeast Asia.
 - The Asian Development Bank launched a 1992 development program that brought together six Asian countries: Cambodia, China (specifically Yunnan Province, Guangxi Zi Zhuang Autonomous Area), Laos (Burma), Thailand (Thailand), and Vietnam.
 - The Greater Mekong is home to irreplaceable cultural and natural riches. It is also one of the most important biodiversity hotspots in the world.
 - This region is a major food source and has seen many large-scale construction projects that have economic and social implications.

Topic 12. CITES COP19: TWO INDIAN TURTLES FACING HIGH RISK OF EXTINCTION ADDED TO LIST OF THREATENED SPECIES

Important for subject: Environment

Two Indian turtle species, the batagurkachuga (red-crowned roofed) and Nilssonialeithii (leith's softshell turtle) have been added to the Appendix I of the Convention on International Trade in Endangered Species. This is a significant step towards conservation.

- Earlier in 2019, during the 18th CITES plenary in Geneva, Indian star turtles were added to Appendix 1.

Red-crowned roofed Turtle (Batagurkachuga).

- Females may grow up to 56cm (22in) in length and 25kg (55lb) in weight, but men are much smaller.
- Native to India , Nepal , and Bangladesh. They are also known to be widespread in the Ganga- and Brahmaputra river valleys.
- India is currently the only area where the species can be found in significant numbers. The National Chambal River Gharial Sanctuary is the exclusive geographic area .
- The male turtle is beautiful and in high demand on both the domestic and international market.

IUCN Red List- Critically Endangered

Leith's softshell turtle (Nilssonialeithii),

- Leith's softshell turtle is an endemic species in India.
- They live in rivers and reservoirs in the southern peninsular of India, where they are found in states such as Odisha and Madhya Pradesh and Karnataka.
- It is abundant in the Tungabhadra and Ghataprabha drainages.
- While some of these species can be found in protected areas they are under threat to their habitat.
- IUCN Red List- Critically Endangered
- The greatest threats to these turtles- An increasing loss of habitat due to unchecked urbanization and pollution.
- Water extraction and irrigation can lead to an irregular flow of upstream reservoirs

and dams.

- The Ganga is a dangerous area for endangered species, and sand mining and agricultural activities are a significant threat to the sandbars.
- Drowning from illegal fishing nets, poaching, and illegal trade
- There are four species in the genus Nisonia. They are highly sought after in international illegal trade due to their high demand for traditional Chinese medicine and soup delicacy.

What is CITES?

- 1963 was the meeting where CITES was first conceptualized.
- It was implemented in 1975.
- Located in Geneva (Switzerland), the CITES is managed by the United Nations under the UNEP Wing.
- The Convention of Parties to CITES, which includes all of its Parties, is the ultimate decision-making body of this Convention. In 1981, India hosted the third CoP. CITES is legal binding for the Parties but it doesn't replace national laws.
- It provides a framework that can be followed by all Parties. Each Party must adopt its own legislation to ensure that CITES implementation at the national level.
- CITES Classification, or CITES Appendix
- CITES divides plants and animals into three groups, based upon their threat.
- 5,600 different species of animals, and 3 0000 species of plants are all protected by CITES from over-exploitation via international trade.

Appendix Description

- Examples of species

Appendix I

- Species in imminent danger of extinction
- Commercial trade is forbidden
- Export and import require permits.
- Only research-related trade is allowed if the country of origin ensures that the trade will not harm the species' chances of survival.

- Asiatic lions, tigers (tiger skin trading).
- Sea turtles, gorillas, lady slippers orchids (most species), Elephants etc.
- Total 931 species on the list.

Appendix II

- Species are not at imminent risk of extinction, but they need to be monitored to ensure that trade does not become a danger.
- Only legal trade permits can be obtained, and only if the country of origin ensures that the harvesting and trading won't endanger the species' chances of survival.
- American Alligators (Alligator skin trade)
- Paddlefish, Mahogany, corals, etc.
- Total 34,419 species are on the list.

Appendix III

- Protected species in at least one country
- These species have different regulations, but usually the country who requested the listing can issue export permits. Exports from other countries require a certificate of origin.
- Honeybadger (for medicinal or bushmeat purposes)
- Walrus and Map turtles, certain beetles, and others.
- Total 147 species on the list.

Topic 13. ROAD TO COP15 MONTREAL: CAMEROON HOPES TO BENEFIT FROM ITS RICH BIODIVERSITY

Important for subject: Environment



Cameroon seeks maximum benefit from the biological resources it has preserved over years, as the world prepares for the 15th Conference of the Parties to the Convention on Biological Diversity in Montreal (Canada), December 7-19 2022

About Nagoya Protocol

- The UN Convention on Biological Diversity (CBD) has a supplementary agreement, the Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arise from Their Utilization (ABS).
- It provides a transparent and enforceable legal framework to enable the effective implementation one of three CBD objectives: fair and equitable sharing benefits arising from the use of genetic resources.
- The Nagoya Protocol for ABS was approved 29 Oct 2010 in Nagoya (Japan) and entered into effect 12 Oct 2014, 90 day after the deposit the fiftieth instrument.
- It adds to the United Nations Convention on Biological Diversity.

Coverage

- The Nagoya Protocol is applicable to genetic resource that are covered under the CBD, and to the benefits arising out of their use.
- The Nagoya Protocol also includes traditional Knowledge (TK) that is related to genetic resources. It covers the CBD as well as the benefits that result from its use.

Importance

- The Nagoya Protocol will provide greater legal certainty as well as transparency to both users and providers of genetic resources.
- It: Establishes more predictable conditions for genetic resource access.
- Contributing to benefit-sharing in the event that genetic resources are removed from the country that provided them
- The Nagoya Protocol promotes benefit-sharing and encourages biodiversity conservation and sustainable use.

India Signatory of Protocol

- India signed the Nagoya Protocol on 11/11 and ratified it on October 2012.
- India ratified the CBD at the 11th Conference of Parties to it (COP), which took place

in Hyderabad.

Cameron and Access & Benefit Sharing

- Cameroon has plans to develop biodiversity and came up with a National Strategy for ABS in 2012.
- The Strategy offered a national vision for the development of an ABS legal framework by 2020 in order to guide implementation of the Nagoya Protocol so that it benefits local and indigenous communities.
- These genetic resources could have positive effects on the quality of life for local residents and would generate income for the state.
- Law No. 2021-014, which governs access to genetic resources and their derivatives, as well as traditional knowledge, benefit-sharing, was passed in July 2021.
- These provisions established the conditions for accessing genetic resources, derivatives, and traditional knowledge in Cameroon.

Echinops giganteus.

- Echinops giganteus, a plant used in cosmetics and the food industry worldwide, is Echinops giganteus.
- It is found in Nigeria, Ethiopia, and Tanzania.
- It is mostly grown in the wild, but there are efforts to plant it now, given the potential financial rewards.
- The species of the plant were identified and studied. This led to the c organization signing an agreement in 2015 with Cameroon's government to use a small quantity of the product to determine its viability.
- The wild plant was planted for the first time in an effort to promote it and also to help restore the ecology of the Mount Bamboutous, where it is most commonly grown.
- Many women were encouraged to bee-farm by the project.

Mondiawhitei

- It is a perennial woody climber/herbaceous herbaceous, belonging to the Apocynaceae family. As with many members of this family it has milky latex.
- There are two species of Mondia, one Mondiaecornuta.

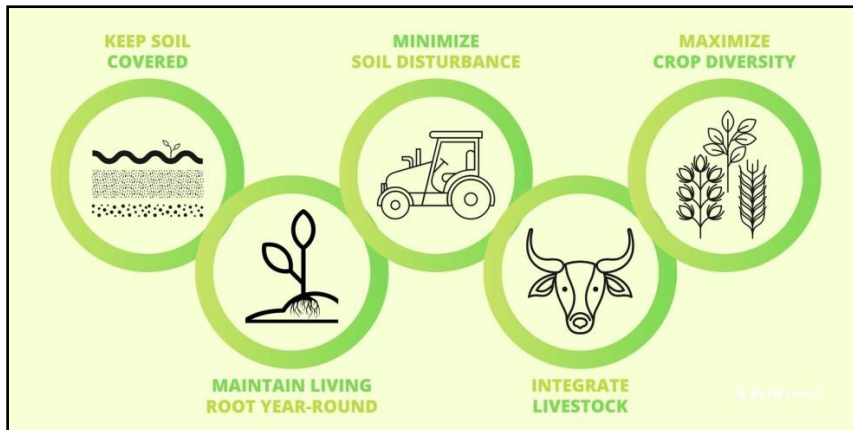
- It is sometimes called 'gondolosi' in certain areas, but in Kenya it's 'mukombero'. The rootstock is frequently collected for medicinal purposes.
- It is found at elevations between 1000 and 1500 m in wet to dry forests and even in swampy grassland across Sub-Saharan Africa. It has been recorded from Guinea (Nigeria, Cameroon), the Sudan, Uganda, Kenya,
- Tanzania, Zimbabwe, Malawi, Mozambique, South Africa, Eswatini, and Angola.
- Kenya's roots get a lot of attention, which often causes the plant to die.
- The same company was interested in Mondia whitei for its medicinal qualities, which are endemic to Africa.
- The endangered plant is used to treat anorexia and other conditions like stress and bilharzia, as well general aches and pains.
- Due to its vanilla-like smell, the plant can also be used as a food flavoring agent.
- It has a mix of ginger and liquorice.
- Its very existence is being threatened by overexploitation. The EruDef initiative aims to encourage locals to grow it.

Cameroon

- Cameroon can be described as a country in West-central Africa.
- It borders Nigeria to the north and west; Chad to the northeast; the Central African Republic (Central African Republic) to the east; Equatorial Guinea, Gabon, and the Republic of the Congo south.
- Its coastline is located on the Bight of Biafra in the Gulf of Guinea, which is part of the Atlantic Ocean.
- Its strategic location at the crossroads of West Africa and Central Africa has led to it being classified as one of both camps.

Topic 14. REGENERATIVE AGRICULTURE

Important for subject: Environment



Regenerative agriculture refers to a set of farming principles and practices that aims to restore and enhance the entire farm ecosystem. It places a high priority on soil quality and also pays attention to water management and fertilizer use.

- It is a way of farming that uses less resources than it destroys or depletes them.

Benefits:

- Regenerative agriculture increases soil biodiversity and organic material leading to more resistant soils that can better resist climate change impacts like flooding and drought.
- Healthy soils are good for yield and nutrients-rich crops.
- It also reduces erosion and runoff, which leads to better water quality both on and off-farm.
- Regenerative agriculture practices, which pull carbon from the atmosphere and store it in the ground, are important.

Topic 15. ORGANIC FARMING

Important for subject: Environment



Organic farming is an agricultural system that uses organic fertilizers like green manure, compost manure and bone meal and places emphasis on techniques such as crop rotation and companion planting.

- This type of agriculture production blends biodiversity with healthy practices that preserve natural resources.

Characteristics

- Protecting soil fertility by increasing soil biological activity and providing organic matter.
- Indirectly providing nutrients for the crop by using relatively insoluble organic resources. Pest control, disease, and weeds depend heavily on natural predators, crop rotations and organic manuring.
- Conservation and protection of wildlife and natural habitats, and careful consideration of the environmental impact of farming.
- Using legumes and biological nitrogen fixation to achieve nitrogen self-sufficiency, as well as effective recycling of organic materials.

Components

- Variety of options
- Manage soil health
- Water management
- Maintain genetic diversity

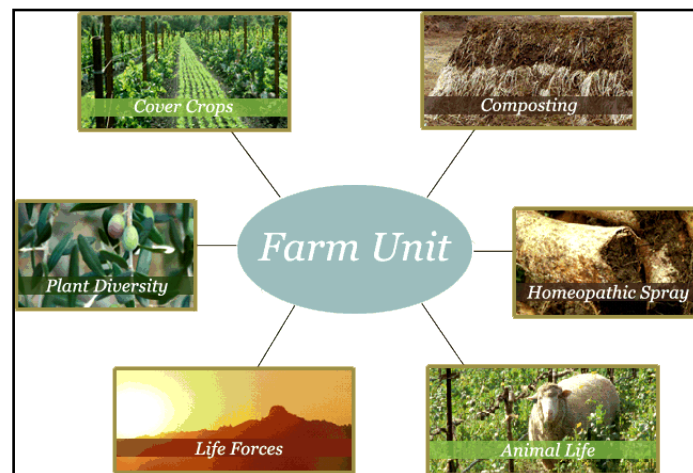
- Management of weeds
- Management of pests and diseases
- Livestock management
- Nutrient management

Types Of Organic Farming

- Integrated Organic Farm is a combination of nutrients and pest management in order to meet ecological needs and requirements.
- Organic farming is avoiding any unnatural chemicals.
- All fertilizers and pesticides used in this process are only obtained from natural sources like blood meal and bone meals.

Topic 16. BIODYNAMIC FARMING

Important for subject: Environment



Biodynamic Agriculture is an alternative form of agriculture that uses pseudoscientific concepts originally developed in 1924, by Rudolf Steiner (1861-1925).

- It was the beginning of organic farming.
- It considers soil fertility and plant growth and livestock care to be interrelated tasks. It emphasizes spiritual and mystical perspectives.
- It stresses the use manures and composts, and exempts synthetic (artificial), fertilizers, pesticides or herbicides on soil or plants.
- Biodynamics is a unique approach to animal and crop management. It focuses on the local production and distribution system and uses traditional breeds and develops new

varieties.

- Some methods employ an astrological sowing or planting calendar.
- Bio-dynamic agriculture employs a variety of herbal and mineral fertilizers for field sprays and compost additives.
- There is no scientific evidence to show that certified biodynamic farming techniques have different benefits than similar organic or integrated farming methods. Because it relies on mystical knowledge and esoteric knowledge, biodynamic agriculture is a pseudoscience.
- 2020 biodynamic methods were used on 251,842 ha in 55 countries. The leaders were Australia, France, and Germany. [10] Germany is responsible for 41.8%;[11] The rest average 1,750 ha per nation.
- Many vineyards are now using biodynamic methods to cultivate grapevines.
- There are many certification agencies that can be used to certify biodynamic products. Most of them are members of Demeter International, an international group of biodynamics standards.

Topic 17. AGROECOLOGY OR AGROECOLOGICAL FARMING

Important for subject: Environment

Agroecology refers to the study of ecological processes that are applied to agricultural production systems.

- The ecological principles can be applied to agroecosystems, which can help develop new management techniques and approaches in agricultural systems.
- Agroecology does not associate with any particular type of farming. It does have many things in common with integrated and organic farming.
- Agroecology does not oppose the use of technology for agriculture, but it evaluates how, when and if technology could be used with natural, social, and human resources.
- It acknowledges that there is no one-size-fits-all formula for success in an agroecosystem. Each site is unique.
- Agroecology does not refer to certain management practices. Instead, it examines questions related to the system properties of agroecosystems.
- productivity,
- stability,

- Sustainability and Equity
- Agroecologists view all four properties together as integral to an agroecosystem.
- They study them both using natural science to understand elements and using social scientists to understand how farming practices affect rural communities and the economic constraints that may prevent the development of new production methods or cultural factors that determine farming practices.
- Agroecologists don't limit their research to agroecosystems at one scale. Gene-organism- population, community- ecosystem- biome and field farm-community-region-state-country-continent-global are just some of the many facets that agroecologists study.

Agroecology

- It offers a solid set of solutions to the economic and environmental pressures currently facing agriculture.
- The current industrial food systems are becoming increasingly dependent upon harmful pesticides and other chemical ingresses that degrade soil, pollinate water, and threaten the health of pollinators.
- Shifting farming practicesto embrace Agroecology will allow us to create a food system that can sustain future generations. It will be rooted in productivity and resilience as well as equity and sustainability.
- Agroecological agriculture can double food output in ten years , without causing any harm to the environment.
- Agroecology recognizes multifunctional agriculture, which produces food, jobs, and economic well-being, but also provides cultural, social, and environmental benefits.
- Agroecology provides ecosystem services such as pollination and natural pest control. It has been proven that Agroecological Farming can increase ecological resilience, particularly in volatile weather conditions.
- Increase health and nutrition by eating more varied, healthy and fresh foods and reducing the incidence of pesticide-related poisonings;
- Protect biodiversity and natural resources like soil organic matter, water and crop genetic diversity, and natural enemies of insects;
- Increase economic stability by having more income sources, a spread of labour and

production, and less vulnerability to price swings. Reduce climate change by reducing reliance on fossil fuels.

Topic 18. NATURAL FARMING

Important for subject: Environment



It can be described as a "chemical free farming and livestock based". This diversified farm system integrates crops and trees, allowing for optimal use of functional biodiversity.

- It promises to increase farmers' income and provide many other benefits such as soil fertility restoration and environmental health and mitigating or reducing greenhouse gas emissions.
- Masanobu Fukuoka (a Japanese farmer and philosopher) introduced this farming method in 1975's book *The One-Straw Revolution*.
- It is based on ecological or natural processes found in or around farms.
- Internationally, Natural Farming has been referred to as Regenerative Agriculture -- a popular strategy to save the Earth.
- It can manage land practices, and sequester carbon in soils and plants. This is where it can be useful rather than being harmful.
- India promotes natural farming as Bhartiya Prakritik Krishi Paddhati
- Programme (BPKP) under Paramparagat Krishi Vikas Yojana (PKVY).

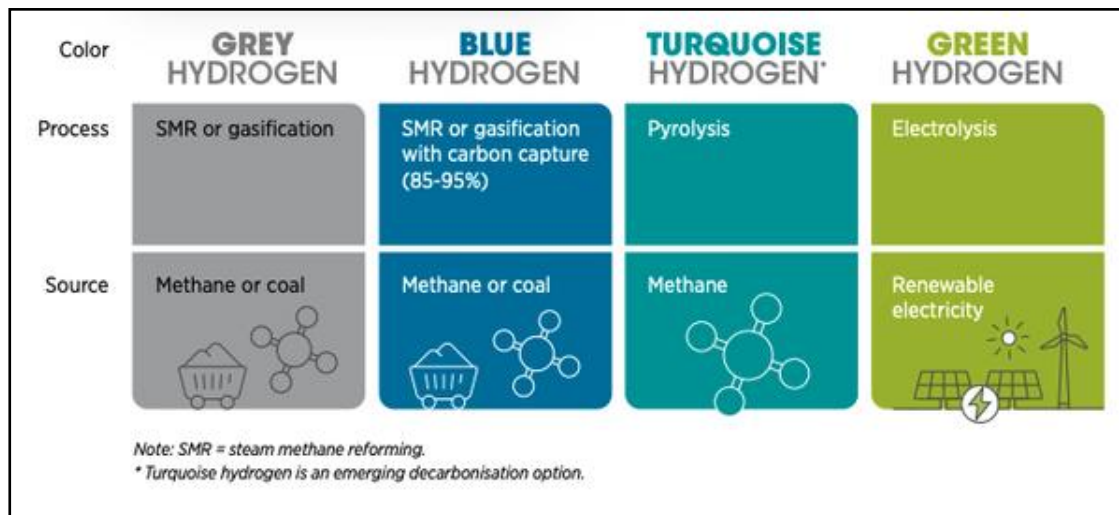
- BPKP aims to promote traditional indigenous practices that reduce the use of externally bought inputs.
- Natural Farming is, as its name implies, the art, science, and practice of working with nature in order to do more with less.

The difference between organic farming and natural agriculture

1. Organic Farming
 2. Natural Farming
- Organic fertilizers and manures such as compost, vermicompost and cow dung manure are used in organic farming. These manures can be added to farmlands by adding them from other sources.
 - Natural farming does not use any chemical fertilizers or organic fertilizers. No external fertilizers are ever added to the soil or given to plants.
 - Organic farming requires some basic agro-practices like plowing, tilting and mixing of manures. To be done.
 - Natural farming encourages the decomposition by earthworms and microbes of organic matter on the soil surface. This gradually increases the soil's nutritional value over time.
 - Organic farming can be expensive because of the need for bulk manures and has an environmental impact on the surrounding environment. Natural agriculture, however, is a low-cost farming method that completely molds with local biodiversity.
 - Natural farming does not involve plowing, tilting soil, or fertilizers. Weeding is done exactly as it would in natural ecosystems.
-

Topic 19. INDIA'S INITIATIVES ON GREEN HYDROGEN COULD HELP GLOBAL DECARBONISATION

Important for subject: Environment



India announced its long-term low emission development strategy at the UN climate summit in Egypt. It joins a small group of 60 countries that have done so.

- India's Vision of the Hydrogen Economy. The India Green Hydrogen Mission was announced in 2021.
- The government of India has set an annual production target of 25 million tonnes per year by 2047.
- Production of green hydrogen. Produced using renewable energy and water breaking down in an electrolyser.
- You can combine the hydrogen with nitrogen to create green ammonia. This will avoid hydrocarbons.
- Green ammonia can be used to store energy or make fertilisers.
- Green hydrogen could be an alternative for coal in steel mills or fossil fuels long-haul transport such as shipping and trucking.

Current status

- The majority of hydrogen currently produced around the globe is made from natural gas, also known as black hydrogen.
- There is also gray hydrogen made with low carbon technologies,, but it is very small in the global market.

- India has set a goal of producing five million tonnes of green hydrocarbons by 2030.
- The country will add 175 GW green hydrogen-based energy over the next decade.

Production costs

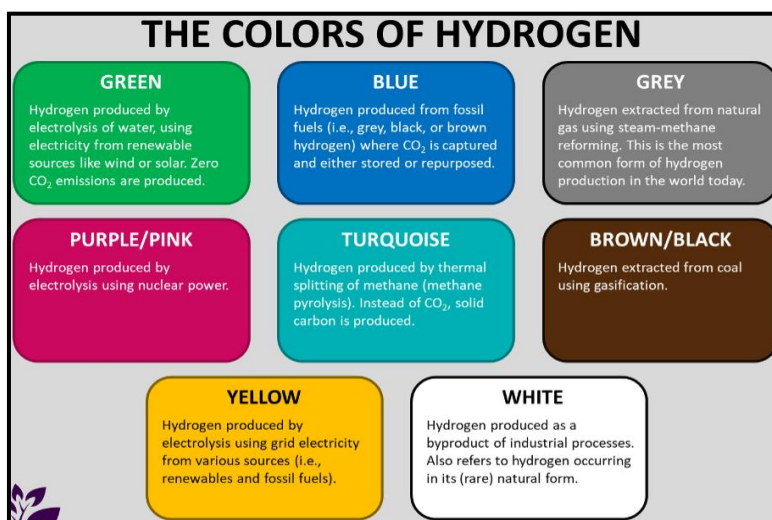
- Hydrogen made from renewable resources can be produced for as little as \$3 per kilogram and as much as \$6.55 per kilogram, while fossil-based hydrogen costs around \$1.80 per kilogram.
- The cost of producing green hydrogen in India is approximately Rs 500 per kilogram.
- Through its policy initiatives, the government hopes to lower the cost of producing hydrogen by 40-50%.

Industry prospects-

- Precedence Research estimates that the global green hydrogen market is worth \$1.83 billion by 2021. It will grow at a compound annual rate of 54% between 2021 and 2030 according to Precedence Research.
- The Asia-Pacific region has the fastest-growing green hydrogen market.
- The challenge of demand generation
- Technology can be scaled up and made more cost-effective by increasing its efficiency.
- Uncertainty regarding demand growth
- Fuel might not be the first choice for transport and industry
- Private investments in hydrogen energy generation
- L&T and Reliance have announced that they will invest in hydrogen energy generation.
- L&T recently signed a deal with the Indian Institute of Technology Bombay for research into green hydrogen technology.
- Indian Oil Corporation announced plans to construct a green hydrogen plant at the Mathura refinery in Uttar Pradesh.
- GAIL and NTPC, India's state-owned power utility, plan to build India's largest green hydrogen plant.

Topic 20. GREY, BLUE, GREEN – WHY ARE THERE SO MANY COLOURS OF HYDROGEN?

Important for subject: Environment



Hydrogen fuel

- When hydrogen is burned, it emits only water. However, it is possible to create it with high carbon emissions.
- Scientists assign colors based on the hydrogen production process.
- Hydrogen can be gray, blue, or green depending on the production method. Sometimes, it may even be pink or turquoise.
- Only one type of hydrogen can be produced in a climate-neutral way: green hydrogen
- It could play an important role in the global effort to reduce greenhouse gas emissions to net zero by 2050. It can be used to make hydrogen in black, brown and grey.
- Grey hydrogen, which is the most popular form, is made from natural gas or methane through a process known as "steam reforming".
- This process produces a lower amount of carbon emissions than black or yellow hydrogen, which makes use of black (bituminous), or brown (lignite), coal in its hydrogen-making process.
- Brown hydrogen is the least environmentally harmful, as neither the CO₂ nor the carbon monoxide generated during the process can be recovered.

Blue hydrogen

- Hydrogen is labeled blue when the steam-reformed carbon is captured underground

and stored through industrial carbon capture (CSS).

- Blue hydrogen, also known as carbon neutral, is a form of blue hydrogen that does not emit any carbon dioxide into the atmosphere.
- However, 10-20% cannot be captured.

Green hydrogen

- Green hydrogen, also known as "clean hydrogen", is made by using surplus renewable energy sources such as solar and wind to produce clean energy. This process, called electrolysis, splits water into two hydrogen molecules and one oxygen atom.
- It currently accounts for 0.1% overall hydrogen production.
- Other colors for hydrogen
- Turquoise hydrogen is a method of creating the element by methanepyrolysis. This produces solid carbon.
- Therefore, CCS is not required and carbon can be used for other purposes, such as in tyre manufacturing or soil improvement.

Pink hydrogen

- It is similar to green hydrogen. However, the electrolysis water creates it. The latter is powered by nuclear energy and not renewables.
- **Yellow hydrogen** is produced by the electrolysis water using solar energy, but some people use it to refer to hydrogen generated from electrolysis water using mixed sources, depending on what is available.
- Hydrogen is also possible from biomass and, depending on the type CCS technologies, can have lower net carbon emissions than black/brown or gray hydrogen.

Topic 21. HOW PRESERVING FORESTS COULD SAVE THE INDIAN GIANT SQUIRREL

Important for subject: Environment

Giant Squirrel species from India

Three of the four giant global squirrels are found in India: the Indian giant squirrel, the black giant squirrel (Ratufa bicolor), and the grizzled giant squirrel (Ratufa macroura).

- Only the IGS (or Malabar giant squirrel), is endemic in India.
- The mammal can display different colour patterns, with shades black, brown and deep Red being most dominant.

The IGS shares a characteristic with rodents: nipping Habitat

- The Indian giant squirrel (IGS) was found in India's deciduous, mixed deciduous and moist evergreen forest.
- It is found in the Western Ghats, Eastern Ghats and Satpura ranges.
- It is also Maharashtra's state animal, and is known as shekru (in Marathi).
- Conservation status
- Currently listed under the Least Concern Category of the IUCN Red List.

Food

- It mostly eats fruits, flowers and seeds. Sometimes, it will eat insects and bird eggs.
- Role within the ecosystem
- It is an indicator species, indicating a healthy forestbalancing forest's ecological system
- Seed dispersal
- Forest growth
- Directly supports local wildlife populations
- Indirectly reducing the conflict between humans and wildlife

Threats and Challenges

- The IGS is an arboreal species and requires access to trees that provide fruits, barks, insects, and breeding opportunities.
- Habitat destruction, Habitat modification like fragmentation and the construction of roads and the laying of powerlines, as well as the cutting of tall and old trees.
- Roadkill from vehicles poaching, especially in Eastern Ghats

Topic 22. TARBALLS DOT INDIA'S WEST COAST ANNUALLY, INDICATING CONTINUED OIL SPILLS, SHIP FUEL DISCHARGE

Important for subject: Environment

Tarballs

- These sticky, dark balls are formed every year by the monsoon spell that strikes the coast of India's western States, including Maharashtra, Gujarat and Goa.
- They are a seasonal phenomenon.
- Tarballs can affect marine life, and there are concerns about oil spillages from an offshore oil well off the Maharashtra-Gujarat coast of the Arabian Sea.

Origin-

- These weathered oil spots are often traces of oil spillages. They can also be made from natural oil seeps, areas where oil slowly escapes from earth's surface over some petroleum reservoirs.

Goa's beaches tell a similar story -

- 2021-22 saw huge tarballs on almost all beaches, including Morjim and Vagator beaches.
- Indian's National Institute of Oceanography, (NIO), documented the source of the 2010/11 tarballs found in Goa. However, the likely source of the tarballs on Gujarat's coastlines in 2012 was the crude oil leakage from the Bombay High offshore oil rig.

Patterns of the Ocean-atmosphere

- The monsoon is connected to tarballs.
- Winds blowing from the southern part of the hemisphere cross the Equator to reach the Indian mainland around mid-May and June.
- These changes in wind direction occur in the atmosphere, which includes the lowest part of the Earth's surface. Sea waves are also affected.
- These winds are why, during the southwest monsoon seasons, which runs from June to September in India, they hammer India's west coast.
- Waves and ocean currents that are close to the surface move towards the west coast and cause accumulations such as the tarballs which wash ashore on beaches.

Ships oil spills

- A report from the Ministry of Shipping shows that approximately 95% of India's

volume trading is done through maritime transport.

- India is also a signatory of the MARPOL Convention, International Convention for the Prevention of Pollution from Ships. This covers the prevention of marine environment pollution by ships from accidental or operational causes.
- Conventions and laws to prevent marine pollution
- The International Maritime Organisation (IMO) adopted the MARPOL Convention on November 2, 1973.
- The central government has the authority to regulate and control marine pollution under the 1976 Territorial Waters, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones Act.
- Pollution Control Boards, Municipal Authorities have the power for rendering assistance and provision of specific facilities.
- The following provisions are for civil liability for ships that cause oil spillages
- Merchant Shipping Act 1958 can be invoked.
- If a series of events leads to an oil spillage, the owner can be held responsible.
- To ensure the protection and preservation of marine life, there are legal provisions (like NG).
- One of the methods for protecting species is in-situ conservation.

Scatter data is a challenge

- The Indian Coast Guard is mandated to report to the Ministry of Defence, Ministry of Shipping, and other allied Ministries when there is an oil spillage.
- The NGT may also form committees, and request detailed reports be submitted to them in the case of oil spillages.
- International Convention for the Prevention of Pollution from Ships. (MARPOL Treaty).
- MARPOL, the principal international convention governing the prevention of marine pollution by ships due to operational or accidental causes, is the most important.
- The MARPOL Convention was approved by IMO on 2 November 1973. It was in response to a series of tanker accident in 1976 and 1977.
- The current convention is a mixture of the 1973 Convention, and the 1978 Protocol. It entered into force 2 October 1983.

- Convention contains regulations that aim to prevent and minimize pollution from ships.

It currently includes six technical Annexes:

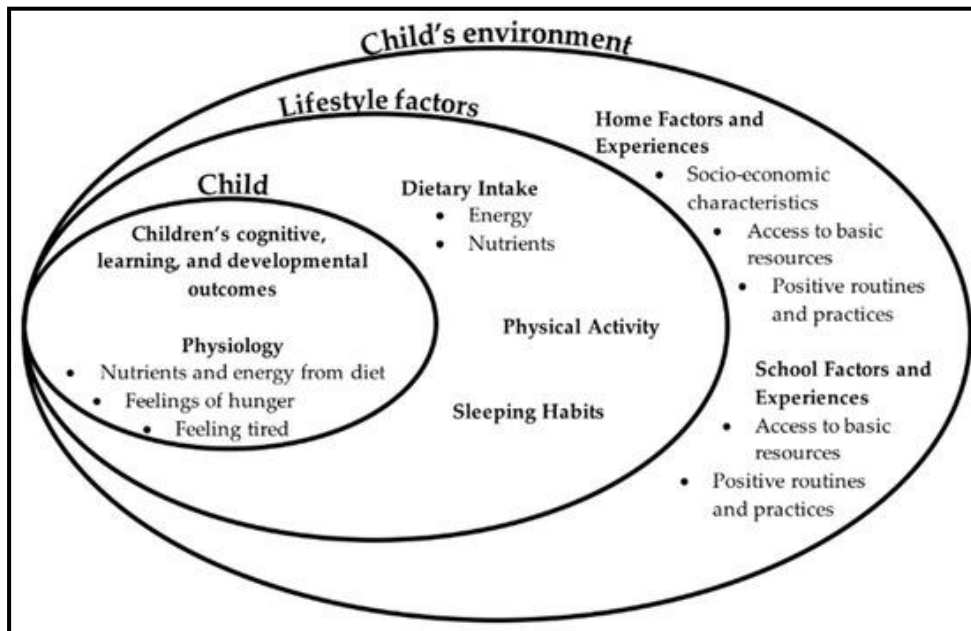
1. **Annexe I:** Regulations to Prevent Oil Pollution
 2. **Annexe II:** Regulations to Control Pollution from Noxious Liquid Substances In Bulk
 3. **Annexe III:** Prevention Of Pollution by Harmful Substances Transported by Sea
 4. Packaging Form
 5. **Annexe IV:** Prevention Of Pollution by Sewage From Ships
 6. **Annexe V:** Prevention Of Pollution By Garbage From Ships
 7. **Annexe VI:** Prevention Of Air Pollution From Ships
- 2011 was the first international regulator to allow a transport sector adopt globally binding energy efficiency standards. These requirements apply to all ships worldwide, regardless of their trading patterns or flag States, and are intended to reduce greenhouse gas emissions from international shipping.

International Maritime Organization

- The International Maritime Organization (International Maritime Organization) is a specialized United Nations agency.
- The IMO is responsible to ensure international shipping safety and security and prevent ship pollution.
- It also participates in legal issues, including liability issues and compensation issues.
- It was created by a Convention that was adopted under the auspices
- United Nations at Geneva, 17 March 1948. First meeting in January 1959.
- It currently includes 174 Member States.

Topic 23. LIFESTYLE FOR ENVIRONMENT IS A NOBLE CONCEPT, BUT NEEDS A HOLISTIC APPROACH

Important for subject: Environment



India introduced Mission LiFE at the 26th United Nations Climate Change Conference of the Parties in Glasgow, 2021.

- Launched at Statue of Unity, Gujrat Piloted and implemented by- Ministry of Environment, Forest and Climate Change
- The idea encourages an environmentally conscious lifestyle. It focuses on "mindful and deliberate utilization" and not "mindless and wasteful use. A net-zero lifestyle or sustainable living.
- India launched the LiFE Global Movement on 5th June 2022. This initiative invited academicians, researchers and start-ups from all over the globe to consider scientific and specific ways that collective action can be used to address the environment crisis.
- The Mission supports the P3 model (Pro Planet People). Promoting the circular economy.

Mission makes all trustees of the environment.

- Mission aims to follow a 3-pronged strategy- The first is by encouraging individuals to take simple, but effective, environment friendly actions in daily life (demand).
- Second was by enabling markets and industries to quickly respond to changing

demand (supply), and;

- Third is to have an influence on government and industry policy in support of sustainable consumption and production (policy).
- Mobilize at most one billion Indians and global citizens to take collective and individual action to preserve and protect the environment between 2022 and 2027.
- The main goals listed in the LiFE concept include saving energy at home and cycling, using public transport and taking public transport, eating more plant-based foods and wasting less and leveraging our position, both as customers and employees, to demand climate-friendly options.

LiFe focuses on urban populations

- The current of LiFE is better suited to the urban populace because urban residents have access to energy-consuming equipment that directly or indirectly influences climate change.
- Because they don't have modern energy-consuming equipment, the rural population doesn't consume much energy.
- Because of their dependence on natural resources, rural communities are directly affected by climate change.
- They are not as prepared to deal with climate change impacts.
- Contribution of the rural population to climate change
- Global warming is less affected by rural populations than urban ones.
- Different ways the rural population contributes towards environmental degradation.
- For survival, the forests are essential for local communities.
- Wood logs are used to generate energy, which can cause air pollution in rural areas.
- To build a home in one location, natural forest was burned.
- Groundwater extraction and greenhouse gas emissions are two of the consequences of agricultural activities.

India's success

- India has nine years earlier than expected achieved its commitment to 40% of installed electrical capacity from non-fossil-fuel-based sources.
- Five months earlier than the November 2022 target, the target of 10% ethanol-

blending in petrol was achieved.

Topic 24. AS ASIATIC ELEPHANTS ARE HERE TO STAY, MADHYA PRADESH LEARNS TO CO-EXIST WITH THEM

Important for subject: Environment

Madhya Pradesh is launching a series of measures to peacefully coexist wild Asiatic elephants. These include a mobile app to quickly dispose of damage and an elephant manual that will outline the roles and duties in various departments to ensure minimal man-elephant conflict.

Migrations of Elephants in MP

- MP is interested in developing an app similar to Karnataka's e-Parihara.
- A 2021 elephant task force was formed to point out that wild elephant migrations into MP are part of the ongoing dispersal of large-scale elephant movements in India's east-central region. This movement began in 1980s when elephants from Jharkhand moved into West Bengal and Sarguja districts of then-emerged MP.
- Wild tuskers have moved from Jharkhand to Odisha, into Chhattisgarh, and then onwards into the MP.
- Wild elephants first began to arrive in MP's Sidhi and Singrauli districts, where they would stay for 2-3 month before returning to Chhattisgarh.
- This changed in 2017, when seven elephants remained in Sidhi's Sanjay Dubri Tiger Reserve.
- Another 40 elephant herd entered MP in 2018 and started residing in Bandhavgarh Tiger Reserve, Umaria.
- The herd now contains almost 50 elephants.

Latest Data on Elephants in India

- According to the 2017 count, there were 29,964 elephants living in India. This is slightly more than 2012's average of 29,576 elephants.
- Asian Elephants
- There are three subspecies that make up the Asian elephants: the Sumatran, Indian and Sri Lankan.

- The Indian subspecies are the most diverse and contain the largest number of elephants remaining on the continent.
- Global Population: Estimated between 20,000 and 40,000.

Protection Status:

- IUCN Red List: Endangered.
- Wildlife (Protection) Act 1972: Schedule 1.
- CITES Annexe I
- African Elephants: There are two subspecies, the Savanna (or Bush) elephant and Forest elephant.
- Global Population: Around 4,00,000.
- Botswana (Africa), witnessed the deaths of hundreds of elephants in July 2020.

Protection Status:

- IUCN Red List Status:
- African Savanna Elephant: Endangered.
- Critically Endangered African Forest Elephant
- CITES Appendix I

Concerns:

1. Poaching escalates.
2. Habitat loss.
3. Human-elephant conflict.
4. Misstreatment in captivity.
5. Elephant tourism is a cause of abuse.
6. Rampant mining, Corridor destruction.

Conservation Steps:

- Declaration and establishment various elephant reserves throughout the US. Cleanse areas from lantana, eupatorium (invasives species) to prevent grass growth for elephants. Barricades are used to stop man-elephant conflict.
- The establishment of a cell for studying forest fire prevention.

- The Monitoring of Illegal Killing Elephants (MIKE), was launched in 2003. It is an international collaboration which tracks trends in information regarding the illegal killing elephants in Africa and Asia to monitor the effectiveness field conservation efforts.
- **Project Elephant:** This centrally-sponsored scheme was established in February 1992 to protect elephants, their habitats, and corridors.
- Through the project, the Ministry of Environment, Forest and Climate Change provides technical and financial support to the major elephant range states of the country.

Topic 25. INDIAN WILDLIFE BIOLOGIST GETS UN HIGHEST ENVIRONMENTAL AWARD

Important for subject: Environment

Indian wildlife biologist Dr Purnima Deva Barman was among the honorees of the Champions of the Earth award. This U.N. highest environmental honour recognizes their efforts to prevent, halt, and reverse ecosystem destruction.

- Dr. Barman was awarded the Entrepreneurial Vision category.

About Dr Purnima Deva Barman

- Dr Barman is the leader of the Hargila Army an all female grassroots conservation movement that protects the Greater Adjutant Stork.
- Dr Barman also serves as the Senior Project Manager for the Avifauna Research and Conservation Division at Aaranyak.
- The "Hargila Army", which includes more than 10,000 women, is a collective of these women.
- They help injured storks and protect nesting areas.
- The UNEP started the Champions of the Earth Award in 2005.
- The Annual Award was presented to trailblazers who are at the forefront in efforts to preserve our natural world.
- It is the highest environmental honor bestowed by the UN.
- This award program is the successor to UNEP's Global 500 Roll of Honour.

The award is presented in five categories

1. A Lifetime Achievement
 2. Policy Leadership,
 3. Entrepreneurial Vision,
 4. Action and Inspiration
 5. Science & Innovation
- The award has been presented to 111 laureates so far: 26 world leaders, 69 individuals, and 16 organizations.
 - Other honorees include Arcenciel, Lebanon; Constantino (Tino); AucchaChutas(Peru); Sir ParthaDasgupta from the United Kingdom (Cameroon); and Cecile BibianeNdjebet.
 - Prime Minister Narendra Modi received the Champions of the Earth Award 2018 from the United Nations.
 - About Greater Adjutant Stork (Harjila in Assam)-
 - Scientific Name:Leptoptilosdubius

Genus:

- A member of the stork family Ciconiidae is the greater adjutant.
- The family includes approximately 20 species.
- They are large, long-necked birds.
- Habitat:
- South & Southeast Asia were once home to the Greater Adjutant , making it one of the most endangered stork species.
- Only three breeding grounds are known - one in Cambodia and two in India (Assam, Bihar).

Threat:

- This scavenger bird is now dependent on the wetlands for food. The loss of nesting trees and widespread destruction of the wetlands that this scavenger bird needs to forage (i.e.

Protection Status:

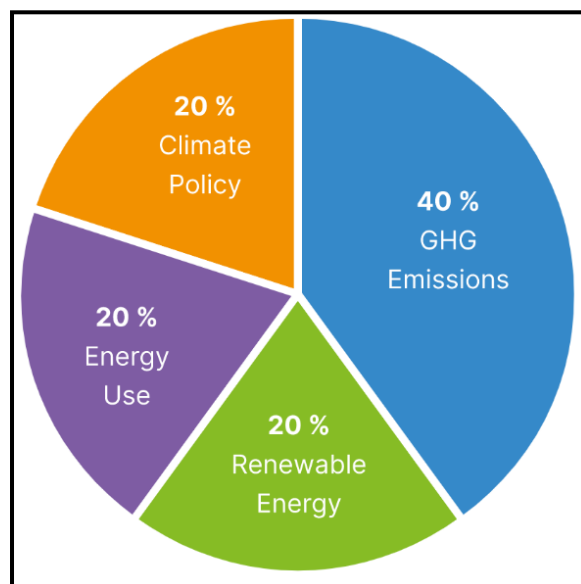
- IUCN Red List: Endangered
- Wildlife Protection Act 1972: Schedule I

Significance:

- They are known as the Mount of Vishnu in Hinduism, which is one of the most important deities.
- Many worship the bird and name it Garuda Maharaj (Lord Garuda), or “Guru Garuda” (Great Teacher Garuda).
- They are able to kill rats and other pests on farms, which is a great help for farmers.

Topic 26. THINK LOCAL CLIMATE ACTION, THINK MEENANGADI

Important for subject: Environment



Projects for carbon neutrality in India

- Many panchayats have been promoting the concept carbon neutrality in recent years. A prominent example is Meenangadi Gram Panchayat in Kerala's Wayanad District,, which serves as an example to follow.
- 'Carbon neutral Meenangadi' Project
- 2016 The panchayat had in mind as a project called "Carbon neutral Meenangadi".
- Meenangadi will be transformed into carbon neutrality.

Steps taken were

- Multiple multi-sector schemes were developed to reduce carbon emissions, increase carbon sequestration, preserve biodiversity, and conserve the environment.
- "Tree banking" was one of the most important schemes to help carbon neutral activities. It encouraged more tree planting by providing interest-free loans.
- 1,58,816 trees were also planted and geo-tagged to track their growth.
- Local economic growth was another area in which LED bulb manufacturing, and related micro-enterprises, were launched.
- Other Panchayats Palli Gram Panchayats in Jammu & Kashmir have followed the same people-centric model with local activities.
- Untitled climate-resilient plan is being developed.
- Solar panels and bio-gas plants were also introduced.
- To power 340 homes, a solar panel (500KW) was installed.
- The Gram Panchayat Development Plan 2022-23 has been prepared, which includes a climate-resilient component.
- Seechewal Gram Panchayat, The Kali Bein River was revived through the participation of people.
- Odanthurai Panchayat is located in Tamil Nadu and has its own windmill (350KW).
- Tikekarwadi Gram Panchayat in Maharashtra has a long history of green energy production and extensive use biogas plants.
- Chapparapadavu Gram Panchayat is located in Kerala and has many green islands which have been cared for by the community.

The theme 'Clean and Green Village'

- The Ministry of Panchayati Raj has focused its attention on the Sustainable Development Goals (SDGs) on a thematic basis.
- The fifth theme, 'Clean and Green Village', has been identified by panchayats as where they can engage in activities on natural resources management, biodiversity protection and waste management.
- The latest data shows that 1,09,135 gram Panchayats prioritize 'Clean & Green Village' as one of their main focus areas in 2022-23.

Carbon Neutrality

- According to World Resources Institute, carbon neutrality is each ton of anthropogenic CO₂ that is released is offset by an equal amount of CO₂ taken.
- Carbon neutrality by the mid-21st Century is crucial to limit global warming below 1.5 degrees Celsius. This goal is also set out in the Paris Agreement, which was signed by 195 countries including the EU.
- Any system that absorbs more carbon dioxide than it emits is called a carbon sink.
- Soil, forests, and oceans are the main natural carbon sources.
- No artificial carbon sinks have been able to remove carbon dioxide from the atmosphere at the required scale to combat global warming.
- Carbon stored in forests as natural sinks is released into the atmosphere by forest fires, land use changes or logging.
- A second way to reduce carbon emissions and achieve carbon neutrality is to offset the emissions from one sector by reducing them elsewhere.
- This is possible by investing in Renewable Energy, Energy Efficiency, or other clean, low-carbon technologies.

Topic 27. FINANCIAL SERVICES INSTITUTIONS BUREAU

Important for subject: Economy

01	Shri Bhanu Pratap Sharma: Former Secretary, Department of Personnel & Training, Government of India
02	Shri Sanjay Malhotra: Secretary, Department of Financial Services, Government of India
03	Shri Ali Raza Rizvi: Secretary, Department of Public Enterprises, Government of India
04	Shri M. Rajeshwar Rao: Deputy Governor, Reserve Bank of India
05	Shri Animesh Chauhan: Former MD & CEO, Oriental Bank of Commerce, Expert Member
06	Shri Shailendra Bhandari: Former MD & CEO ING Vysa Bank, Centurian Bank of Punjab, ICICI AMC, Expert Member

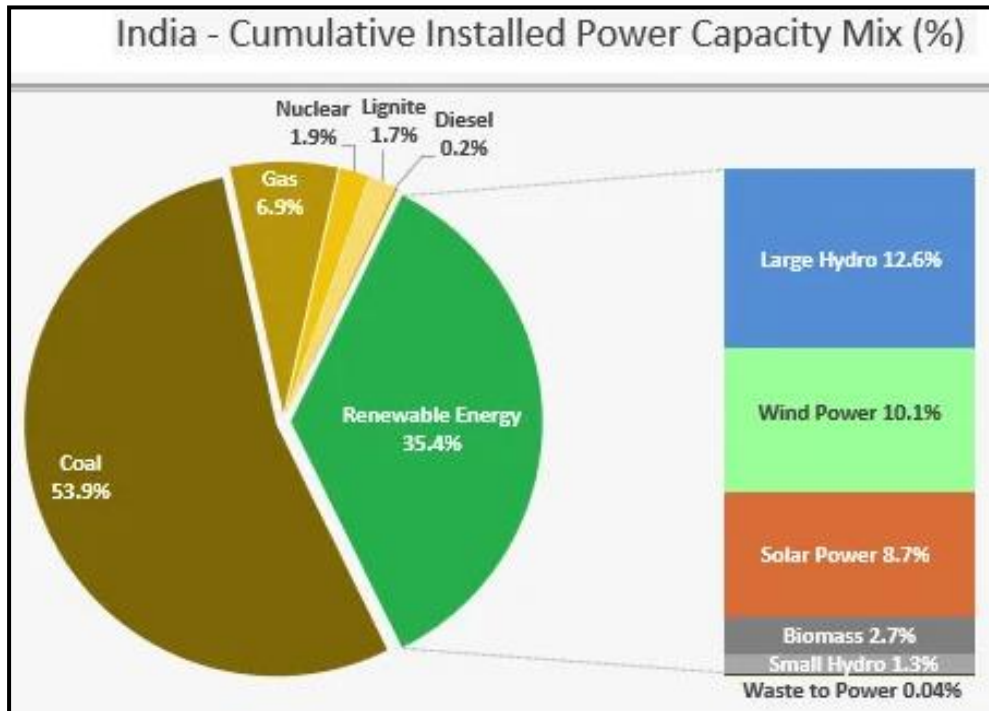
The Nationalised Banks Management and Miscellaneous Provisions Scheme was amended by a notification.

- Current norms for the Managing Director, and all other directors in the public sector banks, require that they be appointed for a period of three years or until the age of sixty-five years.
- Initial appointments can be made for up to five years. This can then be extended for the same period. The Central Government can, after consulting with the Reserve Bank and the Bank of England, appoint the Managing Director or other full-time directors of public sector banks.
- Financial Services Institutions Bureau is responsible for selecting and appointing the Board of Directors in Public Sector Banks.
- In consultation with the Prime Minister's Office, the Ministry of Finance makes the final decisions about the appointments.
- After vigilance clearance etc., the Government appoints Whole-time Directors (WTD), Managing Directors (Managing Directors) to a bank in the public sector.
- Financial Services Institutions Bureau (FSIB) recommends the names of these WTDs.
- The CEO and MD have key responsibilities. They must establish the vision, mission, and values of the company in consultation with the Board. This will allow them to create a strategy and structure that can be monitored and controlled.
- Mandates of Financial Services Institutions Bureau, (previously Bank Bureau of India).
- FSIB is the only entity that can make recommendations for the appointment of whole-time directors (WTDs) or nonexecutive chairpersons (NECs) at public sector banks, public sector insurers and financial institutions.
- It advises the government regarding the extension and termination of WTDs or NECs at financial institutions.
- The FSIB recommends a performance evaluation system for WTDs at PSBs, FIs, and PSIs. The FSIB also assists the government in formulating and enforcing a code for conduct and ethics for NECs and WTDs.
- It creates a database about the performance of PSBs, FIs, and PSIs.
- The FSIB assists PSBs, FIs, and PSIs in developing business strategies and capital raising plans.
- The FSIB provides advice to the government about the management structure of PSBs, FIs, and PSIs.

- It also provides advice to the government regarding the development of training and development programs for managers in PSBs, FIs, and PSIs.

Topic 28. POWER SECTOR AT GLANCE

Important for subject: Economy



The Central Electricity Authority (CEA), which is currently 215 GW, expects peak demand to increase by 9 percent to 230-235GW by April 2023.

- India was faced with one of the most severe power crises in India last year. This was also the case in the current fiscal year.
- Power Sector at A Glance ALL INDIA
- India has approximately 210 GW of coal-based power.
- It intends to increase its coal-based generation capacity by 27 GW by 2026-27, and by 30 GW by 2030.
- Total Installed Capacity Sector % of Total
- Central Sector 24.3% State Sektor 25.7% Private Sector 50%

Installed CAPACITY (FUELWISE)

1. Fossil Fuel 57.9%
2. Coal 50.0%

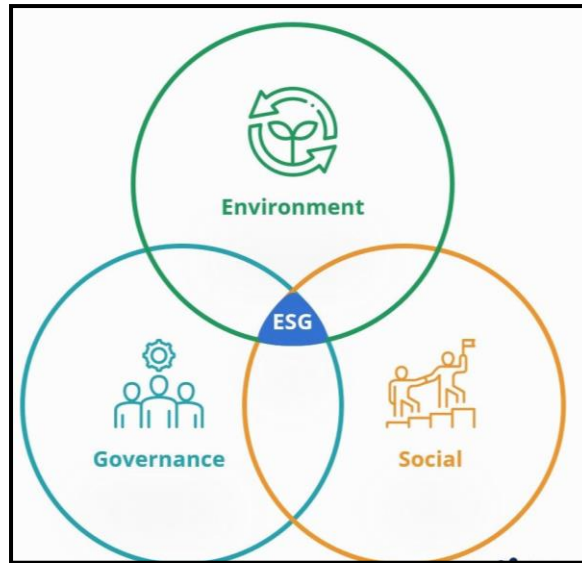
3. Lignite 1.6%
4. Gas 6.1%
5. Diesel 0.1%
6. Non-fossil fuel 42.1%
7. Hydro 11.5 %
8. Renewable Energy, Solar & Other 29.0 %
9. Wind 10.2 % 8/29
10. Solar 14.9 %
11. BM Power/Cogen 2.5 %
12. Waste to Energy 0.1%
13. Small Hydro Power 1.2 percent
14. Nuclear 1.7%

The Central Electricity Authority

- It is a Statutory Organization, constituted under Section 3(1) of the Electricity (Supply) Act of 1948, and continued under Section 70, Electricity Act, 2003.
- The Electricity Act, 2003, Section 70 (3) states that the authority must consist of no more than 14 members, with a chairperson. No more than eight full-time members shall be appointed by Central Government.
- The CEA is a body headed by a Chairperson who, as Chief Executive, supervises the development of the country's power sector.
- It provides advice to the government regarding the National Electricity Policy and formulates short term and future plans for developing electricity systems.
- It is the designated authority to facilitate cross-border trade in electricity.
- It also specifies the standards on matters such as the construction of electric plants, electric lines, connectivity to the grid, safety standards, and installation and operation meters.
- It also oversees cooperation of hydropower development schemes of the central, state, and private sectors to develop river and its tributaries efficiently for power generation.
- It is located in New Delhi and works under the Ministry of Power.

Topic 29. ENVIRONMENTAL, SOCIAL, GOVERNANCE (ESG) FRAMEWORK

Important for subject: Economy



A country like India should have its own view on Environmental, Social, Governance (ESG).

- ESG should be measured on a purchasing power parity basis in order to make emerging market economies like India comparable with companies in the US.
- ESG rating providers are the second-most important part of the ESG ecosystem. The third leg is ESG-focused funds.
- The ESG (Environmental, Social, and Governance) goals are a set standards that companies must follow to ensure better governance, ethics, and environmental-friendly practices. This metric is used to guide investment decisions that do not focus on financial returns.

ESG Funds

- It is a type of Mutual Fund.
- ESG-focused funds fall under the Thematic Fund Category as defined by the Association of Mutual Funds in India.
- Its investment is synonymous with sustainable investing, or socially responsible investing.
- The ESG fund selects stocks for investment based on their environmental, social, and corporate governance scores. Next, it looks at financial factors.
- The key difference between ESG funds and other funds, therefore, is "conscience",

which means that the ESG fund focuses only on companies with environmentally-friendly practices, ethical business practices, and an employee-friendly record.

- Securities and Exchange Board of India, (SEBI) regulates the fund.
- ESG regulation for India
- The Ministry of Corporate Affairs issued voluntary guidelines on ESG compliance, while the Securities and Exchange Board of India mandates ESG-related disclosures for the top 1,000 listed businesses.
- Investors often rely upon third party ESG rating providers to assess ESG compliance of portfolio companies.
- ESG ratings in India are relatively new, with the first ERP established in January 2021.
- ERPs are currently not regulated.
- In January 2022 SEBI issued a consultation paper proposing an ERP regulatory framework that rates listed companies.
- SEBI proposes that ERPs should be SEBI-accredited, and that credit rating agencies and research analysts only be eligible for this accreditation.
- SEBI also proposed criteria to be accredited ERPs, including net worth, knowledge and sustainability, as well as infrastructure, staff quality, technical know-how, and quality.
- SEBI proposes two types of ratings: risk rating and impact rating.
- SEBI has referred the Important subject of ERP regulation to an advisory ESG committee, which was established in May 2022.

Topic 30. INCREMENTAL CAPITAL OUTPUT RATIO

Important for subject: Economy

This article suggests steps to help our economy achieve high growth.

- India's Growth after 2011-12
- Period
- Growth rate
- **First phase till Q3 of**
- 2016-17

- 7.2
- **Second phase - Q4**
- 2016 -17 to Q1 2020
- 21.
- 5.7

Third phase - Q2 of

- 2021-2022-22-23 saw a V-shaped recovery, followed by moderate growth. 2022-2023-23's overall growth would be 6.5-7%.
- Studies of auto regressive integrated mobile averages (ARIMA), point to a possible output of less than 6 percent for 2021-26 India.
- Factors that affect growth in India - both cyclical as well as structural factors:
- High resource intensity The decline in manufacturing value added to output has been attributed to a lower share of 25 percent during 1983-83.
- In 2019-20, 94 to 16.6 percent of the population will not be able to invest in technology, innovation, or compensation for skilled workers.
- Three E - Optimism, increased investment and consumption, and efficient use of resources.
- Stable policy regimes can improve consumer sentiments over the medium term. They can also improve law and order, take measures to facilitate innovation, openness in economy, and create stability and predictability in tax regimes.
- The Labour force participation ratio A 5 percentage point increase of the labour participation rate would boost GDP growth by 0.71 Percent.
- Structural modifications- such as GST, Demonetization and Covid.
- Fluctuations in growth patterns for industries-utilities, manufacturing and
- Construction Service sector - Relatively steady growth in services, partly because they aren't traded and therefore protected from global changes.

Constrained capital formation

- The ratio of non-food credit (NFC), to GDP, declined in Q4 2017-18, but increased later.
- The longer period of slowdown in growth from Q1 2016-17 could also be attributed

lower Gross fixed capital formation and Private final consumption expenditure (PFCE).

- The net financing of the household sector grew from 21 percent of total investment in 2011-12, to 45 percent in 2020-21.
- Problems in the informal sector -difficulty accessing resources
- The GDP growth was lower than the export growth, but it was still volatile.
- Incremental Capital Output ratio is a surrogate measure for efficiency of the economy.
- In the initial phase of growth, ICOR stood at 4.51, while it climbed to 5.52 in the second phase.
- Formalisation of an economy or a shift to services can reduce ICOR.

Incremental Capital Output Ratio:

- Capital output refers to the capital required to produce one unit.
- Let's say, for example, that 32% of GDP is invested in an economy and that the economic growth is 8%. Rs 32 investment results in Rs 8. The Capital output ratio of $32/8$ or 4 is thus $32/8$.
- Another variation of capital output ratio is the Incremental Capital Output Rate
- (ICOR). -defines additional capital units or investments required to produce an additional unit.
- This is used to measure efficiency of an industrial unit, country or economic unit.
- The lower the ICOR, and the more efficient an organization is.
- A lower ICOR shows that only low levels of investment are required to achieve a certain growth rate in an economy. This is considered a desirable situation.
- A lower capital output ratio indicates that capital is highly productive or efficient.
- A high ICOR indicates an inefficient economic climate, as large capital resources are being used to produce low-value goods.
- The ICOR is a measure of the capital's productivity or marginal efficiency. It should be lower than the ICOR.

Structural Reforms (structural Factors):

- Structural Reforms address the main drivers of growth through liberalizing labour, product, and service markets. This encourages job creation, investment, and improves

productivity.

- They are designed to boost an economy's competitiveness, growth potential and adjustment capacity.
- The most common structural reforms are policies that make labour markets more flexible and responsive, liberalise service sector, increase competition in product-service markets, certain sectors, or improve overall business environment, encourage innovation, improve the quality and efficiency of public taxation, and address the problems of the ageing population.
- Example - India launched a New Economic Policy in 1991 to overcome the macro-economic crisis. It was based upon LPG, Liberalisation, Privatisation, and Globalization.
- The LPG Model offered a wide range of reforms: Liberalizing Industrial Policy: Abolition of industrial license permit Raj, Reduction of import tariffs etc.
- The beginning of privatization: Bank reforms, deregulation of markets, etc.
- Globalization: Exchange rate correction, liberalising direct foreign investment and trade policies; Removal of the mandatory convertibility cause

Topic 31. MUDRA YOJANA

Important for subject: Economy



मudra लोन | प्रधानमंत्री मुद्रा लोन

जरूरत मंदो की आवश्यक सहायता प्रधान मंत्री मुद्रा लोन द्वारा

मudra लोन

शिशु : ₹ 50,000/- तक के लोन

किशोर : ₹ 50,000/- से अधिक और 5 लाख तक का लोन

तरुण : ₹ 5 से ₹ 10 लाख तक का लोन

मुद्रा लोन का लाभ उठाने के लिए अपने किसी नजदीकी बैंक शाखा से तुरंत संपर्क करें.

मुख्य विशेषताएँ

- कम ब्याज दर
- रियायती प्रोसेसिंग शुल्क
- कार्यशील पूंजी ऋण
- मुद्रा कार्ड के माध्यम से
- गारंटी आवश्यक नहीं

The non-performing assets of Mudra loans banks are lower than the average sector NPAs - data obtained under the Right to Information Act.

- The percentage of bad loans in the Pradhan Mantri MUDRA Yojana is 3.38 percent of total disbursements under the scheme.

- In the six previous years, the gross NPAs for the banking sector were much higher than those in 2021-22.
 1. 7.3 per cent in 2020-21
 2. 8.2 per cent in 2019-20
 3. 9.1 per cent in 2018-19
 4. 11.2 per cent in 2017-18
 5. 9.3 per cent in 2016-17
 6. 7.5 per cent in 2015-16
- The NPAs were for Shishu loans up to Rs 50,000. They accounted for 2.25 percent of all disbursements.
- The highest was for Kishore loans (Rs50,001 to Rs5 lakh), at 4.49 percent. Under Tarun loans (over R 5 lakh to Rs 10 lakh), bad loans accounted for 2.29 percent of all disbursements.

MUDRA yojana

- Prime Minister Narendra Modi launched the Micro Units Development & Refinance Agency on April 8, 2015.
- MUDRA stands for Micro Units Development & Refinance Agency Ltd. and is a financial institution that was established by the Government.
- It funds the non-corporate small-business sector through various financial institutions such as Banks, Non-Banking Financial Companies and Micro Finance Institutions.
- MUDRA does not lend directly to micro-entrepreneurs/individuals.
- The loan is available to small, medium and non-corporate enterprises.
- It is also known as the Pradhan Mantri Mudra Yojana. The three categories are used to provide loans:
 - Shishu as high as Rs 50,000
 - Kishore Rs 50,001 - Rs 5 Lakh,
 - Tarun starting at Rs 5 lakh to Rs 10,000
- At least 60% of the credit would be given to Shishu Category Units. The remaining 40% would go to Kishor or Tarun Categories.
- Loans provided under the PMMY are not subvention. If the loan proposal is tied to a Government scheme where the Government provides capital subsidy, the PMMY will

also be applicable.

- Mudra loans don't require collateral or security and are therefore considered very risky.
- These loans are offered by the public sector banks, such as PSU Banks or Regional Rural Banks and Cooperative Banks.

Eligibility:

- Indian citizens who have a business plan to generate income in the non-farm sectors, such as manufacturing, processing or trading, and whose credit needs are less than Rs 10 million, can apply to a Bank or MFI for Micro Units Development & Refinance Agency Ltd. loans under Pradhan Mantri Mudra Yajana (PMMY).

Sectors:

- Land Transport Sector/ Activity –This will support units for the purchase of transport vehicles for goods or personal transport, such as an auto rickshaw and small goods transport vehicle. 3 wheelers, erickshaws, passenger cars, taxis, and so on.
- Community and Social Service Activities -Saloons and beauty parlours, gyms, boutiques and tailoring shops are all examples.
- Food Products Sector - Support would be provided for activities such as papad and achaar making, jam and jelly making, preservation of agricultural produce at rural level, sweet shops and small service food stalls, day to day catering and canteen services, cold chain vehicles and cold storages, ice makers, ice cream making units and biscuit, bread, and bun making.
- Textile Products Sector/Activity - To support activities such as handloom and powerloom, zari work, zardozi work and traditional dyeing, traditional embroidery, hand work and traditional dyeing, traditional handwork, traditional dyeing, printing, apparel design and knitting, cotton ginning and computerized embroidery. Also, other textile products like bags, vehicle accessories and furnishing accessories.

Topic 32. PERPETUAL FUND

Important for subject: Economy

In order to unlock capital flows for long-term investors, the IVCA expert committee

requested that the government allow perpetual capital vehicles.

Perpetual fund

- It can also be referred to endowment funds.
- It is a gift of money to a charity from a donor to ensure that it has a constant source of income.
- The fund is often named after loved ones or donors.
- Charity can be certain that it will receive support year after year by using only interest income and not decreasing the capital portion.

A perpetual capital vessel

- This is an investment type that has capital available, or permanent capital that is managed for an unspecified period.
- It does not include drawdowns, capital calls or exit deadlines as are the traditional features of PE-VC funds with a fixed cycle or life.
- Permanent Capital Structures Examples
 - Real estate investment trusts
 - Master limited partnerships
 - Companies that own, finance or operate income-producing real property are modelled after mutual funds
 - A public exchange allows limited partnerships to trade publicly
 - Yield cos are companies that have been structured so their operating assets produce long-term contracts and steady cash flow.
 - Companies that manage public assets
 - Interval fund (a closed-end type of fund that is not traded on the secondary markets)
 - Variable funds like annuities and life insurance.
 - Closed-end mutual funds (a type of mutual fund)

Topic 33. DRAFT FOOD SAFETY AND STANDARDS (FOOD PRODUCTS STANDARDS AND FOOD ADDITIVES) AMENDMENT REGULATIONS 2022

Important for subject: Economy



Food Safety and Standards Authority of India, FSSAI proposes to establish standards and labelling norms in traditional Indian sweets (mithais and namkeens).

- These standards are proposed in the Draft Food Safety and Standards (Food Products Standards and Food Additives Amendment Regulations), 2022.

More about the bill:

- The draft regulation describes Indian Mithais to be sweets, and Namkeens to be salty savoury items that are "traditionally and innovatively based on Indian heritage and culture."
- It proposes standards for categorising traditional Indian sweets in milk-based, non-milk-based and mixed sweets.
- Milk based- mithais include milk-concentration-based, channa-based and khoa-based mithais.
- Traditional sweets that are not milk-based refer to those made from grain-based, dried fruits and nuts, as well as seeds-based mithais.

- In addition to labelling norms, the draft also proposes standards for different Namkeens including fruit and vegetable-based, dry fruits and nut based products.
- According to the draft regulation, mithai packaging should include the name of the product (such a Khoa burfi), as well as relevant categories (such khoa-based mithai).
- The Food Business Operator must declare the percentage and type of milk solids under the list of ingredients. Food Safety and Standards Authority of India
- It is an independent statutory body that was established under the Food Safety and Standards Act 2006.
- FSSAI's administrative Ministry is the Ministry of Health & Family Welfare (Govt of India).
- The Chairperson holds the rank of Secretary of Government of India.
- Headquarters: Delhi.
- FSSAct, 2006 consolidates several acts& or orders that previously dealt with food-related issues in different Ministries and Departments.
- 1954 Prevention of Food Adulteration Act
- Fruit Products Order, 1955
- Order of Meat Food Products, 1973
- Order for Control of Vegetable Oil Products, 1947
- Order 1988: Edible Oils Packaging Regulation
- Milk and Milk Products Order 1992
- FSSAI was founded in 2008 and became fully functional in 2011, after its Rules and key regulations were notified.
- This represented a shift away from multi-level control to a single line with a focus on compliance rather than a regulatory regime.
- FSSAI was mandated by 2006 FSS Act to perform the following functions.
- The framing of Regulations is used to establish the Standards and Guidelines in relation to articles food, and to specify appropriate systems for enforcing different standards.
- Establishing guidelines and mechanisms for the accreditation of certification bodies that are involved in food safety management system certification for food businesses.
- Developing guidelines and procedures for the accreditation of laboratories.

Notification of accredited laboratories.

- Provide technical and scientific support to the Central Government.
- The State Governments are responsible for determining the policies and rules that will be applied in areas that have a direct or indirectly bearing on food safety and nutrition.
- Collect data about food consumption, the incidence and prevalence biological risk, contaminants and foods products, as well as residues of various contaminants.
- Establishing an information network throughout the country to ensure that consumers, Panchayats, and the general public receive timely, reliable, and objective information on food safety and other concerns.
- Training programs for people who are interested in or plan to become involved in the food business.
- Contribute towards the development of international technical standards in food, sanitary, and phyto-sanitary.
- Increase awareness of food safety standards and promote food safety.

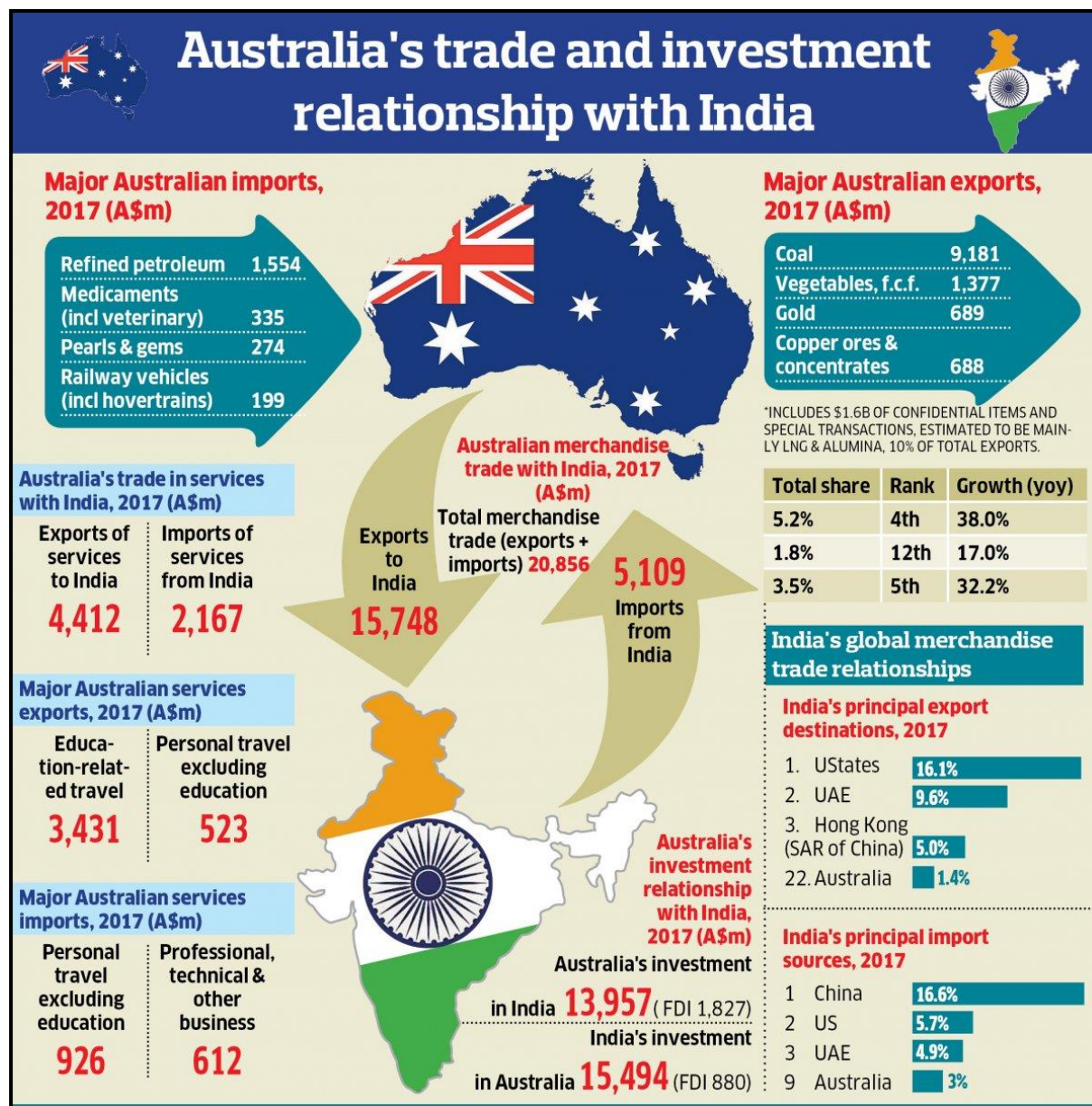
Lists of food regulations from the FSSAI:

1. Food Safety and Standards Regulation (Licensing and Registration of Food Businesses), 2011.
2. Food Safety and Standards Regulation (Food Products Standards and Food Additives), 2011.
3. Food Safety and Standards Regulation (Prohibition and Restriction of Sales), 2011.
4. Food Safety and Standards Regulation (Contaminants Toxins and Residues), 2011.
5. Food Safety and Standards Regulation (Laboratory and Sampling Analysis), 2011.
6. 2016 Regulations on Food Safety and Standards: Nutraceuticals, Health Supplements, Foods for Special Dietary Uses, Foods for Special Medical Purposes, Foods for Functional Foods and Novel Foods
7. Regulation 2017 on Food Safety and Standards (Food Recall Procedure).
8. Regulation 2017 on Food Safety and Standards (Import),
9. Food Safety and Standards Regulation (Approval of Non-Specific Food and Food Ingredients), 2017
10. Regulation 2017 on Food Safety and Standards (Organic Foods)
11. Regulation 2018 on Food Safety and Standards (Alcoholic Beverages).
12. Regulation 2018 on Food Safety and Standards (Fortification of Food).

13. Regulation 2018 on Food Safety and Standards (Food Safety Auditing).
 14. Regulation 2018 on Food Safety and Standards (Recognition and Notification of Laboratories).
 15. Regulation 2018 on Food Safety and Standards (Advertising and Claims).
 16. Regulation 2018 on Food Safety and Standards (Packaging),
 17. Food Safety and Standards Regulation (Recovery and Distribution of Surplus Food) Regulation, 2019.
 18. Food Safety and Standards Regulations 2020
 19. Food Safety and Standards (Foods for Infant Nutrition Regulations 2020)
 20. Food Safety and Standards (Labelling and Display) Regulations 2020
 21. Food Safety and Standards Regulations (Ayurveda Aahara), 2022
 22. Food Safety and Standards Regulations (Vegan Foods), 2022
 23. Food Safety and Standards Authority of India (Transaction of Business At Its Meetings) Regulations (2010)
 24. Food Safety and Standards Authority of India (Procedure to Transaction of
 25. 2010 Regulations on Business of the Central Advisory Committee (Business of the Central Advisory Committee).
 26. Food Safety and Standards Authority of India (Salary, Allowances and Other)
 27. 2013 Regulations on Conditions of Service for Officers and Employees
 28. Food Safety and Standards Authority of India (Transaction of Business and
 29. 2016 Regulations - Procedure for Scientific Committee and Scientific Panel
 30. Food Safety and Standards Authority of India (Recruitment and Appointment Regulations), 2018
-

Topic 34. INDIA-AUSTRALIA TRADE RELATIONS

Important for subject: Economy



The free trade agreement with India was approved by the Australian Parliament in April.

- The pact will be in effect from January 2023.
- This agreement will likely increase bilateral trade to USD 45-50 Billion in the next five to six years, compared to the current USD 31 billion.
- The India-Australia Economic Cooperation and Trade Agreement would allow Indian exporters to have duty-free access in Australia to over 6,000 broad sector products, including jewellery, leather and textiles.

- From day one, Australia offers zero-duty access for India to approximately 96.4 percent of its exports (by values).
- This applies to many products that are currently subject to 4-5 percent customs duty in Australia.
- Australia will allow 100 percent of its lines (products), without any restriction even on quota.
- This is Australia's first attempt at this feat for any other country.
- The most labour-intensive industries that would benefit are textiles, apparel, few agricultural products and fish products, leather and footwear, leather, shoes, furniture, sport goods, jewellery and machinery, as well as electrical goods and railway wagons.

India-Australia Trade Relations:

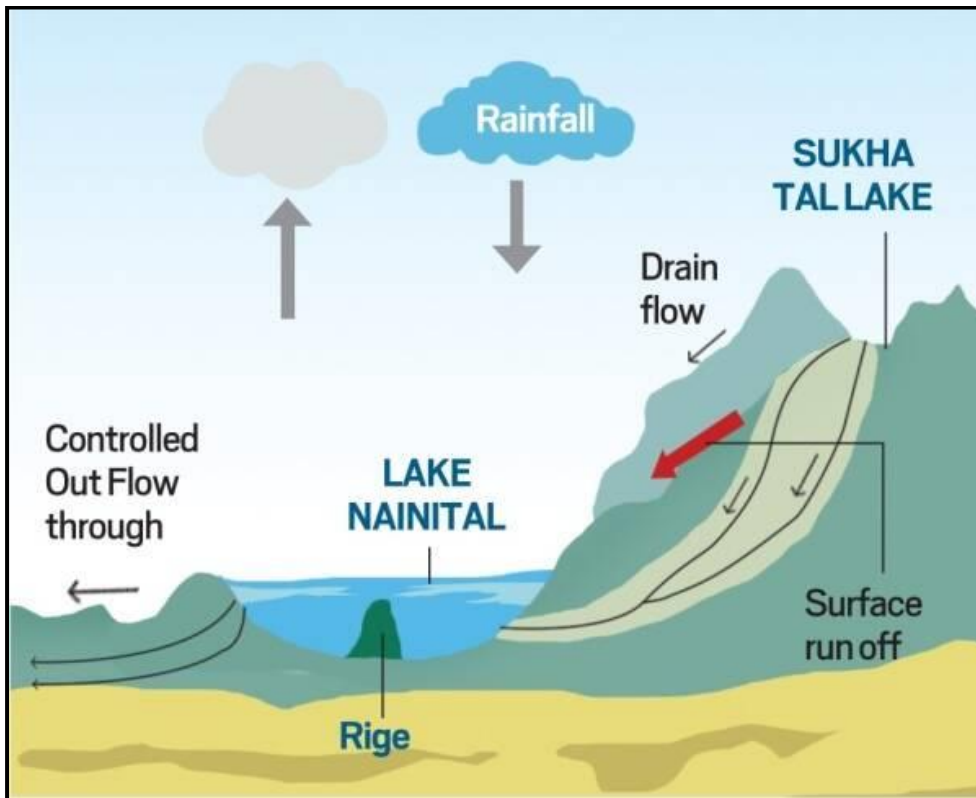
- Australia and India have upgraded their bilateral relationship from 'Strategic Partnership' in 2009 to Comprehensive Strategic Partnership in 2020.
- India was Australia's seventh largest trading partner in 2020. It was also the sixth largest export market, thanks to coal and international education. India currently ranks 9th among Australia's trading partners (2021).
- In 2021, bilateral trade in goods & services with India reached US\$ 27.5 Billion. India exported goods and service worth US\$ 10.5 Billion and India imported goods and service worth US\$ 17B.
- Australia is ahead in terms of balance of trade by US\$ 6.5 Billion
- Between 2019 and 2021, India's merchandise exports from India to Australia increased 135%. India's major exports to Australia include refined petroleum and medicaments (incl. veterinary, pearls & gemstones, jewellery, made up textile articles, women's clothing (excl. knitted), and manufactures of base metal while
- India imports a lot of coal, confidential trade items, copper ores and concentrates, natural gas as well as non-ferrous waste, scrap, ferrous, and education related services.
- Education is Australia's largest export to India. was valued at \$6Billion and accounted for approximately 88 percent of the total in 2020.
- A commitment to increase trade and investment flows for the benefit of both countries

is part of the Australia-India relationship's elevation to a Comprehensive Strategic Partnership.

- The Australia India Business Exchange (AIBX), a program that supports more Australian-Indian business partnerships, was launched by the Australian Government.

Topic 35. CHOKING LAKE: NAINITAL GETS SOME HC RELIEF BUT FINGER CROSSED

Important for subject: Geography



Sukhtal lake

- Sukhatal, a freshwater lake with a length 150m and a depth of 10m, is located in the middle of India. It is surrounded by dense oak and pine forests.
- Sukhatal is an important source of water for Nainital lake.
- Previously known as Khudaiya Tal
- Sukhatal was given its current name because all the water from the lake was drained to the Nainital region.
- These forests are home to many migratory birds.
- Important Manmade lakes in India

Manmade Lakes

Bhojtal Lake

- Bhojtal, also known as "Upper Lake", is Asia's largest artificial lake and is located in Bhopal (Madhya Pradesh).
- The Kolans River was once a tributary to the Halali River. However, with the construction of the lake via an earthen dam, a diversion channel, and the construction of the lake, the upper course and Bada Talab of the Kolans River now flow into the Kaliasot River.

Gobind Sagar Lake

- Gobind Sagar Lake can be found in the Himachal Pradesh district of Una and Bilaspur.
- It is due to the Bhakra Dam.
- Guru Gobind Singh, the eleventh Sikh Guru, is the reservoir's name. It is located on the Sutlej River.
- One of the most gravity-dense dams in the world is Bhakra Dam.
- In 1962, the lake was designated a 'waterfowl sanctuary'.
- The Gobind Sagar Lake is still home to many bird and animal species including the Panther, Wolf and Chausinga.
- The water level in Gobind Sagar Lake changes constantly. One can participate in many sports at the reservoir.

Jaisamand Lake

- Jaisamand Lake is also known as Dhebar Lake. It is India's oldest and largest historical lake.
- It is located in the Rajasthan State of western India, within the Udaipur district.
- All three islands of Jaisamand Lake are occupied by the Bhil Minas tribe.
- Maharaja Jai Singh built Jaisamand Lake in 17th-century using waters from the Gomti River.
- There are 11 islands on the lake. Some of these islands provide refuge for many species of migratory birds.

Hussain Sagar Lake

- Hussain Sagar Lake is a lake with a heart shape in Hyderabad, Telangana. It is located on the Musi River, which was founded in 1563 by Ibrahim Quli Qutb Shah.
- The lake was named after Hussain Shah Wali (the Kingdom's Master in Architecture).
- It is a artificial lake, which is continuously supplied by canals from Musi River.

Chembarambakkam Lake

- Chembarambakkam lake is located in Chennai Tamil Nadu, India. It is approximately 25 km from the city centre.
- It is one of the two rain-fed reservoirs that provide water delivery to Chennai City. The other is Puzhal Lake.
- This lake is the source for the Adyar River. It provides water to Chennai city.
- Puliur Kottam refers to Chembarambakkam Lake. The many types of plants complement its turquoise waters.

Kodaikanal Lake

- Kodaikanal Lake (also known as Kodai Lake) is a manmade lake that can be found in Kodaikanal, Tamil Nadu's Dindigul district.
- Sir Vere Harry Levinge was the Collector of Madurai at the time. He was responsible for creating the lake in 1863, in the Kodaikanal area, which was built by British missionaries and later Americans.
- According to Kodaikanal, the lake is both the most tourist-attractive and popular geographical landmark.

Govind Pant Sagar

- Rihand dam, India's largest dam by volume, was constructed.
- Located in U.P.'s Sonbhadra district
- It is situated on the Rihand River which is a tributary to the Son River.

Narayan Sarovar

- It is located in Gujrat's Kutch region.
- Pilgrimage site for Hindus at the Kori Creek.

- Near the Koteswar temple is a lake

Kankaria lake

- Located in Ahmedabad and Gujrat
- Second largest lake in Gujrat
- It was completed in 1451 under the reign of Sultan.
- Qutb-ud-Din Ahmad Shah II, though it is sometimes placed in the Chaulukya period.

Hamirsar lake

- It is located in Bhuj, in the Kutch area of Gujrat
- It is a old lake that has been around for 450 years. It was named after Rao Hamir (1472-1524), who was the founder of Bhuj.
- Rao Khengarji I (1548-1585), who was the founder of Jadeja Dynasty in Cutch and gave the lake its name after Rao Hamir, built the lake.

Topic 36. INDO-GANGETIC PLAIN DRYING UP? WATER STORAGE DECLINED, 'STREAM FLOW' ROSE IN GANGA, INDUS BASINS LAST YEAR, SAYS WMO

Important for subject: Geography



To assess the impacts of climate, environmental, and societal changes on Earth's water resources, the WMO published its first State of Global Water Resources.

The report

- This annual inventory is designed to assist in the management and monitoring of

global freshwater resources.

- This report is focused on three main areas:
- Stream flow. The volume of water moving through a river channel at any one time.
- Terrestrial water storage - All water on the surface of the earth and under the ground.
- The cryosphere (frozen waters).

Highlights

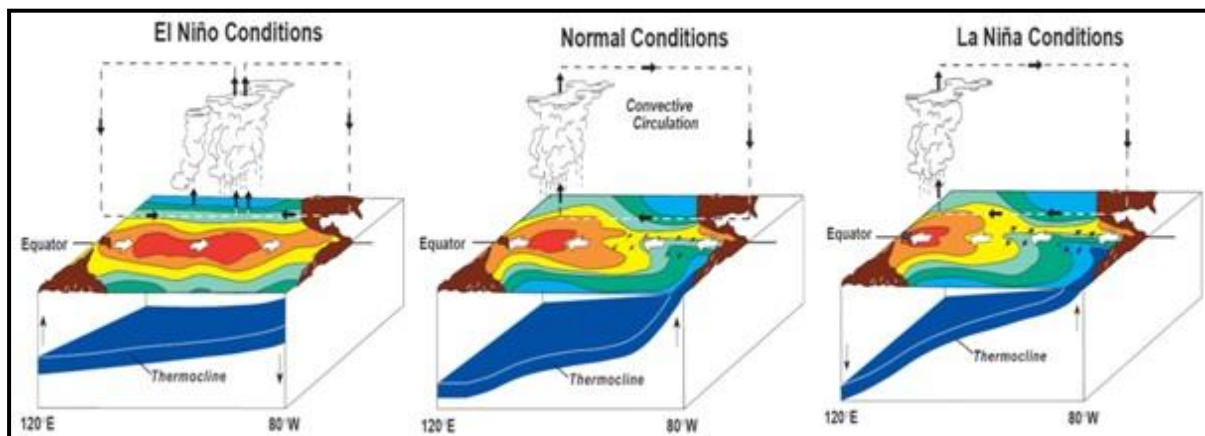
- Large areas around the globe experienced dryer-than-normal conditions 2021, despite an extended La Nina event.
- The area with below-average stream flow was about two-fold larger than the area, compared to the 30-year average.
- The discharge levels in the Amur river basin of northern China and southern China were above average, which is similar to that found in some northern India basins.
- Headwaters of Ganges River in India were known for their high levels of discharge.
- TWS has declined over the past 2021 in major Indian river basins, including the Ganges, Indus, and Brahmaputra.
- The report highlighted several hotspots that showed a negative trend for terrestrial water storage, including Brazil's Rio Sao Francisco Basin, Patagonia and the Ganga, Indus and Southwest US headwaters.

World Meteorological Organization -

- The World Meteorological Organization is an intergovernmental organisation that has a membership of all 192 Member States as well as Territories.
- India is a member WMO.
- It was created by the International Meteorological Organization, which was established following the 1873 Vienna International Meteorological Congress.
- WMO was established by the ratification WMO Convention, 23 March 1950. It became the specialized agent of the United Nations in meteorology (weather, climate), operational hydrology, and related geophysical sciences.
- WMO headquarters is in Geneva, Switzerland.

Topic 37. EL NINO YEAR OR NEUTRAL PHASE LIKELY IN 2023; TRANSITION MAY LEAD TO MONSOON DEFICIT: EXPERTS

Important for subject: Geography



The La Nina weather phenomenon, which entered its 3rd year in September, is unlikely to last through 2023. Instead, there is a possibility of an El Nino or neutral phase developing next year.

The ENSO Cycle

- El Nino is characterized by warmer-than average waters in the central and east tropical Pacific, and a slowdown in trade winds (which blow east-west). La Nina is characterized by cooler-than normal waters and intensified trading winds.
- When conditions are neither hot nor cold, a neutral phase is formed.
- El Nino and La Nina are part of EnSO, climate phenomena which alter atmospheric circulation.
- This has an impact on temperature and precipitation around the world.

India's Impact

- The La Nina phase started in September 2020, and will likely continue through December 2022.
- La Nina will transition to ENSO-neutral in February-April 2023.
- The Pacific Ocean's western portion is warm. The oceans must be pushed towards the eastern and central parts of the ocean by the winds. This is where ENSO develops or switches phases.
- The western Pacific Ocean's heat content is rising below the sea surface.

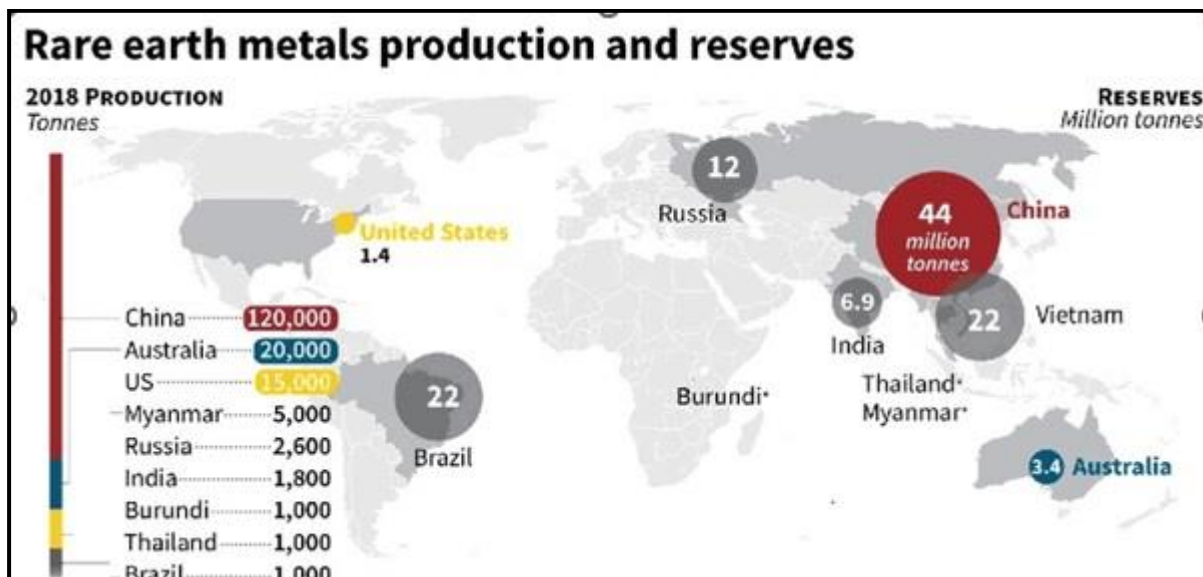
- A neutral summer phase usually means bad news for India.
- India could experience monsoon deficits during the transition from La Nina winter into neutral summer.
- The monsoon can drop to 15% below the normal level. This could change if the Arctic experiences heavy late-season rainfalls, as was the case between 2021 and 2022.

Triple-dip La-Nina

- A Triple-dip La Nina (or multiyear cooling) of the surface temperature in the equatorial Pacific Ocean can lead to severe droughts, strong winds, and heavy rains.
- WMO predicts that the current La Nina will last three consecutive winters in northern hemisphere.
- 1950 The Earth witnessed a triple La Nina, including the current.
- It has yet to be recorded a La Nina Phase four years in succession.

Topic 38. INDUSTRY URGES GOVT. TO ESTABLISH 'INDIA RARE EARTHS MISSION' TO REDUCE RELIANCE ON CHINA

Important for subject: Geography



Industry has asked the government to promote private mining and diversify supply sources for critical rare earth minerals in order to counter India's dependence on China for imports.

India Rare Earths Mission

- CII suggested that an "India Rare Earths Mission" be established , manned by professionals like the India Semiconductor Mission, and their exploration become a crucial component of the Deep Ocean Mission plan.
- India holds 6% of the world's rare Earth reserves. However, India only produces 1% global output and most of its needs for such minerals come from China.

'Broad-base supply'

- 2018-19, 92% rare earth metal imports by Value and 97% were sourced directly from China.
- CII recommended that the public sector company Indian Rare Earths Limited, administered under the Department of Atomic Energy be divided into two entities.
- IREL is primarily focused on Thorium mines, but could also pursue other minerals.

Rare earth elements

- The 17 rare Earth elements (REE) also include the 15 Lanthanides.
- 57 (which is Lanthanum -- to 71 on the periodic table), plus Scandium, (atomic number 21), and Yttrium (39) The REEs can be classified as either light RE elements (LREE), or heavy RE elements, (HREE).
- There are some REEs available in India, such as Lanthanum and Cerium, Praseodymium, Samarium and Neodymium.
- Other materials, such as Dysprosium and Terbium are not found in Indian deposits.
- Therefore, the dependence on China for HREEs is high. China is an important producer of REEs with a 70% share of global production.

These minerals are important for what?

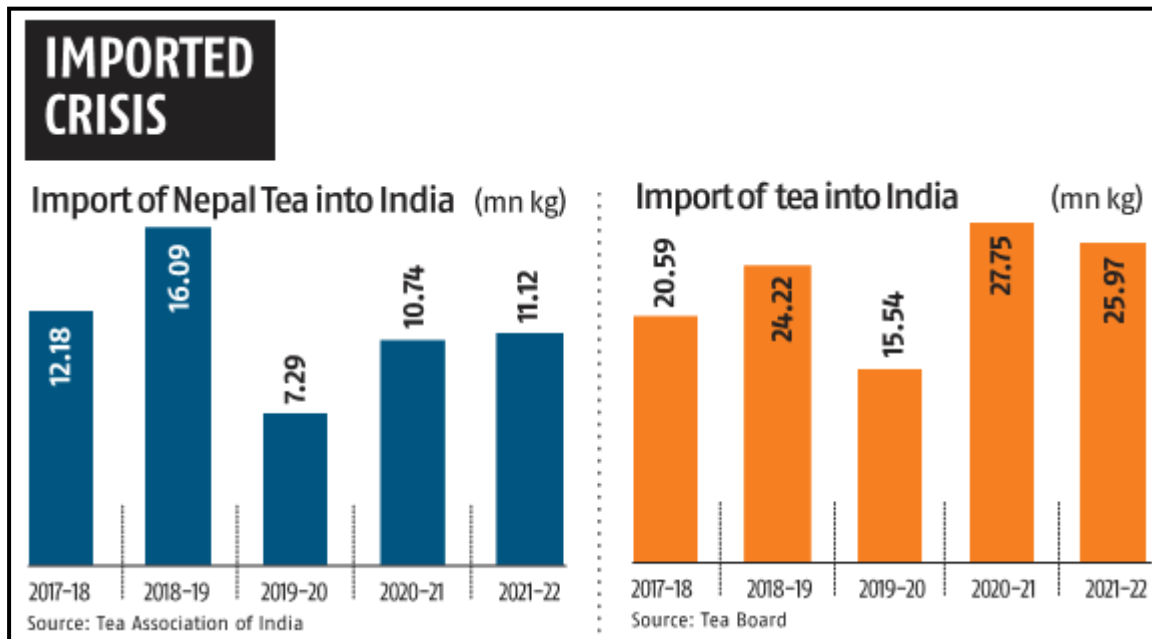
- For electric vehicles to be powered by batteries, they will need minerals like Cobalt and Nickel.
- REEs are an important component, but often very small, of over 200 consumer products including mobile phones, laptops, hybrid vehicles, semiconductors and flatscreen TVs and monitors as well as high-end electronics.
- India is seen as a late entrant in the lithium value chain. This comes at a time when

EVs will be a sector that is poised for disruption.

- The plan calls for EVs to replace 80 percent of the country's two-wheeler and three-wheeler fleets, 40 percent of buses and 30 to 70% of cars by 2030.

Topic 39. WHY IS THE DARJEELING TEA INDUSTRY IN CRISIS?

Important for subject: Geography



One of the most important brands of the Tea Board's Tea Board, Darjeeling Tea is currently under severe stress.

- The Tea Board of India requested a special financial package of Rs1,000 Crore from the Centre for the tea Industry for five years during the Indian Tea Association's annual general meeting in Kolkata.

Darjeeling Tea: Why is it so important?

- Darjeeling Tea is known as the 'Champagne of Teas'. It was the earliest Indian product to be given the GI (Geographical Identification), tag in 2004. This was due to its unique aroma and flavor.
- Million Kg Darjeeling Tea is made from 87 gardens, and most of these were exported.
- These gardens' owners have had to change several times over the last few months due to financial difficulties and government support.

What are the dangers to Nepal's gardens and plants?

- Tea is produced in Nepal due to its similar climate and terrain. has a lower cost because of fewer input costs, especially labour, and fewer quality controls.
- Importing inferior tea from Nepali was done in order to resell it as premium Darjeeling Tea.
- Both the governments of India and Nepal had signed the Revised Treaty of Trade in October 2009.both sides had also agreed to exempt basic customs duties as well as quantitative restrictions from the import of mutually agreed primary goods.
- The Tea Association of India data shows that total tea imports from are a record.
- In 2020-21, Nepal's tea imports to India were 10.74 million kilograms.
- The 2017 influx of Nepalese teas at a cheap price began.
- 2017 saw a drop in Darjeeling Tea production to 3.21 million kilograms.

Are climate change and production affecting each other?

- Another concern is the decrease in production, and increase of input costs.
- The tea production in Darjeeling, which was around 10-12 millions kg a decade ago, now stands at 6.87mkg (2021).
- The multiple elements are responsible for the decline in production.
- Climate change
- Sinking yields
- High absenteeism among workers.
- Due to the steep terrain of Darjeeling, there is not much land available for tea garden expansion.
- Tea bushes in the tea region are more mature than those in other areas of the country.
- It is time-consuming and expensive to remove and plant them. Stagnant Darjeeling Tea auction prices
- CAGR (cumulative annual rate of growth) for the past six years is only 1.7% against an increasing inputbetween 10 and 12% CAGR
- The fall in demand from European markets
- The country's per capita tea consumption is still 850g, which is lower than neighbouring countries.

Topic 40. CHINAR TREES

Important for subject: Geography

It is a deciduous tree that lives in colder regions, mostly the Kashmir valley of India. The true beauty of these trees is revealed in autumn when their foliage changes to a mauve and blood-red color. They eventually turn yellow-amber.

- Chinar is a Persian word that means "What a Fire" and it's the name of the tree. It's found in Eastern Himalayas.
- Their botanical name is *Platanus Orientalis*.
- Type It is a large deciduous tree that is known for its longevity, spreading crown and long life span.
- Because Chinar trees are long-living, they have survived for centuries. It can spread wide in a cool climate that has enough water. Its deep green leaves can turn to amber, yellow, or blood red in autumn.

History of Chinar

- The oldest known Chinar from Kashmir is actually said to be planted in 1374, and is nearly 600 years old.
- It stands 14.78m high and is found in Kashmir's Budgam region. Mughal Emperors like Akbar, Nurud-Din Muhammad Jahangir and Aurangzeb adored the tree.
- It was even called the "royal trees" After his conquests of Kashmir in 1586, Akbar the great Emperor is said to have planted more than 1,200 Chinar trees.
- A small Chinar Island is located on Dal Lake called "Char Chinar". It is home to four Chinar trees. This island gets its name.
- These four trees were erected by Emperor Jahangir so that they would always cast a shadow over the island.
- These are some of the most visited tourist spots in Kashmir.
- In Kashmir, the Chinar tree is known locally as Bouin. This name is derived from the Sanskrit term "Bhawani," which means Goddess. You can find the Chinar trees, a symbol of faith, at the Kheer Bhawani Temple as well as other Goddess Bhawani shrines in Kashmir. These beautiful trees can be found at some of Kashmir's most renowned shrines and mosques, including Sultan-ul-Arifeen or Hazratbal.
- Application of Chinar Tree

- Medicine: Bark leaves
- Wood - Also known as Lacewood, it is used to make delicate furniture
- Roots and twigs are used to make dyes

Topic 41. INDIAN TEAM IN ARGENTINA TO SCOUT FOR LITHIUM DEALS

Important for subject: Geography



India sent three geologists to Argentina to "assess potential lithium deposits" and possible acquisition opportunities in this Latin American country.

The team is made up of

- A team of one geologist from Mineral Exploration Corporation Ltd. (MECL), KABIL, KhanijBidesh India Ltd. and the Geological Survey of India has been sent to Catamarca in Argentina.
- A second team would be sent to the region to conduct possible commercial negotiations based on their feasibility report.
- The feasibility study would include the determination of the lithium resource and deciding if mining is economically viable. To determine if it is worth investing in the resources.

Property of Lithium:

1. It is a chemical element that bears the symbol Li.

2. It is a soft, silvery white metal.
 3. It is the lightest of all metals and the lightest solid elements under standard conditions.
 4. It is highly reactive, flammable and should be stored in mineral oils
 5. It is both an alkali and rare metal.
- The chemical elements that make up the alkali metals are lithium, sodium and potassium as well as rubidium, caesium and francium.
 - They make up group 1, which is located in the block of the periodic table.
 - Rare Metals (RM) include Niobium (Nb), Tantalum (Ta), Lithium (Li), Beryllium (Be), Cesium (Cs) etc. Other Rare Earths (RE), include Lanthanum, La, to Lutetium(Lu), as well as Scandium (Sc), and Yttrium.
 - These metals are strategically in nature and have wide applications in the nuclear and high-tech industries such as electronics, telecommunications, information technology, defense, etc.

Uses:

- To make useful alloys, you can use lithium metal.
- To make white metal' bearings, for example, use lead, aluminum to make parts for aircraft, and magnesium, to make armour plates.
- In Thermonuclear reactions.
- To create electrochemical cells.
- Lithium is an essential component of Electric Vehicles, Laptops, and other Electronic Devices.
- Largest Reserves in
- Chile> Australia> Argentina
- 'Lithium Triangle' countries

Lithium for India:

- The Atomic Minerals Directorate, which is part of India's Atomic Energy Commission, has estimated lithium resources of 14,100 tonnes in an area of land that was recently surveyed in Southern Karnataka's Mandya District recently.
- India's first ever Lithium deposit location was also discovered.

Other Potential Websites in India

- These are the major mica belts of Rajasthan, Bihar, Andhra Pradesh.
- Belts of Pegmatite (igneous rock) in Odisha, Chhattisgarh.
- Brines and Pachpadra in Rajasthan, and Ranns of Kachchh respectively in Gujarat.

Production of Lithium in Stars:

- Scientists at the Indian Institute of Astrophysics have shown for the first-time that Lithium production occurs in low-mass Sun-like stars during the Helium (He), core burning phase.

Lithium demand

- Australia ranks among the six top producers of the mineral worldwide. China, Argentina, Chile and the USA are the other five.
- The shift to electric vehicles (EVs) is driving demand, both globally and in India.
- According to various trade reports, global consumption is expected to increase from 500,000 tons in 2021 to 3-4 millions tonnes by 2021.

Boom in Argentina

- You can find lithium in sediments rocks formations and in brine forms which are called salar in Argentina and Bolivia.
- Another option is liquid form.
- About 30% of the world's lithium was produced last year by Chile and Argentina.
- These three countries are collectively known as the "lithium trinity" and together they account for more than half of the world's resources.
- South America is home to lithium. It is usually extracted from salt flats by pumping brine in ponds and then processing the lithium salts once the water has evaporated.
- While it takes time and money to set up, production is much cheaper than hard-rock mining in Australia.

Topic 42. WHAT IS THE HURRY FOR GM MUSTARD?

Important for subject: Science and Technology



Experts are concerned about the recent recommendation by the Genetic Engineering Appraisal Committee for approval for the environment release of genetically engineered (GE), mustard (DMH-11) hybrid in India.

- India's rising oil import bill: In the FY ending March 31,2022, India produced 8.5-9million tonnes (mt), while imported 14-14.5mt, which resulted in a record foreign currency outflow of \$18.99Billion.
- DMH-11 hybrid: This hybrid was created by genetic modification (GM), by the DU's Centre for Genetic Manipulation of Crop Plants. It is based on the hybridization of two alien genes (barnase and barstar), which were isolated from a soil bacterium named *Bacillus amyloliquefaciens*.
- DMH-11 has been shown to yield an average 28% higher than the Indian mustard variety 'Varuna', according to field trials conducted by the Indian Council of Agricultural Research.
- GEAC It is a body that reviews proposals relating to the "release GM organisms or products (ordinarily deemed hazardous) into the environmental.
- It has recommended that the DMH-11 hybrid be released to allow for seed production

and testing before commercial release.

Herbicide-tolerant:

- DMH-11 could have long-term economic and ecological consequences.
- The details of the mandatory trials to ensure food and environmental safety, which are a prerequisite for environmental release, have not been published.
- It remains to be done a detailed, long-term evaluation of the economic and social benefits that DMH-11 can bring.
- This will result in displacement for manual labour engaged with weeding because the GM mustard can tolerate weeds.
- The new system could threaten the honey bee population, as mustard flowers are a major source of nectar.
- The devastating effect of the Spread of Herbicide Resistance (HT) Gene on the normal crops.
- The following guidelines for environmental release were proposed by

GEAC –

- Any herbicide formulation should only be used under carefully controlled conditions.
- Any herbicide formulation is not allowed for cultivation on the farmer's fields.
- The CGMCP applicant should conduct field demonstrations to determine the effects of GM mustard upon honey bees.

Super Seeds

- Super seeds are a combination of two previously existing varieties of seeds to create a new, more efficient variety.

Newly produced seeds may have properties such as

- Productivity increases
- High temperatures are resistant to drought and can withstand high temperatures
- Crop production requires less water
- Herbicide-tolerant
- Resistant to pests etc.

Topic 43. WET LEASING AN AIRCRAFT

Important for subject: Science and Technology

Taking the Shorter Route

IndiGo to wet lease up to 3 Boeing 777 aircraft for international ops

This will be the first time it will deploy wide-body and business class aircraft

SpiceJet to wet lease up to 7 Boeing 737 Max aircraft; may take more

Aircraft will be deployed for short term (till delivery of fresh aircraft)

DGCA permits wet lease up to 6 months in emergency situations like grounding

Labour shortage for engine makers forcing airlines to ground aircraft

It's also delaying fresh induction



The civil aviation ministry of India has granted wide-body planes to Indian airlines on wet lease for upto one year in an effort to increase international air traffic.

What is wet leasing?

- Wet leasing is when the plane is rented together with the operators crew and engineers.
- ACMI stands for aircraft crew, maintenance, insurance, and is the technical term for wet lease.
- These are the operations that the wet-lease airline will take care of. However, the airline client will remain responsible for the direct operating costs.
- These fees include fuel and catering, as well as airport fees, ground handling fees and navigation fees.
- The Directorate General of Civil Aviation has more difficulty monitoring the operations of an aircraft under wet lease, so it is permitted for shorter periods.

What are the new rules for a company?

- The rules were relaxed, allowing wet leasing for one year instead of the six months allowed so far.
- Dry leasing was allowed up to 12 month, with the possibility to extend the contract by 12 more years.

Why is the government extending the limit?

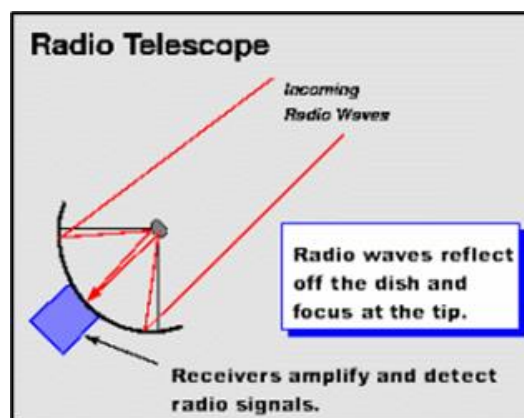
- IndiGo, the country's biggest airline, requested that the civil aviation ministry make this decision.
- It intends to induct B777 aircraft on wet/damp leasing basis during this winter.
- All Indian carriers will be eligible for the relaxation, which will be based on their international destinations.
- International travel is improving as Covid-related restrictions are lifted. Wet leasing will enable airlines to fly more routes.
- Wide-body planes are able to carry more passengers and increase revenue.

Why do airlines lease aircraft?

- About 50% of the planes used worldwide by airlines are not owned, but leased.
- Leasing planes is preferred by airlines and operators to avoid large lump sum payments and increase their capacity temporarily on specific routes or sectors.

Topic 44. INDIA'S SARAS RADIO TELESCOPE GIVES CLUES TO UNIVERSE'S 1ST STARS & GALAXIES

Important for subject: Science and Technology



Bengaluru's Raman Research Institute (RRI), said that scientists discovered the properties of radio-luminous galaxies formed 200 million years after Big Bang. This period is known as the Cosmic Dawn.

What was the research all about?

- They used the Shaped Antenna measurement to determine the background RAdio Spectrum-3 telescope (SARAS-3).
- SARAS-3 was indigenously designed and built by RRI and deployed over Dandiganahalli Lake, Sharavathi backwaters and Karnataka's Karnataka in the early 2020s.
- Scientists use radiation from hydrogen atoms around galaxies to study the properties of their very early galaxies. This frequency is approximately 1420 MHz.
- The radiation travels through space and time and arrives at earth in lower frequency radio frequencies 50- 200 MHz. is also used for FM and TV transmissions.

The difficult task of detecting the signal

- The cosmic signal is very faint, buried in orders-of-magnitude brighter radiation from our Galaxy and manmade terrestrial interference.
- Astronomers have always struggled to detect the signal even with the best radio telescopes.
- Research findings
- Radio observations of the average 21-cm line from the SARAS-3 telescope provide the first insight into the properties and power of radio-loud galaxies. These galaxies are often powered by super massive dark holes.
- This work builds on the SARAS-2 results, which were the first to provide information about the properties of galaxies and stars.
- It was shown that less than 3% of the gaseous material within early galaxies was transformed into stars, and that the first galaxies with radio emission were also bright in X-rays. which heated the cosmic gases in and around early galaxies.
- SARAS-3 was able to set an upper limit on excess radiation at radio wavelengths. This is in addition to lowering the limits established by the ARADE, and Long wavelength.

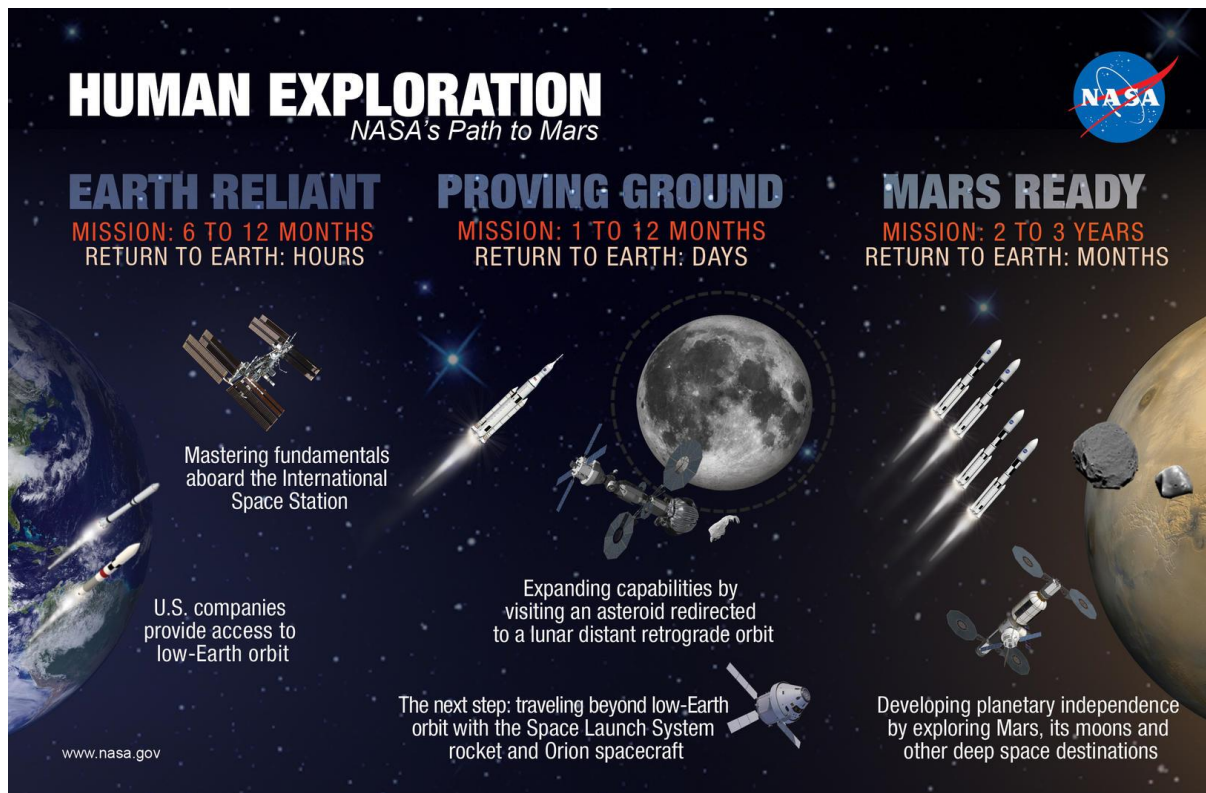
- Experiments with the Array (LWA), in the US
- This analysis revealed that the 21 cm hydrogen signal can be used to determine the population of first stars and galaxies.

Future Challenges

- Limitations in the calculation of the masses early galaxies, and limits on their energy outputs across radio-, X-ray, and ultraviolet wavelengths.
- What are Radio Waves & Radio Telescopes?
- Radio waves are the longest wavelengths within the electromagnetic spectrum.
- They can be as long as a football and larger than the planet. Heinrich Hertz proved the existence of radio waves in late 1880s.
- Radio telescopes gather weak radio light waves and bring them to a point. They then magnify the signal and make it available for analysis.
- They are used to study radio light naturally occurring from stars, galaxies and black holes, and other astronomical objects.
- These telescopes are specially designed to see the longest wavelengths, which can be as long as 10 meters.
- Visible light waves are just a few hundred nanometers in length, and a nanometer has a thickness of only 1/10,000th of a piece of paper. Radio light is not usually referred to by its wavelength. It's actually referred to by its frequency.
- Measurement of the background Radio Spectrum-3 by a Shaped Antenna (SARAS-3 telescope) SARAS is a niche, high-risk, high-reward experimental effort of RRI.
- SARAS is a project to design, build, and deploy in India an extremely faint radio telescope. It will detect radio waves from the depths of time from our Cosmos Dawn when the first stars and galaxies were formed in the early Universe.

Topic 45. RED PLANET DAY: THE MANY MISSIONS THAT BROUGHT HUMANS CLOSER TO MARS

Important for subject: Science and tec



Red Planet Day is November 28, to commemorate the launch of one of the most important missions to Mars.

- This day was 1964. The United States launched a space probe Mariner 4 to Mars. It flew past Mars in July 1965. Sending back images of the red planet.
- It was the first ever time that a spacecraft made a flyby of the red-colored planet. This spacecraft became the first to take close-up photos of another planet.

Critical space missions to the MARS -

19th century

- Giovanni Schiaparelli, an Italian astronomer, claimed that he had observed lines on the surface the planet's surface in the latter part of the 19th century. He called these canali.
- This was mistranslated as canals in English, leading some people to believe that

canals were constructed by intelligent beings from Mars. This is an early example of Mars being believed to have life similar to Earth.

1964: Mariner4

- After 8 months on the voyage to Mars, Mariner 4 sends the images of lunar-type impacts craters.
- A television camera aboard took 22 photos, approximately 1% of the globe.
- These photos were sent to Earth in just four days.
- Mariner 4 stays in solar orbit for about three years, continuing long-term research on the solar wind environment, and taking coordinated measurements with Mariner 5.
- These photographs also showed a cratered surface that resembled the Moon, although they were limited in their coverage and did not cover all the geologically diverse features we now know.

Viking missions in the 1970s and 1980s

- The Viking missions (1970s), carried out the first chemical analysis on Martian soil and four biology experiments to detect biological activities.
- In the early 80s, scientists hypothesized, based upon mineralogic content and rock texture, that certain meteorites might be from Mars.
- 1984 study by the Viking spacecraft showed that the rare gas isotopic composition (Xenon Krypton, Neon, and Argon), matched the Martian atmosphere isotopic ratios.
- This discovery opened up a new way for geochemists and scientists to study Martian samples.
- It also provided an enormous boost to our understanding about the geochemical evolution Mars.

Odyssey 2001 and water on Mars

- The Gamma Ray Spectrometer aboard Mars Odyssey's Mars Odyssey spacecraft in 2001 detected a remarkable hydrogen signature, which seemed to indicate the presence water ice.
- NASA's Phoenix was able to land on the Martian North Pole in May 2008. It survived for approximately 150 days.

- Phoenix's robotic arms scooped soil from the surface and heated it in eight ovens. The mass spectrometer measured the composition of the gases using a mass-spectrometer. The Phoenix mission proved conclusively that hydrogen discovered by Mars Odyssey in 2002 was actually water ice.

Beyond The West

- NASA has a Lander (Mars Insight), Curiosity, a Rover (Curiosity), and Three Orbiters (Mars Reconnaissance Orbiter (Mars Odyssey), MAVEN).
- India is equipped with an orbiter, Mangalyaan-1;
- India's Mars Orbiter Mission was a technology demonstration project. It carried five scientific payloads (totaling 15 kg), collecting data on surface geology, morphology and the atmospheric escape process. The EU has two orbiters (Mars Express, ExoMars Trace Gas Orbiter), and China and UAE each have one orbiter (Hope and Tianwen-1).
- The UAE mission will examine the Martian atmosphere, and attempt to answer the question of why Mars lost its atmosphere.

About Mars, planet

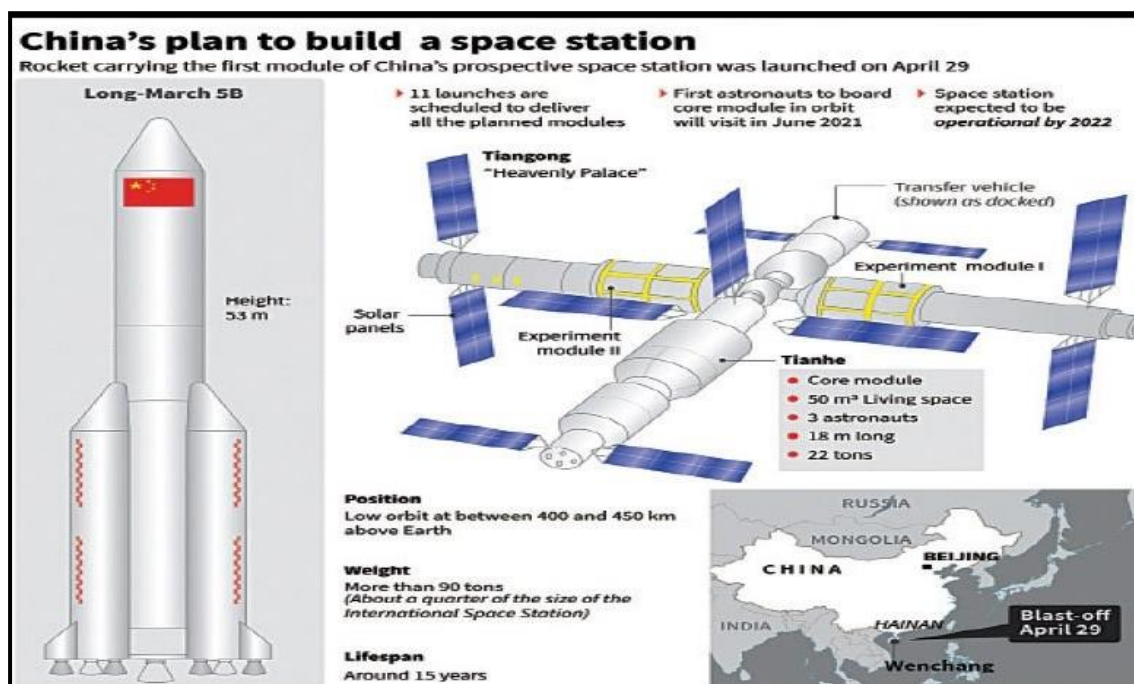
- Mars is the fourth planet after the Sun, and the second-smallest in the Solar System. It is larger than Mercury.
- Mars is a terrestrial planet that has a thin atmosphere (less than 1% of Earth's). It also has a crust that's mainly composed of elements similar in composition to Earth's crust and a core of iron and nickel.
- There are many surface features on Mars, including valleys, dunes and impact craters.
- There are two small, irregularly shaped moons in the area: Deimos and Phobos.
- Some of the most prominent features on Mars include Olympus Mons (the largest volcano on Mars and the highest-known mountain on the Solar System), Valles Marineris (one of the largest canyons in all of the Solar System), and Valles Marineris (the largest canyons on the Solar System).
- The Borealis Basin in Northern Hemisphere is approximately 40% and may have a significant impact.
- Mars has seasons and days that are similar to Earth's. The planets have a similar

period and a tilt in the rotational axis relative the ecliptic.

- Low atmospheric pressure means that liquid water cannot exist on Mars' surface. It is less than one percent of Earth's atmospheric pressure.
- Both Mars's two polar ice caps are made of a lot of water.
- Mars may have been a wetter planet in the distant past and was therefore more suitable for life.
- It is not known if life ever existed on Mars.
- Mars is viewable from Earth with the naked eyes, as well as its reddish colouring.
- Because of the iron oxide found on Mars' surface, this makes it the Red Planet.
- It is one of the brightest objects in the sky and has an apparent magnitude of -2.94. This is comparable to Jupiter's and only surpassed by Venus, Venus, and the Sun.

Topic 46. BEIJING TO LAUNCH 3 ASTRONAUTS TO ITS SPACE STATION

Important for subject: Science and Technology



China will send a three-person crew to its under construction space station

Learn more about the launch:

- To carry out the spaceflight mission, the spaceship will transport three astronautse Fei Junlong, Deng Qingming and Zhang Lu.
- Fei Junlong will command the mission.

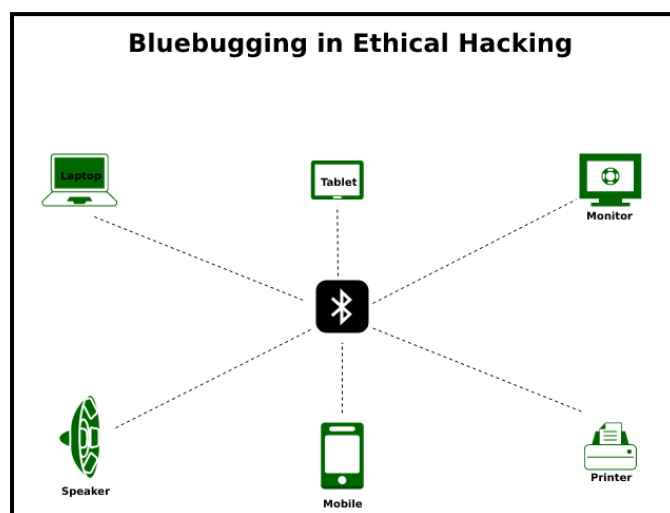
- The crew will remain in orbit for approximately six months. During this period, the construction work on the low-orbit space station should be complete.
- China will launch the third manned mission in order to link up to its space station.

What's the Tiangong Space Station?

- The Tiangong spacestation is a Chinese station that was built in low earth orbit, between 340-450 km above the Earth.
- It is part China Manned Space Program's first long-term orbital station.
- The Tiangong Station's three modules are
- Core module is the Tianhe, which means "Harmony of the Heavens".
- Wentian is "Quest for the Heavens". is alaboratory cabin module.
- Mengtian is a laboratory module that means "Dreaming of the Heavens".
- China, with the Space Station fully operational, will be the third country to launch both astronauts and build a space station.
- It is one fifth the Mass of International Space Station

Topic 47. BLUEBUGGING

Important for subject: Science and Technology



Bluebugging allows you to hack into a device that has a detectable Bluetooth connection.

Prerequisite to hacking:

- Bluebugging attacks must take place within a 10-meter radius of your device. Hackers have the option to use booster antennas in order to increase their

attack range.

- Bluetooth must be set to discoverable mode. This is the default setting for most Bluetooth devices.

What is blue bugging?

- Hackers attempt to pair with victim's devices via Bluetooth. Once the connection is established, the hacker will install malware or a backdoor to bypass authentication.
- Malware is often designed to allow unauthorized access through exploiting vulnerabilities.
- Sometimes, an attacker may be able to compromise a device using a brute attack. involves repeatedly log into victim's account, by randomly guessing username/password combinations.
- Once the hacker has access to the device, he/she can do everything the owner can. This includes reading and making calls as well as changing contact details.
- Bluebugging is a technique that manipulates a target phone to compromise its security.
- It creates a backdoor attack and then returns control of the phone's owner.

What is bluebugging?

- The hacker can read, send, and access messages from the victim, as well as access their phonebook and initiate or eavesdrop phone calls.
- Once a phone is in control, it can be used to dial the hacker, who is then able to listen to conversations. This is why the "bugging" name is given.
- It pretends to be the headset, and thus "tricks" the phone into answering call commands. Hackers can not only receive calls from the target phone but can also send messages, view phonebooks and review calendars.
- Even the most secure smartphones, like iPhones, are vulnerable. Any app that has Bluetooth access can record conversations with Siri, and audio from the iOS keyboard. A hacker could gain unauthorised access to these apps and devices to control them.

How to protect yourself from bluebugging?

- The difference between bluebugging and bluesnarfing is
- Bluejacking uses Bluetooth for pairing with your device to "prank".
- Bluejacking hackers send irritating images or messages to promote products.
- Bluesnarfing uses Bluetooth for hacking into your device and downloading sensitive data such as images, phonebook information and messages.

Topic 48. QR CODE FOR DRUGS

Important for subject: Science & technology

The Government of India recently introduced Quick Response (QR) codes in order to verify the authenticity and traceability of 300 popular drug brands.

- The Centre mandated that all 300 top brands in countries have QR/barcodes by August 2023. This was to eliminate counterfeit and fake products.
- Representatives from the pharma industry agreed that they are still looking at logistics for its rollout. They spoke on behalf of drugmakers of all stripes.
- Information about the notification
- To implement these changes, the Union Ministry of Health made modifications to the Drugs Rules 1945,.
- The National Pharmaceutical Pricing Authority identified the 300 drugs.
- The plan will be implemented in phases starting May 2023.
- The QR code will be displayed by top brands that have at least 35% market share for life-saving drugs in the initial phase.
- This is to prevent the sale of false drugs.
- These top-selling brands were shortlisted based upon their annual moving turnover (MAT) value.
- The draft notification from the ministry states that the manufacturers of formulation products will print or attach a barcode or QR code to its primary packaging label. This is for information or data that can be used with software applications to facilitate authentication.
- The data stored will include the unique product identification code, correct and generic names of the drugs, brand names, address and name of the manufacturer, batch numbers, expiry dates, and the manufacturing license number.
- The Centre stated earlier this year that active pharmaceutical ingredients (APIs), or

bulk drugs, that are manufactured in India, should have a QR code on their label at every level. This is packaging that contains data or information that can be readable with software to facilitate tracking.

- The new rule will take effect on January 1, 2023.

About Barcode:

- Barcode can be described as a machine-readable representation or information. It can be read by barcode scanners and computer programs that extract the relevant information from images.
- Computers can then use the encoded information to perform tasks such as reading cards into databases or performing mathematical calculations based upon the encoded data stored on cards.
- Barcodes can be used to store information such as price, product type and product identification numbers.

About QR code

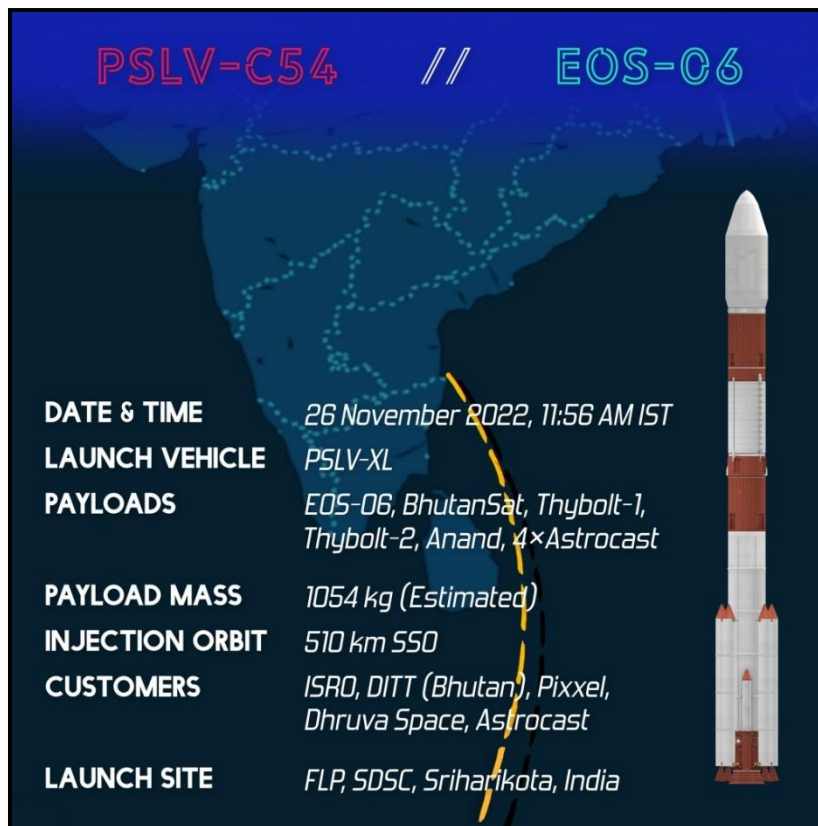
- QR codes are two-dimensional versions of barcode that were created in 1994 by Denso Wave, a Japanese automotive company.
- An QR code (quick reply code) is used for easy access to online information via the digital camera on a tablet or smartphone.
- A QR code functions in the same way as barcodes.
- Each QR code is composed of black squares and dots that represent different information.
- The unique barcode pattern is translated into human-readable data when it's scanned.

The difference between QR Code and Barcode

- The main difference between QR code and Barcode is that QR codes can store data in both one and two dimensions.
- Barcodes store less data than QR Codes, but they can store more.
- Barcode stores data horizontally, while QR Code stores it both vertically and horizontally.

Topic 49. ISRO LAUNCHES PSLV C-54/EOS-06 MISSION

Important for subject: Science and Technology



Indian Space Research Organization launched the PLV-C54/EOS06 Mission with Oceans-3, eight nanosatellites and a crew from Sriharikota's spaceport.

- The C54/EOS06 Mission consists of EOS06 (Oceans-3), plus eight nanosatellites that are BhutanSat two numbers from Pixxel and Thybolt four numbers from Spaceflight USA.

Bhutan Sat

- ISRO Nano Satellite-2 for Bhutan (INS-2B spacecraft) is configured with an INS-2 Bus.
- INS-2B will be carrying two payloads, NanoMx (APRS-Digipeater) and NanoMx. Space Applications Centre (SAC) has developed NanoMx, a multispectral optical image payload.

Anand

- Anand Nano satellite is a technology demonstrator that demonstrates the capabilities

and commercial uses of a miniaturized earth-observation camera to observe earth using a microsatellite at low Earth orbit.

- This satellite is three-axis stabilized and includes a satbus. It can accommodate all subsystems such as telemetry, telecommand, electrical power system, attitude determination and control system (ADCS), onboard computers, etc.

Astrocast

- Astrocast is a 3U spacecraft that serves as a technology demonstrator satellite to the Internet of Things (IoT). There are four of them. This mission has 4 Astrocast Satellites.
- These spacecraft can be stored in an ISISpaceQuadPack.
- The satellite is protected from contamination by the dispenser.

Thybolt

- Thybolt, a spacecraft bus measuring 0.5U in length, includes a communication payload that allows for rapid technology demonstrations and constellation development.
- It also provides Store-and-Forward functionality to authorized users within the amateur frequency band. Dhruva Satellite Orbital Deployer shall be used to deploy the satellites for specific missions that have a minimum life of one year.

About the EOS-06 Satellite

- The EOS-6 satellite is a third generation earth observation satellite from the Oceansat series of satellites.
- This is to provide continuity service for Oceansat-2 with enhanced payload specifications and application areas.
- The payloads include Ocean Colour Monitor (OCM-3), Sea Surface Temperature Monitor, Ku-Band Scatterometer and Sea Surface Temperature Monitor (SCAT-3), as well as the 'ARGOS Mission.
- ARGOS, the global satellite-based location and data collection system for the environment, is dedicated to studying and conserving the environment.

What is EOS?

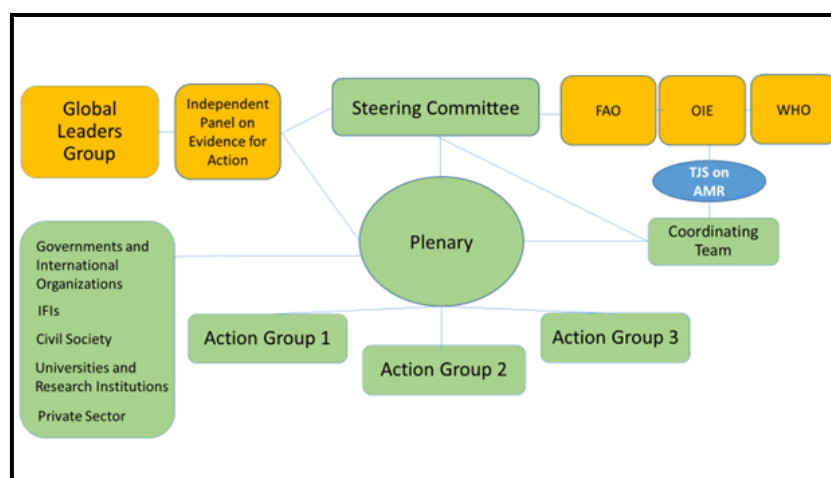
- An EOS (or Earth remote sensing Satellite) is a satellite that's used for Earth observation (EO).
- It includes spy satellites as well as similar ones that are intended for non-military purposes such environmental monitoring, meteorology and cartography.
- The most popular type is Earth-imaging Satellites, which take satellite images in a manner similar to aerial photos.
- Remote sensing may be performed by some EOS without the formation of pictures, as in GNSS radio occultation.

Other nomenclature

- ISRO had changed its naming system two years ago for its satellites for earth observation. Previously, had been named thematically. This reflected their intended purpose.
- Cartosat was a series of satellites that provided data for mapping and topography, while Oceansat was for observation overseas.
- Some INSAT-series and Resourcesat series, GISAT, GISAT, Scatsat and a few other Earth observation satellites were named differently to reflect the jobs they were given or the instruments they used.
- All of these satellites will now be part of the EOS series.

Topic 50. ANTIMICROBIAL RESISTANCE: MULTI-STAKEHOLDER PLATFORM LAUNCHED TO DRIVE COLLECTIVE ACTION, COLLABORATION

Important for subject: Science and Technology



To mark the start of the World Antimicrobial Awareness Week, a Multi-Stakeholder Partnership Platform (MSPP), was created November 18, 2022.

Information about the Platform

- Launched jointly by the Food and Agriculture Organization of the United Nations (FAO), the UN Environment Programme (UN Environment Programme), the World Health Organization, the World Health Organization, and the World Organisation for Animal Health through a webinar.
- A part of the AMR Global Governance Structures is the multi-stakeholder partnership forum.
- This network also includes the Global Leaders Group as well as the Independent Panel on Evidence for Action Against AMR.
- The Interagency Coordination Group on AMR (IACG), recommended it in its 2019 report to UN Secretary General.

The platform will:

- Encourage multidisciplinary action at all levels, including regional and national ones through action groups and the formation of action plans. Building global momentum and high level advocacy to fight AMR. Creating a global commitment to using antimicrobials responsibly and prudently to maintain their effectiveness.

Severity AMR

- In 2019, almost five million people died from the 'silent Pandemic', with 1*27,000,000 deaths due to bacterial AMR.
- AMR is when bacteria and viruses, and parasites become unresponsive to medicine.
- This makes it more difficult to treat infections and increases the chance of severe illness, death and disease spread.
- AMR can lead to death, morbidity and high costs of treatment, as well as increased hospital stays, and loss in animal productivity.
- It can also pose a threat to food security.
- The main drivers of AMR are misuse and overuse antibiotics in the animal food production, as well as wastes from homes, factories, hospitals, and farms.

Topic 51. PREVENTION OF CRUELTY OF ANIMAL ACT, 1960***Important for subject: Polity***

The Centre proposes to amend the Prevention of Cruelty to Animal Act-1960. It includes provision for three years imprisonment for "gruesome cruelty", and five years for the killing of an animal.

What is Prevention Of Cruelty to Animal Act, 1960?

- This act prohibits anyone from inflicting or causing pain to any animal, or if the owner permits it, permitting them to suffer.
- This act provides punishment for inflicting unnecessary cruelty and suffering on animals.
- Section 2 in the act defines animals and types of animals such as domestic or captive animals.
- Section 4 of Act provides for the Animal Welfare Board of India, a statutory advisory board for animal welfare.
- The act mentions cruelty and exceptions as well as the killing of suffering animals in case it has been subject to further suffering.
- This act also contains guidelines for experimentation on animals for scientific purposes.

A animal can't be displayed or trained by anyone if:

- This person is not registered as per this chapter. An animal such as this has been banned from performing any function by the Central Government via a notification in The Official Gazette.
- This Act allows for a limitation period of three months during which no prosecution will be filed for any offenses under this Act.

What amendments are in the draft?

- The Ministry of Fisheries, Animal Husbandry and Dairy has prepared the draft Prevention of Cruelty to Animal Act (Amendment) Bill 2022.
- The draft contains 'bestiality' as a crime in the new category 'gruesome cruel'. It defines gruesome cruelty as "an act which causes extreme pain and suffering to

animals that may cause lifelong disability or death".

- Gruesome cruelty will be punished with a minimum penalty of Rs 50,000. This may be increased to Rs 75,000 by the judicial magistrate or in consultation with the jurisdictional vets. Or with imprisonment for a year, which can be extended to three years.
- Drafts propose a maximum five-year sentence and a \$500 fine for killing an animal. A new section, Section 11(B), has been added to address this issue.

The draft also proposes the insertion of a new Section 3A, that provides five freedoms' to animals.

It shall become the obligation of anyone who has taken care of an animal to ensure that it:

1. Freedom from hunger, thirst, and malnutrition;
 2. No discomfort from the environment;
 3. Freedom from injury, pain, and other diseases
 4. The freedom to exhibit normal behavior for the species;
 5. Freedom from fear or distress.
 6. Community Animals: The local government shall be responsible to their care.
- The Draft proposals defined the community animal as "any animal that is born in a community and has no ownership, except wild animals as per the Wildlife Protection Act of 1972.

Topic 52. CHIEF ELECTION COMMISSIONERS MUST BE APOLITICAL, STRONG AND BEYOND INFLUENCE

Important for subject: Polity

A series of petitions are being heard by the Constitution Bench of Supreme Court regarding functional independence for Election Commissioners.

What's the problem?

- The Constitution Bench of Supreme Court heard a series of petitions requesting functional independence for Election Commissioners.
- The petitioners challenged the constitutionality in the current appointment process. They claimed that appointments were being made according to the whims of the

executive.

- Petitioners pleaded to create an independent collegium/selection committee for future CEC and EC appointments.
- The court examines specifically the question of setting up an independent, neutral mechanism, outside of the control of government, to appoint Election Commissioners.
- Learn more about the Election Commission of India, (ECI):
- The independent constitutional authority responsible for managing State and Union elections in India.
- The body administers elections in India to the Lok Sabha and Rajya Sabha and State Legislative Assemblies. It also oversees the offices of President and Vice President.

What are the most important Constitutional Provisions relating to ECI?

1. Part VIII (Article 324-329) of India's Constitution deals with Election Commission of India.
2. Article 324 Superintendence, direction, and control of elections to be vested into an Election Commission.
3. Article 325 No person is ineligible to be included or claim to be included on a special electoral roll based on religion, race or caste.
4. Article 326 Elections to the House of the People as well as to the Legislative Assemblies of States shall be made on the basis of adult voting.
5. Article 327: The power of the Parliament to make regulations regarding elections to Legislative bodies
6. Article 328: Power of Legislature to provide for elections to such Legislatures.
7. Article 329 No jurisdiction to interfere with electoral matters by the courts.

What structure is the Commission?

- In the beginning, the commission had one election commissioner. But after the
- Election Commissioner Amendment Act 1989 has been made a multi member entity
- The Election Commission will consist of the Chief Election Commission (CEC), and as many other election commissioners as the President may choose.
- It currently consists of two Election Commissioners and the CEC.
- The state election commission is assisted by the Chief Electoral Office who is an IAS

rank Officer.

How are Commissioners appointed and tenured?

- The constitution does not prescribe a procedure for appointing Chief Election Commissioner and Election Commissions.
- The Transaction of Business rules provide that the President shall appoint CEC and EC based upon the recommendations of the Prime Minister.
- CECs and ECs can be appoint by the executive powers of the President.
- Article 324(5) however, gives the Parliament the power to set the terms and conditions of service for ECs. This article is the basis of all laws that have been made by Parliament to date.
- They are entitled to a fixed tenure for six years or until they turn 65.
- They have the same status as Judges of Supreme Court of India and enjoy the same salary and perks.

What was the Supreme Court's Observation?

- The Supreme Court ruled that the Central government does not give any "lip-service" whatsoever to the independence of Election Commissioners.
- This can be seen in the fact that the tenures for Chief Election Commissioners have "slid" down from more than eight years back in the 1950s to only a few hundred days following 2004.
- According to the court, successive governments, especially after 2004, had chosen people it knew would never get close the six-year term prescribed by the Election Commission Act, 1991.
- Section 4 in the 1991 Act states that the term for a CEC or Election Commissioner is six years. The earlier is the .
- According to the court, Article 324 protections, such as removal by impeachment under the Constitution to CECs, would only be of any value if the person had served a full term.
- The court referred to former CEC TN Seshan and said that people became aware of the Commission when he assumed charge. He also took a slew if decisions to make the panel independent.

- The bench noted that the inclusion of the Chief Justice of India (CJI), in the selection process for CEC/ECs would be a great way to ensure transparency.
- The CJI's presence would send a message to you that you can't play games in selection, and the best character would be chosen.

Topic 53. STATE FINANCE COMMISSION

Important for subject: Polity

The National Institute of Rural Development and Panchayati Raj organized a two-day national conclave of State Finance Commissions.

State Finance Commission

- The 73rd, and 74th Constitutional Amendments to the were created to rationalize and systematize India's fiscal relations at sub- and State levels.
- It is established under Article 243 of Indian Constitution by the Governor of a State - every five year.
- Purpose this is to determine the allocation of resources between the Panchayati Raj Institutions and the state government.
- Article 243-Y also brought cities councils or municipalities under jurisdiction of the State Finance Commission.
- Article 243Y states that the Finance Commission, established under article 243 I, shall review and evaluate the financial situation of the
- Make recommendations to the Governor for municipalities.
- Role- A State Finance Commission performs functions similar to those of the Central Finance Commission.
- It allocating resources from a state to its Panchayatiraj institutions at all levels of tax, duties and levies that are to be collected by both the state and local bodies.
- A State Finance Commission r examines the financial situation of panchayats within a state and makes recommendations to the Governor about the principles that should govern tax proceeds distribution - taxes, duties and toll fees collected by the state between it and its citizens.
- Institutions of Panchayati Raj at all three levels: village, block and district.

It also recommends:

- Panchayats' taxes, levies, and fees. Panchayati Raj Institutions receive grants-in-aid from the consolidated state fund.
- There are ways to improve the financial situation of Panchayati Raj Institutions. The overall improvement of the finances of Panchayat.
- Recommendations of the State Finance Commission - Action taken
- The Indian Constitution Article 243-I states that the governor of a state is responsible for laying the recommendations of the State Finance Commission to the table.
- It also contains a memorandum describing the government's actions in response to the Commission report.

15th Finance Commission

- Establishment under Article 228 of The Constitution
- Its core duty is to evaluate the State of Finances of the Union and State
- The governments recommend that taxes be shared between them and set out the principles for distributing these taxes among States.
- In 1951, the first Finance Commission was established. There have been fifteen of them so far.
- The Fifteenth Financing Commission was established on 27/11/2017 under N.K.Singh
- The Terms and Reference of current Commission include distinctive features such as recommending monitorable performance criteria to important national flagship programs. They also examine the possibility of setting up permanent, non-lapsable funding for India's defense needs.

Topic 54. ADANI WINS DHARAVI SLUM REDEVELOPMENT BID

Important for subject: Polity

Adani Group was the highest-bidder for the project to redevelop Dharavi, a slum in Mumbai.

- Dharavi is a well-known slum and is located at the heart of India's financial capital Mumbai.
- The Dharavi Slum was created in 1884.
- It was originally inhabited by fisher folk back when there were still creeks, swamps, and rivers.
- One city within another city is a continuous stretch of narrow, dirty lanes, open

drains, and cramped dwellings.

- It was appealing to migrant workers in South Mumbai and others, when the swamp started to fill in from natural and artificial causes.

What is Dharavi Redevelopment Project?

- This state had envisioned that this sprawl would be transformed into high-rises with better urban infrastructure.
- It involved the relocation of 68,000 people including slum dwellers as well as those with commercial establishments.
- The state provided 300-square-foot houses to residents for free.
- The project was originally proposed in 2004 but did not get off the ground because of various reasons.

When the first proposal for redevelopment was made:

- 1999 was the government's first proposal to redevelop Dharavi.
- In 2003-04, the government of Maharashtra decided to redevelop Dharavi into an integrated planned city.
- Action Plan for Redevelopment was approved by issuing an official government resolution.
- It was decided to develop Dharavi using land to cross subsidize development cost by a sale component based on the Slum Rehabilitation Scheme.
- The government also decided to notify the whole Dharavi as an area undeveloped and to appoint Special Planning Authority to assist in its development.
- In 2011, all tenders were cancelled and was created a master plan.

Learn more about the Slum Rehabilitation Authority:

- The Government of Maharashtra has launched a comprehensive scheme to slum rehabilitation. It introduced an unique concept of using land resources and allowed incentive floor space index (FSI in the form of tenements to be sold on the open market, to cross-subsidize the slum rehabilitation. Tenements will be free for the slum-dwellers.

What is the jurisdiction of Slum Rehabilitation Authority?

- According to the 3A(1) of the Chapter I-A of Maharashtra Slum Areas (Improvement, Clearance and Rehabilitation) Act, 1971 State Government of Maharashtra and necessary statutory amends has established Slum Rehabilitation Authority, Mumbai, as Planning Authority for all Slum Areas under the jurisdiction of Municipal Corporation of Greater Mumbai.
- The Thane Municipal Corporation was then added to the SRA's jurisdiction.

What is the government's different approach to managing slums in India?

- National Slum Development Programme, (NSDP),: Initiated 1996, NSDP provided loans and subsidies for states to finance slum rehabilitation projects based on their urban slum population.
- Valmiki Ambedkar Malina Basti Yazana (VAMBAY): This was introduced in 2001. It focuses on sheltering the urban poor. 20% is allocated for community sanitation facilities under Nirmal Bharat Abhiyan.
- Basic Services for the Urban Poor (BSUP): BSUP is an important part of Jawaharlal Nehru National Urban Renewal Mission. BSUP was designed to provide basic services for urban poor in 63 cities in India.
- Integrated Housing & Slum Development Programme : The launch of the Integrated Housing & Slum Development Programme was by GoI by merging NSDP with VAMBAY. The scheme's objective is to provide basic infrastructure and shelter for slum dwellers living in urban areas.
- Housing the Urban Poor Interest Subsidy Scheme (ISHUP): This Scheme provides interest subsidy for economically poor and low-income groups in order to help them buy or build houses.
- **Rajiv Adwas Yojana (RAY):** This scheme was launched in 2013,. It aimed to bring existing slums into the formal system or . They will be able to access the same basic amenities as the rest. Redressing the shortcomings of the formal systems that lead to the creation of slums, and addressing the housing shortages that keep shelter from the urban poor.
- **Pradhan Mantri Yojana- Housing for All (Urban),:** This scheme was launched in 2015 and provides central assistance to States and UTs for providing housing to all

beneficiaries by 2022. It includes the following:

- In-situ rehabilitation of slums with participation by private developers using and as an resource.
- This approach aims to unlock the potential land beneath slums in order to provide housing to eligible slum dwellers and bring them into formal urban settlement.
- Promotion of Affordable Housing for weaker section through credit linked subsidy Affordable Housing in Partnership with Public & Private Sectors Subsidy for beneficiary led individual house construction/enhancement Slum areas (Improvement and Clearance) Act, in the year 1956: The act aimed at mechanical improvement or complete eradication of slums.
- It allows the competent authority to declare any area of slum according to the definition, and look into possible improvements or elimination.

Topic 55. SC JUNKS PIL SEEKING DOUBLING OF JUDGES' NUMBERS IN HCS, DISTRICT COURTS

Important for subject: Polity

The Supreme Court rejected a PIL for the doubling of all 25 high courts and subordinate court in India. It stated that more judges were not the solution to all problems.

What was the Supreme Court's verdict?

- A Bench headed by Chief Justice of India DY Chaud observed that populist solutions and simplistic solutions were unlikely to resolve such issues.
- Upadhyay was allowed to withdraw his PIL and was given the liberty to file another one after proper research on statistics about recruitment, vacancies, etc. in the lower judiciary.

Who is able to increase the strength and number of judges at various high courts?

- The Parliament is competent authority to raise the number of judges, if necessary.
- Through The Supreme Court (Number Of Judges) Amendment Bill 2019, the Parliament increased the Supreme Court Of India's strength from 31 to 34.
- In 2009, the Supreme Court (Number of Judges Act) Act 1956 was amended to

increase the strength of the judge from 25 to 31 (including CJI).

- The Constitution of India Article 124(1) states that the law passed by the Parliament determines the strength of Supreme Court.

Topic 56. JALLIKATTU CASE

Important for subject: Polity

On Tuesday, the Supreme Court asked activists about what they thought was wrong with Tamil Nadu's jallikattu. It protects animals from "unnecessary suffering" and seeks to preserve "culture and traditions" of people in the State.

What the court said about this issue:

- Justice K.M. led a Constitution Bench. Joseph pointed out that the law contains provisions prohibiting cruelty to bull-taming animals.
- The Prevention of Cruelty to Animals Act (Tamil Nadu Amendment), 2017 and the Prevention of Cruelty to Animals Act (Conduct of Jallikattu), Rules of 2017 also recognized the culture and traditions of people as a fundamental right.

Jallikattu -

- Jallikattu, a bull-taming event that is performed in Tamil Nadu during Pongal celebrations
- It is celebrated on Mattu Pongal, the 3rd Day of the 4-day-long harvest, Pongal.
- Jallikattu is a combination of the words 'calli' and 'attu'. This refers to a bundle that is tied to the bull's horns.
- Jallikattu can also be called eru thazhuvuthal, manju virattu.
- The Tamil word "Mattu" means bull, and Pongal's 3rd Day is dedicated to cattle.
- Because it allows bulls to pull their carts of goods, plough the field and mating with cows, they have precedence over other cows.
- Bulls are brought together at a common location, where the ritual takes place. Participants are expected to hug the bull's head and attempt to control it by stopping the bull.

What's the history of Jallikattu?

- Jallikattu is thought to have been practicing since at least 2500 years.

- The National Museum, New Delhi preserves a seal depicting the practice from Indus Valley civilization.
- The Archaeologists estimate that a cave painting depicting a man trying tame bulls is 2500 years old.
- It is possible to see references of people participating in Jallikattu at Silappatikaram, one of the 5 great epics in Tamil classical period, and 2 other ancient literary works such as Malaipadukadaam and Kalithogai.

Why Jallikattu is important in Tamil culture?

- Jallikattu can be considered a traditional way that the peasant population preserves their native bulls.
- Conservationists and peasants believe Jallikattu is an effective way to preserve male cattle that are otherwise used for meat, if not for ploughing.
- Kangayam , Pulikulam , Umbalachery and Bargur are some of the most popular native cow breeds that are used for Jallikattu. These breeds are highly respected locally.

Topic 57. CHINA INDIAN OCEAN MEET

Important for subject: International relations

The China International Development Cooperation Agency held recently a meeting at the China-Indian Ocean Region Forum, in which 19 countries took part India was not invited.

- CIDCA is an association with the Chinese Foreign Ministry.
- **Theme:** Shared development: Theory and practice from the perspective of the blue economy
- **Participating countries:** Indonesia, Pakistan and Myanmar, Sri Lanka. Bangladesh, Maldives. Nepal. Afghanistan. Iran. Oman. South Africa. Mozambique. Tanzania. Seychelles. Madagascar. Mauritius. Djibouti. Australia. Representatives of 3 international organisations were also present.
- India was reportedly Not Invited.

What has been proposed?

- China suggested establishing a cooperation mechanism for marine disaster prevention

and mitigation between China and other countries in the Indian Ocean region.

- China indicated its willingness and ability to provide financial, material and technical support to countries that are in need.

What's Indian Rim Association (IORA), and how can it help you?

- The Indian Ocean Rim Association is an intergovernmental organisation that aims to strengthen regional cooperation and sustainable growth within the Indian Ocean Rim region.
- It was established in 1997 on the initiative of South Africa and India.
- The IORA is made up 23 members, and ten dialogue partners.
- Australia, Bangladesh and Comoros are among the members.
- China, Egypt and Germany are the ten partners in the dialogue.

Topic 58. EGYPT PRESIDENT TO BE CHIEF GUEST AT REPUBLIC DAY CELEBRATIONS

Important for subject: International Relations

The Republic Day will be held in January 2023, with President Abdel Fattah Al Sisi as the chief guest.

- This will be the first occasion that the President of Egypt is the Chief Guest on our Republic Day.
- The last few chief guests are:
- The reason for the invitation:
- 2022 marks the 75th anniversary diplomatic relations between India & Egypt.
- With India's recognition of India's independence on 18th August 1947, Egypt established diplomatic relations with India. This was just three days after India gained independence.
- They became closer together in the 1950s, and in 1955 they signed a historic Friendship Treaty.
- Egypt was also invited to be a 'Guest country' during India's Presidency at G20 in 2022-23.

Where is Egypt?

- The Arab Republic of Egypt is a transcontinental nation that spans the northeast corner of Africa as well as the southwest corner of Asia through a land bridge created by the Sinai Peninsula.
- It borders the Mediterranean Sea to its north, Gaza Strip of Palestine, Israel to the northeast, Sudan to south, Red Sea to east, Sudan and Libya to the Gulf of Aqaba to northeast. This is where Egypt and Jordan meet.
- Cairo is the capital, and the largest city in Egypt. Alexandria is the second-largest city.
- It is the 30th largest country in the world.
- India Relationship:
- Economic Relationship:
- Since March 1978, the India-Egypt Bilateral Trade Agreement is in effect. It is based upon the Most Favoured Nations clause.
- The bilateral trade has grown rapidly in 2021-22 to 26 billion, a 75% increase over FY 2020-21.
- India's exports from Egypt in this period were US\$ 3.74 Billion, which is a 65% increase over the same period in FY 2020-21.
- The Egyptian exports to India grew 86%, reaching US\$ 3.52 Billion.
- India was Egypt's third largest export market, Egypt's 6th largest trading partner, and Egypt's 7th largest exporter during this time.
- Many grant in-aid projects are involved with India
- Pan Africa Telemedicine and Tele-education Project in Alexandria University
- Project for solar electrification in Agaween village
- Vocational Training Centre in Textile Technology, Shoubra, Cairo

Defence Relations:

- The first ever IAF/EAF Joint Tactical Air Exercise, Desert Warrior was held in Oct 2021.
- In January 2022, Jodhpur was the location for the first ever Special Forces Exercise " Clone 1 " zwischen India and Egypt.
- Egypt expressed interest in purchasing arms from India, including the Akash missile.

Topic 59. GANDHI BUST TO COME UP AT UN HEADQUARTER

Important for subject: International Relations

As a gift from India, a bust of Mahatma Gandhi will be unveiled at the United Nations headquarters. This will be the initial sculpture by the Mahatma.

It will be in the North Lawn. Who designed the current bust?

- The bust was designed by Padma Shree winner Ram Sutar, who also designed the "Statue of Unity" in Gujarat.

What other noteworthy works of art are there at the U.N. headquarters?

- Germany donated a section of Berlin's wall. Soviet sculpture 'Let us beat Swords into Ploughshares'. South Africa gifted Nelson Mandela a life-size bronze statue. The 'Guernica' tapestry is named after Pablo Picasso's Guernica painting.

What other gifts of India are on display?

- The 11th-century black-stone statue by 'Surya of the Sun God' was donated July 26, 1982.
- The statue dates from the late Pala period. It is currently on display in the Conference Building. This gift was made by Indira Gandhi, then Prime Minister, to the UN.
- Javier Perez de Cuellar, then Secretary General, had accepted the sculpture for the United Nations.

Topic 60. INDIA FIRST BUDDHIST VARSITY TO COME UP IN SOUTH TRIPURA

Important for subject: International Relations

Shakya Gasan (chief monk of South Korea's World Buddhist Pope Association) will lay the foundation stone of the International Buddhist University at Manu Bankul, Sabroom district of South Tripura.

Dhamma Dipa International Buddhist University, (DDIBU),

- The Dhamma Dipa International Buddhist University will be the first Buddhist university in India to provide Buddhist education along with courses from other disciplines of modern education.

- This university will establish a precedent in Indian-Buddhism by promoting and reviving Buddhist culture, which is the birthplace of Buddhism.
- It will be India's first Buddhist University.
- Dhammadipa is a word that describes a core principle as well as a guiding force. It seeks Dharma's international reach and measure, and the light it brings.
- DDIBU hopes to engage the modern world more effectively through the understanding and depth of Buddhist words.
- It is also eager to provide knowledge and skills to students and youth so they can lead happy, healthy and peaceful lives.
- A plan is also in place to create general, technical, and medical colleges on the campus.
- Students in 31 countries will have the opportunity to study and also conduct research on Buddhist literature.
- Concept - Nalanda is 95 km from Patna (the capital of Bihar) and 110 kilometers from Bodh Gaya (the site of the Buddha's enlightenment).
- Nalanda was declared a World Heritage Site in 2016. It is considered the oldest university in the world, having been established long before Bologna (Europe's oldest university) was founded in the 11th-12 century.
- However, contemporary sources describe the site as a mahavihara. This is a great monastery.
- Nalanda, therefore, functioned as a premier monastic-cum-scholastic establishment in ancient and early medieval India.
- You can still see the remains of monastic dwellings and temples as well as votive structures, and art in bronze, stone, and stucco from the 5th Century C.E. up to the 12th Century C.E.

Literary Sources

- In terms of literary sources, the majority of information about the history, function, and sometimes the layout of mahavihara is derived from accounts of Chinese Buddhist monks Xuanzang (also known under Hiuen Tsang), and Yijing (also known as I Tsing), primarily.
- Both traveled to India with their wives and stayed at the magnificent monastery

- complex in the 7th Century.
- Xuanzang's account ties both the Buddha (6th Century BCE), and the Mauryan king Asoka (268-232 BCE), with Nalanda.
 - A Chinese monk also credits Asoka for the construction of a stupa/temple to honour Sariputra (one of the Buddha's closest disciples).
 - Furthermore, the archaeological finds--the Nalanda material remains belong to the Gupta era/5th century C.E. onwards--does not support Xuanzang's pre-Gupta history.
 - The Gupta dynasty rulers (c. 300-600 C.E. They were well-known for their support of Brahmanical cults. However, some of them also supported Buddhism.
 - According to Buddhist sources, the Gupta King Vikramaditya sent his daughter Baladitya and his son Baladitya for study at Nalanda under the famous Buddhist scholar Vasubandhu.
 - Some texts mention King Narasimhagupta becoming a Buddhist monk after he gave up his life to meditation. Xuanzang also mentions the royal connection of the Guptas to Nalanda. He says that shortly after the death of Buddha, Shakraditya, a king built a monastery on the spot.
 - Scholar Heras identified Shakraditya as Kumaragupta I and Buddhagupta II, Tathagatagupta as Puragupta, and Baladitya as Narasimhagupta.
 - Nalanda continued to be patronized by the royals in post-Gupta days, during Harshavardana's reign (606-648 C.E.)., the King and Queen of Kannauj (in Uttar Pradesh); as well as the Palas, who ruled over modern Bihar and West Bengal from the 8th to the 12th centuries. Xuangzang visited Nalanda during Harshavardana's reign.

The Palas

- The Palas were Buddhists.
- Dharmapala (c.781-821 C.E. The second Pala king is known to have supported two monasteries: Somapura, better known as Paharpur now in Bangladesh, and Vikramshila in Bhagalpur in Bihar.
- Nalanda's inscription records that he gave a village to the monastery.
- Another inscription on the site mentions Devapala (c.821-861 C.E.). Dharmapala's son, Balaputra, was described as having helped Balaputra, the ruler of Suvarnavdipa,

Sumatra, to build a monastery at Nalanda, and then acquire five villages for its support.

- It is also well-known for gifts to the mahavihara that are not related to the Pala kings.
- Most people believe that Nalanda began to decline in the late-Pala period. Around 1200 C.E., BakhtiyarKhalji invaded Afghanistan. BakhtiyarKhalji was the Afghan military commander under the Turkish ruler QutbuddinAibek.
- The mahavihara is a university
- The majority of information about Nalanda's university functions, including its student strength, curriculum, and buildings, comes from Chinese and Tibetan texts. These texts also emphasize the purity of its monastic discipline.
- Nalanda attracted students primarily from China, Japan and Korea.
- Although there is no direct evidence to support this argument, some scholars believe that Nalanda's curriculum included literature, theology and logic in addition to grammar, medicine and philosophy.

Declined Nalanda

- Both the major theories explaining the fall of Nalanda are based on the possibility of destruction of the mahavihara or a sudden, cataclysmic event.
- BakhtiyarKhalji is the most popular explanation for the fall of Nalanda.
- This theory is based entirely on a Persian work by Minhaj Al-SirajJuzjani (1199-1260), called Tabaqat-iNasiri. It provides an extensive history of Islam during the reigns of the Delhi sultan Nasiruddin Shah (1246-66).
- Important to remember that Minhaj does not mention the word Nalanda in his account.
- This second theory places the decline in the context the animosity between Buddhists and Brahmins. This theory is reflected in the writings historians like D.N. Jha, B.N.S. Yadava, R.K. Mookerji and Sukumar Dutt.

Topic 61. RUSSIA NUCLEAR ICEBREAKER AND MILITARISATION OF THE ARCTIC

Important for subject: International relations



At a dock launch ceremony for two nuclear-powered, nuclear-powered icebreakers, which will provide year-round navigation in Western Arctic waters, President Vladimir Putin extolled Russia's Arctic power.

Information about the new nuclear-powered Icebreakers:

- Yakutia It measures 3m in length and can move up to 33.540 tonnes. It can break through the ice of up to three meters. It will be in service by 2024.
- Rossiya This is a super-powerful, nuclear 209-metre-long icebreaker. It can move 71.380 tonnes and would be complete by 2027. It will be capable of breaking through four-metre thick ice .
- Two more icebreakers from the same series, The Arktika and, are in service. Another icebreaker, Chukotka is in service. These are parts of Russia's large scale systematic

work to retool and replenish the domestic fleet of icebreakers, to further strengthen Russia's position as an Arctic power.

India's position in relation to the Arctic:

- India's relationship with the Arctic dates back as far as 1920, when the Svalbard Treaty was signed in Paris.
- India is one of very few countries that has established a permanent station at the Arctic for scientific research.
- In the first week in August 2007, it launched its first Arctic expedition.
- In the years that followed, India sent scientific teams each summer and winter to conduct Arctic research.
- Indian studies focus mainly on the areas of hydrochemistry, glaciology, microbiology and atmospheric sciences.
- The Himadri Research Station is located in Ny Alesund in Svalbard in Norway. It was established in July 2008.
- IndArc was deployed in 2014 by India. It is a multisensory observatory located in Kongsfjorden.
- Gruebadet, India's northernmost atmospheric lab, was established in 2016.
- It was created to study clouds and precipitation, as well as long-range pollutants and other atmospheric parameters.
- Since 2013, India has been an observer to the Arctic Council. In 2019, , India was re-accredited as an observer to the Arctic Council. This membership will continue for five more years.

What's the Arctic Council?

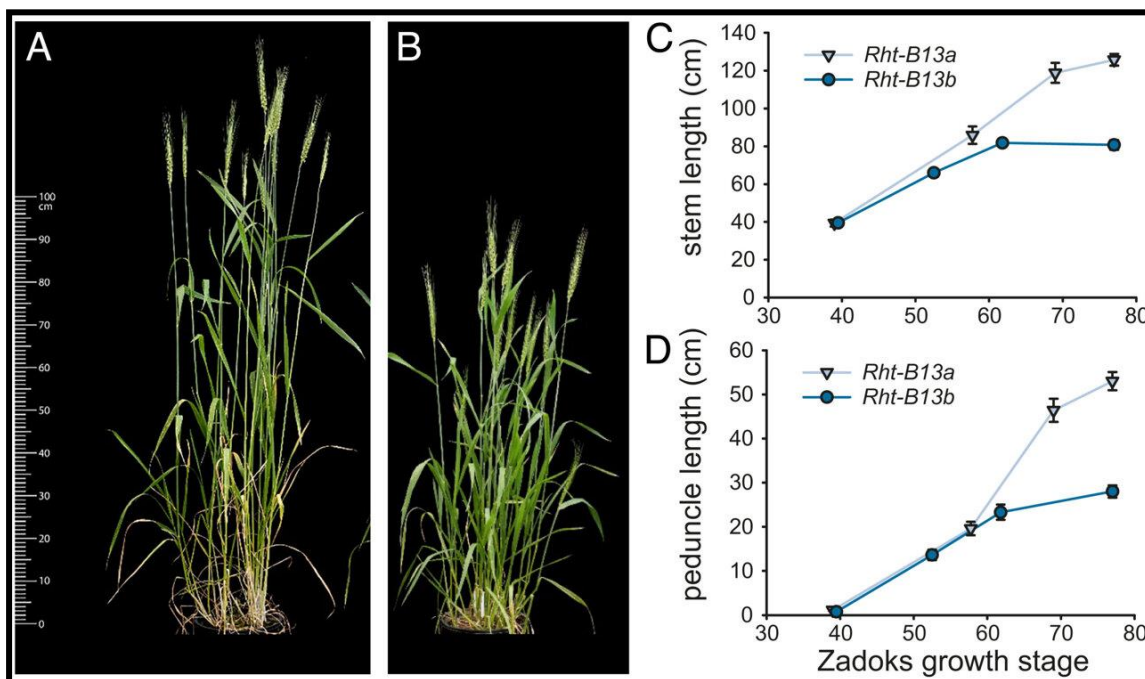
- The Arctic Council is the premier intergovernmental forum promoting cooperation on common ArcticEstablished through the eight Arctic Statese countries whose territories are in the Arctic region by the Ottawa Declaration of 1995.
- Member Countries of the Council – Canada Kingdom of Denmark, Finland Iceland, Norway and the Russian Federation, Sweden, and the United States.

What's India's Arctic Policy?

- March 2022 was the launch of an Arctic policy by the Indian government.
- It envisions India's engagement with the Arctic region in climate research, environmental monitoring and energy security.
- The National Centre for Polar and Ocean Research of the Ministry of Earth Sciences is the nodal agent for implementation of the Arctic Policy.

Topic 62. SCIENTISTS DISCOVER NEW DROUGHT-RESILIENT WHEAT GENE, SUITABLE FOR DRIER SOIL CONDITIONS

Important for subject: Agriculture



Information about the new wheat variety-



- In collaboration with an international research team, scientists at the John Innes Centre discovered Rht13, a new "reduced height" or semi-dwarf gene. It is drought-resistant and can be grown on drier soils.
- The Lower height gene allows seeds to be buried deeper in soil. This gives access to moisture and reduces the risk of seedling emergence.
- The 1960s has seen a reduction in height genes. Green Revolution has increased global wheat yields. This is because the short-stemmed wheat they produce invests more into the grains than the stems. It also improves standing ability.
- These genes that are bred into wheat have the unfortunate side effect of not working

under drought conditions.

- These varieties can be damaged if they are not planted deep enough to get moisture in areas with limited water supply.
- Because the gene acts in higher levels of the wheat stem, the recently discovered gene solves the problem of seedling emergence.
- The dwarfing mechanism is only effective once the seedling is fully grown. This provides farmers with a significant advantage when they plant deeper in dry conditions.

Topic 63. PERENNIAL RICE

Important for subject: Agriculture

PERENNIAL	ANNUAL
<p>The same plant returns year after year</p> <p>Often "woody" to remain hardy over winter, unless in tropical climate</p> 	<p>Produces seeds each year before dying, must be replanted every year</p> <p>Requires more tilling, leading to more soil degradation</p> 

China's farmers are now able to grow a perennial rice variety that does not require planting every year.

What is the perennial rice variety?

- Perennial Rice are varieties long-lived, resilient rices that can reseed year after season. They are being developed at several institutions by plant geneticists.
- Perennial rice-- can spread horizontally below or just above soil surface. However,

they also reproduce sexually through the production of flowers, pollen, and seeds. It is the seeds, just like any other grain crop that can be harvested and consumed by humans.

- The Yunnan University's Researchers developed the Researchers and the first version was released to Chinese growers in 2018.

Name- perennial rice PR23

- By crossing regular annual rice *Oryza Sativa* with wild perennial varieties from Africa,
- Feature
- Higher production-6.8 tonnes per hectare, which is comparable to regular irrigated Rice
- Perennial Unlike regular rice, which is planted every year, PR23 can produce eight consecutive harvests over four years. This is because plants with stronger roots are more likely to grow vigorously after each harvest.
- Less expensive- It is cheaper to grow it because it uses less labour, seeds, and chemical inputs.
- Other benefits- as per the journal Nature Sustainability-growing perennial rice over a period of four years resulted;
- There are environmental benefits like soils accumulating around a ton (per hectare) of organic carbon per year and increasing water availability for plants.
- Drought resistance: Annual Rice has a shallow root system, making it very drought-resistant.
- Resist weed invasion: As the fallow period has decreased, weed pressure has increased in upland systems of rice.
- Plant nutrition: Although shallow-rooted species like rice get most of their nutrients from topsoil (such as rice), deep-rooted perennials can also obtain significant amounts of their phosphorus through the subsoil.

Rice;

- *Oryza Sativa* is thought to be associated with humid, wet climates, but it is not tropical.

- Historians believe the indica of rice was first grown in the Eastern Himalayas foothills (i.e. north-eastern India, extending through Burma and Thailand, Laos, Vietnam, Vietnam, and Southern China. The japonica was domesticated from wild rice from southern China that was later introduced to India. Perennial wild rice is still grown in Assam, Nepal and Nepal.
- Rice is grown in India under many conditions, including climate and altitude. India's rice cultivation ranges from 8 to 35°N latitude to as high as 3000m above sea level.
- A hot and humid climate is essential for rice crops.
- It's best to use it in areas with high humidity, long sunshine hours and an assured supply water.
- The crop requires an average temperature of 21-37°C throughout its life span.
- The maximum temperature the crop can tolerate is between 40 and 42 degrees C.

India rice is mostly grown in two types soils: (i) uplands, and (ii).

- The following methods are used to grow rice.
- Semi-dry or dry upland cultivation - Broadcasting, Sowing behind the plough or drilling
- Wet or lowland cultivation-Transplanting in puddled fields. Broadcasting sprouted seedlings in puddled areas
- India is the second-largest rice producer in the world, after China. It also has the largest exporter, with 40% of global trade.
- India is the largest exporter of Basmati Rice to the international market.
- Jammu and Kashmir (Himachal Pradesh), Punjab, Haryana and Haryana have the highest Basmati rice production in India.
- India's largest rice producer is primarily located in states such as Uttar Pradesh, West Bengal and Andhra Pradesh.
- These largest rice-producing states account for 72% of India's total rice producing area and produce more than 75% of all rice in India.
- West Bengal is home to the largest rice production in India, followed by UP and Punjab. TamilNadu, Andhra Pradesh, and TamilNadu are close behind.

Topic 64. MILLETS

Important for subject: Agriculture



The Ministries of Agriculture and External Affairs organized a pre-launch celebration for the International Year of Millets 2023.

- It cited "Covid, Conflict, and Climate" as the main threats to the world's food security and included the cultivation and popularity of millets within the context of "de-risking global economic."

Millets

- It is used to make small-grained cereals.
- Evidence exists for the consumption of millets among the Indus Valley people (3,000 BC). and several varieties were first grown in India.
- Millet is a staple food for about 60 million people around the world. It is mainly grown in developing and low-income countries in Asia and Africa. China, Japan are home to native varieties of the crop.
- It is the traditional food of more than half a million people in Asia and Africa.

- They are more expensive than wheat and rice, and they can only be grown in areas that have abundant rain.
- Example- sorghum (jowar), pearl millet (bajra), foxtail millet (kangni/ Italian millet), little millet (kutki), kodo millet, finger millet (ragi/ mandua), proso millet (cheena/ common millet), barnyard millet (sawa/ sanwa/ jhangora), and brown top millet (korale).
- sorghum (jowar) is the largest millet crop worldwide.
- The largest producers of jowar are the United States, China and Australia.
- Bajra is another important millet crop.
- Major producers are India and certain African countries.
- Production in India of millets
- Millets are a major crop in India.
- Three millet crops---- bajra (3.67%), jowar (2.13%) and ragi (2.13%) in 2018-19 (0.48%). -- This account accounted for approximately 7 percent of the gross cropped areas in the country.
- Millets are "powerhouses for nutrition"

The 2018 Agriculture Ministry declared millets "Nutri Cereals".

- Jowar, bajra and ragi/mandua are the minor millets -- sawa/sanwa/jhangora and kangani/kakun -- and the pseudo millets, amaranth and buckwheat, which are considered "Nutri Cereals", for purposes of production, consumption and trade.
- Millets are high in protein (7-12%), 2-5% fat (65-75% carbs) and 15-20% dietary fiber (between 5-8% and 7-9%).
- Smaller millets are healthier than fine cereals because they contain more protein, fat, and fibre.
- Main millets states
- Jowar can be found mainly in Maharashtra and Karnataka.
- Maharashtra accounted for the greatest area (1.94 million ha) and highest production (1.76million tonnes) of jowar in 2020-21.
- Bajrais mostly grown in Rajasthan, Uttar Pradesh and Haryana, Gujarat.
- Rajasthan was responsible for the largest area (4.32mn ha) as well as production (4.53mil) of bajra in 2020-21.

Consumption Patterns:

- Less than 10% of urban and rural households reported consumption of millets in the most recent NSSO household consumption survey.
- Rural households consumed more than 95% rice and 59% wheat. Only 8.5%, 6.6% and 5.3% respectively reported consumption of jowar and bajra.
- Urban areas had a lower per capita cereal consumption (9.322 kg) than rural areas.
- It was reported that millets were consumed mainly in Gujarat (jowar, bajra), Karnataka [jowar ragi], Maharashtra (jowar ragi), Rajasthan (bajra), Uttarakhand (ragi)
- Millets under PDS
- Eligible Households are entitled to rice, wheat and coarse grain at Rs 3 and Rs 2 respectively, under the National Food Security Act.
- Although the Act doesn't mention millets, coarse grain are included under Section 2(5) (NFSA) as "food grains".
- The amount of coarse grains purchased for the Central Pool and distributed under the NFSA was however negligible.
- On November 1, 2022, only 2.64 million metric tonnes (LMTs) of coarse grain were available in the Central Pool. However, the Central Pool had 265.97 LMT of rice, wheat and unmilled Paddy respectively at 210.46 and 263.70 LMT.
- The Centre has accepted the recommendation by a committee it established that millets should be included in the PDS to improve nutrition support.
- The government has established a target for procuring 13.72 LMT of coarse grains in the Kharif Marketing Season (2022-23).
- MSP to millets
- The government has set a minimum support price (MSP), for jowar, bajra and ragi.
- Year Of Millets
- The United Nations General Assembly (UNGA), on March 3, 2021, adopted a resolution declaring 2023 the International Year of Millets.
- The proposal was drafted by India and supported by 72 countries.
- Several events and activities-conferences and field activities, and the issuing of stamps and coins, are expected as part of the celebrations aimed at spreading awareness about millets, inspiring stakeholders to improve production and quality,

and attracting investments.

Topic 65. MILLETS IN THE MAINSTREAM | HOW ODISHA'S KUTIA KONDH TRIBE REDISCOVERED A PALATE FOR THE 'POOR MAN'S FOOD'

Important for subject: Agriculture

The Centre seeks to reproduce the "Model for the survival and promotion millet crop" of Kutia Kondh tribes of Kandhamal in Odisha.

Why has millet lost its presence?

- The replacement millet includes Paddy and other grains in its public distribution system replaced.
- Millet was a subsistence crop and tribes began to grow it to eat only and not sell. Millet was viewed by the tribes as food for the poor, particularly the younger generations.
- Harvesting the crop was difficult. It was a laborious task to de-husk millet.
- There was no market for the crop so people didn't produce more than they needed for their own consumption.
- Revival model -Volunteers identified Burlang Yatra to be the occasion for them to strategise about the revival of millets.
- The Burlang Yatra is an annual festival of Kutia Kondh Tribe in which the community, particularly the women, worships and exchanges seeds through a celebration mode of songs, dances, and songs at the village level.
- NIRMAN (an non-governmental organization) started celebrating the Burlang Yatra at large in collaboration with Millet Network of India , , a forum that was established to promote millet.
- More energy was given to the exchange of millet seed.
- Within a few years, the millets made a comeback in our crop field.
- This little-known movement also allowed the tribes to revive oilseeds, pulses and tubers, which were regarded as companion crops.
- Two mint species, believed to be from the Himalayan region, were identified as traditional crops that Kandhamal tribals cultivated. Odisha government initiative. In 2017, the Odisha government launched Millet Mission.

- Nearly two lakh farmers from 19 districts will be involved in millet cultivation by 2022.
- A total of 3.23 lakh quintals have been purchased.
- To popularize the crop, the Odisha government started MandiaDibas on November 10.

About Millet

- It is used to classify small-seeded grasses. These are sometimes called Nutri-cereals, dryland-cereals, or Nutri-cereals.
- They are also more resistant to drought.
- Millets can thrive in soils with poor water, fertiliser, and pesticides.
- They are resistant to higher temperatures and therefore make them the ideal choice for 'climate-smart' cereals.

Distribution –

- India , Nigeria , and China have the highest production of millets around the globe, accounting for more than 55% .
- India has been a major producer for millets for many years.
- However, Africa's millet production has risen dramatically over the past few years.
- Pearl millet, after maize, wheat, and rice, is India's fourth most widely cultivated food crop.
- Nearly all of India has millets.

Benefits –

- Millets are also great for tackling lifestyle issues like obesity, diabetes, and other health problems such as diabetes, as they are gluten-free and low in the glycemic index. They are also high in dietary fiber and antioxidants.
- High-nutrient Millets are Nutri Cereals. They are high in protein, essential fat acids, and B vitamins.
- It can provide nutrition security as well as protect against nutritional deficiencies, especially among children and women.
- It will also be crucial for climate change measures for drylands, and important for

marginal and smallholder farmers.

Concerns /Challenges

- The awareness about the benefits of millets remains low, which is why there are fewer players in India working on value-added products.
- Low remuneration, a lack of input subsidies, and price incentives are the main causes of the decline. Subsidised supply of fine cereals through the public distribution system (PDS) and change in consumer preferences and demand have all contributed to the lower demand. This has led to a limited supply and higher prices.
- Millet consumption is limited to tourist spots, rural haats and festivals, as there are no market links for agricultural and forest products.
- Government Takes Strides to Encourage Millets Production
- Technology dissemination, quality seeds through the millet seed hubs and awareness generation are some of the ways that millets are promoted.
- Now, efforts are being made to include the n smaller, nutrient-rich millets within the midday mealsschemes in government schools and government-aided schools of Telangana and Karnataka.
- Millet awarenessis growing rapidly in urban centers such as Kolkata , Mumbai and Delhiamong other.
- In April 2018, the Union Agriculture Ministry declared millets "Nutri Cereals" due to their "high nutritional value" and "anti-diabetic qualities".
- 2018 was declared the "National Year of Millets", and the UN General Assembly adopted a resolution sponsored by India to make 2023 the "International Year of Millets".
- The Government of India's Millet Mission falls under the National Food Security Mission, launched in October 2007.
- The Centre's Millet Mission will focus on the development of farm-gate process and empowering farmers through collectives, while also focusing on the value-addition or aggregation.

Topic 66. EGRAMSWARAJ AND AUDIT ONLINE OF MINISTRY OF PANCHAYATI RAJ HAS WON THE GOLD AWARD

Important for subject: Government schemes

The GOLD AWARD for Excellence in Government Process Re-engineering for Digitization has been awarded to e-Panchayat Mission Mode Project of Ministry of Panchayati Raj under the category "Excellence of Government Process Re-engineering for Digitization" of the National Awards for e-Governance.

eGramSwaraj:

- To increase transparency and empower panchayats Ministry has integrated beneficiary details from various union Ministries/ Departments using e-Gram SWARAJ Application.
- Gram Panchayats will have access to the information, which they can read during the Gram Sabhas for verification.
- This verification will be a significant step in ensuring accountability via digitalization and public participation. As of December 2021, nine beneficiary details from three Union Ministries/ Departments have been integrated into the eGramSwaraj Application.
- These five schemes are part of the Ministry of Rural Development, namely. PM Awas Yojana - Gramin (PMAY-G), Indira Gandhi National Old Age Pension Scheme (IGNOAPS),
- Indira Gandhi National Widow Pension Scheme, Indira Gada National Disability Pension Scheme (IGNDPS), Indira Gida National Family Benefit Scheme(IGNFBS), and two other Schemes of Department of Animal Husbandry and Dairy viz. National Agricultural Innovation Project, NAIP & NAIP II, and National Animal Disease Control Programme. One scheme of Ministry of Agriculture and Family Welfare viz. Pradhan Mantri (PMKSN) - One scheme of Department of Drinking Water and Sanitation Ministry of Jal Shakti. Swachh Bharat Mission (Gramin).

Audit Online:

- As part of critical institutional reform, XV FC stipulates that Panchayat accounts audited reports must be made public as an eligibility criterion.

- MoPR has developed the online application "Audit Online" to audit Panchayat accounts that are related to Central Finance Commission Grants.
- This application allows for the easy auditing of accounts and also provides the ability to keep digital audit records that pertain to audits that have already been completed. This application streamlines the audit process, including audit inquiries, draft local auditor reports, draft paras, and so on.
- This application has a unique feature: it can be configured to fit the States' Audit process/flows according to their respective State Audit Rules/Acts.
- For easy access to accounting information pertaining the Panchayats, Audit Online can also be linked to eGram Swaraj.

Topic 67. THE MAHATMA GANDHI NATIONAL RURAL EMPLOYMENT GUARANTEE SCHEME (MNREGA)

Important for subject: Government Schemes

India's Rural Development Ministry has set up a panel to overhaul its sole job guarantee scheme. This is in the hopes of providing more work for the country's poorer areas.

- This is because rural unemployment in India has remained above 7 percent for the majority of the current fiscal year.
- The panel will make recommendations on institutional mechanisms including governance and administrative structures to improve the effectiveness of funds. This is especially important for those who are trying to alleviate poverty.
- The official said that the system will analyze expenditure trends in different states and pinpoint reasons for variations.
- This panel will now redesign the work opportunities that are available under this scheme.

Significance?

- MGNREGA's performance may be the most important indicator of the health of India's informal economy. It accounts for between 80% and 90% of all Indian employment.

Mahatma Gandhi National Rural Employment Garant Scheme (MNREGA),

- Mahatma Gandhi National Rural Employment Guarantee Act 2005 (MNREGA), formerly known as the National Rural Employment Guarantee Act, or NREGA.
- It is also called Mahatma Gandhi National Rural Employment guarantee.
- Scheme (MNREGS), which was adopted on August 25, 2005.
- Its purpose is to increase livelihood security by providing at minimum 100 days of wage work in a fiscal year to at most one household member whose adult members volunteer for unskilled manual labor.
- Women are guaranteed one-third of the jobs available under the MGNREGA.
- MGNREGA also aims to build durable assets (such as roads and canals)
- Employers must be within five kilometers of the applicant's home. Minimum wages must be paid. Applicants who are unable to find work within 15 days after applying for employment will be eligible for unemployment benefits.
- Rural households are granted the right to work under the MGNREG Act, making it mandatory for the State that they provide work upon demand.
- If the government is unable to provide employment, it must provide unemployment allowances. Thus, employment under
- MGNREGA is a legal right.
- In collaboration with state governments, the Ministry of Rural Development monitors the implementation of this scheme.
- MGNREGA will be implemented mainly through gram panchayats, or GPs.
- The act mentions explicitly the principles and agencies that will be used to implement, the list of permitted works, the financing pattern, monitoring, evaluation, and other details to ensure transparency, accountability, and accountability.

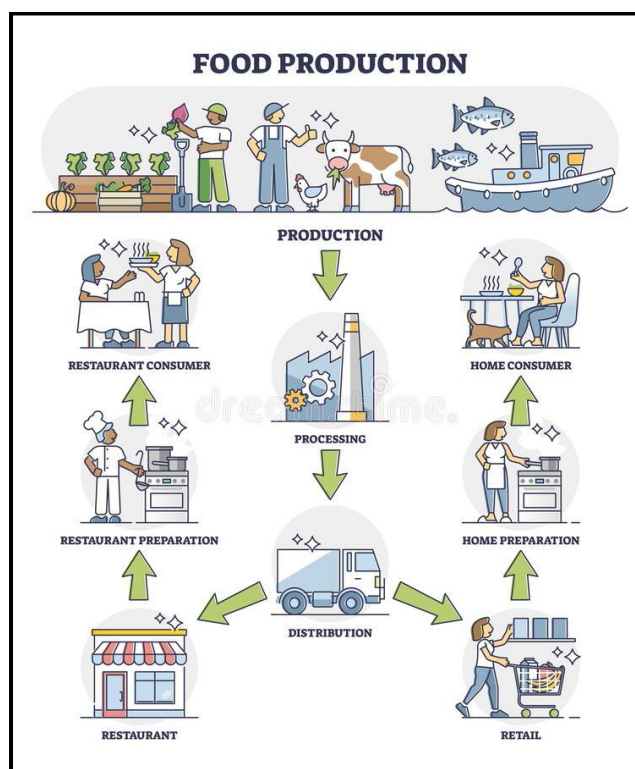
How to get employment?

- The Gram Panchayat requires adult members of rural households to submit their name, address, and photo.
- After making an enquiry, the Gram Panchayat registers households and issues a jobcard.
- The job cards contains details about the adult member enrolled as well as his/her photo.
- A registered person can submit an work application in writing to Panchayat (for at

- most fourteen days of continuous employment) or to a Programme Officer.
- The Panchayat/Programme Officer will accept valid applications and issue a date receipt of application. A letter providing work, along with a letter providing information, will be sent to the applicant. It will also be displayed at the Panchayat office.
 - Wage employment will be granted within 15 days after the submission of the application.
 - Individual beneficiary-oriented works can be undertaken on the cards of Scheduled Castes/ Scheduled Tribes, marginal farmers, beneficiaries of land reforms, or beneficiaries under Indira Awaas Yojana of Government of India.
 - Social Audit is mandatory for MGNREGA workers. This ensures accountability and transparency.
 - Gram Sabha is where wage seeker can raise their concerns and demand wages. The Gram Sabha and Gram Panchayat approve the MGNREGA shelf and determine their priority.

Topic 68. FOOD DISTRIBUTION SCHEME

Important for subject: Government Schemes



The department of expenses will most likely recommend stopping the pandemic-era foodgrain program.

- We expect that the fiscal deficit for FY23 will be limited to 6.4% of GDP if the free foodgrain program is not extended.

Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY)

- Pradhan Mantri Kalyan Anna Yojana, also known as PM-GKAY, is an Atmanirbhar Bharat scheme that provides free food grains for migrants and the poor.
- To cushion the suffering of the poor caused by the pandemic, the scheme offers 5kg free foodgrain to 800,000,000 households.
- The food program that was launched in 2020 has been extended multiple times. The most recent announcement was in September when the government extended it by three months to 31 Dec.
- Over 81.35 million people will receive 5kg of wheat/rice free per person/month and 1 kg of whole chana per family/month.
- Wheat was allocated to six States/UTs - Punjab Haryana, Rajasthan Chandigarh and Delhi, and rice was provided to the rest of the States/UTs.
- This is in addition to the monthly entitlements provided by National Food Security Act, 2013, (NFSA).

Eligibility

- The scheme is open to families belonging to the Below Poverty Line- Antyodaya Anna Yojana(AAY) or Priority Householdss (PHH).
- PHH must be identified by the State Governments/Union Territory Administrations according to their criteria. States/UTs are responsible for identifying AAY families according to the Central Government's criteria.
- Heads of households that are headed by widows, terminally ill or disabled people or those over 60 with no guaranteed means of subsistence or social support.
- Widows, terminally ill or disabled people or individuals aged 60 or older or single women and men without any family or societal support.

All primitive tribal households.

- Marginal farmers, landless agricultural labourers and rural artisans/craftsmen, such as potters and tanners or weavers, blacksmiths and carpenters, and people earning their daily livelihood in the informal sector, such as porters, coolies and rickshaw pullers and hand cart pullers, fruit sellers and snake charmers and cobblers, destitutes, and others in rural and urban areas.
- All HIV-positive persons who are eligible for the Below Poverty Line family.

National Food Security Act

- The enactment on July 5, 2013, of the National Food Security Act (NFSA), marks a paradigm shift of food security policy from welfare to rights-based. It is legally authorized to provide highly subsidized grain to 75% and 50% of rural populations under Targeted Public Distribution System.
- Beneficiaries of NFSA receive 5kgs of foodgrains each month at subsidized rates of Rs 3/2/1 for rice/wheat/coarse grain.
- Subsidized prices for foodgrains under NFSA were to reach Rs. For a period of three years, the Act will be in effect for rice, wheat, and coarse grains.
- The prices would be set by the Central Government periodically, but not exceeding MSP.
- In addition, Antyodaya Anna Yojana households will continue to receive 35 kgs of foodgrains per household each month.
- To encourage women empowerment, The Act mandates that the household's oldest woman (18 years old or older) be the head for issuing ration cards.
- The identification of beneficiaries by States/UTs is a continuous process, which involves exclusion of ineligible/fake/duplicate ration cards and also exclusion on account of death, migration etc. and inclusion on the basis of birth, as well as that of genuine left out households.
- It is based on a life-cycle approach. Special provisions have been made to pregnant and lactating women, and children aged 6 months to 14 Years. They will receive nutritious meals free of charge through a wide network of Integrated Child Development Services centres (ICDS), and schools participating in the Mid-Day Meal program (MDM).
- Women who are pregnant or breastfeeding have the right to cash maternity benefits

not less than Rs. To partially compensate for wage loss in pregnancy, and to supplement nutrition, 6,000

- If the NFSA does not provide the required quantities of foodgrains and meals to the eligible persons, they shall be entitled for such food security allowance from their State Government. This will be paid in accordance with the Central Government National Food Security Act (2013) which provides for reforms to the TPDS, including Cash transfers to provision food entitlements.
- Government of India has adopted the enabling provisions of section 12 of NFSA to allow cash transfer in accordance with In accordance with section 12 of NFSA for cash transfer, Govt.
- NFSA outlines the joint responsibility between the Centre and the State/UT Government. Centre is responsible to allocate foodgrains to States/UTs and transport foodgrains upto designated depots in each State/UT. It also provides central assistance to States/UTs regarding delivery of foodgrains directly from the designated FCI godowns at the FPSs.
- States/UTs are responsible to the effective implementation of this Act. This includes identification and issuing of ration cards to eligible households, distribution of foodgrain entitlements through fair price shops, (FPS), and issuance of licenses for Fair Price Shop dealers. They also monitor and supervise Fair Price Shop dealers.
- The Scheme can be implemented by States/UTs in any area that is identified in a State Union Territory or any other specified area within the State. The existing system of distribution of food grains via the Public Distribution System can continue to operate in areas that are not covered by the Scheme.

Topic 69. ADIVASIS AT THE BOTTOM RUNG OF INDIA'S DEVELOPMENT **PYRAMID FINDS TRIBAL DEVELOPMENT REPORT 2022**

Important for subject: Governance

Tribal Development Report 2022 was launched by the Bharat Rural Livinglihood Foundation in two volumes. It is the first such report since 1947.

Bharat Rural Livelihood Foundation (BRLF)-

- The BRLF was established by the Union Cabinet on September 3, 2013. It is an independent society that falls under the Union Ministry of Rural Development and

allows civil society to work in partnership with the central and state governments.

- The report
- This report examines the status and economic performance of tribal communities at an all India level and central India, in particular regarding livelihoods, agriculture and natural resources, economy and migration.
- India's Tribal Communities make up 8.6 percent of India's total population, according to the 2011 Census.
- 80% are found in Central India, which is the home of the majority of the tribal communities within the country.
- The report combines data from various government sources, case studies and interviews about key dimensions of tribal life and livelihoods.
- The goal to inform stakeholders (including key policymakers, practitioners and activists), is to provide information to aid understanding of the extent of tribal issues.
- The report focuses upon the central theme of livelihoods for tribe communities in central India.
- It provides a status report about the macroeconomic situation, agriculture and land use, energy and water use, particularly groundwater management.

Report findings -

- Indian indigenous communities have been driven further away from fertile river basins and alluvial plains to the harshest ecological areas of India like forests, hills, and drylands.
- Of the 257 Scheduled Tribe Districts, 230 (90%) are either forest- or hilly- or dry. They make up 88% Indian tribes.
- Adivasi Sub-Districts are part of a larger contiguous backward area or Adivasi Belt, which extends beyond the administrative categories of state and district.
- After the 1980 enactment Forest Conservation Act, was viewed as a conflict between environmental protection, and the needs for Adivasi communities driving a wedge between peoples and forests.
- The National Forest Policy of 1998 was the first to explicitly recognize the domestic needs of local residents.
- The Policy emphasized the importance of protecting their customary rights, and

closely associating Adivasis with forest protection.

- However, the reality is that the people-oriented view has not yet been realized.

Schedule tribes

- Although the Constitution of India doesn't attempt to define the term "tribe", the Constitution of India did include Article 342 (i) which added the term Scheduled Tribe.
- It states that the President may by public notice, identify the tribes, tribal communities, or parts of them, or groups within these tribes, tribal communities, or parts, which shall, for purposes of this Constitution be deemed Scheduled Tribes.
- The Fifth Schedule to the Constitution allows for the establishment of a Tribes Advisory Council within each state with Scheduled Areas.

What are the essential characteristics for a community to be identified as a Scheduled Tribe?

- Lokur Committee (1965) states that has the following essential characteristics:
Indications of Primitive Traits
- Different Culture
- The shyness of contact with the Community at Large
- Geographical Isolation
- Backwardness

Topic 70. OXFORD WORD OF THE YEAR TO BE CHOSEN BY PEOPLE

Important for subject: Msc

People around the globe will vote for the Oxford Word of the Year 2022, the first time ever.

What's the problem?

- People around the globe will vote for the Oxford Word of the Year 2022, the first time ever.
- Expert lexicographers narrowed down the long list of worthy contestants to three words: #IStandWith, #Imetaverse and goblin mode.
- Voting, that began on November 21 and will end on December 2.
- Last year, 'Vax was adjudged word-of-the year.

- The three words that are most relevant to the year are
- The metaverse has a conceptual futurity that was introduced in 2022.
- Usage quadrupled in October 2022, compared to last year's same period.
- The division and activism that have characterized this year are recognized by #IStandWith .
- This 'word' was created on social media to align views with a cause or individual. It can sometimes foster conflict and even hatred speech.
- "Goblin mode" is another concept. The idea that people should reject societal expectations and instead do what they want.
- It was first used in 2009/10. However, has come to be rejected by returning to normal
A fake quote from Julia Fox, actress and model, brought the phrase back into mainstream usage.

PIONEER ACADEMY

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PUNE Address :
204/5, 304/5, 2nd & 3rd Flr., Pinnacle Prestige (Near Durvankur Hotel), Above
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Mob : 91453 39324 / 25

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201/202/203/204, 2nd Flr., Lalzer Arcade, Raghoba Shankar Road,
Chendani, Thane (W) - 400 601
Mob : 75060 10635

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306/7/8, 3rd Flr., Blue Pearl Society, Senapati Bapat Road, Plot No. 14, Near
Janata Cloth Market, Near Dadar Railway Station, Dadar (W), Mumbai - 400 028
Mob : 93241 69627 / 91375 41508

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Better Home Hotel, Opp. Andheri (E) - 400 601
Mob : 84518 55673 / 70302 92316

KALYAN



KALYAN Address :
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Kalyan (W) - 421 301
Mob : 81691 40960

PIMPRI-CHINCHWAD



PIMPRI CHINCHWAD Address :
3rd Flr., Kunal Plaza, Mumbai Pune Road, Chinchwad Station,
Chinchwad, Pune - 411019
Mob : 9975459324 / 9503459325

NERUL



NERUL ACADEMY
16, 20 & 21, 1st Flr., Om Surya complex, Opp. Nerul Railway station,
Beside Abhodaya Bank, Sector 15, Nerul (E), Navi Mumbai - 400707
Mob : 93212 87241 / 93212 89027

BORIVALI



BORIVALI ACADEMY
313/314, 3rd Flr., V Star Plaza, Chandavarkar Rd., Near Saraswat Bank,
Sundar Nagar, Borivali (W), Mumbai - 400092
Mob : 93212 49713 / 96533 04874

Email : pioneeracademypace@gmail.com
Website : www.pioneeracademypace.com / .in
Contact : + 91 75060 10635

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