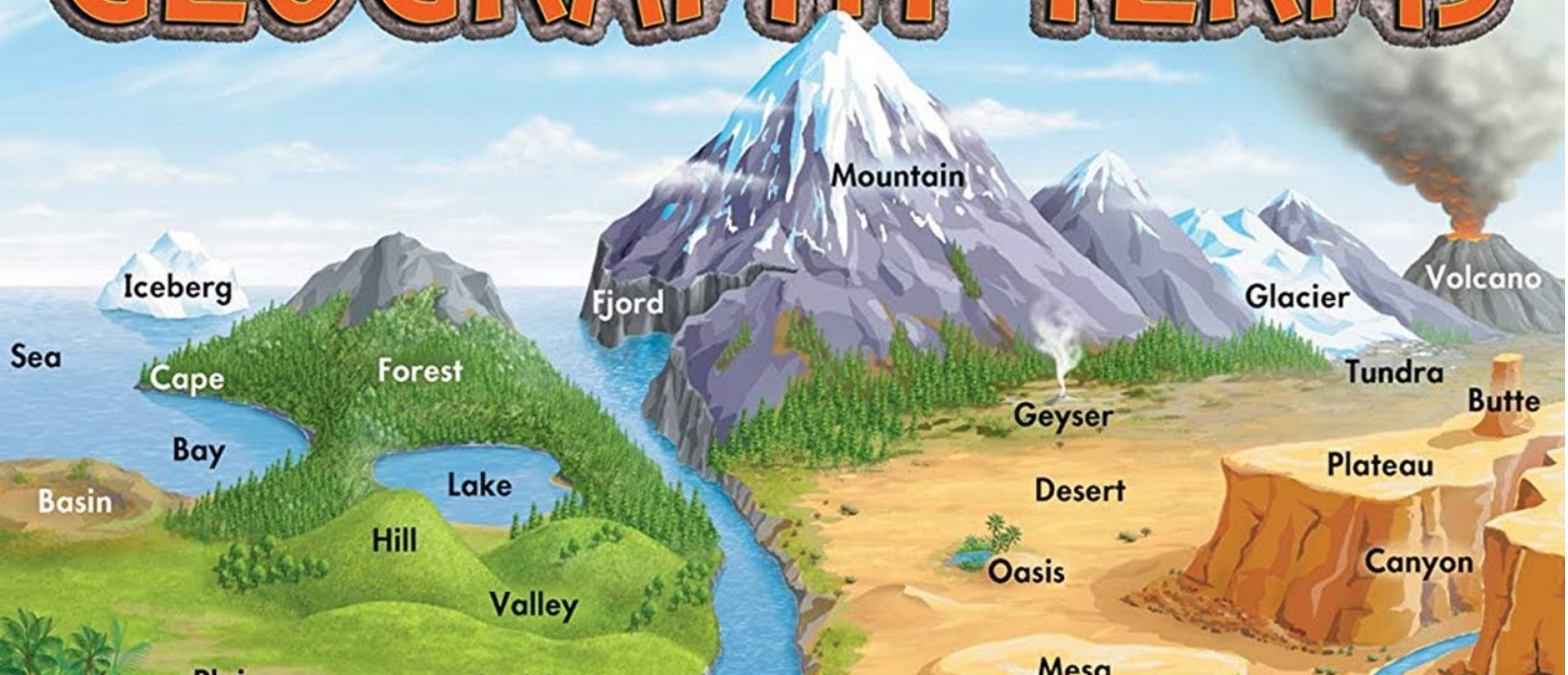




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GEOGRAPHY TERMS



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The road to your dreams...

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1. INDIA'S FIRST CONTAINER MOVEMENT ON INLAND WATERWAYS

Context

The Inland Waterways Authority of India (IWAI) will transport Pepsico's container cargo from Kolkata to Varanasi via National Waterway-1 on the Ganga.

About

- National Waterways-1
- Ganga-Bhagirathi-Hooghly river system from Allahabad to Haldia was declared as National Waterway No.1 vide National Waterway (Allahabad-Haldia stretch of the Ganga Bhagirathi- Hooghly river) Act 1982 (49 of 1982).
- It became operative in 1986 after the formation of the IWAI and covers a distance of 1620 kms.
- The Hooghly river portion of the waterway from Haldia to Nabadwip is tidal. Sea going vessels navigate up to Calcutta (140 kms) and the fairway up to Calcutta is maintained by the Calcutta Port Trust. From Calcutta up to Tribeni there are no restrictions for navigation by inland vessels of a loaded draft up to 4m.

JalMargVikas Project:

- The JalMargVikas Project (JMVP) on NW-1 is being implemented with the financial and technical support of the World Bank.
- The Project entails development of fairway with 3 meters depth between Varanasi and Haldia (Phase-I) covering a distance of 1380 km at an estimated cost of Rs. 5369 crore with target for completion in six years.
- Through the project, the government is also trying to boost infrastructure development such as ferry services, multi-modal and inter-modal terminals, Roll on-Roll off (Ro-Ro) facilities and navigation aids.
- The project is expected to be completed by March 2023.

Inland Waterways Authority of India (IWAI):

- The Inland Waterways Authority of India (IWAI) came into existence in 1986 for development and regulation of inland waterways for shipping and navigation.
- The Authority primarily undertakes projects for development and maintenance of IWT infrastructure on national waterways through grant received from Ministry of Shipping.
- India has about 14,500 km of navigable waterways which comprise of rivers, canals, backwaters, creeks, etc.

Significance

- This would be the country's first container movement on inland vessel post-independence, and a milestone moment in the history of India's IWT sector.
- The mode of communication is considered both cost effective and environment friendly.
- Container cargo transport comes with several inherent advantages. Even as it reduces the handling cost, allows easier modal shift, reduces pilferages and damage.
- It also enables cargo owners to reduce their carbon footprints.
- The event coincides with another momentous day for IWT in India as IWAI's first foray into Public Private Partnership (PPP) model will become a reality with the handing over of operation and management of its terminals in Kolkata to M/s Summit Alliance Port East Gateway (India) Pvt Ltd.

2. INDIA'S FIRST MULTI-MODAL TERMINAL ON INLAND WATERWAYS

Context

Prime Minister Narendra Modi inaugurated India's first multi-modal terminal on the River Ganga in Varanasi.

About

- This is the first of the four multi-modal terminals being constructed on the National Waterway-1 (River Ganga) as part of the World Bank-aided 'JalMargVikas Project' of the Inland Waterways Authority of India.
- The total estimated cost of the project is Rs 5,369.18 crore, which will be equally shared between the Government of India and the World Bank.
- Operation, management and further development of the terminal are proposed to be entrusted to an operator on public-private partnership model. Selection of the operator through an international competitive bidding is at an advanced stage and is expected to be completed by December 2018.

JalMargVikas Project

- It aims at developing the stretch of the river between Varanasi and Haldia for navigation of large vessels weighing up to 1,500 tonnes to 2,000 tonnes.
- It will promote inland waterways as a cheap and an environment-friendly means of transportation, especially for cargo movement.
- The Inland Waterways Authority of India (IWAI) is the implementing agency.
- The project entails construction of three multi-modal terminals (Varanasi, Sahibganj and Haldia), two inter-modal terminals, five roll-on-roll-off (Ro-Ro) terminal pairs, night navigation facilities, modern methods of channel marking etc.
- The JalMargVikas Project is expected to be completed by March, 2023.

Significance

- The multi-modal terminal project and proposed freight village in Varanasi are expected to generate 500 direct employment and more than 2,000 indirect employment opportunities.
- Container cargo transport also comes with several inherent advantages. Such as, it reduces the handling cost, allows easier modal shift, reduces pilferages and damage and also enables cargo owners to reduce their carbon footprints.

3. BHUNGROO WATER HARVESTING SYSTEM

Context

A Geneva based firm Firmenich has installed a unique water harvesting system, named as Bhungroo, near Coimbatore to help farmers overcome water deficiency during dry months.

About

- It is a water harvesting technique that uses an injection module to store excess rain water underground. Farmers can then use the same water for irrigation during summer and winter.
- Bhungroo means “straw” in Gujarati and has been in use in Gujarat since 2002. It is currently being used in Tamil Nadu for horticulture crops.
- It is also used to prevent soil salinity in marshy areas by checking water logging by injecting excess water into the ground.

Technology involved:

- Lowest point of the catchment area is identified after hydrological survey of the area.
- A pipe with a diameter of 5 inches is drilled into the ground up to aquifer or water table.
- Rain water usually flow towards lowest point and goes into the ground.

Significance

- Water stored helps in maintaining ground water level and thus moisture of the soil is maintained during dry spells.





1. GEOGRAPHY IN NEWS

- **Frigid planet detected orbiting nearby star:** Based on two decades of astronomical observation, astronomers have observed that a frozen and dimly lit planet, dubbed a “Super-Earth,” may be orbiting the closest single star to our solar system. The planet, estimated to be at least 3.2 times more massive than Earth, was spotted circling Barnard’s Star, a type of relatively cool and low-mass star called a red dwarf, about 6 light-years away from our solar system, comparatively close in cosmic terms. It is believed to orbit Barnard’s Star every 233 days.
- **Greenland ice sheet hides huge ‘impact crater’:** A large impact crater has been identified beneath the Greenland ice sheet. The 31km-wide depression came to light when scientists examined radar images of the island’s bedrock. Investigations suggest the feature was probably dug out by a 1.5km-wide iron asteroid sometime between about 12,000 and three million years ago.
- **Increasing reflection of cirrus cloud:** As cirrus clouds are not able to reflect ample sunlight back into space, scientists have devised a noble method to inject ice dust nuclei into strata where they form to reduce their optic depth. This would allow more heat to escape into space. This will control global warming.
- **How ‘miniature suns’ could provide cheap, clean energy:** In quest of harnessing clean energy, Scientists have opted to create miniature suns which use nuclear fusion technology. This technology includes fusion of nuclei of two atoms, a reaction similar to sun’s nuclear energy. This step will help to generate sustainable and clean energy.
- **Strange waves rippled around the world, and nobody knows why:** On the morning of November 11, a mysterious rumble rolled around the world. The seismic waves began roughly 15 miles off the shores of Mayotte, a French island sandwiched between Africa and the northern tip of Madagascar. The waves buzzed across Africa, ringing sensors in Zambia, Kenya, and Ethiopia. They traversed vast oceans, humming across Chile, New Zealand, Canada, and even Hawaii nearly 11,000 miles away. Unique feature of this earthquake wave was that it rolled across the globe, without causing any disturbance. This is the first instance when such phenomenon has been observed.
- **Asteroid Bennu:** Recently Oris Rex Spacecraft reached asteroid Bennu. Asteroid Bennu which formed 4.5 billion years ago is carbon rich and can provide vital evidences regarding the origin of our solar system. Bennu is also considered potentially hazardous to earth and its atmospheres as in near future it can strike earth and form a large crater. Hence, it becomes essential to study it. This is the first time NASA will be able to collect material from an asteroid before it only Japan had accomplished this task.

2. GEOSPATIAL TECHNOLOGY FOR MONITORING NATURAL RESOURCES.

Context

Vast size of Indian mainland and its vast potential of rich natural resources which are not uniformly distributed, has made it necessary to use advanced technology like remote sensing and GIS (Geographic Information System).

Remote sensing and GIS have potential to map natural resources in difficult valleys and terrain which will be a boon for country like India which possesses difficult relief and physical features in Himalayan and Peninsular plateau region.

About

- Remote Sensing: It is a science of measuring the Earth using sensors mounted on high flying aircrafts or satellites. These sensors collect data in the form of images and provide insights for manipulating, analyzing and visualizing those images.
- GIS: It is a computer-based tool that analyzes stores, manipulates and visualizes geographic information, usually in a map. It uses data from satellites and remote capturing using high resolution cameras by aircrafts.
- Major applications:
 - Land Management: Around 50% population of India has been totally dependent on agriculture for their livelihood. ISRO (Indian Space Research Organization) and ICAR (Indian Council for Agricultural Research) together did an experiment called ARISE (Agricultural Resource Inventory and Survey Experiment) in a quest to find possibility to analyze changing land use pattern.
 - Soil Management: GIS is a powerful tool in management of soil resources of the country. GIS, GPS and RS have much to offer soil fertility maps. Once soil fertility maps are created, it is possible to transform the information from Soil Test Crop Response models into spatial fertilizers recommendation maps.
 - Watershed Management: A watershed is a natural hydrological unit and its management involves the holistic linking of upstream and downstream areas. Watershed Management is the best way to conserve rain fed marginal areas enabling a sustainable living. With the help of satellite data and GIS, water bodies such as lakes, reservoirs can be mapped in 3D formats and data can be used in the planning of sustainable management of water bodies.
 - Urban land Management: Urbanization is a major problem for a country like India. Rapid increase in rate of inter-state migration and internal displacement has made it essential for better and effective urban planning. Multi layered mapping can be done by using GIS which can be further used by Municipal Corporation and real state planners. This will help effectively in laying down transportation lines and telecommunication network.
 - Forest and ecosystem: India being the 10th largest country in terms of forest cover has potential to increase its forest cover along with sustainable use of forest resources. Use of LISS-I sensor, LandSat satellite data and ResourceSat, IRS-1A has helped Forest Survey of India to map canopy cover in a better way.
 - Coastal Zone Management: Rapid increase in sea level due to global warming is causing habitat loss to coastal community and loss of biodiversity to a greater extent. GIS will help in monitoring loss of biodiversity in form of coral polyps, mangrove species etc. It also maps mineral resources available of continental shelves.

3. NEW NOTIFICATION FOR COASTAL REGULATION ZONE

Context

Recently, the Central Ministry of Environment Forests and Climate Change (MoEFCC) notified new Coastal Regulation Zone (CRZ) norms to replace the existing CRZ Notification of 2011.

About

Background

- With the objective of conservation and protection of the coastal environment, MoEFCC notified the Coastal Regulation Zone Notification in 1991, which was subsequently revised in 2011.
- MoEFCC constituted a Committee in June 2014 under the Chairmanship of Shailesh Nayak (Secretary, Ministry of Earth Sciences) to examine the various issues and concerns of Coastal States/UTs and other stakeholders for recommending appropriate changes in the CRZ Notification, 2011. The Committee submitted its recommendations in 2015.
- The Union Cabinet approved the current Coastal Regulation Zone (CRZ) Notification, in November 2018 revising one issued in 2011.

Main aspects of Notified Rules

(i) No Development Zone (NDZ) reduced

- ▶ For CRZ-III (Rural) areas, two separate categories have now been stipulated as below
- ▶ CRZ-III A - These are densely populated rural areas with a population density of 2161 per square kilometer as per 2011 Census.
- ▶ Such areas shall have a NDZ of 50 meters from the HTL as against 200 meters from the HTL stipulated in the CRZ Notification, 2011.
- ▶ CRZ-III B - Rural areas with population density of below 2161 per square kilometer as per 2011 Census. Such areas shall continue to have an NDZ of 200 meters from the HTL.

(II) Floor Space Index (FSI) norms eased

- ▶ As per CRZ, 2011 Notification, for CRZ-II (Urban) areas, FSI or the Floor Area Ratio had been frozen as per 1991 Development Control Regulation (DCR) levels.
- ▶ In the CRZ, 2019 Notification, it has been decided to de-freeze the same and permit FSI for construction projects, as prevailing on the date of the new Notification.

(iii) Tourism infrastructure for basic amenities to be promoted

- ▶ Temporary tourism facilities such as shacks, toilet blocks, change rooms, drinking water facilities etc. have now been permitted on beaches.
- ▶ Such temporary tourism facilities are also now permissible in the NDZ of the CRZ-III areas.
- ▶ However, a minimum distance of 10 m from HTL should be maintained for setting up of such facilities.

(iv) CRZ Clearances streamlined

- ▶ Only such projects/activities, which are located in the CRZ-I (Ecologically Sensitive Areas) and CRZ IV (area covered between Low Tide Line and 12 Nautical Miles seaward), shall be dealt with for CRZ clearance by the Ministry of Environment, Forest and Climate Change.
- ▶ The powers for clearances with respect to CRZ-II and III have been delegated at the State level with necessary guidance.

(v) NDZ of 20 meters has been stipulated for all Islands

- ▶ For islands close to the main land coast and for all Backwater Islands in the main land, in wake of space limitations and unique geography of such regions, bringing uniformity in treatment of such regions, NDZ of 20 m has been stipulated.

(vi) All Ecologically Sensitive Areas have been accorded special importance

- ▶ Specific guidelines related to their conservation and management plans have been drawn up as a part of the CRZ Notification.

(vii) Pollution abatement has been accorded special focus

- ▶ In coastal areas, treatment facilities have been made permissible activities in CRZ-I B area subject to necessary safeguards.

(viii) Defense and strategic projects have been accorded necessary dispensation.





1. DRAKE PASSAGE AND “THE IMPOSSIBLE ROW” PROJECT

Context

In a first, six rowers from four countries crossed the Drake Passage, in just under two weeks after pushing off from the southern tip of South America.

About

- The Passage is located between Cape Horn at the tip of South America and the Antarctic Peninsula.
- This is the first completely human-powered crossing of the passage.
- The project was dubbed “The Impossible Row”, for which the team departed from Cape Horn in Chile and arrived at Primavera Base on San Martin Land on the Antarctic Peninsula.

What is the Drake Passage?

- The passage is named after Sir Francis Drake, who was the first Englishman to circumnavigate the globe.
- The passage has an average depth of about 11,000 feet, with deeper regions going up to over 15,600 feet near the northern and southern boundaries.

Why is it considered so treacherous?

- The Drake Passage is considered one of the roughest waterways in the world because here, layers of cold seawater from the south and warm seawater from the north collide to form powerful eddies, which when combined with strong winds and storms can be treacherous for those attempting to navigate it.
- It is also the narrowest stretch in the Southern Ocean and spans approximately 800 km between the southern tip of South America and the northern tip of the West Antarctic Peninsula.
- NASA describes the waters of the passage as “notoriously turbulent, unpredictable, and frequented by icebergs and sea ice.

2. WHAT IS ANNULAR SOLAR ECLIPSE

Context

The last solar eclipse of this year took place in December, which will fall over the eastern hemisphere of the Earth and be visible from India, Saudi Arabia, Qatar, Malaysia, Oman, Singapore, Sri Lanka, Mariana Islands and Borneo among a few other places.

About

- An eclipse happens when the moon while orbiting the Earth, comes in between the sun and the Earth, due to which the moon blocks the sun's light from reaching the Earth, causing an eclipse of the sun or a solar eclipse.
- It was visible from India, Saudi Arabia, Qatar, Malaysia, Oman, Singapore, Sri Lanka, Mariana Islands and Borneo among a few other places.

About annular solar eclipse

- There are three types of eclipses: one is a total solar eclipse, which is visible only from a small area on Earth.
- People who are able to view the total solar eclipse are in the centre of the moon's shadow as and when it hits the Earth.
- A total solar eclipse happens when the sun, moon and Earth are in a direct line.
- The second type of a solar eclipse is a partial solar, in which the shadow of the moon appears on a small part of the sun.
- The third kind is an annular solar eclipse, which happens when the moon is farthest from the Earth, which is why it seems smaller.
- In this type of an eclipse, the moon does not block the sun completely, but looks like a "dark disk on top of a larger sun-colored disk" forming a "ring of fire".

Additional information

- Furthermore, during a solar eclipse the moon casts two shadows on the Earth, the first one is called the umbra, which gets smaller as it reaches the Earth.
- The second one is called the penumbra, which gets larger as it reaches the Earth.
- According to NASA, people standing in the umbra see a total eclipse and those standing in the penumbra see a partial eclipse.
- One of the reasons that NASA studies solar eclipses is to study the top layer of the sun called the corona.
- During an annular eclipse, NASA uses ground and space instruments to view this top layer when the sun's glare is blocked by the moon.

Where can the annular solar eclipse be viewed from In India?

- Some of the areas in India from where the annular solar eclipse can be viewed include Kannur, Ooty, Palakkad, Kozhikode, Erode Trichy, Madurai and Karaikudi among a few others.

Is it safe to view solar eclipses?

- NASA maintains that the sun can be viewed safely using the naked eye only during a total eclipse, while during partial and annular solar eclipses, the sun should not be viewed without proper equipment and techniques.
- Not using proper methods and equipment for viewing can cause permanent eye damage or severe visual loss.
- Safety equipment includes eclipse glasses and using appropriate solar filters for covering binoculars, telescopes and cameras.

3. ROHTANG TUNNEL

Context

Prime Minister honoured the contribution of former Prime Minister AtalBihari Vajpayee by naming the Strategic Tunnel under Rohtang Pass after him.

About

- The historic decision to construct a strategic tunnel below the Rohtang Pass was taken on June 03, 2000, when late AtalBihari Vajpayee was the Prime Minister.
- The foundation stone for the Access Road to the South Portal of the tunnel was laid on May 26, 2002.

How long is the tunnel, and what is special about it?

- Upon completion, the 8.8 km-long tunnel will be the world's longest highway tunnel at an altitude of above 10,000 feet (3,000 metres).
- It is a 10.5 m-wide single tube, a bi-lane tunnel with a fireproof emergency tunnel built into the main tunnel itself. The 10.5-m width includes a 1-metre footpath on both sides.
- Vehicles will travel at a maximum speed of 80 km per hour inside the tunnel. Up to 3,000 cars and 1,500 trucks are expected to use the tunnel every day.
- It will reduce the distance between Manali and Leh by 46 kilometres and save crores of rupees in transport costs.
- It will also provide all-weather connectivity to remote border areas of Himachal Pradesh and Ladakh, which otherwise remained cut off from the rest of the country for about six months.
- The project has significant strategic implications for the military. Once the tunnel is operational, the forces will have access beyond the Rohtang Pass even in peak winter.
- The tunnel is now nearing completion and is a step in the direction of providing all weather connectivity to remote border areas of Himachal Pradesh and Ladakh which otherwise remained cut off from the rest of the country for about six months during winters.
- While Rohtang Pass is at a height of 13,050 feet, the pass on the road to Leh is Baralacha La at 16,040 feet. A 13.2-km long tunnel would be required to bypass this pass.
- An alternative road link to Ladakh has also been developed by BRO on the Darcha-Padam-Nimu axis, but here again; a 4.15 km-long tunnel at Sinka La Pass (16,703 feet) would be required for all-weather access.

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1. CHAR DHAMPROGRAMME

Context

Union Minister for Road Transport and Highways has informed Lok Sabha about the Char Dham Programme.

About

Char Dham Programme:

- The Char Dham programme is an initiative to improve connectivity to the Char Dham pilgrimage centres in the Himalayas namely Gangotri, Yamunotri, Kedarnath and Badrinath.
- These four ancient pilgrimages sites in Uttarakhand are known as Chota Char Dham to differentiate them from the bigger circuit of modern day Char Dham sites namely Badrinath, Dwarka, Puri and Rameswaram.
- The works under Char Dham Pariyojna are being implemented on Engineering Procurement and Construction (EPC) mode of contract.
- These projects are being implemented by three executing agencies of Ministry of Road Transport and Highways, viz,
 - ▶ Uttarakhand State PWD,
 - ▶ Border Road Organization (BRO) and
 - ▶ National Highway & Infrastructure Development Corporation Limited (NHIDCL).

Features of the programme:

- The project proposes the widening of single lane roads into double lanes by up to 10 metres, developing highways in Uttarakhand and thereby improving access to the Char Dham.
- The projects also includes mitigation measures/ stabilisation of chronic landslide & sinking spots/ zones as a standalone project or part of road widening projects to avoid landslide and safety of road users.

2. KALAPANI, A SMALL AREA ON THE INDIA MAP THAT BOTHERS NEPAL

Context

The new political map of India, recently released by the government to account for the bifurcation of Jammu and Kashmir, has triggered fresh protests over an old issue in Kathmandu.

About

- Kalapani is a 35 square kilometre area. The Kali River in the Kalapani region demarcates the border between India and Nepal.
- While the Nepal government and political parties have protested, India has said the new map does not revise the existing boundary with Nepal.
- The Nepal government described India's decision as "unilateral" and claimed that it will "defend its international border".

Defining the boundaries

- Nepal's western boundary with India was marked out in the Treaty of Sugauli between the East India Company and Nepal in 1816.
- Nepali authorities claim that people living in the low-density area were included in the Census of Nepal until 58 years ago.

3. DANAKIL DEPRESSION

Context

Nature Ecology & Evolution recently published a new study. It says that active and naturally occurring life cannot be sustained at Danakil Depression, a place having water.

About

Danakil Depression:

- The Danakil Depression is located in Ethiopia. It is the northern part of Afar Triangle there.
- It is a geological depression that has resulted from the divergence of three tectonic plates in the Horn of Africa.
- It is one of the **lowest place** in the surface of earth measuring 125m below sea level.
- It is the **hottest place** on Earth in terms of year-round average temperatures. It remains without rain for most of the year.
- At the northern end of Danakil Depression which is separated by live volcanoes from the Red Sea, this depression was formed by the evaporation of an inland water body. All the water entering Danakil evaporates, and no streams flow out from its extreme environment. It is covered with more than 10 lakh tonnes of salt.

Findings of the report:

- There are extremophile microbes that can adapt to environmental conditions that are too extreme for any living organism. This new research has pointed out that in Danakil Depression, a place having bubbling pools of water and mounds of salt covering its landscape, even these microorganisms cannot live.
- It identifies two barriers for this: magnesium-dominated brines that cause cells to break down; and an environment having simultaneously very low pH and high salt (toxic hyperacid-hypersaline water), a combination that makes adaptation highly difficult.
- The scientists have the opinion that the fact that this research has not revealed life form does not mean that organisms more complex than microfossils are not present there.
- They say that until more intricate studies are done, this Danakil Depression for now is the most inhospitable area not fit for living.



1. KERALA ON ALERT AS MAHA INTENSIFIES INTO SUPER CYCLONE OFF ITS COAST

Context

- The Kerala State Disaster Management Authority (KSDMA) set up 11 shelter camps in the state as cyclonic storm Maha in the Arabian Sea intensified into a severe cyclonic storm.
- It urged fishermen not to venture into the sea, putting several districts on yellow alerts.

About

- Storm not likely to hit state directly. However, there would be heavy wind and rain.
- The India Meteorological Department (IMD) stated that the storm was over Lakshadweep and adjoining southeast Arabian Sea, moving north-north westwards.
- It intensified into a severe cyclonic storm and lay cantered over east-central Arabian Sea and adjoining Lakshadweep area, about 325 kilometre west-northwest of Kozhikode.
- With the cyclone intensified, the IMD forecast wind at 100-110 kilometre per hour, gusting 120 kmph over east-central Arabian Sea.
- Lakshadweep is likely to receive extremely heavy rainfall and the IMD issued a “red message” for the island.

Cyclone Maha

- Cyclone Maha, the fourth cyclone of 2019 in the Arabian Sea, was set to intensify further into a ‘Severe Cyclonic Storm’
- The depression that had developed in the Comorin Sea, gained strength and turned into a cyclonic storm.
- An Orange alert had been issued in four districts of Kerala —Ernakulam, Thrissur, Malappuram and Kozhikode.

2. STORMQUAKE

Context:

- Scientists have discovered an earthquake-like event “stormquake” that can happen during a hurricane or other powerful ocean storms.

What is a stormquake?

- It is a new geophysical phenomenon entirely unknown to science - a hybrid entity where powerful storms such as hurricanes trigger seismic episodes that can rumble for hours or even days.

- Storms trigger giant waves in the sea, which cause another type of wave. These secondary waves then interact with the seafloor only in certain places and that causes the shaking.
- Stormquakes are limited to places along the edge of continental shelves or on ocean banks.
- Stormquakes frequently occur in the Maritimes and Labrador Sea in the North American margin.

When is a stormquake generated?

- To be a stormquake the source of the seismic data had to meet several criteria:
- It had to occur during a stormy day.
- It should not be a part of known earthquake event and belong to a swarm of similar quakes on the same day.
- Stormquakes are confined to certain regions along the coast where seafloor topography has small raised regions called **ocean banks**.

Examples of stormquake:

- Hurricane Bill, a storm that formed 10 years ago in the Atlantic Ocean. Bill strengthened into a Category 4 hurricane before weakening to a tropical storm and hitting Newfoundland. This storm caused "numerous seismic events "off the northeast U.S. and Canadian coasts. As Bill approached several stormquakes located offshore New England and Nova Scotia were detected and caused continent-wide ground motions that lasted for about 30 hours.
- Hurricane Ike (2008) and Hurricane Irene (2011) which led to stormquake activity in the Gulf of Mexico, while Irene caused seismic events off the coast of southern Florida.

3. GOLDEN TRIANGLE AND GOLDEN CRESCENT

About

Golden Triangle and Golden Crescent are the Asia's two largest principal illicit opium producing areas.

The Golden Crescent

- The Golden Crescent is located in Southwest Asia and consists of three contiguous countries of Pakistan, Afghanistan and Iran from East to West.
- Iran is the largest country, Afghanistan the only land locked country and Pakistan shares the maximum land boundaries in this region.
- This is the world's leading illicit opium producing region with the potential production of 5,020 metric tons, out of which Afghanistan alone has 4,950 metric tons of illicit opium production, followed by Pakistan with meager 70 metric tons in 2005 (UNODC, INCSR, 2006).
- Iran is not an opium producing country in this region but is more that of a trans-shipment country.

The Golden Triangle

- The Golden Triangle is located in Southeast Asia comprising of three contiguous countries of Laos, Thailand and Myanmar from East to West.
- Myanmar is the largest country; Laos is the only landlocked country not only of the Golden Triangle but also of that of the entire Southeast Asia and Thailand has the largest coastline in the region.
- The Golden Triangle is the world's second largest illicit opium producing region with a potential production of 5,020 metric tons out of which, Myanmar itself has 30,900 metric tons followed by 10,000 metric tons in Laos and Thailand having the least production of 128 metric tons in 2005 (UNODC, INCSR, 2006). Laos is more that of trans-shipment country. Thailand and Myanmar are money laundering countries.

Comparative Geospatial Profile

- **Golden Crescent is territorially larger than Golden Triangle.**
- Both Golden Crescent and Golden Triangle are similar regarding the major coastal features such as seas, gulf and deltas. The coastally neighboring countries to Golden Triangle and Golden Crescent make trans-boundary narco-trafficking an international concern.





1. TOP FIVE LONGEST RIVERS IN THE WORLD

About

Following are the top five longest rivers in the world:

- Nile River
- Amazon River
- Yangtze River
- Mississippi River
- Yenisei River

Nile River:

- The River Nile is in Africa. It originates in Burundi, south of the equator, and flows northward through northeastern Africa, eventually flowing through Egypt and finally draining into the Mediterranean Sea.
- It is the main source of water in two countries: Egypt and Sudan.
- The Blue and the White Nile are the two tributaries of the river with the latter having a greater length than the former.
- The source of the White Nile is not yet fully determined but is believed to be somewhere in Burundi or Rwanda. According to some reports, Lake Victoria is considered to be the source of the White Nile which is, in turn, fed by the Kagera River whose two major tributaries are the Ruvyironza and the Nyabarongo rivers of Burundi and Rwanda, respectively.
- The Kagera is formed at the confluence of these two rivers near the Tanzania-Rwanda border.
- The Blue Nile has a more defined origin in Lake Tana in Ethiopia. The two tributaries meet near the Sudanese capital of Khartoum.
- The Nile River's final course is through Egypt before it forms a delta and drains into the Mediterranean Sea.
- The Nile basin is huge and includes parts of Tanzania, Burundi, Rwanda, Congo (Kinshasa), Kenya.

Amazon River:

- The Amazon River runs 4,000 miles from the Andes to the sea, and is the second longest river in the world.
- It is also the largest in terms of the size of its watershed, the number of tributaries, and the volume of water discharged into the sea.
- The headwaters of the Apurímac River were considered to be the origin of the Amazon River. However, a recent 2014 study claims that the origin of the Amazon can be traced to the Cordillera Rumi Cruz from where Peru's Mantaro River originates.

- This river then confluences with the Apurímac River (whose headwaters were earlier regarded as the source of the Amazon) and then other tributaries join the river downstream to form the Ucayali River which finally confluences with the Marañon River to form the main stem of the Amazon River.

Yangtze River:

- The Yangtze River is the world's third longest river and the longest to flow entirely within one country.
 - It is also Asia's longest river.
 - The river basin of the Yangtze houses one-third of the population of China.
 - Two origins of the Yangtze River have been suggested. Traditionally, the government of China recognizes the Tuotuo tributary located in the Tanggula Mountains as the source of the river.
 - According to new data, however, the source of the Yangtze River is located in the Jari Hill from where the headwaters of the Dam Qu tributary originate. These tributaries and more join to form the mighty Yangtze River which finally drains into the East China Sea at Shanghai.
 - The Yangtze River has over 700 tributaries but the principal tributaries are the Hun, Yalong, Jialing, Min, Tuo Jiang, and Wu Jiang.

Mississippi River:

- The river system comprising of the Mississippi, Missouri, and Jefferson rivers, is regarded as the world's fourth longest river system.
- The Mississippi River begins in northern Minnesota where Lake Itasca is believed to be the origin of the river and drains into the Gulf of Mexico.
- When we regard the Jefferson River as the furthest source of the Mississippi River, then we get the Mississippi-Missouri-Jefferson river system.

Yenisei River:

- This is the world's fifth-longest river system and the largest draining into the Arctic Ocean.
- The source of the river is Mungaragiyn-Gol, which is located at the ridge of Dod-Taygasyn-Noor, Mongolia. The Selenge River is regarded as the headwaters of this river system. The Selenge River is 992 km long and drains into Lake Baikal.
- The Angara River rises from Lake Baikal near Listvyanka and flows through the Irkutsk Oblast of Russia and finally joins the Yenisei River near Strelka.
- The Yenisei finally drains into the Kara Sea, Arctic Ocean.

2. DELAYED WITHDRAWAL OF MONSOON

Context

The Monsoon season of 2019 officially ended with September, but rainfall has continued in several parts of the country which indicates the delayed withdrawal of Monsoon.

About

Monsoon trends this year:

- After an extremely dry June, which saw a rain deficiency of 33 per cent, the monsoon brought generous rainfall in July, August and September, each subsequent month exceeding the normal by a higher deviation.
- September produced rainfall that was 152 per cent of normal, and this was the second highest rainfall ever recorded in this month. The only higher deviation during September was way back in 1917, when the rainfall was 165 per cent of the then normal for the month.

- August and September together produced 130 per cent of normal rainfall, and this was the highest since 1983. And this was the first time since 1931 that the monsoon ended up producing more than 100 per cent rainfall after having a 30 per cent or more deficiency at the end of the first month.

Why there is late withdrawal of monsoon?

- September marks the beginning of the withdrawal of the monsoon. This year, however, withdrawal has seen a record delay. So far, the longest delay happened in 1961 when the withdrawal started on October 1. According to IMD this year the withdrawal is likely to begin only after October 10.

Reasons:

- Last time September produced so much rain, 1917 which happened to be a La Niña year. This year is not a La Nina year but instead of that the rainfall is higher in September. Though there was no La Niña, a similar phenomenon called the Indian Ocean Dipole, could have contributed to the enhanced rainfall.
- During the monsoon season, the Intertropical Convergence Zone (ITCZ) is located over the Indian subcontinent. By September, as the temperature begins to go down, the ITCZ starts moving southwards of the Indian landmass, towards the equator, and further into the southern hemisphere. This year, this process has not yet started.
- In September this year, the northern hemisphere was much warmer than the southern hemisphere, and that could be one reason why the ITCZ has remained longer than usual over the northern hemisphere which resulted into longer stay of monsoon.
- There was a cooling of the eastern equatorial Indian Ocean, below Sumatra, and that could be one of the reasons for this years extended withdrawal of Monsoon.

What is Indian Ocean Dipole?

- The Indian Ocean Dipole is a phenomenon similar to the ENSO condition observed in the Pacific Ocean which creates the El Niño and La Niña events.
- The sea surface temperatures in the Indian Ocean gets warmer and cooler than normal, and this deviation influences regional atmospheric and weather patterns i.e. The Indian monsoon.
- While the Pacific Ocean only has an El Niño or a La Niña condition at a time, the Indian Ocean experiences both warm and cold conditions at the same time – that's why known as dipole.
- One of these poles is located in the Arabian Sea while the other is in the Indian Ocean, south of Indonesia.
- The Indian Ocean Dipole is said to be positive when the western pole is warmer than the eastern one and negative when it is cooler.
- The Indian Ocean Dipole and ENSO are not unrelated. Positive Indian Ocean Dipole events are often associated with El Niño and negative Indian Ocean Dipole with La Niña.
- When the Indian Ocean Dipole and ENSO happen at the same time, the Dipole is known to strengthen the impacts of the ENSO condition.

3. ATLANTIC MERIDIONAL OVERTURNING CIRCULATION (AMOC)

Context

According to scientists weakening of AMOC could have drastic consequences on global climate.

About

What is Atlantic Meridional Overturning Circulation (AMOC)?

- The Atlantic Meridional Overturning Circulation (AMOC) is a large system of ocean currents that carry

warm water from the tropics northwards into the North Atlantic.

- AMOC ensures the oceans are continually mixed, and heat and energy are distributed around Earth.

How does the AMOC work?

- The AMOC is a large system of ocean currents, like a conveyor belt, driven by differences in temperature, salt content and the water's density.
- As warm water flows northwards it cools and some evaporation occurs, which increases the amount of salt. Low temperature and a high salt content make the water denser, and this dense water sinks deep into the ocean.
- The cold, dense water slowly spreads southwards, several kilometres below the surface. Eventually, it gets pulled back to the surface and warms in a process called "upwelling" and the circulation is complete.

Has the AMOC been changing?

- For thousands of years, AMOC has remained stable, but since the past 15 years, it has been weakening which could have dramatic consequences for Europe and other parts of the Atlantic rim.
- Indirect evidence (for example from sediments on the sea floor) shows that there have been some large, rapid changes in the AMOC in the past (for example around the end of the last ice age).

What will be the effect of climate change on the AMOC?

- Climate models suggest that the AMOC will weaken over the 21st Century as greenhouse gases increase. This is because as the atmosphere warms, the surface ocean beneath it retains more of its heat.
- All these changes make the ocean water lighter and so reduce the sinking in the 'conveyor belt', leading to a weaker AMOC. So the AMOC is very likely to weaken, but it's considered very unlikely that large, rapid changes in the AMOC, as seen in past times, will happen in the 21st
- A weaker AMOC will bring less warm water northwards, and this will partly offset the warming effect of the greenhouse gases over Western Europe.

What is the role of Indian Ocean?

- As the Indian Ocean warms faster and faster, it generates additional precipitation. This draws more air from other parts of the world to the Indian Ocean, including the Atlantic.
- With so much precipitation in the Indian Ocean, there will be less precipitation in the Atlantic Ocean. Less precipitation will lead to higher salinity in the waters of the tropical portion of the Atlantic because there won't be as much rainwater to dilute it.
- This saltier water in the Atlantic, as it comes north via AMOC, will get cold much quicker than usual and sink faster.



1. COASTAL REGULATION ZONE

Context

Supreme Court has ordered the demolition of Maradu Apartments in Kerala for violation Coastal Regulation Zone (CRZ) norms.

About

- Under the Environment Protection Act, 1986 Ministry of Environment and Forests (MoEF) issued notification in 1991, for regulation of activities in the coastal area.
- Coastal Regulation Zone (CRZ) is the area up to 500m from the high-tide line and a stage of 100m along banks of creeks, estuaries, backwater and rivers subject to tidal fluctuations.
- CRZ Rules govern human and industrial activity close to the coastline, in order to protect the fragile ecosystems near the sea.
- The Union Ministry of Environment, Forest and Climate Change has notified the 2019 Coastal Regulation Zone (CRZ) norms, replacing the existing CRZ norms of 2011.
- The new CRZ norms aim to promote sustainable development based on scientific principles.
- Coastal Regulation Zones (CRZ) 1991 notification gave four fold classifications of coastal areas.
 - ▶ CRZ-1: These are ecologically sensitive areas as they help in maintaining the ecosystem of the coast. They lie between low and high tide line. Exploration of natural gas and extraction of salt are permitted
 - ▶ CRZ-2: These areas are urban areas located in the coastal areas. Now under new coastal zone regulations 2018, the floor space index norms have been de-frozen.
 - ▶ CRZ-3: rural and urban localities which fall outside the 1 and 2. Only certain activities related to agriculture even some public facilities are allowed in this zone
 - ▶ CRZ-4: this lies in the aquatic area up to territorial limits. Fishing and allied activities are permitted in this zone. Solid waste should be let off in this zone. This zone has been changed from 1991 notification, which covered coastal stretches in islands of Andaman & Nicobar and Lakshdweep

Changes Brought about by CRZ Regulations 2019

- States found the 1991 Rules to be extremely restrictive. They complained that if applied strictly, the Rules would not allow simple things like building decent homes for people living close to the coast, and carrying out basic developmental works 2019 CRZ notification brought following changes:
- Two separate categories for CRZ-III (Rural) areas:
 - ▶ CRZ-III A: The A category of CRZ-III areas are densely populated rural areas with a population density of 2161 per square kilometre as per 2011 Census. Such areas have a No Development Zone (NDZ) of 50 meters from the High Tide Line (HTL) as against 200 meters from the High Tide Line stipulated in the CRZ Notification, 2011.

- ▶ CRZ-III B – The B category of CRZ-III rural areas have population density of below 2161 per square kilometre as per 2011 Census. Such areas have a No Development Zone of 200 meters from the HTL.
- No-development zone of 20 m for all islands close to the mainland coast, and for all backwater islands in the mainland.
- The government has decided to de-freeze the Floor Space Index and permit FSI for construction projects to do away with CRZ 2011 notification
- Tourism infrastructure like shacks, toilet blocks, change rooms, drinking water facilities, etc. permitted in coastal areas: The new norms permit temporary tourism facilities such in Beaches.
- To address pollution in Coastal areas, the treatment facilities have been made permissible in CRZ-I B area subject to necessary safeguards.

Criticism

- CRZ notification has been amended 34 times in 27 years, not to protect the coast but to open it up for development.
- Though exemption was made for the construction of the Navi Mumbai airport but the POSCO project had failed to take off due to other reasons. Projects of the Department of Atomic Energy, which plans to set up nuclear power plants near the coast, were also exempted which have serious environmental implication as we learnt from the Fukushima nuclear disaster 2011.
- Large scale construction in CRZ has huge implications on Environment.

Conclusion

A balanced approach to achieve developmental goals without hurting the environment should be the policy push.

2. MASS EXTINCTIONS

Context

In the last 500 million years, 75 to more than 90 percent of all species on Earth have disappeared in mass extinctions.

About

What is mass extinction?

Mass extinctions are defined as any substantial increase in the amount of extinction (lineage termination) suffered by more than one geographically wide-spread higher taxon during a relatively short interval of geologic time, resulting in an at least temporary decline in their standing diversity.

Major mass extinction events in the geological history of Earth:

Ordovician-Silurian extinction 485 to 444 million years ago:

- During this period massive glaciation locked up huge amounts of water in an ice cap that covered parts of a large south polar landmass. This may have been triggered by the rise of North America's Appalachian Mountains.
- The large-scale weathering of these freshly uplifted rocks sucked carbon dioxide out of the atmosphere and drastically cooled the planet.
- As a result, sea levels plummeted by hundreds of feet. Creatures living in shallow waters would have seen their habitats cool and shrink dramatically, dealing a major blow.

Late Devonian extinction - 383-359 million years ago:

- Starting 383 million years ago, this extinction event eliminated about 75 percent of all species on Earth over a span of roughly 20 million years.
- Volcanism could be a possible trigger for this extinction.
- Within a couple million years of the Kellwasser event, a large igneous province called the Viluy Traps erupted 240,000 cubic miles of lava in what is now Siberia. The eruption would have spewed greenhouse gases and sulfur dioxide, which can cause acid rain.
- Asteroids may also have contributed. Sweden's 32-mile-wide Siljan crater, one of Earth's biggest surviving impact craters, formed about 377 million years ago.
- During the Devonian, plants hit on several winning adaptations, including the stem-strengthening compound lignin and a full-fledged vascular structure. These traits allowed plants to get bigger and for their roots to get deeper than ever before, which would have increased the rate of rock weathering.
- The faster rocks weathered, the more excess nutrients flowed from land into the oceans. The influx would have triggered algae growth, and when these algae died, their decay removed oxygen from the oceans to form what are known as dead zones. In addition, the spread of trees would have sucked CO₂ out of the atmosphere, potentially ushering in global cooling.

Permian-Triassic extinction - 252 million years ago:

- Of the five mass extinctions, the Permian-Triassic is the only one that wiped out large numbers of insect species. Marine ecosystems took four to eight million years to recover.
- The extinction's single biggest cause is the Siberian Traps, an immense volcanic complex that erupted more than 720,000 cubic miles of lava across what is now Siberia. The eruption triggered the release of at least 14.5 trillion tons of carbon.
- Magma from the Siberian Traps infiltrated coal basins on its way toward the surface, probably releasing even more greenhouse gases such as methane.
- In the million years after the event, seawater and soil temperatures rose between 25 to 34 degrees Fahrenheit.
- As temperatures rose, rocks on land weathered more rapidly, hastened by acid rain that formed from volcanic sulfur. Just as in the late Devonian, increased weathering would have brought on anoxia that suffocated the oceans. Climate models suggest that at the time, the oceans lost an estimated 76 percent of their oxygen inventory. These models also suggest that the warming and oxygen loss account for most of the extinction's species losses.

Triassic-Jurassic extinction - 201 million years ago:

- This mass extinction caused the extinction of 80 percent of all land and marine species.
- At the end of the Triassic, Earth warmed an average of between 5 and 11 degrees Fahrenheit, driven by a quadrupling of atmospheric CO₂ levels. This was probably triggered by huge amounts of greenhouse gases from the Central Atlantic Magmatic Province, a large igneous province in central Pangaea.
- Remnants of those ancient lava flows are now split across eastern South America, eastern North America, and West Africa.
- The Central Atlantic Magmatic Province was enormous. Its lava volume could cover the continental U.S. in a quarter-mile of rock.
- The uptick in CO₂ acidified the Triassic oceans, making it more difficult for marine creatures to build their shells from calcium carbonate.
- On land, the dominant vertebrates had been the crocodylians, which were bigger and far more diverse than they are today. Many of them died out. In their wake, the earliest dinosaurs—small, nimble creatures on the ecological periphery—rapidly diversified.

Cretaceous-Paleogene extinction - 66 million years ago:

- The Cretaceous-Paleogene extinction event is the most recent mass extinction and the only one definitively connected to a major asteroid impact.
- Some 76 percent of all species on the planet, including all nonavian dinosaurs, went extinct.
- About 66 million years ago, an asteroid roughly 7.5 miles across slammed into the waters off of Mexico's Yucatán Peninsula at 45,000 miles an hour. The massive impact left a crater more than 120 miles wide flung huge volumes of dust, debris, and sulfur into the atmosphere, bringing on severe global cooling.
- Wildfires ignited any land within 900 miles of the impact, and a huge tsunami rippled outward from the impact. Overnight, the ecosystems that supported nonavian dinosaurs began to collapse.
- Global warming fueled by volcanic eruptions at the Deccan Flats in India may have aggravated the event. Some scientists even argue that some of the Deccan Flats eruptions could have been triggered by the impact.

Extinction today

- Earth is currently experiencing a biodiversity crisis. Recent estimates suggest that extinction threatens up to a million species of plants and animals, in large part because of human activities such as deforestation, hunting, and overfishing.
- Other serious threats include the spread of invasive species and diseases from human trade, as well as pollution and human-caused climate change.
- Today, extinctions are occurring hundreds of times faster than they would naturally. If all species currently designated as critically endangered, endangered, or vulnerable go extinct in the next century, and if that rate of extinction continues without slowing down, we could approach the level of a mass extinction in as soon as 240 to 540 years.

3. HURRICANE DORIAN

Context

- Hurricane Dorian is a strong tropical cyclone currently affecting the Bahamas and the South-eastern United States. At least 5 people have died and 21 injured.
- It is one of the most powerful storms ever to hit Atlantic. Despite getting downgraded to Category 2, it is expected to remain very powerful for the next few days.

About

- Hurricane - A hurricane is a large rotating storm with high speeds of wind that gust at least 74 mph that forms over warm waters in tropical areas.
- Hurricanes have three main parts, the calm eye in the center, the eyewall where the winds and rains are the strongest, and the rain bands which spin out from the center and give the storm its size.
- In the southern hemisphere, hurricanes rotate in a clockwise direction, and in the northern hemisphere they rotate in an anti-clockwise direction. This is due to what's called the Coriolis force, produced by the Earth's rotation.

How are hurricanes formed?

- Hurricanes begin as tropical disturbances in warm ocean waters with surface temperatures of at least 80 degrees Fahrenheit (26.5 degrees Celsius). Those low-pressure systems are fed by energy from warm seas.
- A storm with wind speeds of 38 miles (61 km) an hour or less is classified as a tropical depression. It becomes a tropical storm—and is given a name, according to conventions determined by the World Meteorological Organization—when its sustained wind speeds top 39 miles (63 km) an hour.
- Hurricanes are enormous heat engines that deliver energy on a staggering scale. They draw heat from warm, moist ocean air and release it through condensation of water vapor in thunderstorms.

- Hurricanes spin around a low-pressure center known as the eye. Sinking air makes this 20- to 40-mile-wide (32- to 64-kilometer-wide) area notoriously calm. But the eye is surrounded by a circular “eye wall” that contains the storm’s strongest winds and rain.

Measurement

- The size of Hurricane is mainly measured by the Saffir-Simpson scale – other scales are used in Asia Pacific and Australia.

The system divides storms into five categories:

- Category 1: Winds 74 to 95 mph (Minor damage)
- Category 2: Winds 96 to 110 mph (Extensive damage — Can uproot trees and break windows)
- Category 3: Winds 111 to 129 mph (Devastating — Can break windows and doors)
- Category 4: Winds 130 to 156 mph (Catastrophic damage — Can tear off roofs)
- Category 5: Winds 157 mph or higher (The absolute worst and can level houses and destroy buildings)

Naming

- Hurricanes are given names by the World Meteorological Organisation (WMO) so that they can be distinguished.
- Each year, tropical storms are named in alphabetical order according to a list produced by the WMO.
- That name stays with the storm if it develops into a hurricane.
- The names can only be repeated after six years.

Hurricane Dorian

- Dorian is estimated to be the second-most-powerful hurricane ever recorded in the Atlantic Ocean and ties the record for the most-powerful storm to make landfall, according to the National Weather Service
- The storm is not currently expected to make landfall in the US; it should instead stay uncomfortably close offshore.
- The storm could bring several inches of rain or more for parts of Florida and the Southeast.
- The deadliest aspect of a hurricane tends to be storm surge (flooding caused by seawater pushed onshore by the hurricane’s winds).
- Reason behind downgrading of Category of Dorian: Dorian has slowed down because a high pressure ridge that was steering the storm westward has weakened. Now, the storm is essentially waiting for another external force before it starts moving quickly again.



1. GULF OF GUINEA

Context

- Recently, nine Chinese and eight Ukrainian seamen have been abducted after two merchant vessels came under attack in Cameroonian waters.
- The attacks took place off the Port of Douala.

About

Gulf of Guinea

- The Gulf of Guinea is the north-easternmost part of the tropical Atlantic Ocean.
- The intersection of the Equator and Prime Meridian (zero degrees latitude and longitude) is in this gulf.
- Among the many rivers that drain into the Gulf of Guinea are the Niger and the Volta.

Piracy in the Gulf of Guinea:

- Piracy in the Gulf of Guinea affects a number of countries in West Africa as well as the wider international community making it becoming an issue of global concern.
- Pirates here are often part of heavily armed criminal enterprises, who employ violent methods to steal oil cargo.
- The International Maritime Bureau (IMB) has recently described the Gulf of Guinea as the most dangerous area in the world for shipping.
- According to its estimations, 73 percent of all sea kidnappings and 92 percent of hostage-takings occur there, with pirates normally taking sailors for ransom.

Causes of piracy in the Gulf of Guinea:

- **Youth unemployment and widespread poverty** are one of the main triggering factors for piracy in the Gulf of Guinea, and as admitted by the UN Security Council during a meeting set to discuss a mission to the region 'any comprehensive anti-piracy strategy might also need to take into account root causes, including high levels of youth unemployment'.
- **Severe political disputes** are considered another reason contributing to the rise of piracy in the area, and in some cases directly feeding into the piracy activity itself.
- Of particular relevance are the activities of the Movement for the Emancipation of the Niger Delta, in the south of Nigeria; this organization has publicly stated to steal and smuggle oil 'as a form of re-appropriation of wealth and as a form of protest'.
- Another major and relevant controversy has involved the governments of Cameroon and Nigeria; the two countries have been in dispute about the sovereignty over the **Bakassi Peninsula**, which has caused a lack of cooperation between the governments resulting in poor control over illegal activities.

- **Corruption** is another major contributing factor, especially with regards to the case of Nigeria. Attention has been called towards the political protection that some of those who attack installations and personnel of oil companies, especially in the Niger Delta, enjoy protection from certain local authorities.

2. TESLA-STYLE GIGA FACTORIES

Context

- India is planning for \$4 billion Tesla-scale battery storage plants to expedite India's **battery storage revolution**.

About

More on news:

- India is planning to build at least four Tesla-style giga factories to manufacture batteries with an investment of around \$4 billion to switch to electric vehicles to curb pollution and reduce the dependence on foreign oil.
- According to NITI Aayog, India will need 6 such gigawatt-scale facilities (of 10 GWh each) by 2025 and 12 by 2030 but it does not include the export market potential. Hence, the base scenario envisions 11 factories by 2025 and 24 by 2030.
- On the demand creation side, the plan involves providing tax credits at the retail level and state-level grants to promote usage of electric vehicles.
- Union budget of 2019-20 also announced tax breaks for setting up mega-manufacturing plants for solar photovoltaic cells, lithium storage batteries and solar electric charging infrastructure.

India's Renewable Energy

- India has become one of the top renewable energy producers globally.
- It has a capacity of about 80 gigawatts (GW) and is running the world's largest renewable energy programme, with plans to achieve 175GW by 2022 and 500GW by 2030, as part of its climate commitments.
- It is the world's third-largest oil consumer. Hence, its imports are more than 80% of its oil requirements and around 18% of its natural gas.
- Currently, there are no indigenous battery manufacturers in India. Almost all of the electric lithium-ion batteries are imported from China.
- The upcoming four Tesla-inspired Gigafactories in India seek to address that problem.

Significance of this plan

- Demand Side: Factories are set up to secure India's energy needs directed by NITI Aayog and it aims to accomplish what Tesla has done at its Gigafactory in Nevada, USA.
- Consumer needs: This plan aim to fulfil the needs of consumer's electronics industry and electricity grids apart from Electronic Vehicles.
- Self-Sufficient: This step will reduce India's dependence on foreign oil.
- Electric vehicle: This plan will enable India to develop an electric vehicle ecosystem including manufacturing and R&D.
- Environment: It aims to achieve clean energy targets and the irregular nature of electricity from clean energy sources such as solar and wind.

Support extended by the Indian government

- Government may offer a number of incentives to manufacturers such as concessional financing options with around 3% foreign exchange hedge on overseas loans and a fixed 3% interest subvention on loans availed in Indian rupees.

- In addition, a reduction in minimum alternative tax (MAT) may be offered.
- Another support includes an investment-linked tax incentive.
- It may also offer an output-linked subsidy on kilowatt hour (KWh) of sold cells.

Global Performance

- USA provided a R&D capital support of \$2.4 billion of grants for battery manufacturing under American Recovery and Reinvestment Act (ARRA) in 2009; it also included a \$1.5 billion in grant to develop a domestic battery supply chain.
- States such as South Carolina, Georgia and Michigan have also given tax breaks for setting up battery manufacturing.
- Europe has been at the forefront of promoting battery manufacturing with the European Union Battery Alliance planning with the goal of opening production sites in France and Germany.
- There is also concessional finance with funds from European fund for strategic investments (EFSI) set up by European Investment Bank (EIB) for setting up such giga scale factories.

3. TIGERS UNDER HIGH STRESS

Context

- A study conducted by the Hyderabad-based Centre for Cellular and Molecular Biology (CCMB) has found that the Tigers in Bandhavgarh, Kanha and Sariska are under tremendous stress induced by tourism and this is probably affecting their reproduction.

About

Highlights of the study

- Results of the study were published in CCMB's Laboratory for Conservation of Endangered Species.
- This study is based on the comparison between the samples of fecal glucocorticoid metabolite (fGCM) of the same tigers from the same location during tourist and off-peak seasons, which is regarded as a marker of stress.
- The stress levels of tigers during the 8-9 month tourism period were very high. Although females are known to undergo more stress, study shows that males were also under tremendous stress.
- Study could also be distinctly correlated with the stress levels depending on the number of vehicles entering the tiger reserves.
- The report suggests that unsustainable wildlife tourism causes distinct physiological stress in tigers in protected areas. Recently introduced tigers in Sariska Tiger Reserve, Rajasthan, failed to reproduce effectively presumably due to high levels of stress caused by high anthropogenic disturbance.
- It recommends strict regulation of vehicular traffic, and reducing other anthropogenic disturbances.

What the study focused on?

- The study examines the relationship between anthropogenic disturbances and physiological stress levels in tiger populations in protected areas.
- The research team collected a total of 341 fGCM, a stress marker among tigers, samples from **Bandhavgarh** and **Kanha** reserves during tourist and off-peak seasons, besides data on various anthropogenic disturbances, including tourism activities.

Current status of Tigers in India

- The count of big cats is increasing constantly. In 2006, there were 1,411 tigers, which increased to 1,706 in 2010 and 2,226 in 2014.

- Around 97 % of the world tiger population perished in the last 100 years and according to the latest statistics, only 3,890 tigers are left in the world, out of which 2,226 are in India.
- Major threats to the tiger include habitat destruction, habitat fragmentation and commercial poaching for fur and body parts, which have simultaneously reduced tiger populations in the wild.
- The country's first **Wildlife Crime Cell** has been established by the forest department at **Melghat Tiger Reserve** to stop the poaching of tigers and other wild animals.
- **Uttarakhand** has recorded a massive jump in the tiger numbers with the **Corbett Tiger Reserve** becoming home to 45 more tigers since 2015 and the **Rajaji Tiger Reserve** having 18 more big cats than were recorded in the 2014 tiger census.
- Uttarakhand has the country's second highest tiger population after Karnataka, according to the 2014 tiger census.

NATIONAL TIGER CONSERVATION AUTHORITY

- It is a statutory body under the **Ministry of Environment, Forests and Climate Change** constituted under enabling provisions of the **Wildlife (Protection) Act, 1972**, as amended in 2006, for strengthening tiger conservation, as per powers and functions assigned to it under the said Act.

International or Global Tiger day

- It is observed on 29 July every year, which is dedicated to the worldwide awareness and support for tiger conservation.
- It was created when 13 countries came together in 2009 and pledged to double the world's Tiger population by 2022 -- the next "Year of the Tiger" on the Asian lunar calendar.

Steps taken

- In 2010, the governments of 13 countries where wild tigers roam decided that the business-as-usual approach was not enough.
- They came together and committed to TX2 - the most ambitious conservation goal set for a single species - to double wild tigers by 2022, the next Chinese Year of the Tiger.
- Project Tiger was launched in 1973 in India that aims at conserving Tiger



1. ORCHIDS OF INDIA: A PICTORIAL GUIDE

Context

The **Botanical Survey of India** has published **Orchids of India: A Pictorial Guide**- the first comprehensive census of orchids of India.

About

Highlights of the survey

- Orchids of India: A Pictorial Guide gives all details of all the species of India, which was unveiled by the Ministry of Environment, Forest and Climate Change.
- According to the publication, the total number of orchid species endemic to India is 388.
- 757 (60%) of all orchids found in India are epiphytic, 447 are terrestrial and 43 are mycoheterotrophic.
- The Himalayas, North-East parts of India and Western Ghats are the hot-spots of orchids.
- The highest number of orchid species is recorded from Arunachal Pradesh followed by Sikkim and West Bengal. The Western Ghats have high endemism of orchids.
- Among the bio geographic zones of India, the Himalayan zone is the richest in terms of orchid species followed by Northeast, Western Ghats, Deccan plateau and Andaman & Nicobar Islands.
- The publication point out that Kerala has 111 of these endemic species while Tamil Nadu has 92 of them.

Orchids

- Orchids have unique shape and ornamentation and have complex floral structure that facilitates biotic cross-pollination
- They are broadly categorised into three life forms: a) epiphytic (plants growing on another plants including those growing on rock boulders and often termed lithophyte), b) terrestrial (plants growing on land and climbers) and c) mycoheterotrophic (plants which derive nutrients from mycorrhizal fungi that are attached to the roots of a vascular plant).
- The epiphytic orchids are abundant up to 1800 m above the sea level and their occurrence decreases with the increase in altitude.
- Terrestrial orchids, which grow directly on soil, are found in large numbers in temperate and alpine region whereas mycoheterotrophic orchids, mostly associated with ectomycorrhizal fungi, are found in temperate regions, or are found growing with parasites in tropical regions.
- The entire orchid family is listed under appendix II of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) and hence any trade of wild orchid is banned globally.
- Some of the orchids like Dendrobium, Phalaenopsis, Oncidium and Cymbidium are quite popular in floriculture trade and have a demand both within and outside country.

Botanical Survey of India (BSI)

- BSI is the apex research organization under the Ministry of Environment and Forests (MOEF) for carrying out taxonomic and floristic studies on wild plant resources of the country.
- Its objective is to undertake intensive floristic surveys and collect accurate and detailed information on the occurrence, distribution, ecology and economic utility of plants in the country.
- It was established in 1890 with objective to explore plant resources of country and to identify plants species with economic virtues.
- It develops National database of Indian plants, including herbarium and live specimens, botanical paintings and illustrations, etc.

CITES

- It is an international agreement between governments aimed to ensure international trade in specimens of wild animals and plants does not threaten their survival.
- By this agreement States and regional economic integration organizations adhere voluntarily. States that have agreed to be bound by the Convention ('joined' CITES) are known as Parties.
- Although, legally binding – in other words they have to implement the Convention – it does not take the place of national laws. Rather it provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES, is implemented at the national level.

How CITES works?

- It works by subjecting international trade in specimens of selected species to certain controls. All import, export, re-exports and introduction from the sea of species covered by the Convention has to be authorized through a licensing system.
- Each Party to the Convention must designate one or more Management Authorities in charge of administering that licensing system and one or more Scientific Authorities to advise them on the effects of trade on the status of the species.

2. POLAVARAM IRRIGATION PROJECT

Context

The **Ministry of Jal Shakti** has constituted a committee to examine the cost escalation of the Polavaram irrigation project under the instructions of the **Ministry of Finance**.

About

More on news:

- Revised Cost Committee has been formed to rework the cost of Polavaram Irrigation Project (PIP) in Andhra Pradesh, under the chairmanship of a joint secretary of the Finance Ministry.
- The revised cost estimates is being assessed by the Technical Advisory Committee.
- Ministry of Finance has also asked the state government to soon send an audit of Rs 5,000 crore spent prior to 2014, as an audit of Rs 3,000 crore spent has been held so far.

Compensation to affected people

- Compensation package of Rs. 6,36,000 has been fixed for per affected family and those whose cattle is also affected, they will get another Rs. 25,000, as per the package decided.
- There is no complaint pending with the Government of India. To ensure rehabilitation and resettlement of those affected by the project, committees have been formed by state governments and are headed by collectors to look into grievances. Even, a committee has also been set up under the Secretary of Ministry of Tribal Affairs to redress the grievances of tribal people.

Funding Issue of PIP

- The Government of Andhra Pradesh submitted Revised Cost Estimates (RCE) for Rs 57,297.42 crore at 2017-18 price level to Central Water Commission (CWC) in January, 2018.
- The Advisory Committee on Irrigation, Flood Control & Multipurpose Projects of the Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Jal Shakti in its 141st meeting held in February, 2019 accepted the RCE of the PIP for Rs 55,548.87 crore at 2017-18 Price level (PL) of which cost of irrigation component is Rs.50,987.96 crore
- The approved RCE has reduced mainly on account of reconciliation in estimated cost of certain land under submergence, land for which compensation is payable, cost of remaining works as per relevant schedule of rates.

Polavaram Irrigation Project (PIP)

- This project is located in West Godavari district of Andhra Pradesh, which will also interlink several rivers in the state.
- It has been accorded national project status by the Centre. Its implementation is monitored by the Central Water Commission.
- The project involves relocation of about 50,000 families especially in Khammam, East Godavari and West Godavari districts in Andhra Pradesh, besides 2,000 families in Odisha and Chhattisgarh.

Aim of the Project

- Purpose of this multi-purpose project is to facilitate irrigation and it will also help in the supply of drinking water to Visakhapatnam and water for industrial purposes.
- It also endeavours hydropower to regions of East Godavari, Vishakhapatnam, Krishna and West Godavari districts of Andhra Pradesh.
- It seeks to address the challenges of flooding and droughts witnessed in the respective basins.
- The project also aims to help the Rayalaseema region (comprising Anantapur, Chittoor, Kadapa and Kurnool districts out of the total 13 districts) get more water.

Issues with the project

- **Displacement:** The environmental impact assessment (EIA) of the project says 276 villages will be affected. The Polavaram Project Environmental Impact Appraisal Report of 1985 expected 150,697 people to be displaced in 226 villages. Of the displaced population, tribals constitute 50%. With inadequate resettlement and rehabilitation measures, this has severe implications on the socio-economic life of the displaced populations.
- **Changes to the ecology of the region:** Environmental activists argue that the project will submerge forests, wildlife sanctuaries and as a result disturb the ecology.
- **Too costly:** The project will heavily burden the exchequer and low-cost alternatives for flood and drought prevention should be explored.

3. HEAT WAVES

Context

In early June 2019, an intense heat wave scorched many parts of India which led to the death of 36 people in the country, mostly from Andhra Pradesh.

About

More on News

- In 2019, sparse rainfall during the pre-monsoon season, along with a delayed monsoon, has made the heat more unbearable.

- The NDMA official added that Churu (Rajasthan), where temperature crossed the 50 degrees Celsius mark, has not registered a single death whereas parts of Andhra Pradesh have witnessed most number of deaths, where the temperature was relatively lower.
- **Reason behind this Anomaly**
- The **Comfortable Index** of a region increases with the increase in humidity. **Comfortable Index** measures the human discomfort due to the **combined effects of heat and humidity**.
- Since humidity in Andhra Pradesh would be 80-90 per cent, it makes the overall comfortable index much more than a person in the state is used to experiencing. This will make people feel that they are experiencing temperatures above 70°Celsius.
- This is true about most coastal states like Odisha, Andhra Pradesh and Telangana whereas Churu has humidity around 10 to 15 per cent.
- This happens because it is not just temperature, but **humidity** also plays a
- Weak El Niño conditions may also play their part in ensuring higher than normal temperature.

Heat Waves

Heat Wave is simply, a continuous spell of abnormally hot weather. Heat wave need not be considered till maximum temperature of a station reaches at least 40° C for Plains and at least 30° C for Hilly regions.

Criteria for declaring Heat Wave followed by IMD

Situation 1 - When normal maximum temperature of a station is less than or equal to 40° C. Declare Heat Wave if:

- ▶ Heat Wave Departure from normal is 5° C to 6° C
- ▶ Severe Heat Wave Departure from normal is 7° C or more

Situation 2 - When normal maximum temperature of a station is more than 40° C. Declare Heat Wave if:

- ▶ Heat Wave Departure from normal is 4° C to 5° C
- ▶ Severe Heat Wave Departure from normal is 6° C or more

Situation 3 - When actual maximum temperature remains 45°C or more irrespective of normal maximum temperature, heat wave should be declared.



1. CYCLONE VAYU

Context

Cyclone Vayu hit Gujarat and ravaged port town.

About

- Cyclone Vayu is the second deadliest cyclone to hit the state since 1998 that had ravaged port town. It is the strongest cyclone in past 20 years.

What is Cyclone?

- Cyclone forms over different areas and revolve around low-pressure eye. Warm air rises and when it rises, it cools. Cool air cannot hold much moisture and so water gets squeezed out and clouds begins to form.
- If warm air rises quickly it creates **updraft**. Similarly, if the water in the clouds is build enough then it may fall into the ground in the form of rain and is known as **downdraft**. When they work together, a storm cell is created. This process continues, the cloud grows and we get a large thunderstorm cloud. These thunderstorm clouds are ready to diversify into other storms like tropical **cyclone Vayu** and **tornadoes**.
- Six factors responsible for the formation of cyclone: (1) Sufficient warm temperature at sea surface (2) Atmospheric instability (3) Impact area of **Coriolis force** so that low pressure can be develop (4) High humidity in the lower to middle levels of the troposphere (5) A pre-existing low-level focus or disturbance (6) Low vertical wind shear.

Impact of Cyclone Vayu on India

- It may cause a significant delay in the arrival of monsoon in some parts of the country.
- Coastal areas in Karnataka, Kerala, Konkan, Goa and Lakshadweep are also expected to receive fairly widespread rainfall.

Cyclone Prone area in India

- According to the meteorological department, there are 13 coastal states and Union Territories in India are Cyclone prone region.
- Four states like West Bengal, Andhra Pradesh, Odisha, Tamil Nadu-and one UT Puducherry on the east coast and Gujarat on the west coast are more vulnerable.

Cyclone Warning System in India

- The **India Meteorological Department** is the nodal agency, which is responsible for meteorological observations, weather forecasting and seismology.
- A cyclone in the Bay of Bengal is predicted by the **Area Cyclone Warning Centres (ACWC)** and in the Arabian Sea it is predicted by the **Cyclone Warning Centre (CWC)**.

- Both ACWC and CWC sent their report to **National Cyclone Warning Centre (NCWC)**.

Naming of Tropical Cyclones

- The **World Meteorological Organisation (WMO)** has devised a mechanism where countries submit a list of names from time to time. Names of cyclones are chosen from this pool. The practice of naming these tropical cyclones in the Bay and Arabian Sea began in September 2004.
- For tropical cyclones developing in the North Indian Ocean, countries like India, Sri Lanka, Bangladesh, Maldives, Myanmar, Oman, Pakistan and Thailand send their names to the Regional Tropical Cyclone Committee.
- At present, all eight countries have submitted eight names each for naming future cyclones. The name Vayu was chosen from this list containing 64 names and was suggested by India.
- As per the existing list, the next cyclone that forms over the Indian Ocean will be named **Hikka** (Maldives), followed by **Kyarr** (Myanmar), **Maha** (Oman), **Bulbul** (Pakistan), **Pawan** (Sri Lanka) and **Amphan** (Thailand). Once the list is exhausted, the committee would meet again and a fresh list will be prepared by the **Regional Specialized Meteorological Centre (SMC)**.

2. LOCAL INDIAN OCEAN PHENOMENON MAY BRING BETTER RAINFALL DESPITE EL NINO

Context

The dreaded El Nino is likely to be neutralised by a local phenomenon in the Indian Ocean, which can lead to good rainfall in the June-September season.

About

El Nino:

- El Nino refers to the warming of the equatorial Pacific, which weakens the flow of wind and consequently the monsoon system. In some other parts of the world, it leads to heavy rainfall but in India it weakens rain.
- In this phenomenon, sea-surface temperatures rise over a threshold of +0.5 degree Celsius (and cools by the same margin during La Nina).
- There are a few other key atmospheric indices which one comes across while tracking El Nino. For instance, the **Southern Oscillation Index (SOI)** that gives an indication of the development and intensity of El Nino or La Nina. The SOI is calculated on the basis of the atmospheric pressure differences between Tahiti (South Pacific Ocean) and Darwin (Australia). Sustained positive SOI values are indicative of La Nina conditions while negative values suggest El Nino conditions.
- Another atmospheric index is the **ENSO** (El Nino Southern Oscillation) which refers to the oscillation between the El Nino and the La Nina. ENSO shifts irregularly back and forth between El Nino and La Nina every two to seven years.
- Each phase led to disruptions of temperature, precipitation and winds.
- The warmer area of the ocean is also a source for convection and is associated with cloudiness and rainfall.

Indian Ocean Dipole (IOD)

- The phenomenon called Indian Ocean Dipole (IOD) refers to the temperature difference between the eastern and western parts of the water body.
- The negative impact of weak El Nino will be compensated by positive Indian Ocean Dipole. El Nino phenomenon is getting weak and IOD is moving from neutral to positive. This will help rains in the country. The monsoon would be near normal.

What lies ahead?

- El Nino has been generally known to suppress monsoon rainfall in India while La Nina increases it. El Nino years tend to be drier than average, but one of the strongest El Nino of the century (1997-98) produced a monsoon season with above-average rainfall for India.
- Anomalous warming in the Central and East Pacific could have a more profound adverse impact on the monsoon than when the warming shifts to the adjoining Far East Pacific.
- Last but not the least is the 'dipole' effect, wherein the Indian Ocean mimics El Nino-La Nina in which the western and eastern basins warm up relative to each other every few years with associated impact on the monsoon. Warming up of the West Indian Ocean boosts a prevailing monsoon, and vice-versa. International and domestic weather agencies expect that this year, the Indian Ocean dipole could be either 'neutral' or weakly positive.

3. ZOJI LA PASS

Context

- The 434-km strategic Srinagar-Leh National Highway, connecting the Kashmir Valley with the Ladakh region, was thrown open for traffic after being closed due to heavy snowfall.
- Zoji La Pass, connects the picturesque Kashmir Valley with the cold Indus valley desert through this 434-km long Srinagar-Leh road. Border Road Organisation is involved in the snow clearance operation.

About

Zoji La pass:

- It is a high mountain pass in Jammu and Kashmir, located on National Highway 1 connecting Srinagar in Kashmir Valley to Leh in Ladakh region.
- It runs at an elevation of approximately 3,528 metres (11,575 ft), and is the second highest pass after Fotu La on the Srinagar-Leh National Highway.
- Every year due to heavy snowfall, vehicle flow stops for 4 months during winter from December to April.
- During the Indo-Pakistani War of 1947, it was seized by Pakistani supported invaders in 1948 in their campaign to capture Ladakh. The pass was re-captured by Indian forces on 1 November in an assault codenamed Operation Bison, which achieved success primarily due to the surprise use of tanks, then the highest altitude at which tanks had operated in combat in the world.

Zoji La Tunnel:

- It is a 14.2 km long road tunnel under Zoji La pass on the Himalayas between Sonmarg and Dras town of Kargil district of Jammu and Kashmir. It is currently under construction.
- The project was approved by the government of India in January 2018 and the construction commenced from May 2018. The construction period is 5 years.
- The tunnel along with 6.5 km long Z-Morh Tunnel, (which is 22 km before Zoji La tunnel towards Srinagar) will ensure year-long road connectivity between Srinagar and Leh which currently remains closed for about 4 months due to heavy snowfall on the Zoji La pass.
- It takes more than 3 hours to cross the pass but the tunnel will reduce the time to only 15 minutes. This tunnel was a strategic requirement of the army and the Ladakhi people as the pass is close to LOC and vulnerable to hostile actions by terrorists.
- Once built, this will be the longest bi-directional road tunnel in Asia.



1. NAMING OF CYCLONES

Context

- The recent cyclone to emerge out of the Bay of Bengal was named Fani. It has made landfall in Odisha causing the most destruction in 2 cities- Puri and Bhubhneswar.
- Before this, there were cyclones Hudhud in 2014, Ockhi in 2017 and Titli and Gaja in 2018.
- The first cyclone after the list was adopted was given the name in the first row of the first column — Onil, proposed by Bangladesh. The next cyclone will have name- Vayu.

About

Naming of cyclones:

- Each Tropical Cyclone basin in the world has its own rotating list of names.
- For cyclones in the Bay of Bengal and Arabian Sea, the naming system was agreed by eight member countries of a group called WMO/ESCAP and took effect in 2004.
- These eight countries are – Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka and Thailand.
- The first cyclone after the list was adopted was given the name in the first row of the first column — Onil, proposed by Bangladesh.
- Subsequent cyclones are being named sequentially, column-wise, with each cyclone given the name immediately below that of the previous cyclone.
- Once the bottom of the column is reached, the sequence moves to the top of the next column.
- So far, the first seven columns have been exhausted, and Fani (again proposed by Bangladesh) is the top name in the last column.
- The next cyclone will be named Vayu. When all the names in list are exhausted, the eight countries will propose fresh lists of names.
- The lists for storms in the Atlantic and Eastern Pacific basins are, however, rotated when the names in the list get exhausted. Exception are, however, made in certain cases — if a storm causes excessive death and destruction, its name is considered for retirement and is not repeated; it is replaced with another name.

Why naming of cyclones is done?

- Appending names to cyclones makes it easier for the media to report on these cyclones, heightens interest in warnings, and increases community preparedness.
- Names are easier to remember than numbers and technical terms and hence can reach greater masses.

- If public wants to suggest the name of a cyclone to be included in the list, the proposed name must meet some fundamental criteria. The name should be short and readily understood when broadcast. Further, the names must not be culturally sensitive and should not convey any unintended and potentially inflammatory meaning.

2. DISASTER RESILIENCE IN RISK-PRONE ASIA NEEDS REALISTIC POLICY AND FINANCIAL PLANNING

Context

- As per new Asian Development Bank (ADB) report four in five people affected by natural disasters are in Asia, putting the region's prosperity at risk.

About

- The report is published under ADB's flagship Asian Development Outlook (ADO) 2019. It released ahead of the biennial global platform for Disaster Risk Reduction (DRR) scheduled in May 2019 — is very well-timed and deserves to be discussed on behalf of the Asian nations to strengthen disaster resilience in the region.
- Over the past three decades, natural disasters have affected over 10 million people throughout the Central Asian region and caused economic losses of almost \$2.5 billion. In this backdrop, experts from the Central Asian countries also agreed on increasing financial protection against natural disasters at a regional forum on Disaster Risk Financing held at Almaty in February 2019.

Key Findings:

- With nearly 38,000 disaster fatalities per year between 2000 and 2018, the region accounted for 55 per cent of the 60,000 disaster fatalities across the world.
- The region also accounted for 26 per cent of the \$128 billion in economic damage due to natural disasters.
- In Asia, 82 per cent of the disasters ensued from extreme weather events such as floods, storms and droughts.

Who suffers the most?

- It has been recognised that the poor suffer the maximum brunt of natural catastrophes.
- A survey conducted across five Asian countries found that, among the rural households surveyed, 90 per cent suffered either loss of life or significant damage to assets from floods in the past decade, and their financial recovery took more than three times longer compared to urban households.
- The ADB report highlights case studies from Indian cities like Mumbai, Chennai and Puri, which show that in the absence of social protection; disaster-hit families deplete their savings or borrow at high interest rates from informal sources, pushing them into indebtedness and poverty traps.

Way Forward:

Funding needed to strengthen disaster resilience

- Asia is projected to need \$26 trillion in infrastructure investment between 2016 and 2030, or \$1.7 trillion per year.
- Hence, planning for and investing in climate-friendly and disaster-resilient infrastructure from the start will be a cost-effective way to reduce future losses.
- The report calls upon the international agencies for more financial support.
- At present, international agencies provide seven times more assistance to the developing countries to respond to disasters after they occur, than fund preparation programmes beforehand.

- Even though many countries in the region are adapting the Sendai Framework for Disaster Risk Reduction 2015-2030, the increasingly high losses from such disasters need effective actions too.
- It also urges governments in the region to work on realistic policy and budget planning.
- It suggests that Asian nations integrate disaster risk reduction into national development and investment plans, and spend more on prevention.
- **b) Insurance against catastrophes**
- According to the report, although climate change is spurring more natural hazards and rapid urbanisation is increasing exposure to such hazards, only around 8 per cent of Asia's catastrophe losses since 1980 have been covered by insurance.
- Many developing countries in Asia now boast of multiple disaster insurance schemes, including 15 in India, but effectiveness of such schemes needs to be prioritised.
- In fact, Southeast Asia Disaster Risk Insurance Facility (SEADRIF) — Asia's first regional facility to provide climate and disaster risk financing and insurance solutions, including a regional catastrophe risk insurance pool — was established nearly four months ago.

3. COLOUR CODED WEATHER WARNING

Context

- Recently Indian Meteorological Department issued a yellow weather warning for rain in Himachal Pradesh.
- The weather department forecast thunderstorm with hail in isolated places of mid hills, including Shimla, Mandi, Kullu, Chamba, Solan and Sirmaur.

About

Colour coded weather warning:

- It is issued by the country's apex weather agency Indian Meteorological Department (IMD) from Ministry of Earth Sciences.
- Its objective is to alert people ahead of severe or hazardous weather which has the potential to cause damage, widespread disruption or danger to life.
- As per the regular practice, warnings are uploaded in the website every day. District wise rainfall forecast along with warnings with colour coded alerts are also uploaded and updated thrice daily in the website.

Four colour codes:

The Four colour codes are issued to indicate various categories of warnings. The meanings of these codes are:

Red:

- Take action.
- Extremely bad weather is expected.
- People need to take action to keep themselves and others safe.
- Widespread damage, travel and power disruption and risk to life are likely. People must avoid dangerous areas and follow the advice of the emergency services and local authorities.

Amber:

- Be prepared.
- There is an increased likelihood of extremely bad weather, which could potentially cause travel delays, road and rail closures, and interruption of power supply.

- Amber means people need to be prepared to change plans and protect themselves, their family and community from the impacts of the severe weather based on the forecast from the Met Office.
- There could be risk to life and property.

Yellow:

- Be updated.
- Severely bad weather is possible over the next few days, plan ahead thinking about possible travel delays and disruption of day-to-day activities possible.
- It indicates the weather may change or worsen in the next few days.

Green:

- No action required.
- No severe weather concerns.
- No advisory is issued.





1. CYCLONE 'IDAI'

Context

The Indian Navy was the first to respond **cyclone Idai**, a **category 4 tropical storm**, which hit southern Africa, is the worst weather-related disaster to hit the southern hemisphere.

About

More on News

- Cyclone '**IDAI**' made landfall at Beira, Mozambique in early hours of 15 March 2019 causing widespread damage and loss of human life in the Central and Northern provinces of the country.
- The situation is being monitored closely and the Indian Navy is prepared to render all necessary assistance to the local population in Mozambique.
- Ships of First Training squadron of Indian Navy, Sujata, Sarathi and Shardul, operating in Southern Indian Ocean were diverted to Port Beira in Mozambique based on the request of the Government of Mozambique.
- The Indian Navy has made HADR (**Humanitarian Assistance and Disaster Relief**) assistance a major tool of its **foreign cooperation initiative** in the Indian Ocean Region (IOR) which has a high incidence of natural disasters.

Tropical Cyclones

- Tropical Cyclones are low pressure systems that form over warm tropical waters and have gale force winds (sustained winds of 63 km/h or greater and gusts in excess of 90 km/h) near the centre.
- They derive their energy from the warm tropical oceans and do not form unless the sea-surface temperature is above 26.5°C.
- Once formed, they can persist over lower sea-surface temperatures.
- Tropical cyclones can persist for many days and may follow quite erratic paths. They usually dissipate over land or colder oceans.
- The circular eye or centre of a tropical cyclone is an area characterised by light winds and often by clear skies. Eye diameters are typically 40 km but can range from under 10 km to over 100 km.
- The eye is surrounded by a dense ring of cloud about 16 km high known as the eye wall which marks the belt of strongest winds and heaviest rainfall
- Tropical Cyclones are dangerous because they produce destructive winds, heavy rainfall with flooding and damaging storm surges that can cause inundation of low-lying coastal areas.

Categories of tropical cyclone:

The severity of a tropical cyclone is described in terms of categories ranging from 1 to 5 related to the zone of maximum winds. Using this severity scale, communities will be able to assess the degree of cyclone threat and take appropriate action. A gale is a strong wind, typically used as a descriptor in nautical contexts.

- **Category 1:** Less than 125 km/h Gales - Minimal house damage. Damage to some crops, trees and caravans. Boats may drag moorings.
- **Category 2:** 125 - 164 km/h Destructive winds - Minor house damage. Significant damage to signs, trees and caravans. Heavy damage to some crops. Risk of power failure. Small boats may break moorings.
- **Category 3:** 165 - 224 km/h Very destructive winds - Some roof and structural damage.
- **Category 4:** 225 - 279 km/h Very destructive winds - Significant roofing and structural damage
- **Category 5:** More than 280 km/h extremely destructive winds - Extremely dangerous with widespread destruction.

2. INTERNATIONAL WORKSHOP ON DISASTER RESILIENT INFRASTRUCTURE

Context

International Workshop on Disaster Resilient Infrastructure is being organised by the National Disaster Management Authority (NDMA) in collaboration with United Nations Office for Disaster Risk Reduction (UNISDR), and in partnership with the Global Commission on Adaptation, United Nations Development Programme and the World Bank.

About

- The workshop will bring together countries from different parts of the world, multilateral development banks, UN agencies, academia and research institutions, the private sector, academics and policy think tanks to discuss and collaborate on promoting policies and practices towards achieving disaster resilience of large infrastructure systems (transport, telecom, energy, water). This will also be a great opportunity to learn from the unique experiences of different countries.
- Various international agreements have also reiterated the importance and long-term benefits of investing in resilient infrastructure.
- The first International Workshop on Disaster Resilient Infrastructure (IWDR I 2018) was held in January 2018.

The workshop aims to:

- Identify good practices of disaster risk management in key infrastructure sectors,
- Identify specific areas and pathways for collaborative research on DRI (Transport, Energy, Telecom and Water),
- Discuss and co-create the broad contours of the Coalition for Disaster Resilient Infrastructure (CDRI) as well as a notional roll-out plan for the next three years, and
- Build a forum for members to work on areas of common interest and make specific commitments.

The main objectives of the workshop are to:

- Take stock of impact of disasters on different infrastructure sectors and good practices in making infrastructure disaster resilient;
- Identify critical gaps in current practices that need to be addressed in the coming years; and
- Identify good practices and potential areas of collaboration along four themes:
 - Development of risk assessment methodologies, risk metrics and indicators of sustainability for different infrastructure classes;
 - Issues of standards, design and regulation for infrastructure development, operations and maintenance;

- Financing for disaster resilient infrastructure including risk transfer mechanisms; and
- Reconstruction and recovery of key infrastructure sectors after disasters.

3. FLOOD MANAGEMENT AND BORDER AREAS PROGRAMME (FMBAP)

Context

Cabinet approves “FMBAP” for Flood Management Works in entire country and River Management Activities and works related to Border Areas during 2017-18 to 2019-20.

About

- The Scheme “FMBAP” has been framed by merging the components of two continuing XII Plan schemes titled “Flood Management Programme (FMP)” and “River Management Activities and Works related to Border Areas (RMBA)”.
- The aim of the Scheme is to assist the State Governments to provide reasonable degree of protection against floods in critical areas by adopting optimum combination of structural and non-structural measures and enhancing capabilities of State / Central Government officials in related fields.

Features-

- The works under the scheme will protect valuable land from erosion and flooding and help in maintaining peace along the border.
- The Scheme aims at completion of the on-going projects already approved under FMP. Further, the scheme also caters to Hydro-meteorological observations and Flood Forecasting on common rivers with the neighbouring countries.
- The Scheme also includes survey and investigations, preparation of DPR etc. of water resources projects on the common rivers with neighbouring countries like Pancheshwar Multipurpose Project, Saptakosi-Sun Kosi Projects in Nepal which would benefit both countries.

Funding pattern-

- The funding pattern for FM Component for works in general category States will continue to be 50% (Centre) : 50% (State) and for projects of North Eastern States, Sikkim, J&K, Himachal Pradesh and Uttarakhand, the funding pattern will continue to be 70% (Centre) : 30% (State).

Benefits-

- It will be implemented throughout the country for effective flood management, erosion control and anti-sea erosion.
- The proposal will benefit towns, villages, industrial establishments, communication links, agricultural fields, infrastructure etc. from floods and erosion in the country.
- The catchment area treatment works will help in reduction of sediment load into rivers.



1. INTERNATIONAL DAM SAFETY CONFERENCE

Context

- Central Water Commission in collaboration with Odisha Water Resources Department and World Bank has organized the International Dam Safety Conference in Bhubaneswar, Odisha.

About

More on news

- International Commission on Large Dams (ICOLD) and National Committees on Large Dams were among the organizing partners for this conference.
- Dam Safety Conferences are being organized as an annual event in different Dam Rehabilitation and Improvement Programme (DRIP) States in collaboration with the Implementing Agencies and leading academic institutes to provide a common platform for all stakeholders including non-DRIP States.
- Conference aims on deliberate all aspects related to dam safety and the solutions that worked best in addressing dam safety concerns.

Why is Dam rehabilitation and dam safety necessary?

- India ranks third globally with 5264 large dams in operation and about 437 are under construction. In addition, there are several thousand smaller dams.
- According to National Register of Large Dams (NRLD) maintained by Central Water Commission (CWC) 209 dams are 100 years or more old in India.
- Dams are vital for ensuring the water security of the country therefore constitute a major responsibility in terms of asset management and safety.

Dam Rehabilitation and Improvement Programme (DRIP)

- In 2012, Ministry of Water Resources, River Development & Ganga Rejuvenation embarked upon the six year DRIP with World Bank assistance.
- The objective was to improve safety and operational performance of selected dams, along with institutional strengthening with system wide management approach.
- The project originally envisaged the rehabilitation and improvement of 223 dam projects in four states namely, Kerala, Madhya Pradesh, Odisha, and Tamil Nadu.
- Later Karnataka, Uttarakhand (UJVNL) and Damodar Valley Corporation (DVC) joined the DRIP and presently 198 dam projects are being rehabilitated.
- DRIP has been successful in bringing together dam owners, engineers, scientists, academicians, industries, World Bank as well as renowned dam safety professionals.
- In addition to rehabilitation of dams, other important activities include activities such as development of Dam Health and Rehabilitation Monitoring Application (DHARMA) etc.

- It also developed Seismic Hazard Mapping along with development of Seismic Hazard Assessment Information System (SHAISYS).
- Under DRIP, capacity building in dam safety area of eleven academic institutions is being done.
- Also, capacity building of two Central Agencies i.e. Central Soil and Material Research Station (CSMRS) as well as Central Water and Power Research Station (CWPRS), is also one of the activities.
- Collaboration with few renowned international agencies for capacity building includes Deltares Netherlands, Bureau of Reclamation USA, and Japan Water Agency Japan, Entura.
- The overall supervision and coordination has been entrusted to Central Water Commission, and is being assisted by Egis Eau, Engineering and Management Consultant.

2. SHIFTING OF NORTH MAGNETIC POLE

Context

- Scientists have released a new World Magnetic Model (WMM) to represent the fast drifting of the magnetic North Pole, from the Canadian Arctic to Russia. Since 2000 the rate of moving has jumped from about nine miles (14.5km) to 34 miles (55km) a year.
- A new and updated version of the WMM is released every five years.

About

What are magnetic poles and how are they different from geographical poles?

- The magnetic North Pole, or South Pole, does not coincide with the geographical North or South Pole.
- Currently, the magnetic North Pole is located somewhere over northern Canada, a fact discovered in 1831 by Sir James Clark Ross.
- Earth behaves like a giant bar magnet characterized by its magnetic north and south poles, which are not static. A compass points towards magnetic north.
- The Earth's magnetic behaviour is far more complex than that of a simple bar magnet. Its north poles and south poles move around sometimes erratically.
- Over large periods of time, they change their locations significantly, sometimes even interchanging their positions.
- The last time it so happened, with the magnetic North Pole getting somewhere near where the magnetic South Pole currently is, was about 780,000 years ago.

What is the source of magnetic field of earth?

- The origin of Earth's magnetism lies in its outer core, a more than 2,000-km layer of liquid iron and some other metals like nickel that surrounds the central core, or the innermost part.
- This liquid iron is in constant motion due to Earth's rotation and various other reasons, and this motion produces a magnetic field.

What causes the current shift?

- The movement of liquid iron and other metals in the outer core of the Earth is known to influence the magnetic field, but this movement is chaotic and turbulent. Though it has not been fully understood but scientists hope that this acceleration in the shifting of magnetic north pole would throw some new insights into the phenomena happening deep inside the Earth's surface.
- The pole's recent travels are believed to be caused by the formation of a narrow stream, much like the jet stream in the atmosphere, in the Earth's liquid outer core.
- The iron-nickel core is so hot that it flows like water, 1,869 miles (3,000km) beneath the surface, creating the magnetic field and dragging it around the planet.

- The north magnetic pole has been caught up in this jet and it's pushing it rapidly across to Siberia.
- The south magnetic pole is moving far more slowly than the north, because the liquid outer core is moving differently in the southern hemisphere.

Does it mean stronger magnetic field for earth at present?

- Earth's magnetic field is growing steadily weaker, leading scientists to think it will eventually flip, with the north and south poles changing places like a bar magnet flipping over.
- Researchers know from traces left in rocks that this has happened before, but not in the past 780,000 years.
- Magnetic field's movement, and the rise and fall in its strength, are all part of its natural behaviour.
- In the long term, the movement of the north magnetic field could become noticeable because it affects where aurora, such as the northern lights, can be seen.
- The aurora is centred on the north magnetic pole in a ring, so as the pole moves, the aurora will follow it.

What are the uses of World Magnetic Model?

- Accurate readings of the magnetic north pole by the WMM are vital for military, surveying and mapping, satellite/antenna tracking, undersea and aircraft navigation, airlines, search-and-rescue operations and other projects circling the North Pole.
- Smartphone and consumer electronics companies also rely on the WMM to provide consumers with accurate compass apps, maps, and GPS services.

3. 1ST INTERNATIONAL CONFERENCE ON "LANDSLIDES RISK REDUCTION AND RESILIENCE-2019"

Context

The Union Minister of State for Home Affairs inaugurated the 1st International Conference on "Landslides Risk Reduction and Resilience" in Delhi. The conference has been organised by the National Institute of Disaster Management.

About

- The conference has been organised by the National Institute of Disaster Management.
- Aim of the Conference is to explore and debate the most recent advances in landslide risk reduction and resilience.
- Continent-wise, Asia suffers the maximum damages / losses due to landslides and among the Asian countries, South Asian nations are the worst sufferers and even among South Asian countries India is one of the worse affected by landslides.
- As landslides are frequent and widespread, the annual cumulative losses worldwide amount to tens of billions of USD in terms of lost property, environmental damage, repair works, and the maintenance of defence measures.
- As per Geological Survey of India, the window of economic loss due to landslides may reach between 1-2% of the gross national product in many developing countries.

OBJECTIVES

The aim of Conference is to explore and debate the most recent advances in a discipline. This will be directed towards understanding past and present processes and through different approaches involve in landslide risk reduction and resilience with the following objectives:

- To enhance the understanding of the issues and solutions on governance and administration for landslides risk reduction and resilience

- To discuss about current practices in the landslides risk assessment, mitigation and monitoring technologies for landslide risks and resilience with case examples
- To highlight the environmental and emerging issues in context with urbanization, development and climate change
- To share experiences related to community based landslides risk reduction and resilience
- To disseminate information related to national and local strategies for landslides risk reduction and resilience as well as to develop a network mode roadmap for addressing the gaps by engaging with the institutions, researchers and experts.

SPECIAL FOCUS IS GIVEN TO:

- Governance and administrative issues and support for LRR&R
- Tools, techniques and technologies for LRR&R
- Impact of climatic change, development, urbanization, and population growth for LRR&R





1. Banihal-Qazigund tunnel

Context

- National Highway Authority of India (NHAI) has announced that Banihal-Qazigund tunnel will be commissioned soon.

About:

- BanihalQazigund Road Tunnel is an 8.5 km road tunnel at an elevation of 1,790 m in the PirPanjal range in the Indian state of Jammu and Kashmir connecting Banihal and Qazigund.
- It is a double tube tunnel consisting of two parallel tunnels - one for each direction of travel. Each tunnel is 7 m wide and has two lanes of road.
- The two tunnels are interconnected by a passage at every 500 m for maintenance and emergency evacuation.
- The tunnel will have forced ventilation for extracting smoke and stale air and infusing fresh air. It will have state of the art monitoring and control systems for security.

Significance:

- It will replace existing dependence on Jawahar Tunnel which is prone to avalanches and is closed time to time.
- The new Banihal-Qazigund tunnel's elevation is 1,790 metres (5,870 feet), 400 metres below the Jawahartunnel. This makes it less prone to avalanches.

2. Water aerodrome in Chilika Lake

Context

- The Airports Authority of India has proposed to set up a water aerodrome in Chilika Lake for starting amphibious aircraft operations in Odisha.

About

- This airport will be setup as a green field project under UDAN regional connectivity scheme.
- However, there are some chances that this project may face regulatory hurdles.
- As for six months between October and March, Chilika turns into a temporary habitat for lakhs of migratory and residential birds.
- If an aircraft flies at low height, there is every chance of the birds getting hit.
- While the bird population will be in danger, safety of passengers of amphibious aircraft will also be jeopardized.

- As aerodrome may boost tourism at a Ramasar convention site which is also the largest brackish water lake of Asia but at the same time it may cause threat to migratory birds and safety of passengers.

3. Gas Trading Hub

Context

- Ministry of Petroleum & Natural Gas has given its nod to set up the gas trading hub(s)/exchange(s) in the country wherein the natural gas can be freely traded and supplied through a market mechanism.

About

- Draft National Energy Policy of NITI Aayog advocates for investment of US \$ 150 billion in energy sector on an annual basis until 2040 to strengthen this sector for a better developmental pace.

What is a gas Trading/ Exchange hub?

- Natural gas hubs tend to be at the heart of gas infrastructure networks such as pipelines and liquefied natural gas (LNG) terminals.
- The hub is used as a central pricing point for the network's natural gas. In some cases, a financial derivative contract is priced off gas delivered at this point as well.

Significance of a Gas Trading Hub:

- Establishing a Gas Trading hub takes time, investment and political will !to let prices develop without regulatory intervention.
- Gas hubs require pipeline networks and storage sites that allow supplies to be traded and moved about at short notice.
- Diverse sources of gas supply, including from domestic output, pipeline imports and overseas LNG shipments, are seen as favorable to avoiding domination by a few producers.
- A strong consumer base, with competing buying interests - for example, from household, power and industrial consumers - is also seen as crucial to developing a diverse market place.
- Regulation allowing domestic and foreign participants to trade and access pipelines and storage facilities is also seen as essential to establishing a gas hub. Participants also need to know they can trust a government not to intervene when prices go against local interests.
- An oversupply of gas is also seen as necessary in the early stages of developing a trading hub to allow the commodity to be exchanged in significant volumes.

Major Gas Trading Hubs of the world:

- The world's biggest natural gas hub is the Henry Hub in the U.S. state of Louisiana.
- Britain's National Balancing Point (NBP) and the Dutch Title Transfer Facility (TTF) have emerged as the main natural gas hubs in Europe.
- Japan, China, India and Singapore in Asia are trying to establish gas trading hubs.



1. MASSIVE RESERVES OF MERCURY HIDDEN IN PERMAFROST

Context

Researchers have discovered permafrost in the northern hemisphere stores massive amounts of natural mercury, a finding with significant implications for human health and ecosystems worldwide.

About:

- Researchers from American Geophysical Union have discovered permafrost in the northern hemisphere which stores massive amounts of natural mercury.
- The study revealed that northern permafrost soils are the largest reservoir of mercury on the planet, storing nearly twice as much mercury as all other soils, the ocean and the atmosphere combined.
- Thawing of permafrost due to global warming can release mercury into ocean and can impact ecosystem in different ways.
- Mercury accumulates in aquatic and terrestrial food chains, and has harmful neurological and reproductive effects on animals.

Advantages:

- If mercury reserve found in permafrost can be exploited, it can serve humanity.
- Mercury is the only metal which is in liquid state at room temperature and has high coefficient of expansion.
- Mercury is still used for the manufacture of industrial chemicals and for electrical and electronic applications.

Disadvantages:

- If the mercury is transported across waterways, it could be taken up by microorganisms and transformed into methylmercury.
- This form of mercury is a dangerous toxin that causes neurological effects in animals ranging from motor impairment to birth defects.
- This is called Minamata disease, or Chisso-Minamata disease, which is a neurological syndrome caused by severe mercury poisoning.

2. INDIA JOINED IEA BIOENERGY TCP

About:

Bioenergy:

- Bioenergy is one of many diverse resources available to help meet our demand for energy. It is a form of renewable energy that is derived from recently living organic materials known as biomass, which can be used to produce transportation fuels, heat, electricity, and products.
- International Energy Agency's Technology Collaboration Programme on Bioenergy (IEA Bioenergy TCP)
- International Energy Agency's Technology Collaboration Programme on Bioenergy (IEA Bioenergy TCP) is an international platform for co-operation among countries with the aim of improving cooperation and information exchange between countries that have national programmes in bioenergy research, development and deployment.
- IEA Bioenergy TCP works under the framework of International Energy Agency (IEA) to which India has "Association" status since 30th March, 2017.
- The primary goal of joining IEA Bioenergy TCP by Ministry of Petroleum & Natural Gas (MoP&NG) is to facilitate the market introduction of advanced biofuels with an aim to bring down emissions and reduce crude imports.
- IEA Bioenergy TCP also provides a platform for international collaboration and information exchange in bioenergy research, technology development, demonstration, and policy analysis with a focus on overcoming the environmental, institutional, technological, social, and market barriers to the near- and long-term deployment of bioenergy technologies.
- The R&D work in IEA Bioenergy TCP is carried out within well-defined 3-years programmes called "Tasks". Each year the progress of the Tasks is evaluated and scrutinized and each 3 years the content of the Tasks is reformulated and new Tasks can be initiated.
- Technical persons from Public sector Oil marketing companies will also be contributor in the Tasks participated by MoP&NG.

Significance:

- It will give a boost to India's commitment to harness 227 GW of Renewable energy by 2020 (Previously it was 175 GW).
- India has vast potential to develop bioenergy as it is 10th richest country in terms of forest cover.
- India has also largest cattle population in the world which are producers of biomass as byproducts which can be used to harness bioenergy.
- A part from it India's crop residues can be used to produce this renewable form of Energy.
- International collaboration in terms of R&D and technology transfer will also help India to grow in this sector.

3. INDIA AND THE GLOBAL COMPACT FOR MIGRATION

Context

The Global Compact for Safe, Orderly and Regular Migration, a non-binding agreement for the better management of migration, was adopted by the United Nations member countries.

About:

- The major goal of the Global Compact for Migration is to assist nation states to frame well-managed migration policies.
- India is not a signatory to the UN Refugee Convention of 1951 or the 1967 Protocol, which protects refugee rights.
- Hence, signing of global compact of migration is a better step by India as it is one of the worst hit countries by illegal migration and is also the world's largest contributor of migrant workforce.

Global Compact for Migration

- It is a non-binding agreement, which aims for Safe, Orderly and Regular Migration (GCM) aims to better manage migration at local, national, regional, and global levels, including reducing the risks and vulnerabilities that migrants or refugees face at different stages of their journey.
- Despite its non-binding nature, the adoption of the compact has led to a wide range of discussions within and outside parliaments, especially in receiving states.
- Out of the 193-member states, 164 countries have adopted the compact.

Implications on India of migration treaties:

- Among the emigrant countries, India receives the highest amount of remittance per year. The World Bank classifies India as one of the top emigrating countries in the world, and the Indian diaspora is identified as the largest in the world.
- Simultaneously, India has witnessed immigration to the country over the years, especially from neighboring countries.
- Another stream is the internal migration within India. But, the Indian state's approach towards all three streams of migration is not explicit in nature and the management of migration is ill-developed as compared to other major sending and receiving countries.
- There is no balanced migration policy in the country which has led India to face criticism over the migration issue.

Significance:

- By signing global compact for migration, India will ensure its emigrants safety and will draft a migration policy with the help of GCM (Global Compact for Migration).
- India has a long history of immigration from Tibet, Bangladesh, Sri Lanka, Pakistan, Afghanistan and recently Myanmar.
- India has also internal migration from eastern and North-eastern states to western and North-western states. Hence, India needs a migration policy to counter these problems.
- India's limited natural resource has been overburdened by its population explosion and regular illegal immigration. A migration policy will help to manage migration issues in a better way.
