

Current Affairs from 13th May to 24th May 2019

Indo-Australia relation:

Why in News?

Although the Australian Navy is, at present, —hanging off|| COMCASA — India’s secure communications agreement with the U.S. — Australia and India are —moving forward|| toward a classified-level communications environment.

Details:

- COMCASA (the Communications Compatibility and Security Agreement) was a —major step forward||, especially for interactions between navies of two countries that are restricted to the classified environment, for example conversations on counter-terrorism.
- —Now India is moving to classified communications environment that one would see, for instance, in the operations [relating to counter-terrorism, anti-piracy and maritime security], where there’s a bunch of like-minded countries that have a communications system that is operating at the classified level, to be able to allow them to talk together,
- Australian officials said that for a basic exchange of pleasantries and identity, and then doing —some things together||, Indian Navy commanding officers no longer must go back to New Delhi to get authority.
- This could even be for conducting an —exercise, in a simple set of manoeuvres, or some gunnery.

About COMCASA:

- COMCASA stands for Communications Compatibility and Security Agreement and is one of the four foundational agreements that the U.S. signs with allies and close partners to facilitate interoperability between militaries and sale of high end technology.
- COMCASA is an India-specific version of the Communication and Information on Security Memorandum of Agreement

(CISMOA). It comes into force immediately, and is valid for a period 10 years.

- COMCASA allows India to procure transfer specialised equipment for encrypted communications for US origin military platforms like the C-17, C-130 and P-8Is. Currently, these platforms use commercially available communication systems.

Apache Helicopter:

Why in News?

The first AH-64E Apache attack helicopter built for India was formally handed over to the Indian Air Force (IAF) at the Boeing production facility in Mesa, Arizona in the U.S. on Saturday.

About the Apache:

- The first batch of these helicopters is scheduled to be shipped to India by July this year.
- The Air Force had contracted 22 Apache helicopters from the U.S. Govt and Boeing in September 2015.
- The helicopter has been customised to suit IAF's future requirements and would have significant capability in mountainous terrain.
- The helicopter has the capability to carry out precision attacks at standoff ranges and operate in hostile airspace with threats from ground.

Important Features:

- **Boeing AH-64 Apache** is an American twin-[turboshaft attack helicopter](#) with a tailwheel-type [landing gear](#) arrangement and a tandem cockpit for a crew of two. It features a nose-mounted sensor suite for [target acquisition](#) and [night vision systems](#).

- It is armed with a [30 mm \(1.18 in\) M230 chain gun](#) carried between the main landing gear, under the aircraft's forward fuselage, and four [hardpoints](#) mounted on stub-wing pylons for carrying armament and stores, typically a mixture of [AGM-114 Hellfire](#) missiles and [Hydra 70](#) rocket pods.
- The AH-64 has significant systems redundancy to improve combat survivability

Electric Vehicles in India:

The story so far:

Ola Electric is undertaking several pilot programmes including charging solutions, battery swapping stations, and deploying two- and three-wheeler electric vehicles. Will Ola Electric's initiative provide the spark to meet India's ambitious goal of having 30% electric vehicles by 2030?

What is India's policy for electric vehicles?

- While carmakers in the rest of the world have been focussing on electric cars in the premium segment (costing over ₹10 lakh), India is targeting smaller vehicles.
- The reason for this is, according to NITI Aayog, 79% of vehicles on Indian roads are two-wheelers, while three-wheelers and cars costing less than ₹10 lakh account for 4% and 12% of the vehicle population, respectively.
- Concentrating on small electric vehicles will help meet domestic demand and place India in a —position of global leadership||.
- While China, the U.S. and a few European countries offer various subsidies up to 40% to encourage uptake of electric cars, India wants to offer non-fiscal incentives.
- In the next five years, India aims to have at least 15% of electric vehicles on the road.
- To encourage faster adoption, incentives will be provided on purchase of an electric vehicle. The scheme will support 10

lakh two-wheelers, 5 lakh three-wheelers, 55,000 four-wheelers and 7,000 buses.

- The aim is to set up charging stations and other infrastructure under 'Make in India'.

What's the driving range of electric vehicles?

- In electric cars using lithium ion battery (the most widely used battery worldwide), it is between 200 and 300 km per charge.
- The driving range in a city is typically 25-30 km per day.
- Battery technology to increase driving range and energy density has been and will continue to be the focus area in the coming years.
- The most important determinant will be the lifespan of the battery.
- As per current battery technology, its lifetime will be shorter than the rest of the vehicle.

How long will it take to charge the battery?

- Currently, batteries used in electric cars have capacities of 50 kWh (kilowatt hour) and can be charged overnight using the existing power supply available at home.
- Like in the case of mobile phones, batteries used in electric vehicles can be fast-charged using 7 and 22 kW supply.
- Charging stations at service stations have 50 or 120 kW supplies and the battery can be charged in 20-30 minutes.
- But fast-charging causes overheating and degradation, and if done frequently reduces battery life.

Will electric vehicles reduce carbon emission?

- At nearly 55%, electricity generation in India is primarily using coal.
- Hydroelectric generation is 13% and renewable energy sources including small hydro projects, wind and solar, account for about 21%.
- So like in the case of the U.S. and China, net reduction in carbon emission will not be much even if there is large-scale adoption of electric vehicles in India.

- This is unlike France and the U.K., where non-fossil fuel is a major source of electricity generation.
- However, cities and town using electric vehicles in large numbers will see a reduction in exhaust-pipe emissions, particularly particulate matter.
- This will be important in the case of India which is home to 14 of the 20 most polluted cities in the world.

Can used batteries be recycled?

- Lithium ion batteries used in electric vehicles can be recycled.
- According to the *Financial Times*, China and the European Union have rules that make carmakers responsible for recycling their batteries.
- Battery recycling will become an industry by itself by 2025 when used batteries will become plentiful.

Is there enough cobalt to meet the demand?

- In lithium ion batteries, cobalt is a key component of the cathode (positive electrode).
- Cobalt plays a pivotal role in preventing overheating and provides stability to the battery thus allowing charging and discharging over many years.
- Cobalt is a by-product of mining nickel and copper.
- About 60% of the world's supply of cobalt comes from the [Democratic Republic of Congo](#), the mining of which has been linked to human rights abuse including child labour.
- As battery technology evolves, the amount of cobalt used may reduce or even stop. ||.

Asiatic Lion Genome Sequencing:

Context:

For the first time, the entire genome of Asiatic lion, an endangered species, has been sequenced by scientists from CSIR-Centre for Cellular and Molecular Biology, Hyderabad.

De novo sequencing and annotation have resulted in a draft assembly of the entire genome of a male Asiatic lion.

Comparative study:

With the complete genome of royal Bengal tiger, African Cheetah and Jaguar available, comparative studies of all these big cats would be possible.

Only partial genomic information of the African lion was available now.

Comparative genomics between African and Asiatic lions could be undertaken once the complete genome of the African lion is sequenced.

Advantages of Sequencing:

- The population of the endangered Asiatic lion is very low — only 523 animals are present in the Gir forests.
- The genome sequencing would enable scientists to develop specific markers to study population [genetics](#) (the differences at the gene level within a population) and get newer insights into its population status and subsequent management.
- Comparative analysis with other felids and mammalian genomes unravelled the evolutionary history of the Asiatic lion and its position among other felids.
- The study noted that the evaluation of genetic diversity placed the Asiatic lion in the lowest bracket of genomic diversity index highlighting the gravity of its conservation status.
- The genome is estimated to be 2.3 Gb (Gigabase) long and is found to have 20,543 protein-coding genes.

Multi-pronged approach

- They found several candidate genes which are up-regulated in Asiatic lion and a few of them were specific to males.
- As regards the crucial aspect of conservation of Asiatic lions, there is a need to adopt a multi-pronged approach and the study will enable better disease and population management

of the endangered big cat by identifying characteristics which are specific to Asiatic lions.

Rain loving Snake:

Why in News?

It's literally raining reptiles in the Northeast, and the latest to be discovered has a Mizo name that means rain-loving.

A month after a Russian journal published the discovery of a reddish-brown pit viper in Arunachal Pradesh, the New Zealand-based journal *Zootaxa* has come out with the discovery of a non-venomous snake in Mizoram.

About the Snake:

- The new genus and species of the natricine — predominantly aquatic — that took a seven-member team of herpetologists 12 years to document, has been named *Smithophis atemporalis* after eminent British herpetologist Malcolm Arthur Smith for his immense contribution to Indian herpetology.
- Although new to science, the discovery is locally called Ruahlawmrul or rain-loving snake.
- The maximum recorded size of the new species is 655 mm and is commonly seen in human dominated landscapes after rains.

Distinct species

- Based on DNA and morphology, the study established that the two species are not at all closely related and what was once considered to be a single species from the Northeast, are actually two distinct species.
- While the species from the Western Ghats continues to remain in the genus *Rhabdops*, the two species from the Northeast have been assigned to a new genus — *Smithophis*.

- The species from Mizoram lacks specific enlarged scales in the temporal region of the head.
- This character is extremely rare in snakes of this family, hence its name *Smithophis atemporalis* or the Mizo rain snake.

WTO Ministerial Meeting

Why in News?

A WTO Ministerial meeting of developing countries is being hosted by India in New Delhi on 13-14 May 2019.

About the Meeting:

Sixteen developing countries, Six Least Developed Countries (LDC)(Argentina, Bangladesh, Barbados, Benin, Brazil, Central African Republic (CAR), Chad, China, Egypt, Guatemala, Guyana, Indonesia, Jamaica, Kazakhstan, Malawi, Malaysia, Nigeria, Oman, Saudi Arabia, South Africa, Turkey, Uganda)and DG, WTO are participating in the meeting.

The two-daymeeting will be interactive in order to provide an opportunity to the Ministers to discuss various issues and the way forward.

The meeting is being held at a time when the multilateral rule-based-trading system is facing serious and grave challenges.

Reasons of Meeting:

- In the recent past, there have been increasing unilateral measures and counter measures by members, deadlock in key areas of negotiations and the impasse in the Appellate Body, which threaten the very existence of Dispute Settlement Mechanism of the WTO and impacts the position of the WTO as an effective multilateral organisation.
- The current situation has given rise to demands from various quarters to reform the WTO.
- This meeting at New Delhi is an effort to bring together the developing countriesand Least Developed Countries on a platform for sharing common concerns on various issues affecting the WTO and work together to address these issues.

Expected Benefits:

- The two-day meeting also provides an opportunity to the developing countries and LDCs to build consensus on how to move forward on the WTO reforms, while preserving the fundamentals of the multilateral trading system enshrined in the WTO.
- The deliberations will aim at getting a direction on how to constructively engage on various issues in the WTO, both institutional and negotiating, in the run up to the Twelfth Ministerial Conference of the WTO to be held in Kazakhstan in June 2020.

ABHYAS

Why in news?

Defence Research and Development Organisation (DRDO) conducted successful flight test of ABHYAS - High-speed Expendable Aerial Target (HEAT) from Interim Test Range, Chandipur in Odisha today.

The flight test was tracked by various RADARS & Electro Optic Systems and proved its performance in fully autonomous way point navigation mode.

About ABHYAS:

- The configuration of ABHYAS is designed on an in-line small gas turbine engine and uses indigenously developed MEMS based navigation system for its navigation and guidance.
- The performance of the system was as per simulations carried out and demonstrated the capability of ABHYAS to meet the mission requirement for a cost effective HEAT.
- The Abhyas is launched from a mobile launcher with the help of two 68 mm booster rockets (being manufactured at

ordnance factories). At the end of its launch phase the burnout booster rockets are jettisoned.

- Thereafter, the main gas-turbine engine powers the vehicle during cruise phase.
- Abhyas's [radar cross-section](#) (RCS) as well as its visual and [infrared signatures](#) can be augmented to simulate a variety of aircraft for air-defense weapon practices.
- It can also function as a jammer platform and decoy.
- The HEAT system is utilized to do away with the post-launch recovery mode, which is time-consuming and difficult in a scenario as the sea.

Environment Impact Assessment (EIA):

Why in News?

The Ministry of Environment and Forest (MoEF) has granted the Terms of Reference (ToR) to Vedanta Ltd's Cairn Oil & Gas, to carry out Environment Impact Assessment (EIA) for drilling a total of 274 offshore and onshore oil and gas exploration wells in the Bay of Bengal, Nagapattinam, Karaikal, Villupuram and Puducherry.

About EIA



- The ToR for carrying out an EIA is the first in a series of steps that need to be completed and certified for setting up a project.
- The EIA will study the environmental impact of the project, explain the consequences and the mitigation measures to be undertaken.
- Approval for carrying out the EIA is no guarantee of a project being granted the final nod, but generally, it is granted clearance, unless the reasons are too difficult to justify.
- "Under the provisions of the EIA Notification 2006, as amended, the Standard ToR for the purposes of preparing the environmental impact assessment report and the environment management plan for obtaining prior environmental clearance is prescribed with public consultation.

MLA Disqualification Issue:

The story so far:

On May 6, the Supreme Court stayed the proceedings initiated by Tamil Nadu Assembly Speaker P. Dhanapal for the disqualification of three MLAs of the ruling All India Anna Dravida Munnetra Kazhagam (AIADMK) — E. Rathinasabapathy (representing Aranthangi constituency), V.T. Kalaiselvan (Virudhachalam) and A. Prabhu (Kallakurichi) under the anti-defection law.

How did it come about?

The rebel MLAs made two arguments in the Supreme Court.

- One, they accused the Speaker of having —acted in a partisan and biased manner||
- Two, they contended that Mr. Dhanapal should not act on the disqualification matter while a motion of no-confidence against him was pending.
- Apparently, the AIADMK's plan was to establish that by supporting Mr. Dhinakaran, the three MLAs had —voluntarily given up|| membership of the party. It was the same ground on which 18 pro-Dhinakaran MLAs were disqualified in September 2017.

Why does it matter?

- The show-cause notice was issued about 10 days after polling took place for 38 Lok Sabha constituencies and 18 Assembly seats, for which by-elections were held. Four more Assembly constituencies will also see by-polls on May 19.
- This means the Assembly will be at its full strength of 234 once the results are out.
- If all the 22 vacancies are filled, the ruling party has to show 118 members on its side.

- Had the court not stayed the disqualification proceedings, the three MLAs could have been disqualified, and the House's strength brought down to 231.
- In that case, the AIADMK would need only 116 members, just two more than its present strength.

What are the rules on disqualification?

- As per Paragraph 2 of the Tenth Schedule to the Constitution, a Member of Parliament or Legislative Assembly or Legislative Council can be disqualified on two grounds: if the member voluntarily gives up membership of the party on whose ticket he or she got elected; or, if the member votes or abstains from voting in the House contrary to any direction of such party.
- However, disqualification may be avoided if the party leadership condones the vote or abstention within 15 days.
- The procedure for disqualification is laid down in the Members of the Tamil Nadu Legislative Assembly (Disqualification on Ground of Defection) Rules, 1986. Each State has similar rules.

What lies ahead?

- After the Supreme Court's notice is served on the Assembly Speaker and his office, the normal practice is that the Assembly Secretary will file a response.
- The results of the by-elections to 22 Assembly constituencies will also have a bearing on what happens from now on.
- If the ruling AIADMK wins a comfortable number of seats, it won't mind if the motion against the Speaker is taken up first.
- This will have the effect of rendering redundant one of the arguments of the rebel legislators: the Speaker facing a motion for his own removal should not adjudicate disqualification issues.
- There are at least two more MLAs against whom the party may initiate action for going against the AIADMK leadership.
- If the DMK wins in all 22 seats, there can be a regime change, which may be followed by the election of a new Speaker. In

that case, the disqualification proceedings may not be pursued at all.

Moon Shrinkage:

Context:

The Moon is shrinking as its interior cools — getting over 50 metres skinnier through the last several hundred million years — and causing quakes on the lunar surface, a study has found. Just as a grape wrinkles as it shrinks down to a raisin, the Moon gets wrinkles as it shrink.

Mechanism:

Unlike the flexible skin on a grape, the Moon's surface crust is brittle, so it breaks as the Moon shrinks, forming —thrust faults|| where one section of crust is pushed up over a neighbouring part.

These faults are still active and likely producing moonquakes today as the Moon continues to gradually cool and shrink.

Some of these quakes can be fairly strong, around five on the Richter scale.

These fault scarps resemble small stair-step shaped cliffs when seen from the lunar surface, typically tens of metres high and extending for several kilometres.

How was it Detected?

- The study, published in the journal *Nature Geoscience*, analysed data from four seismometers placed on the Moon by the Apollo astronauts using an algorithm, or mathematical programme, developed to pinpoint quake locations detected by a sparse seismic network.
- The algorithm gave a better estimate of moonquake locations.
- Seismometers are instruments that measure the shaking produced by quakes, recording the arrival time and strength

of various quake waves to get a location estimate, called an epicentre.

- Astronauts placed the instruments on the lunar surface during the Apollo 11, 12, 14, 15, and 16 missions.
- Other evidence that these faults are active comes from highly detailed images of the Moon by NASA's Lunar Reconnaissance Orbiter (LRO) spacecraft.
- The Lunar Reconnaissance Orbiter Camera (LROC) has imaged over 3,500 of the fault scarps.
- Some of these images show landslides or boulders at the bottom of relatively bright patches on the slopes of fault scarps or nearby terrain.

Global warming:

Introduction:

- The Earth and the atmosphere surrounding it receive radiation from the Sun, and get —heated||.
- Some of the gases in the atmosphere, notably carbon dioxide (CO₂) absorb this heat radiating from the earth's surface and bounce it back. T
- This is what keeps the earth- land and seas- at a temperature range —comfortable|| for us humans and the other organisms inhabiting the earth today. We thus live in a large —green house||.

Why Global warming?

- What happens when the level of these greenhouse gases increases?
- The temperature will rise. And this rise has been due to increases in the levels of CO₂ and other gases, produced upon burning carbon-rich fuels (coal, wood, petroleum products).
- Over the last 100 years alone, the global temperature has risen by close to 2 degree.

- And if we do not reduce or stop these fuels and use alternate sources of energy (solar, wind and others), the global temperature will rise further.

Threats Posed :

- We already see it in the form of the melting of ice caps and glaciers, causing a rise in sea level.
- This can submerge small island countries such as Maldives and Mauritius.
- It has also led to a change in the global climate, causing errant monsoons, cyclones, tsunamis, El Nino and so on, affecting life on earth and in the oceans (fish, algae, coral reefs).
- Temperature rise and climate change affect not just some countries but the entire globe, on which all species live- humans, animals, plants, fish, microbes.
- And if it is left uncontrolled, disaster looms for all life across the globe.
- Climate change, plus relentless industrial farming and fishing are leading to the extinction of 1 million species from Mother Earth within decades.

Action Taken:

- It is for acting against this catastrophe that the UNO brought countries across the world get together and in 2015 came up with what is called the Paris Agreement 2015 wherein they decided to make all efforts contain the temperature rise to no more than 1.5 degrees.
- While 195 countries across the globe signed the Paris Agreement and promised to take steps towards it, some oil producing/ importing) countries such as Turkey, Syria, Iran and USA have not. President Trump says climate change is —fake||!

Measures Required:

- We need to do two urgent things.

- One is to reduce, indeed replace carbon-based fuels, with other forms of energy generation that do not generate greenhouse gases; hence solar power, wind power and others.
- The second is to enhance all natural methods which absorb CO₂.
- Forests and plants do this best. Photosynthesis is done by all varieties of plants- algae in water, mangroves on the coast, crops and forests on land.
- They absorb atmospheric CO₂ and produce oxygen for us to breathe. Tropical forests do this best; hence, deforestation in the Amazon, tropical Africa and in India must end.
- These regions also house over 200 million species of plants, animals and fungi. They are thus termed as Key Biodiversity Areas (KBAs); likewise are Marine Protection Areas (MPAs).
- They restore and protect biodiversity, increase yields and enhance ecosystem protection and defense.
- They alone help us preserve over 17% of land realm and 10% of marine areas by 2020, and preserve millions of species from extinction. But we need to do more beyond next year.

[Global Deal for Nature](#)

It is with all this in mind that a diverse group of scientists and ecologists from across the world have come up with a companion pact to the Paris Agreement, called: —A Global Deal for Nature: Guiding Principles, Milestones and Targets||.

This policy document is published on 19 April 2019 in the journal *Science Advances*, which should be read by every concerned citizen and government.

Global Deal for Nature (or GDN) has five fundamental goals:

- (1) representation of all native ecosystem types and stages across their natural range of variation;
- (2) maintain viable populations of all native species in natural pattern of abundance and distribution – or —saving species||;
- (3) maintain ecological functions and ecosystem services;
- (4) maximize carbon sequestration by natural ecosystems and

(5) address environmental change to maintain evolutionary processes and adapt to the impact of climate change.

These five goals of GDN have three Priority themes.

- Theme 1 is on *protecting biodiversity*.
- Theme 2 is on *mitigating climate changes* by conserving carbon storehouses or climate stabilization areas (CSAs) and Other Effective area- based Conservation Measures (OECMs).
- Theme 3 is on *reducing threats to ecosystems*, and concerns reducing major threats (such as overfishing, wild life trade, laying new roads cutting across forest lands, and building major dams).

Is it Economically Viable?

- And in order to do all this, the gross cost is estimated to be \$ 100 billion per year.
- Considering that these are over 200 nations across the world (plus the private sector, which too should also be involved), this is a sum well worth achievable if we are to leave the world livable for our children, and all the flora and fauna that have enriched our earth since the last 550 million years.
- And if one wishes count the pennies gained for this investment, as biodiversity conservation can actually offer \$ 50 billion annual profit for the sea food industry and save the insurance industry \$52 billion annually through reducing flood damage losses!

Ban on LTTE for five years

Context:

The Central Government has extended the ban on the Liberation Tigers of Tamil Eelam (LTTE) for another five years under sub-sections (1) and (3) of section 3 of the Unlawful Activities (Prevention) Act, 1967 (37 of 1967) with immediate effect.

What does it say?

The notification states that the LTTE's continued violent and disruptive activities are prejudicial to the integrity and sovereignty

of India; and it continues to adopt a strong anti-India posture as also continues to pose a grave threat to the security of Indian nationals.

About LTTE

- The **Liberation Tigers of Tamil Eelam** was a Tamil militant and political organization that was based in northeastern [Sri Lanka](#).
- Its aim was to secure an independent state of [Tamil Eelam](#) in the north and east in response to [the state policies](#) of successive Sri Lankan governments towards Tamils.
- Founded in May 1976 by [Velupillai Prabhakaran](#), it was involved in armed clashes against the [Sri Lankan state](#) forces and by the late 1980s was the dominant Tamil militant group in Sri Lanka.
- The escalation of intermittent conflict into a full-scale nationalist insurgency however did not commence before the [countrywide pogroms](#) against Tamils.
- Since 1983, more than 80,000 have been killed in the [civil war](#) that lasted 26 years, a large number of them who were Sri Lankan Tamil civilians

What is UAPA?

- **Unlawful Activities (Prevention) Act** is an [Indian](#) law aimed at effective prevention of unlawful activities associations in [India](#).
- Its main objective was to make powers available for dealing with activities directed against the integrity and sovereignty of India.
- The [National Integration Council](#) appointed a Committee on National Integration and Regionalisation to look into, the aspect of putting reasonable restrictions in the interests of the sovereignty and integrity of India.
- Pursuant to the acceptance of recommendations of the Committee, the Constitution (Sixteenth Amendment) Act, 1963 was enacted to impose, by law, reasonable restrictions in the interests of the sovereignty and integrity of India.

- In order to implement the provisions of 1963 Act, the Unlawful Activities (Prevention) Bill was introduced in the Parliament.

Global Facility for Disaster Reduction and Recovery (GFDRR)

Why in News?

India is unanimously chosen as co-chair of the Consultative Group (CG) of Global Facility for Disaster Reduction and Recovery (GFDRR) for the fiscal year 2020.

The decision was taken during the CG meeting of GFDRR held in Geneva, Switzerland today, on the margins of the 6th Session of the Global Platform for Disaster Risk Reduction (GPDRR) 2019.

About GFDRR:

- GFDRR is a global partnership that helps developing countries better understand and reduce their vulnerability to natural hazards and climate change.
- GFDRR is a grant-funding mechanism, managed by the World Bank, that supports disaster risk management projects worldwide.
- It is presently working on the ground with over 400 local, national, regional, and international partners and provides knowledge, funding, and technical assistance.

India and GFDRR:

- India became member of CG of GFDRR in 2015 and expressed its interest to co-chair in last meeting of CG held in October 2018.
- India's candidature was backed by its consistent progress in disaster risk reduction (DRR) in the country and its initiative to form a coalition on disaster resilient infrastructure.
- This will give the country an opportunity to work with the member countries and organizations of GFDRR with a focused

contribution towards advancing the disaster risk reduction agenda during the course of the year.

- This is the first time that the country has been afforded the opportunity of co-chairing the CG meeting of GFDRR.
- India would like to pursue a focused agenda and develop synergies with ongoing work streams of GFDRR. Disaster Resilient Infrastructure (DRI) will be a central theme of engagement with the GFDRR partners and stakeholders.

Radar and Radar evasion:

Why in News?

Prime Minister Narendra Modi's recent comment about how he gave the go-ahead for the Balakot airstrike despite bad weather as the clouds would enable Indian Air Force fighter jets to evade enemy radars, has raised a storm on social media. So, what is a radar and how does it function?

What is a radar?

- Radar stands for radio detection and ranging.
- A radar typically has a magnetron, transmitter, receiver, and a screen.
- The magnetron generates radio waves which are released through an antenna in different directions at certain time intervals.
- If there is an object in the air, an aeroplane for instance, the radio waves hit it and bounce back, to be caught by the receiver of the radar.
- By mapping the reflected waves on a screen with a grid map, the aeroplane is displayed as a blip on the screen and its movement is shown as the radio waves strike it at intervals (Remember all the Hollywood action movies!).
- This is the basic principle of a radar.

Evolution of RADAR:

- Over the decades, there have been tremendous technological advancements in radars, making them highly sophisticated and powerful.
- By virtue of being radio waves, radars can see through cloud cover, and during day and night.
- In fact, that is what they are meant to do. Imagine rough weather and overcast skies over a city, but commercial flights continue taking off and landing at the airport.
- This is because the Air Traffic Controllers (ATC) across the world depend on radars.
- All ATCs have two radars -- primary and secondary.
- The primary is a classic radar based on the principle described above. The secondary radar identifies the details of the aircraft by communicating with the transponders on the aircraft.
- Thus, radars enable continuous airport operations in cloudy conditions. And that goes for military radars as well, including those of Pakistan, which has an advanced military.

Origin of Radar

- The origin of the radar goes back to World War II, when the first radar was demonstrated in Britain in 1935.
- By the time the war began, Britain had a chain of radars along its coast to detect intruders. And by the end of WW-II, all major countries involved deployed radars.
- Ground based radars have limitations primarily due to the curvature of the earth.
- So radars were mounted on aircraft which fly thousands of feet above the ground with 360-degree coverage.
- These are known as Airborne Warning and Control System (AWACS), and are major force multipliers in today's battlefields.
- During the Balakot airstrike on February 26, IAF had fielded both indigenous and Israeli AWACS to direct the fighters jets on their strike mission and monitor the skies for any movement by Pakistani jets.

Radar evasion:

- Over the years, as radars have improved so have the technologies to evade them.
- There are many ways of evading radars or reducing the radar cross section or foot print.
- That's where the concept of stealth comes in. Stealth is a relative concept and not absolute.
- Radars essentially identify an object by the reflected radio waves.
- So if the radio waves can be deflected away from the receiver, that reduces the footprint. A classic example for this is the US F-117 which is now out of service.
- Another way is to absorb some or most of the radio waves with radar absorbent paint, and changing the shape to minimise the cross section. The iconic US B2 bomber is a perfect example for this.
- The latest stealth planes F-22 and F-35 use a combination of these to evade radars.

Rhino DNA Profile:

Why in News?

The Union Environment Ministry has embarked on a project to create DNA profiles of all rhinos in the country.

By 2021, the project's deadline, the Indian rhino could be the first wild animal species in India to have all its members DNA-sequenced.

About the Project:

- The project's proponents, including the World Wide Fund for Nature-India (WWF-India) and the Centre-funded Wildlife Institute of India (WII), said the exercise would be useful in curbing poaching and gathering evidence in wildlife crimes involving rhinos.

- There are about 2,600 rhinos in India, with more than 90% of the population concentrated in Assam's Kaziranga National Park.
- The project would formally be under way in a year.
- Around 60 samples of tissue have been collected so far from some rhinos living outside Kaziranga. .
- Once the database is complete, identifying rhinos that were killed or poached would be easier.
- The project is a subset of the Centre's larger, ongoing rhino conservation programme.

Since the 1980s, the government has been trying to move a significant number of rhinos out of Kaziranga in the interest of the species' conservation, threats from poaching and challenges to their habitat.

Rhinos in India:

- Outside Kaziranga, there are about 200 rhinos in West Bengal, 40 in Uttar Pradesh and 1 in Bihar. .
- There are three species of rhinos, of which only one — the Indian rhino — is found in the country.
- The rhinos were once abundant and well-distributed in the country.
- However poaching reduced its numbers to about —200 wild animals by the end of the 20th century.

Comprehensive Convention on International Terrorism (CCIT):

Why in News?

India has expressed support to Nigeria's Ambassador to the UN Tijjani Muhammad-Bande as the next president of the General Assembly and called him to make the body more action-oriented to deal with the global scourge of terrorism.

India drew Mr. Muhammad-Bande's attention to the long-pending global convention on international terrorism and called for action in the UN body to adopt it.

About CCIT:

- India proposed a draft document on the Comprehensive Convention on International Terrorism (CCIT) at the UN in 1986 but it has not been implemented as there is no unanimity on the definition of terrorism among the member states.
- The **Comprehensive Convention on International Terrorism** is a proposed [treaty](#) which intends to criminalize all forms of international [terrorism](#) and deny terrorists, their financiers and supporters access to funds, arms, and safe havens.
- The negotiations for this treaty are currently (May 2018) under way has been under negotiation at the [United Nations General Assembly's](#) Ad Hoc Committee established by Resolution 51/210 of 17 December 1996 on Terrorism and the [United Nations General Assembly Sixth Committee \(Legal\)](#).
- The negotiations are currently deadlocked even after two decades of proposal i.e. through 1996 till 2016.

Although consensus eludes towards adoption of the terrorism convention, but discussions have yielded three separate protocols that aim to tackle terrorism: International Convention for the Suppression of Terrorist Bombings, adopted on 15 December 1997; International Convention for the Suppression of the Financing of Terrorism, adopted on 9 December 1999; and International Convention for the Suppression of Acts of Nuclear Terrorism, adopted on 13 April 2005.

SIMBEX-19

Why in News?

On successful completion of IMDEX 19, *IN* ships Kolkata and Shakti are continuing their stay at Singapore to participate in the annual Singapore India Maritime Bilateral Exercise SIMBEX-2019 scheduled from 16 May to 22 May 19.

About SIMBEX:

- Since its inception in 1993, SIMBEX has grown in tactical and operational complexity. the annual bilateral exercise saw its

progression from traditional anti-submarine exercises to more complex maritime exercises such as advanced air defence operations, anti air/ surface practice firings, tactical exercises, etc.

- Over the years SIMBEX has stood the test of time in demonstrating the nation's commitment to enhance maritime cooperation between the two navies and bolster bonds of friendship between the two countries.
- For SIMBEX 19, the *IN* has deployed its finest assets for with an aim to strengthen mutual trust, enhance interoperability, and build greater synergy to address common maritime concerns among both navies.

Objectives:

- SIMBEX 19 would also conclude the two month long deployment of *IN* ships Kolkata and Shakti to South and East China Seas.
- It is aimed at extending the bridges of friendship through enhanced cultural, economic and maritime interactions with countries of east and south-east asia.
- *IN* ships' participation in International Fleet Review (IFR) at Qingdao, China as part of PLA (Navy) 70th anniversary celebrations and ADMM-plus MS FTX also reflects the government of India's 'Act East' policy and the Indian Navy's efforts to —*unite nations through the oceans*||.

[Shanghai Cooperation Organisation :](#)

Why in News?

External Affairs Minister Sushma Swaraj will attend a two-day meeting of the Shanghai Cooperation Organisation (SCO), beginning on Tuesday, in Kyrgyz capital Bishkek. At the meeting, several pressing issues, including threat of terrorism, are expected to be discussed.

India and SCO:

- India became a full member of the China-dominated grouping in 2017 and New Delhi's entry has increased the bloc's heft in regional geopolitics, besides giving it a pan-Asian hue.

- India is also keen on deepening its security-related cooperation with the SCO and its Regional Anti-Terrorism Structure (RATS), which specifically deals with issues relating to security and defence.
- —India actively took part in various SCO dialogue mechanisms under the Chairmanship of the Kyrgyz Republic over the past year.
- India was an observer at the SCO since 2005 and has generally participated in the ministerial-level meetings of the grouping which focus mainly on security and economic cooperation in the Eurasian region.
- Along with India, Pakistan was also granted SCO membership in 2017.

About SCO:

- The SCO was founded at a summit in Shanghai in 2001 by the presidents of Russia, China, Kyrgyz Republic, Kazakhstan, Tajikistan and Uzbekistan.
- The SCO is widely regarded as the "alliance of the East", due to its growing centrality in [Asia-Pacific](#), and has been the primary security pillar of the region.
- It is the largest regional organisation in the world in terms of [geographical coverage](#) and [population](#), covering three-fifths of the [Eurasian continent](#) and nearly half of the human population.

RISAT-2B:

What is it?

RISAT-2B, the satellite due to be launched before dawn on May 22 from Sriharikota, will mark the resumption of a vital ring of Indian all-seeing radar imaging satellites after seven years.

At least a half-dozen could be foreseen in the near future, mainly to add to the reconnaissance capability from about 500 km in space.

A constellation of such space-based radars means a comprehensive vigil over the country.

Advantages:

- When it is cloudy or dark, 'regular' remote-sensing or optical imaging satellites — which work like a light-dependent camera — cannot perceive hidden or surreptitious objects on the ground.
- Satellites that are equipped with an active sensor, the synthetic aperture radar (SAR), can sense or 'observe' Earth in a special way from space day and night, rain or cloud.
- This all-weather seeing feature is what makes them special for security forces and disaster relief agencies.
- —Radar imaging satellites are at a premium in the Earth observation scene.
- Worldwide, quite a few of them are planned to be launched.
- There is also a large availability of radar images data in the market.||

Complex task

- A radar imaging satellite is complex to assemble. Interpreting its images is equally complex.
- ISRO took almost 10 years to realise RISAT-1.
- India has almost kept pace with the world with radar sats.
- Radar imaging satellites pick up structures, new bunkers very well, and sometimes help to count them, too.
- —In India we also use radar imaging for crop estimation because our main crop growing season of kharif is in May-September when it rains and gets cloudy.
- We have used this data extensively for forestry, soil, land use, geology and during floods and cyclone.||

US-China trade war:

The story so far:

On July 6, 2018, the United States administration slapped a tariff of 25% on \$50 billion worth of imports from China. China responded immediately with retaliatory tariffs on a similar scale. On May 10, 2019, U.S. President Donald Trump raised the tariff rate to 25% (from the existing level of 10%) on \$200 billion of imports from China.

When did the trade war begin?

The first stone was cast in what looks to be a protracted global economic conflict when the Trump administration decided, in January 2018, to impose tariffs on solar panels and washing machines.

In March, tariffs were slapped on steel and aluminium.

China, already facing allegations of dumping cheap metal across global markets, retaliated with duties on \$3 billion of U.S. products.

The trade dispute between the U.S. and China now includes around 10,000 products of global trade.

Why did Mr. Trump impose tariffs on China?

The American President is a long-time critic of the U.S.'s deficit with its trading partners and believes that countries such as China do not provide a level-playing field for free trade, especially denial of market access.

There is also bipartisan consensus in the U.S. that Beijing has taken advantage of the American economy for decades, including by theft of intellectual property, leading to the loss of millions of jobs.

The U.S. trade deficit with China has soared, rising from around \$100 billion in 2000 to \$419 billion in 2018.

The Trump administration considers this a threat to economic, hence national, security.

Can tariffs address the deficit problem?

- There are structural reasons why the trade deficit may be hard to reverse.
- The U.S. earns a bulk of its net income from services, such as finance, travel and tourism, whereas China exports a far greater proportion of manufactured goods.
- Therefore, even if the intention behind the crackdown on Chinese trade practices is purposeful protectionism — shielding U.S. domestic industries from foreign competition — it is unclear that the massive shifts in global supply chains required to achieve that goal will happen any time soon, or produce the macroeconomic effects.

What has the economic impact of the tariffs been?

- Higher tariffs have already had an impact on prices for American companies and individuals.
- The price of steel and washing machines, for example, has already spiralled upward in the U.S. since the trade war kicked off.
- Reports suggest China's retaliatory tariffs, and the resulting steep fall in demand for U.S. export products, have impacted everything from soybean from North Dakota to bourbon from Kentucky and fossil fuels, copper and wood.
- Simultaneously, stock markets have almost inevitably reacted badly to every new announcement of additional tariffs.
- However, the impact that tariffs on Chinese have on overall inflation should not be exaggerated.
- According to reports, researchers at the Federal Reserve Bank of San Francisco have estimated that —China tariffs have added 0.1% to inflation for consumers and 0.3% for business investment goods||.

What has India's position been?

- While India had last year secured an exemption from the U.S. on steel and aluminium tariffs, the U.S. Trade Representative said in March 2019 that India would no longer be eligible for preferential market access to the U.S. under the Generalised System of Preferences programme.
- This meant New Delhi lost out on \$190 million per year in duty reductions.
- This comes on the back of repeated allusions by Mr. Trump to India's high tariff barriers, for example impacting Harley-Davidson motorcycles and medical devices.
- With an overall bilateral trade value of \$126.2 billion in 2017, the U.S.'s goods and services deficit with India was \$27.3 billion (2017).
- In June 2018 India joined the EU and other countries in imposing retaliatory duties to counter Washington's tariff on steel and aluminium.

When can we expect the dispute to be resolved?

- In 2018, at the G20 summit in Buenos Aires, Argentina, Mr. Trump called a —temporary truce|| with President Xi Jinping of China after the bruising year-long trade battle between their countries.
- The agreement that they reached was effectively to pause the trade war and apply themselves toward agreeing a pact.
- However, it failed to produce any tangible progress.
- A solution remains elusive for now.

Climate Change:

The story so far:

On May 10, 20 institutional investors from 11 countries convened by the U.N. Environment Finance Initiative (UNEP FI) made public [a report](#) that helps investors understand how to calculate the risk

companies face from climate change. What necessitated this new protocol, which is more like an investor guide?

What led to the investor guide?

- This guide was made in line with recommendations by the Task Force on Climate-related Financial Disclosures (TCFD), a 32-member board formed as a result of an agreement at a G20 summit in London, 2009.
- This board consisted of representatives from large banks, insurance companies, asset managers, pension funds, large non-financial companies, accounting and consulting firms, and credit rating agencies.
- The TCFD in 2017 developed voluntary, consistent climate-related financial risk disclosures for use by companies in providing information to stakeholders.
- To do that they considered the physical, liability and transition risks associated with [climate change](#) and what constitutes effective financial disclosures across industries.

Why is the report significant?

- Climate change is already impacting economies around the world and this will continue to intensify.
- Extreme weather events, including floods, tropical cyclones, and extreme hot and cold days are already physically impacting business operations.
- Several reports by the Intergovernmental Panel on Climate Change warn of myriad risk to economies but so far there's been no specific assessment of how companies can account for such risks.

How was it compiled?

- The 20 institutional investors made up an Investor Pilot Group (IPG) and used a methodology developed by an analytics firm called Carbon Delta and the IPG to determine the risk to their portfolios.
- Each of the IPG members prepared scenarios, on how an average rise of global temperature by 1.5°C, 2°C, and 3°C

respectively would impact the —portfolios|| the companies they had invested in.

- This was intended as a pilot project and a model for other companies to account for the risk of climate change to their business activities.

What does the report find?

- Investors face as much as 13.16% of risk from the required transition to a low-carbon economy:
- The 1.5°C scenario, in line with the latest special report by the Intergovernmental Panel on Climate Change, exposes companies to a significant level of transition risk, affecting as much as 13.16% of overall portfolio value.
- Extrapolating this to the total assets under management (AUM) for the largest 500 investment managers in the world — \$81.2 trillion — would represent a value loss of \$10.7 trillion.
- Utilities, transportation, agriculture as well as mining and petroleum refining sectors are at high levels of policy risk.
- On the bright side, there were profits to be made too and the report said that there was potentially \$2.1 trillion as 'green profits' for the taking.
- However, green revenues generated from the sale of low carbon technologies, which support the transition, will help companies offset costs from complying with greenhouse gas (GHG) reduction policies.

What necessitated these new protocols?

- Governments have long been collaborating with scientists who use computer models to forecast how warming will impact their economies.
- These same models, which have been the basis for inter-governmental negotiations on the greenhouse gas emission cuts they must undertake, are now being used by large companies to plan — and hedge — for the risks posed by climate change.

What is in it for India?

- India, in spite of being one of the top greenhouse gas emitters, finds no mention in this report.
- However, the guidelines proposed can — in theory at least — be adopted by any company based anywhere in the world. India has committed to reducing the emission intensity of its GDP by 33-35% below 2005 levels by 2030.

Hornbill:

Why in News?

Researchers from Nature Conservation Foundation, Mysore, have mapped the different frugivore (fruit eater) birds and their interactions that are important for the forest ecosystem.

Details:

- The study carried out in Pakke Tiger Reserve in Arunachal Pradesh noted that hornbills, one among the large-sized frugivores, are the top seed dispersers.
- Sadly, they are also the most threatened. This is because they are hunted for meat, and the tribal communities use their feathers for head dresses.
- The study looked at 43 tree species, 48 frugivore bird species that were seen visiting them.
- A single bird species could visit different tree species, and a single tree species would be visited by different bird species. So a complex network of over 400 interactions was created and studied.

Dispersal in Trees:

- The trees were classified into small-, medium- and large-seeded. The large-seeded trees mainly depended on hornbills and imperial pigeons for their dispersal.
- The medium-size seeded trees were visited by bulbuls, barbets along with hornbills and imperial pigeons.

- Though the frequency of visits was similar for all four bird species, the number of fruits removed from trees was high for hornbills.
- —Among the different bird species, hornbills were found to be the most effective seed dispersers.
- They were found to swallow and disperse most of the fruits they handled.
- They also removed maximum number of fruits — and therefore seeds — in every visit to a fruiting tree.

Importance of Dispersal Agent:

- Seeds that fall under the parent tree face heavy competition, predation by rodents and insects and fungal infections.
- So their chances of survival are very low.
- Plants depend on frugivore birds to disperse the seeds at favourable sites, which have low competition and predation pressures, to expand their geographic range.
- And so the decline of frugivores could severely affect the ecosystem.

World gets the redefined units of measurement of kilogram, Kelvin, mole and ampere

Context:

After decades of ground-breaking laboratory works, the world's scientific and technical community, in a landmark and historic decision taken in the recent open session of the General Conference on Weights and Measures (CGPM) at BIPM on 16 November 2018, has unanimously adopted the resolution to redefine four of the seven base units, the kilogram (SI unit of weight), Kelvin (SI unit of temperature), mole (SI unit of amount of substance), and ampere (SI unit of current).

What will change?

- This decision has now enabled scientists and researchers to base the SI units entirely on fundamental properties of nature, which will ensure their ongoing refinement and improvement for years to come.

- The fundamental constants are invariants of time and space and successfully replaced the artifact based units, and aptly opened up the new era for quantum world by linking all seven base units to fundamental constants/quantum standards.
- The new SI is being implemented worldwide from 20th May 2019 i.e. the World Metrology Day.
- The World Metrology Day (WMD) is celebrated annually on this very day as the Metre Convention was signed by representatives of seventeen nations on May 20, 1875.
- The Convention set the framework for global collaboration in the science of measurement and in its industrial, commercial and societal applications.

How are they measured?

- The kilogram, symbol kg, is the SI unit of [mass](#). It is defined by taking the fixed numerical value of the [Planck constant](#) h to be $6.626\ 070\ 15 \times 10^{-34}$ when expressed in the unit J s,
- "The kelvin, symbol K, is the SI unit of [thermodynamic temperature](#). It is defined by taking the fixed numerical value of the [Boltzmann constant](#) k to be $1.380\ 649 \times 10^{-23}$ when expressed in the unit J K⁻¹, which is equal to kg m² s⁻² K⁻¹.
- The mole, symbol mol, is the SI unit of [amount of substance](#). One mole contains exactly $6.022\ 140\ 76 \times 10^{23}$ elementary entities. This number is the fixed numerical value of the [Avogadro constant](#), NA, when expressed in the unit mol⁻¹ and is called the [Avogadro number](#).
- The ampere, symbol A, is the SI unit of [electric current](#). It is defined by taking the fixed numerical value of the [elementary charge](#) e to be $1.602\ 176\ 634 \times 10^{-19}$ when expressed in the unit C, which is equal to A s

8th Indo – Myanmar Coordinated Patrol

Why in News?

Myanmar Navy Ship UMS King TabinShweHtee (773) and UMS Inlay (OPV-54) have arrived Port Blair on 20 May for the Opening

Ceremony' of the 8th Indo-Myanmar coordinated patrol (IMCOR), at Andaman and Nicobar Command.

About the Initiative:

- The CORPAT initiative between the two navies is meant to address issues of terrorism, illegal fishing, drug trafficking, human trafficking, poaching and other illegal activities inimical to interest of both nations.
- Started in Mar 2013, the CORPAT series has enhanced the mutual understanding and fostered improved professional interaction between the two navies for maritime interoperability.
- The patrolling effort will be augmented by Maritime Patrol Aircraft from both the navies.
- The ships would patrol along the International Maritime Boundary Line (IMBL) between the two countries covering a distance of approximately 725 Kms over a period of four days.
- The ships will also undertake joint manoeuvres and drills during the sea phase of coordinated patrol (CORPAT) prior 'Closing Ceremony' of the CORPAT onboard Myanmar Naval Ship

Human Rights Council Report:

Why in News?

Reacting angrily to a submission from the Geneva-based Human Rights Council (HRC) on the alleged violations in [Jammu and Kashmir](#), India has informed the United Nations body that it will no longer entertain any communication with the HRC's Special Rapporteurs on its report.

About the report



- The report from the UN body came at the same time a report from two NGOs in the State on the alleged cases of torture was released in Srinagar, which was endorsed by a former UN Special Rapporteur.

- The current Special Rapporteurs on Extrajudicial Executions, Torture, and Right to Health had referred to a June 2018 report of the Office of the High Commissioner of Human Rights (OHCHR) and written to the government in March 2019, asking about steps taken by New Delhi to address the alleged human rights violations listed in the report.
- In addition, the Special Rapporteurs had listed —13 cases of concern|| from 2018 alone, in which —four children were among eight civilians killed by members of the security forces.||



India's Response:

- Rejecting all the claims, the Indian Permanent Mission to the [United Nations](#) in Geneva replied to the OHCHR saying that —India... does not intend to engage further with these mandate-holders or any other mandate-holders on the issue,|| whom it accused of —individual prejudice||.
- India had also rejected the OHCHR's report on the 'Situation of Human Rights in Kashmir' — the [first-ever such report on Jammu and Kashmir that came out in June 2018](#) — and accused the High Commissioner of Human Rights Zeid Ra'ad Al Hussein of —clear bias|| in bringing it out.
- When asked, the Ministry of External Affairs clarified that India's stand on not engaging with the Special Rapporteurs was only for those wishing to refer to the OHCHR report.

What did UN Say?

- However, UN officials say that India is already in contravention of several Conventions it has committed to, including a —Standing Invitation|| signed in 2011 to all special rapporteurs to visit India.
- According to the UN records, more than 20 such visit requests, including to Jammu and Kashmir, are pending at present.

- UN sources also said that between 2016-2018, the OHCHR Special Rapporteurs had sent as many as 58 communications, and had received no response other than the April 23 letter on Jammu and Kashmir.
- —The only response so far has been to the communication relating to Jammu and Kashmir....The last visit was by the Special Rapporteur on water and sanitation, in October-November 2017.

[Report from NGOs](#)

- The UN submission on Jammu and Kashmir coincided with the release of an extensive 560-page report on Monday, prepared by the J&K based Association of Parents of Disappeared Persons (APDP) and the J&K Coalition of Civil Society (JKCCS).
- The report, entitled ‘Torture: Indian State’s Instrument of Control in J&K’, documented 432 cases of suspected human rights violations and brutality by security forces of which only 27 had been investigated by the State Human Rights Commission.
- The report claimed that nearly —70% of torture victims in Jammu and Kashmir were civilians (not militants) and 11% died during or as a result of torture||.
- The cases included incidents of electrocution, ‘water-boarding’ and sexual torture, which the government has repeatedly denied.

[Waste Water Treatment:](#)

Why in News?

Shortage of water is an annual story in [Gujarat](#), with limited sources of fresh water and rising demand. Every year, the State faces water shortage, particularly for drinking water in far-flung areas in Saurashtra and north Gujarat, both drought-prone regions in the State.

Now, the State government has come up with a detailed plan to address the water shortage by limiting the supply of fresh water only for drinking and irrigation purposes, while the growing demand of industries will be met through treated waste water, which will be supplied by State.

Detailed plan

- In the next 3-4 years, more than 80% of the water requirement of industries will be met through the supply of treated waste water (TWW), which will be supplied from Sewerage Treatment Plants (STPs).
- Industry will get only treated water in order to reserve fresh ground water for drinking and irrigation.
- State has limited sources of fresh water while demand is rising, which forces the authorities to adopt novel ways to address the issue.
- It has capacity to treat water at STPs and since there is no demand for treated water, it gets diluted and treated water is released into water bodies or farms.
- Now, It will be made mandatory for industries to use treated waters..

Biotherapeutic medicines

Why in News?

Over 60 civil society organisations from across the world have written to the Director General of World Health Organisation (WHO) demanding revision of the global health body's 'Guidelines for Evaluation of Similar Biotherapeutic Product (SBPs),' which were adopted in 2009.

What are these products?

Biotherapeutic medicines, also known as biologics, are produced through biological processes and differ from the older generation small-molecule medicines that are derived through chemical synthesis.

Concern::

- Unfortunately, both accessibility and affordability of this new class of medicines in developing countries is abysmally poor, owing largely to their high prices.
- Civil Society groups claim that even though a Resolution of the World Health Assembly in 2014 mandates the Director General to convene the WHO expert committee on biological standardization to update the 2009 guidelines, —till date, the secretariat has neither updated the SBP guidelines nor has the WHO given any scientific reasons for the decision.
- They also sought public consultations to review the scientific evidence with respect to the need for comparative clinical trials, among other things.

Healthcare in India:

Why in News?

Despite the health sector employing five million workers in India it continues to have low density of health professionals with figures for the country being lower than those of Sri Lanka, China, Thailand, United Kingdom and Brazil, according to a World Health Organisation database.

Issues:

- Southeast Asia needs a 50% increase in healthcare manpower to achieve universal health coverage by 2030.
- India faces the problem of acute shortages and inequitable distributions of skilled health workers as have many other low- and middle-income countries.
- This workforce statistic has put the country into the —critical shortage of healthcare providers|| category. Bihar, Jharkhand, Uttar Pradesh and Rajasthan are the worst hit while Delhi, Kerala, Punjab and Gujarat compare favourably.

Statistics:

- —Data on the prevalence of occupational vacancies in the health care system in India overall is scarce.
- Government statistics for 2008, based on vacancies in sanctioned posts showed 18% of primary health centres were without a doctor, about 38% were without a laboratory technician and 16% were without a pharmacist.
- The health workforce in India comprises broadly eight categories, namely: doctors (allopathic, alternative medicine); nursing and midwifery professionals; public health professionals (medical, non-medical); pharmacists; dentists; paramedical workers (allied health professionals); grass-root workers (frontline workers); and support staff.

New courses needed

- The need of the hour is to design courses for different categories of non-physician care providers.
- Competencies (and not qualification alone) should be valued and reform must be brought in regulatory structures to provide flexibility for innovations,

High level Committee to reduce import dependency

The High-Level Committee (HLC) constituted by the Government of India to examine the issues relating to preparation of action plan to create synergy among R&D Centres of Oil & Gas PSUs; tax issues and ways to benefit from GST by the Oil & Gas PSUs today submitted its report to the Minister of Petroleum & Natural Gas .

About the HLC:

- The HLC, consisting of Dr. Anil Kakodkar, eminent Scientist and Shri Sidharth Pradhan, an expert on financial and tax issues, also looked into merger, acquisition and consolidation of Oil & Gas PSUs and the Joint Ventures; explored the need and possibility of formation of new entity dealing with oil services and supply of qualified manpower to Oil & Gas sector around the world.
- The HLC, in the process visited, different R&D and training institutes of different oil & gas PSUs.

- It also engaged with CMDs/ senior executives of the Oil sector to understand the business, challenges and opportunities in the sector before writing its recommendations.
- The Committee has recommended short term, medium term and long term strategies in the report, clearly bringing out the strategy to reduce the import dependency of the nation.

A glimpse into Energy Resources :

- Energy security is a key strategic priority for India. During 2018, India consumed 204.92 MMT petroleum products and 58.64 BCM natural gas whereas the domestic production of crude oil and natural gas has almost stagnated.
- The import dependency of crude oil and LNG during the year was 82.59% and 45.89% respectively which is likely to increase in days to come.
- During 2018, petroleum import (₹7028.37 billion) was 23.42% of total gross import (₹30010.2 billion) of the nation.
- India's projected oil demand is going to grow at CAGR 4% during 2016-2030 against the world average of 1% though the projected oil demand will be much lower as compared to the US and China.
- India is thus at very precarious situation and to secure its energy needs in sustainable manner, out-of-box solutions are needed. R&D is going to play an important role in the process.

Competition Commission of India (CCI)

Why in News?

The Competition Commission of India (CCI) celebrated its 10th Annual Day yesterday, i.e. on 20th May, 2019 which marks the notification of the substantive enforcement provisions of the Competition Act, 2002.

About CCI:

- **Competition Commission of India** is a statutory body of the [Government of India](#) responsible for enforcing [The Competition Act, 2002](#) throughout India and to prevent activities that have an appreciable adverse effect on competition in India.
- It was established on 14 October 2003. It became fully functional in May 2009 with [Dhanendra Kumar](#) as its first Chairman.

Functions:

- Make the markets work for the benefit and welfare of consumers.
- Ensure fair and healthy competition in economic activities in the country for faster and inclusive growth and development of the economy.
- Implement competition policies with an aim to effectuate the most efficient utilization of economic resources.
- Develop and nurture effective relations and interactions with sectoral regulators to ensure smooth alignment of sectoral regulatory laws in tandem with the competition law.
- Effectively carry out competition advocacy and spread the information on benefits of competition among all stakeholders to establish and nurture competition culture in Indian economy.

VVPAT:

Context:

Amid protests by Opposition parties against EVMs without paper trail units, there has been a call for procurement of VVPAT (voter

verifiable paper audit trail) machines for the 2019 Lok Sabha elections.

What are VVPAT machines?

- The Voter Verified Paper Audit Trail is a method that provides feedback to voters.
- It is an independent verification printer machine and is attached to electronic voting machines. It allows voters to verify if their vote has gone to the intended candidate.

How do VVPAT machines work?

- When a voter presses a button in the EVM, a paper slip is printed through the VVPAT.
- The slip contains the poll symbol and name of the candidate. It allows the voter to verify his/her choice.
- After being visible to the voter from a glass case in the VVPAT for seven seconds, the ballot slip will be cut and dropped into the drop box in the VVPAT machine and a beep will be heard. VVPAT machines can be accessed by polling officers only.

What is the Election Commission's stand on the issue?

- The EC has time and again reiterated that EVMs cannot be tampered with. It has made public the findings of inquiries into specific charges of tampering in Madhya Pradesh's Bhand and Rajasthan's Dholpur that give a clean chit to the machines.
- With the Opposition insisting on doing away with the EVMs and the controversy refusing to die down, the EC has now thrown open a challenge, inviting computer experts and political leaders to prove that the machines can be hacked, in the presence of the EVM manufacturers.

What does the Supreme Court say?

- The Supreme Court on April 13, 2017, asked the Centre to respond by May 8 to a plea by the BSP to comply with a 2013 Supreme Court directive to introduce paper trail in EVMs.

- In 2013, the SC had asked the Commission to introduce paper trails in EVMs in a phased manner for the 2014 Lok Sabha Elections. "EVMs with VVPAT system ensure the accuracy of the voting system.
- With an intent to have fullest transparency in the system and to restore the confidence of the voters, it is necessary to set up EVMs with VVPAT system because vote is nothing but an act of expression which has immense importance in democratic system," the Bench had said.

UNPKF:

Why in news?

An Indian peacekeeper is among the 119 military, police and civilian personnel who will be honoured this year with a prestigious UN medal this year for courage and sacrifice in the line of duty.

Police Officer Jitender Kumar made the supreme sacrifice while serving in the UN Organisation Stabilisation Mission in the Democratic Republic of the Congo (MONUSCO).

He will be honoured with the Dag Hammarskjold Medal on Friday as the world organisation observes the International Day of [United Nations](#) Peacekeepers.

India and UNPKF:

- India is the fourth largest contributor of uniformed personnel to the UN peacekeeping.
- It currently contributes more than 6,400 military and police personnel to the UN peace operations in Abyei, Cyprus, the Democratic Republic of the Congo, Haiti, Lebanon, the Middle East, South Sudan and the Western Sahara.
- According to the UN information last year, India has lost the highest number of its peacekeepers deployed in various UN peacekeeping operations in the last 70 years, with 163

military, police and civilian personnel from the country making the supreme sacrifice in the line of duty.

- Of the 3,737 peacekeepers who have died since 1948, 163 have been from India.

About Int'l Day of UN peacekeepers:

- The commemoration of the International Day of United Nations Peacekeepers will begin with the UN Chief laying a wreath to honour all UN peacekeepers who have lost their lives since 1948, when the UN's first peacekeeping mission, the UN Truce Supervision Organization (UNTSO), began operations in Palestine.
- The International Day of United Nations Peacekeepers was established by the General Assembly in 2002, to pay tribute to all men and women serving in peacekeeping, and to honour the memory of those who have lost their lives in the cause of peace.
- The General Assembly designated May 29 as the International Day of UN Peacekeepers.

Coral Bleaching:

Why In News?

The National Centre for Coastal Research, an institute under the Ministry of Earth Sciences, in India, has a field research station in the Gulf of Mannar region have found an alarming pattern of bleaching in the reefs in Mandapam, Keezhakkarai and Palk Bay.

Major Findings:

- They have found that sea surface temperature ranged from 28.7°C to 31°C in the August 2018-February 2019 period and there was no bleaching seen then.
- However, when the temperatures rose to between 32°C and 36°C between March 2019 and May 2019, researchers observed a pattern of bleaching in corals, which was different at different layers within the sea.

- About 12% of coral species observed at depths between 0m and 2m such as *Porites solidus*, *Porites lutea*, *Montipora digitata*, *Acropora hyacinthus* were completely bleached.
- About 5% of species observed at depths between 2m and 4m such as *Acropora formosa*, *Acropora hyacinthus*, *Montipora digitata*, *Montipora foliosa*, *Pocillopora damicornis*, *Goniastrea retiformis*, *Platygyra sinensis*, *Dipsastrea favus*, *Dipsastrea speciosa* were partially bleached.
- *Porites* species observed in Palk Bay region were completely bleached at depths from zero to 4 metres. Corals at depths over 5m did not face bleaching.

What are Coral reefs?

- Coral reefs are important hotspots of biodiversity in the ocean.
- Corals are animals in the same class (Cnidaria) as jellyfish and anemones.
- They consist of individual polyps that get together and build reefs.
- Coral reefs support a wide range of species and maintain the quality of the coastal biosphere.
- Corals control the level of carbon dioxide in the water by converting it into a limestone shell.
- If this process does not take place, the amount of carbon dioxide in the ocean water would increase significantly and affect ecological niches.

About Coral Bleaching:

- Coral reefs are threatened by [climate change](#).
- When the sea surface temperature increases beyond a tolerable limit, they undergo a process of bleaching.
- Basically bleaching is when the corals expel a certain algae known as zooxanthellae, which lives in the tissues of the coral in a symbiotic relationship.
- About 90% of the energy of the coral is provided by the zooxanthellae which are endowed with chlorophyll and other pigments.

- They are responsible for the yellow or reddish brown colours of the host coral. In addition the zooxanthellae can live as endosymbionts with jellyfish also.

When a coral bleaches, it does not die but comes pretty close to it. Some of the corals may survive the experience and recover once the sea surface temperature returns to normal levels.

Drumstick trees:

Why in News?

Researchers have finally unravelled how each part of drumstick (*Moringa oleifera*), the —magic tree||, is nutritionally rich compared with other plants such as rice, papaya, spinach and cocoa.

All the five tissues — stem, root, leaf, flower and seed — of drumstick studied were found to be rich either in certain vitamins or essential minerals.

Findings:

- The team found drumstick leaves, which are the most nutritious part of the tree, are rich in vitamins, while the roots are mineral-rich.
- The stem is rich in vitamin C and the flowers and seeds are rich in potassium. The pod and flower also have enzymes that help bring down cholesterol level.
- Compared with spinach, drumstick leaves have 30 and 100 times more iron and calcium, respectively.
- Secondary metabolites (kaempferol and quercetin) that contribute to anti-inflammatory, anti-microbial and other medicinal properties are in abundance in the flower, seed and leaf.
- The roots showed higher amounts of certain acids (ursolic acid, oleanolic acid and dibenzyl amine) which make it an anti-fertility agent and a cardio protector. However, it should be consumed in lower amounts due to its higher alkaloid content.

- —Moringine, a compound discovered from the plant, is anti-diabetic in nature and thus initiate insulin secretion.

Women in parliament:

Context:

At 78 elected women MPs, the 17th [Lok Sabha](#) will have the highest number of women representatives ever. They will account for 14.39% of the entire strength of the Lower House, which was at 12.5% with a total 65 women MPs in the previous Lok Sabha.

Significance:

- This is for the first time in Independent India that such large number of women MPs are sitting in Parliament.
- With 40 women MPs, BJP has sent the largest number of elected women representatives to Lok Sabha because of the sheer size of its victory.
- It is followed by Trinamool Congress (9), Congress (6), BJD (5) and YSRCP (4), as per data compiled by Association for Democratic Reforms, which analysed 539 out of the total 542 winning candidates.
- However, it is the regional parties that boast of a higher ratio of women MPs to their total MPs in the new Lok Sabha.

Statistics:



- The 78 elected women MPs emerged winners out of the total 716 women candidates who fought during the 2019 Lok Sabha elections, which is a success rate of 10.89%.
- This is much higher than the success rate shown by male candidates of 6.41% with 462 male candidates winning out of the total 7,207 men who fought for a Lok Sabha seat this election season.
- A higher success rate or winnability factor shown by women candidates is consistent with the past record. As per official data maintained from the second Lok Sabha onwards, women have always had a better winnability factor.
- During the 16th Lok Sabha, the winning percentage of women was at 9.13% and those of men was at 6.36%. ENDS

Manual Scavenging:

Why in News?

Stating that just putting in place laws was not enough, National Human Rights Commission (NHRC) chairperson Justice (retired) H.L. Dattu on Friday said the government needs to tell what it has done to end manual scavenging.

Concerns:

- While expressing concern over the continuing practice of manual scavenging, Justice Dattu said at the inauguration of the NHRC's open forum on the issue that merely putting in place laws would not suffice. .
- Even after the intervention of the Supreme Court in the matter, it appears that the laws to eradicate manual scavenging are lying on the table and may remain so unless implemented proactively," the NHRC said.
- Incidents of people dying while cleaning sewage without protective gear continue to occur in the county, including in the Capital.

SECC data:

- According to [Socio Economic Caste Census 2011](#), 180,657 households are engaged in manual scavenging for a livelihood.
- The [2011 Census of India](#) found 794,000 cases of manual scavenging across India.
- The state of Maharashtra, with 63,713, tops the list with the largest number of households working as manual scavengers, followed by the states of Madhya Pradesh, Uttar Pradesh, Tripura and Karnataka.

National Health Authority:

Why in News?

In the first such move to bring in uniform standards of patient care to battle cancer, the National Health Authority (NHA) and National Cancer Grid (NCG) have signed an MoU under the Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (AB-PMJAY).

Objective:

- The main objective of this collaboration includes developing uniform standards of patient care for prevention, diagnosis and treatment of cancer; providing specialised training and education in oncology, and facilitating collaborative basic, translational and clinical research in cancer.

Multi-disciplinary care

- The partnership with the National Cancer Grid will bring in experts to enhance the cancer care services provided under AB-PMJAY.”
- Owing to the multi-disciplinary nature of care required for cancer management, both the NHA and NCG recognise the importance of collaborative efforts required to strengthen delivery of cancer services under AB-PMJAY.
- The partnership with the NHA will allow implementation of top-notch standards across all levels of cancer treatment and care under the AB-PMJAY.

Joint review:

- The NHA and NCG will now jointly review existing cancer treatment packages, pricing of services, and standard treatment workflows covered under the AB-PMJAY, and plug-in necessary gaps to ensure enhanced quality of cancer care.
- Both organisations will work on creating cancer services/package benefits based on priority setting tenets such as evidence of efficacy, value (cost-effectiveness), low harm, demand/burden, medical necessity, and wide availability.
- The NCG will work closely with the NHA to rationalise payment rates for different benefit packages and treatment/diagnosis plans, and also explore mechanisms to signal the right incentives to providers to ensure quality through pricing mechanisms.

UNMISS:
Why in News?

UN Secretary, General Antonio Guterres, has appointed Indian Army officer, Lieutenant General Shailesh Tinaikar, as the new Force Commander of the United Nations Mission in [South Sudan](#) (UNMISS).

The decorated Indian Army officer “has had a long and distinguished career with the Indian Armed Forces spanning over 34 years,” a statement by the UN Spokesperson said. He has won the Sena Medal and the Vishisht Seva Medal for his service.

India and UNMISS:

- India, the fourth largest contributor of uniformed personnel to the UN peacekeeping missions, currently contributes more than 6,400 military and police personnel to the UN peace operations in Abyei, Cyprus, the Democratic Republic of Congo, Haiti, Lebanon, the Middle East, South Sudan and the Western Sahara.
- The UN Mission in South Sudan, a country born in July 2011, has 19,400 personnel deployed with it as of March 2019.
- India is the second highest troop contributing country to UNMISS with 2,337 Indian peacekeepers, second only to Rwanda with 2,750. In addition, India currently contributes 22 police personnel to UNMISS.

DRDO Successfully Flight-Tested Guided Bomb

Details:

Defence Research and Defence Organisation (DRDO) successfully flight tested a 500 kg class Inertial Guided Bomb today from Su-30 MKI Aircraft from the Pokhran test range in Rajasthan.

The guided bomb achieved the desired range and hit the target with high precision.

All the mission objectives have been met. The weapon system is capable of carrying different warheads

What is a guided bomb?

- A **guided bomb** (also known as a **smart bomb**, **guided bomb unit**, or **GBU**) is a [precision-guided munition](#) designed to achieve a smaller [circular error probable](#) (CEP).
- Because the damage effects of [explosive weapons](#) fall off with distance according to a [power law](#), even modest improvements in accuracy (and hence reduction in miss distance) enable a target to be effectively attacked with fewer or smaller bombs.
- Therefore, with guided weapons, fewer air crews are put at risk, less ordnance spent, and [collateral damage](#) reduced.
- The creation of precision-guided munitions resulted in the retroactive renaming of older bombs as [unguided bombs](#) or "dumb bombs".

The Germans were first to introduce Precision Guided Munitions (PGMs) in combat, using the 1,400-kg (3,100 lb) [MCLOS](#)-guidance [Fritz X](#) to successfully attack the Italian [battleship Roma](#) in September 1943.

FB and Cryptocracy:

Why in News?

Facebook, which owns WhatsApp and Instagram, is gearing up to launch its own cryptocurrency next year.

Details:

- Called "GlobalCoin," the cryptocurrency would work with a new digital payments system in about a dozen countries starting in the first quarter of 2020.
- Facebook has been in contact with US and British financial regulators to launch it.
- With over two billion users across its platforms, Facebook could emulate WeChat in China which allows its users to chat, shop and play games without leaving its platform.

- According to media reports, the Facebook currency could be designed to be a “stablecoin” with a value pegged to US currency in an attempt to minimize volatility.

What is Cryptocurrency?

- A **cryptocurrency** (or **crypto currency**) is a [digital asset](#) designed to work as a [medium of exchange](#) that uses [strong cryptography](#) to secure financial transactions, control the creation of additional units, and verify the transfer of assets.
- Cryptocurrencies use [decentralized control](#) as opposed to centralized digital currency and [central banking](#) systems.
- The decentralized control of each cryptocurrency works through [distributed ledger](#) technology, typically a [blockchain](#), that serves as a public financial transaction database.
- [Bitcoin](#), first released as open-source software in 2009, is generally considered the first decentralized cryptocurrency.
- Since the release of bitcoin, over 4,000 *altcoins* (alternative variants of bitcoin, or other cryptocurrencies) have been created.

Foreign Portfolio Investment:

Why in news?

As part of its attempts to streamline the regulations to encourage foreign inflows in the Indian market, the Securities and Exchange Board of India (SEBI) has proposed fast track on-boarding procedure for such investors, apart from a simplified registration process.

Objective of decision:

- As a key source of capital to the Indian economy, it is important to ensure a harmonised and hassle-free investment experience for international investors and improve transparency as economic regulations evolve.
- Against this background, the group’s primary objectives were consolidation, simplification, rationalisation and liberalisation.

Other Recommendations:

- Among other things, the group has also recommended pension funds to be considered for Category I FPIs registration, removal of opaque structure and the review of broad-based conditions for appropriately regulated entities.
- The committee has further proposed a liberalised investment cap under a review of prohibited sectors for foreign investment for FPIs, restriction on Sovereign

Wealth Funds (SWFs) for investment in corporate debt securities, and permitting FPIs for off-market transactions.

- The committee has also proposed alignment of regulations for FPIs and Alternate Investment Funds (AIFs) and the harmonisation between investment restrictions in FPI regulations and Foreign Exchange Management Act (FEMA).
- Interestingly, in terms of restrictions on FPI investments in mutual funds, the group said that there was a need for further deliberations on whether such restrictions should be there.
- FPIs are currently not permitted to invest in liquid and money market mutual fund schemes.

Renewable energy sector: State of disarray

Five years down the line, the Indian renewable industry is in a state of disarray. Wind and solar power capacity additions have been far less than satisfactory and hardly on the path to meeting the targets.

Issues:

- Both sectors are buffeted by a range of issues — some caused by the government — but as we will see a little later, no help from the government was forthcoming.
- And, outside of wind and solar, too, precious little has happened.
- For instance, solar heating is a segment that gives the best bang for the buck in the clean energy space, but no policy *josh* is seen.
- Offshore wind is still distant despite international players responding overwhelmingly when asked to express interest.
- The government has not had the long-term vision to look into other emerging areas where India could leapfrog and lead the world — such as ocean and geo-thermal energy.
- Biomass and small hydro are moribund.

Solar Edition:

- The solar number appears respectable, but that is thanks to the tailwinds provided by the steep fall in the prices of the principal component of a solar plant — the module.
- Module prices plunged from around 63 U.S. dollar cents a watt in 2014 to around 23 cents now. The growth in solar power installations happened, therefore, due to fortuitous module prices.

Record addition

- As for wind, there was one outlier year — 2016-17 — when new capacity additions reached a record 5,500 MW, as energy companies rushed to get their foot in before some incentives expired.
- While, 'solar' has had to face uncertainties in terms of safeguard duties, GST rates and a falling rupee, wind installations have been crippled by land problems in Gujarat, the State that most of the developers flocked to.

Other options:

- The MNRE announced ambitious targets — 5GW for 2022 and 30 GW for 2030.
- A government press release said, "Experts laud India's ambitious offshore wind targets, express optimism."
- In October, at the RE-INVEST event a MNRE official said the Ministry needed just one more approval before rolling out the offshore wind tender.
- Ocean energy (from waves, tides and currents), for instance, shows great promise, can provide steady, 24x7 power.
- After a December 2014 study by CRISIL and IIT-Madras, which recommended kick-start support by the government, there has been absolute silence.
- True, it is expensive — just as solar was a decade ago — but a far-looking government would begin some ground work.
- Yes, the government began on a positive note, but seems to have lost steam during its run.

Superconductivity:

Why in news?

Putting to rest all doubts and criticism, a team led by Prof. Anshu Pandey from the Indian Institute of Science (IISc), Bengaluru confirms that their material exhibits major properties of superconductivity at ambient temperature and pressure.

Superconductor and its Importance:

- A material is said to be a superconductor if it conducts electricity with nil resistance to the flow of electrons.
- Superconductors will help build very high efficient devices leading to huge energy savings.
- Till now, scientists have been able to make materials superconduct only at temperatures much below zero degree C and hence making practical utility very difficult.
- Superconductivity at ambient temperature has been a holy grail in physics for about a century. This is where IISc's work becomes particularly important.

Study details:

- The material that exhibited superconductivity is in the form of nanosized films and pellets made of silver nanoparticles embedded in a gold matrix. Interestingly, silver and gold independently do not exhibit superconductivity.
- The team examined 125 samples, of which 10 showed a drop in resistance signaling the onset of superconductivity.
- They attribute the unsuccessful results in the remaining 115 samples to oxygen exposure at the time of sample preparation and when the samples were taken for study.
- "If this [result] is correct, it would be the greatest work done in India since the discovery of Raman effect.

The proof

- "Two of the most important properties of superconductivity are diamagnetism and zero resistance.
- These two were seen in the material studied. They seem to suggest that the material becomes superconducting below a certain temperature (286 K or 13°C). And it can go up to 70°C.