



CURRENT AFFAIRS - PART 5

Prithvi II Missile

- It is a surface-to-surface tactical missile with a strike range of 350 KM.
- It is developed by DRDO under the Integrated Guided Missile Development Program (IGMDP).
- It is capable of carrying 500 to 1,000 kg of warheads, both conventional as well as nuclear.
- The state-of-the-art missile is powered by liquid propulsion twin engines.

Prithvi II Missile

- It uses an advanced inertial guidance system with manoeuvring orbit to hit its target.
- It was inducted into the armour of the defence forces in 2003.
- India recently conducted a night trial of its indigenously developed, nuclear-capable surface-to-surface Prithvi-II missile off Odisha coast.

Eat Right Movement

- It was launched by the Food Safety and Standards Authority of India (FSSAI).
- The movement aims to cut down salt/sugar and oil consumption by 30% in three years.
- It also aims to engage and enable citizens to improve their health and well-being by making the right food choices.

Eat Right Movement

- FSSAI has put in place robust regulatory measures under three major pillars: Eat Safe, Eat Health and Eat Sustainably for the programme.
- FSSAI has prescribed a limit for Total Polar Compounds (TPC) at 25% in cooking oil to avoid the harmful effects of reused cooking oil.
- Mumbai Central Terminus has become India's first Eat Right Station. FSSAI has been rated the station with four stars.

Drugs Controller General of India (DCGI)

- Drugs Controller General of India (DCGI) is a department of the Central Drugs Standard Control Organization of the Government of India.
- It is responsible for approval of licences of specified categories of drugs such as blood and blood products, IV fluids, vaccines, and sera in India.
- Drug Controller General of India, comes under the Ministry of Health & Family Welfare.

DCGI

- DCGI sets standards for manufacturing, sales, import, and distribution of drugs in India.
- Drugs Controller General of India (DCGI) recently has asked all states and Union Territories to prohibit sale of drugs by online pharmacies as per the Delhi High Court order.

Bougainville island

- It is an island in the Pacific.
- It is holding a referendum to decide if it wants to remain a part of Papua New Guinea or become an independent country.

Global Carbon Project

- It is Formed in 2001 to help the international science community to establish a common, mutually agreed knowledge base that supports policy debate and action to slow the rate of increase of greenhouse gases in the atmosphere.
- It is a Global Research Project of Future Earth and a research partner of the World Climate Research Programme.
- Its projects include global budgets for three dominant greenhouse gases – CO₂, methane, and nitrous oxide – and complementary efforts in urban, regional, cumulative, and negative emissions.

Global Carbon Project

- Observations are made by the Global Carbon Project on India:
- India's emissions in 2019 was likely to be only 1.8 per cent higher than in 2018.
- Weak economic growth in India has led to slower growth in oil and natural gas use.

Extra Neutral Alcohol (ENA)

- It is a by product of the sugar industry.
- Formed from molasses that are a residue of sugarcane processing.
- It is the primary raw material for making alcoholic beverages.
- It is colourless food-grade alcohol that does not have any impurities.
- It has a neutral smell and taste and typically contains over 95 per cent alcohol by volume.
- Alcohol manufacturers citing a shortage of domestic supplies have sought a reduction in import duty of Extra Neutral Alcohol to make it cost-effective for them to import from global markets.

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Classification of Cities

- RBI classify cities (tier-wise)

Based on Population (2001 Census)

- Tier-1 100,000 and above. 8
- Tier-2 50,000 to 99,999. 26
- Tier-3 20,000 to 49,999. 33
- Tier-4 10,000 to 19,999. 5000
- Tier-5 5,000 to 9,999.
- Tier-6 less than 5000

Rural Urban centers

- Based on Population of 2001 census
- Rural Center: upto 9,999
- Semi-Urban center: 10,000 to 99,999
- Urban Center: 1,00,000 to 99,999
- Metropolitan center: 1,000,000 and above

Examples of Tier cities

- TIER ONE (8)
Bangalore, Chennai, Delhi, Mumbai, Hyderabad, Kolkata Pune
- TIER TWO(26)
Agra, Ajmer, Aligarh, Amritsar, Aurangabad
- TIER THREE (33)
Kota, Jodhpur, Madurai, Coimbatore, Meerut, Solapur

MGNREGA

- The total expenditure of the government programme has more than doubled in last 5 years.
- Expenditures 2014-15 : 18,798 Cr.
2015-16 : 29,362 Cr.
2016-17 : 33,636 Cr.
2017-18 : 32,521 Cr.
2018-19 : 41,329 Cr.
- 13 lakh hectare of land has been benefitted
- Spending 60% of the total expenditure is on agricultural and allied activities is mandatory.. Of the remaining 60% is spent on National Resource Management

MGNREGA

- 75% of total activities under MGNREGA focus on improving water security and water conservation efforts.
- State schemes helping in water conservation are:-
 - Rajasthan : Mukhyamantri Jal Swvlamban Abhiyan
 - Maharashtra : Jalaayukta Shivar Abhiyan
 - Jharkhand : Dobha Farm Pond Construction
 - Andhra Pradesh : Neeru Chettu
 - Madhya Pradesh : Kapil Dhara
 - Karnataka : Borewell Recharge
 - West Bengal : Usar Mukti

Electric Vehicles (EV)

- Government has proposed two-phase transition to EV to bring down vehicular pollution in India's towns and cities
- In the first phase beginning 2025, two-three wheeler with internal combustion engine (ICE) to be replaced by electric vehicles with engine capacity of upto 150cc.
- In the second phase, starting 2030, only EV passenger vehicles be sold in the country.
- Two-wheelers comprise about 80% of all vehicles sold in India
- 14 of the world's most polluted cities are in India

Electric Vehicles (EV)

- 20.5 billion tonnes emission of carbon dioxide equivalent in India with emissions rising 5.5% annually between 2005 & 2013
- 90% estimated share of road transport in the transport sector's emission. This sector is the second largest contributor to carbon dioxide emissions.
- India can bring down emissions by 37% in 2030 by pursuing a shared, electric and connected mobility future
- Each e-bike can save approx. 350 kg of carbon dioxide emissions a year and an e-car can save up to 28 tonnes (even accounting for emissions from electricity generation)
- Carbon dioxide emissions in India have increased 69% over the past decade.

Livability Index

- Economist Intelligence Unit prepares Livability Index
- Delhi has dropped by 6 places to rank 118th on the list of world's most livable cities in the world.
- For Delhi the drop is because of increase in cases of petty crimes and poor air-quality
- Mumbai has also declined by 2 places, ranked 119th
- List topped by Vienna (Austria) for the second consecutive year 2nd Melbourne Australia 3rd Sydney Australia, 4th Osaka, 5th Calgary, Canada
- Karachi (136) Dhaka (138) Port Moresby in Papua New Guinea (135}) are among the ten least livable globally

Livable Index

- In India there is a decline in ranking in Reporters without Borders' Press Freedom Index where India now sits in the bottom quartile of countries
- Decline in Mumbai's rank was mainly due to a downgrade in its cultural score, while Delhi has fallen in the Index because of downgrades to its culture and environment score and rising crime rate.
- Ranking of 140 cities is based on score in five categories- stability, health care, culture and environment, education and infrastructure. Each factor in a city is rated as acceptable, tolerable, uncomfortable, undesirable or intolerable
- Delhi score 56.3; Mumbai score 56.2 Vienna score; 99.1

Livable Index

- The 2018 update to the WHO, Global Ambient Air Quality Database shows that New Delhi has the 6th highest annual mean concentration of the Fine particulate matter among cities around the world.

Chief Of the Defence Staff (CDS)

- The post of Chief of the Defence Staff has been created
- This is to be a 'single-point' advisory position position to the government
- With the current situation the forces will be on a heightened sense of alert and there is a need of a seamless state of coordination to meet the challenges.
- After the Kargil war, review committee had strongly recommended for the post of CDS as our initial response to incursions were found wanting
- The CDS is expected to bridge such dangerous gaps and reduce response time.
- CDS will keep the Defence Minister, continuously and fully briefed and effectively advised

Polar Satellite Launch Vehicle (PSLV)

- The Polar Satellite Launch Vehicle (PSLV) is an expendable medium-lift launch vehicle designed and operated by the Indian Space Research Organisation (ISRO).
- PSLV is designed mainly to deliver the “earth-observation” or “remote-sensing” satellites with lift-off mass of up to about 1750 Kg to Sun-Synchronous circular polar orbits of 600-900 Km altitude. The remote sensing satellites orbit the earth from pole-to-pole (at about 98 deg orbital-plane inclination).
- PSLV has three variants: PSLV-Core alone (PSLV-CA) without the solid strap-on motors; a PSLV with six solid strap-on boosters; and PSLV-XL, the top model, with six extended solid strap-on boosters.
- The launch capability of the PSLV with these configurations varies from 1,000-1,750 kg.

PSLV

- The biggest advantage of PSLV is that it is capable of placing multiple payloads into orbit with multi-payload adaptors used in the payload fairing. Multiple engine restarts to achieve multiple orbits in the same mission depending on the mission requirements, have also been demonstrated successfully for the PSLV.
- On December 11 th 2019, PSLV took 50th launch
- Has launched 50 Indian satellites and 222 foreign satellites over the years, for over 70 international customers from 20 countries
- It also successfully launched two spacecraft - Chandrayaan-1 in 2008, which made its way to the moon and the Mars Orbiter in 2013, which travelled to Mars.

Data Labelling

- Data labeling is the process of detecting and tagging data samples.
- Data labelling is the process of attaching meaning to different meaning to different types of digital data like audio files, text, images video and more.
- Data labelling is required for developing Artificial Intelligence algorithms
- The images are uploaded and various objects are identified just as people, animals, buildings, cars, signs and even sky. By doing this across millions of images, AI systems can begin to recognize these objects in the real world.

Data Annotation

- Data annotation is the process of labelling the data available in various formats like text, video or images. For supervised machine learning labelled data sets are required, so that machine can easily and clearly understand the input patterns.
- Labelling is more complex process compare to annotation. Text annotation helps to visualize the important texts or words through computer vision while text labelling, the texts are highlighted and metadata is also added in the each word that are important to integrate into the language processing.

Annotating. Annotate means adding notes

- Annotating a text, or marking the pages with notes, is an excellent, way to make the most out of the reading we do for college courses.
- Annotations make it easy to find important information quickly when we look back and review a text.
- They help us familiarize our self with both the content and organization of what we read.
- They provide a way to begin engaging with ideas and issues directly through comments, questions, associations, or other reactions that occur to you as you read.
- In all these ways, annotating a text makes the reading process an active one.

Bacteria form Power Grid

- Electroactive bacteria are able to produce electricity.
- It is found *Geobacter metallireducens* strip off free electrons and transfer them to oxygen atoms producing water molecule.
- It transfer the electrons to iron oxide which then converted to magnetite
- *Geobacter* is found in deep underground.
- *Geobacter* sprouting hairlike growths called pilus joins together as wire for flow of electrons
- Pilus is like a living wire.
- From bottom to top electrons moves along the 'cable bacteria'.

Lithium Ion Battery

- The biggest challenge for Electric Vehicle is Battery of Sufficient Capacity.
- For renewable Energy also the issue is storage of power.
- Lithium ion battery is showing very promising results
- Lot of research is currently going on through out the world
- The capacity for manufacturing is also stepped up.
- The price also has plunged 85% since 2010.
- Efforts are on to have a car battery capable of running for about 800KM with single charge.

Quantum Computers

- Quantum computing is the now one of the hottest topics in both quantum physics and computer science.
- Suppose we'd like to find the Jack of Hearts from a pack of cards. An ordinary computer uses bits, which assigns everything 0 or 1. The computer may mark the required card '1' and each of the other 51 cards '0'. A search operation goes on checking every card -whether it is 1 or 0, and takes 26.5 operations on an average.
- However, a 6 qubit (quantum bit) quantum computer, if possible, having 2^6 (i.e. $2 \times 2 \times 2 \times 2 \times 2 \times 2$) parallel bits, will be able to identify the required card at one shot.
- Such is the magic of quantum computing. A quantum computer with N coupled qubits has computing power equivalent to a classical computer with 2^N parallel bits

Quantum Computers

- In Nov 2017, IBM announced it had built a 50-qubit quantum computer. The system was not stable. It was in quantum microstate for 90 microseconds only.
- In 2018, Google announced it had a quantum processor with 72 qubits.
- The Department of Science & Technology, has set up a programme called Quantum-enabled Science & Technology (QuEST) and will invest 80 crore in next 3 years to facilitate research on Quantum computers
- Once developed , the exponential speeding could solve many currently unsolved computational problems including decryption quantum chemistry, and combinatorial optimization. The quest for finding a prime number with billion digits might be over in no time.

ASAT Missile

- The anti-satellite (ASAT) test was conducted (27, March) successfully by India under the name Mission Shakti. A live satellite in LEO of 300KM was shot down using a modified interceptor of the Ballistic Missile Defence system.
- It is a deterrence capability.
- Missile can cover all satellites in Low Earth Orbit (LEO)
- Interception is possible at 1,000KM above the Earth.
- Hitting multiple satellites is also possible
- Concern of debris was raised. Test was conducted in such a manner to have minimum debris. International Space Station ISS is safe. Debris will be decayed in 45 days

Geographic Information System (GIS)

- A Geographic information System is designed to capture, store, manipulate, analyze, manage and present spatial or geographic data.
- A geographic information system (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface. GIS can show many different kinds of data on one map, such as streets, buildings, and vegetation.
- GIS applications are tools that allow users to create interactive queries, analyze spatial info, & edit data in maps.
- India Observatory, country's first socio, economic, ecological open source integrated Geospatial data platform has been launched.

Geographic Information System (GIS)

- The observatory is a comprehensive information on India's social, ecological and economic parameters on a single spatial and temporal platform designed to supplement local decision making by village communities, panchayats, NGOs and Govt. officials
- Common uses of GIS include inventory and management of resources, crime mapping, establishing and monitoring routes, managing networks, monitoring and managing vehicles, managing properties, locating and targeting customers, locating properties that match specific criteria and managing agricultural crop data,

GIS

- Organizations using GIS
 - Uber
 - World Health Organization
 - Starbucks
- GIS Data uses
 - Mapping
 - Telecom and Network Services
 - Accident Analysis and Hot Spot analysis
 - Urban Planning, Pest Control
 - Transportation Planning
 - Environment Impact Analysis
 - Agricultural Applications, Dairy Management
 - Disaster Management and Mitigation
 - Navigation
 - Banking Taxation
 - Geology

Asteroids 2019WH2 and 2019WNI

- Asteroids are dubbed as minor planets; they are rocky and airless remnants dating back to the early formation of our solar system. Most of them found orbiting the Sun between Mars and Jupiter within the main asteroid belt.
- If these asteroids collide with Earth, they will likely burn up and explode in the atmosphere. An asteroid is a small rocky object that orbits the Sun. A meteor is what happens when a small piece of an asteroid or, called a meteoroid, burns up upon entering Earth's atmosphere.
- In 2013 a 66 feet wide asteroids detonated over a populated region in Russia. 1500 people were seriously injured during the incident.
- 2019 WH2 79 feet wide speed 36,600 KMPH approached Dec 1 2019 distance 0.00871 astronomical units
- 2019 WNI 98 feet diameter approached Dec 2 2019
- Every year, the Earth is hit by about **6100 meteors** large enough to reach the ground, or about 17 every day,

Thirty Metre Telescope

- It will be world's largest telescope. Scientists from five countries are participating in the construction of TMT at Mount Mauna Kea.
- TMT fund pooled by countries US, Japan, Canada, India, and China
- India is developing (HROS) high-resolution optical spectrometer
- The spectrometer a device that collects light waves and uses them to determine what material created the light
- Study is expected to enhance the telescope's glimpse into formation of the first galaxies as well as Milky Way's neighbor, Andromeda, while also mapping the elements formed during Big Bang such as hydrogen and helium

TMT

- TMT is expected to be ready by 2030
- It will be the world's most advanced and powerful ground based telescope operating at optical and infrared telescope wavelengths.
- The optical spectrometer will gather light operating between 310 nanometers and 1,100 nanometers
- HROS will have resolution capabilities of 25,000, 50,000 and 1,00,000
- It will study beyond Milky Way and Red giant branch (RGB) stars in Andromeda galaxy, dwarf stars, cosmic chemical history, how the first elements- hydrogen, helium, lithium and deuterium were produced during Big Bang and enrichment of gases in galaxies by further generation of stars.

Cholera Bacteria becomes drug-resistant

- Cholera-causing bacterium *Vibrio cholerae* has developed resistance against many antibiotics (sulfamethoxazole 99% and neomycin 4%)
- *Vibrio cholerae* are competent to uptake DNA from the environment
- In the gut when bacteria that have a resistant gene die the DNA gets released and are taken up by the *V. cholerae* and become resistant to antibiotics.

Current Account Deficit

- Current Account Deficit meaning: Current Account Deficit or CAD is the shortfall between the money flowing in on exports, and the money flowing out on imports. This account goes into a deficit when money sent outward exceeds that coming inward.
- CAD came down from 2.3% of GDP (\$15.8 billion) to 2% of GDP (\$ 14.3 billion)
- It contracted due to higher invisible receipts at \$31.9 billion as compared to \$29.9 billion.
- FDI has gone up. Foreign portfolio investment improved. Private transfers have gone up. ECB (External Commercial Borrowing) improved. Net services receipts was better (From travel, Financial services and Telecommunications, Computers and Information Services)

Gadhimai Festival

- Gadhimai Temple (गढीमाई मन्दिर) is a temple of Gadhimai Devi, an aspect of Kali, the Hindu goddess of power.
- The temple is situated in Nepal. It is the world's biggest animal sacrifice conducted at the Gadhimai temple area, every five years.
- Animals are sacrificed as part of the Hindu festival, with the hope that the sacrifice will lead to the fulfillment of wishes by the goddess.
- The ritual began at dawn with a ceremonial "pancha bali" or the sacrifice of five animals, comprising a rat, a goat, a rooster, a pig and a pigeon. It is estimated that 300,000 - 500,000 animals were killed during the period of sacrifice in 2009 while 5 million people visited Gadhimai during the festival.

Live Stock Census (20th census 2019) last was 2012

- Census conducted across 6.6 lakh villages and 89,000 urban wards
- Estimated more than 535 million growth of 5%
- Those largely bred for meat saw significant increase in number
- Pigs constitute 1.7% of total
- Total poultry population 851.8 million TN tops
- Goat 149 million Rajasthan tops the list 2nd WB
- Sheep 74.3 million Telangana tops
- Cattle Cows number up, camel and horses, ponies, mules number down
- West Bengal has surpassed UP and MP in cattle population

Randomized Controlled Trials

- A randomized controlled trial is a type of scientific experiment mainly used in drug trials. It is designed to identify the effectiveness of a treatment and eliminate certain kinds of bias.
- Subjects are randomly split into groups, one is treatment group that receives an intervention; the other the control group, which is left alone. The usefulness of the treatment is assessed in comparison to control group.
- RCTs have been criticized for not offering solutions that can be generalized

RCT Experiment

- Banerjee and Duflo noble laureates did RCT experiment in Rajasthan involving cameras and incentives to stem teacher absenteeism clearly worked. They worked with organizations like Sewa Mandir and Pratham.
- But the same methods yielded no results when applied to a large-scale government setting involving nurses in the state government's health sub-centres.
- Seva Mandir is an Udaipur based NGO that works across areas like nutrition, health, education gender and environment.
- They worked with NGO Pratham which is targeting primary education. They wanted to study how government initiatives in primary education impacts on learning increases.

Flying Shame

- Flights are causing carbon emissions. US contributes 24% of total carbon footprint of flying. India contributes 2.6%.
- Who does the survey: International Council on Clean Transportation (ICCT) a NGO
- Frequent flyers taking more than 9 round trips per year emit the highest share more than 3 tons of carbon dioxide per year
- Proposal put tax in increasing % on each additional flight, banning frequent flier programme

Eradication Of Polio

- The World Polio Day is observed on 24th October
- Global Commission for Certification of Poliomyelitis Eradication officially declared that wild poliovirus type 3 has been eradicated.
- The last case of wild poliovirus type 3 was seen in northern Nigeria in 2012
- This is the second wild poliovirus to be declared eliminated- the first was in 2015 when type2 wild poliovirus was declared as eliminated.
- With two of the three wild polioviruses eliminated, only type 1 wild poliovirus is still in circulation and is restricted to just two countries- Afghanistan and Pakistan.

Wealth in India

- Total wealth in India touches \$ 12.6 trillion
- India is now fifth globally in terms of number of ultra-high net-worth individuals
- Total wealth has increased fourfold between 2000 and 2019
- Report of Credit Suisse 'Credit Suisse Global Wealth Report 2019
- The wealth per adult in India grew by an average of 11% annually over the period 2000-2019 wealth per adult is estimated to be \$14,569 in mid 2019
- India has 8.27 lakh adults in the top 1% of global wealth holders. India has 4460 adults with wealth of over \$ 50 million and 1790 that have more than \$100 million

Wealth in India

- There is still considerable wealth poverty
- 78% of the adult population has wealth below \$10,000
- 1.8% of adult has a net worth of more than \$100,000
- India is on fast trajectory expected to add \$4.4 trillion in just five years reflecting an increase of 43%

Milk Adulteration

- FSSAI Food Safety and Standards Authority of India got the survey done by independent agency in regard to milk adulteration.
- 93% of the samples were found absolutely safe
- Samples were tested for 13 common adulterants and 3 contaminants- pesticide, aflatoxin M1 and antibiotics.
- 12 samples were found to be unsafe for consumption
- 368 samples (5.7%) had aflatoxin M1 residues beyond the permissible limit of 0.5 microgram per kilogram.
- Improper storage of food harvest in warm and humid conditions leads to aflatoxin contamination

Ethanol Blending Programme

- Ethanol Blending in 2015 was less than 1%
- 2019 it was 6%
- Bio-energy is also being pushed in a big way with the government's focus on ways to monetize the 600 million tonnes of non-fossilized biomass available in our country
- Our crude oil import from US was almost nil in 2014. Now the total import of petroleum products from the US including LNG in 2018-19 stood at over \$7 billion.

SONIA

- SONIA & LIBOR are bench marks to calculate interest rate or cost of fund in International Financial Markets.
- SONIA is one of the major alternatives to LIBOR (London Interbank Offered Rate), the predominant global interest rate benchmark that will be not there in 2021.
- SONIA is short for Sterling Overnight Interbank Average Rate.
- In April 2017, the Bank of England selected SONIA as its preferred alternative to LIBOR.
- Why Change: After 2008 global financial crisis borrowing based on LIBOR is not preferred, it is based on estimates rather actual transactions, in 2012 some banks were caught in manipulations of LIBOR rates.
- SONIA is more robust, based on actual transactions and vetted by the Bank of England, giving it a greater credibility

SONIA

- SONIA is more robust, based on actual transactions and vetted by the Bank of England, giving it a greater credibility
- There are some other alternatives to SONIA, SOFR (USA), ESTR (European Union) and TONAR(Japan), India is not having such alternative.
- Finance is the lifeblood of business, and well-oiled global debt and derivative markets are a key part of the financial system.
- These in turn need trustworthy, widely-accepted benchmarks.
- SONIA fits the bill.

SONIA

- The Indian government is not a big borrower abroad. But Indian businesses borrow in the form of external commercial borrowings (ECBs)
- The interest costs are linked to LIBOR. All these borrowers will need to shift to other benchmarks sooner or later.
- Also the MIFOR (Mumbai Interbank Forward offer Rate) that is currently linked to LIBOR has to be changed too.
- All Indian businesses who have borrowed through ECB route will have effect on their profitability as the cost of funds will change the financials.

AIR INDIA Flew Over POLAR REGION

- Air-India flight Delhi-San Francisco non-stop became first commercial flight to fly over the Polar region (North Pole)
- Flying over polar region shortens the flight time (75 minutes) saving of 2,500 kg fuel and about 7,500 kg of carbon emission reduction.
- But issues are a) solar activity in the polar region b) magnetic interference in communication
- The opening of the Polar route will help Air India's operations to all the five cities in the US that it flies to- New York, Newark, Chicago, San Francisco and Washington DC.

ISRO Tests Semi-Cryogenic Engine

- Currently the fuel used in rockets is 'unsymmetrical dimethyl hydrazine (UDMH) which is highly toxic and carcinogenic.
- In semi-Cryogenic engine, kerosene is used which is far greener than UDMH.
- The semi-cryo will raise ISRO's carrying capacity from 4 tonnes to 6 tonnes, all the way upto the Geosynchronous orbit, 36,000 km above earth.
- The cryogenic engine does not need to carry a very heavy load on its head- the heavy lifting is done by the lower stages of the rocket, which detach and fall into the sea after they expend themselves.

Semi-cryogenic Engine

- The semi-cryogenic engine, will be located at the lower part of the rocket and is meant to do the heavy lifting. It generates thrust of 200 tonnes, the pressure inside its combustion chambers is about 190 times the atmospheric pressure.
- Its fuel is kerosene kept in the tank at room temperature. (The oxidizer is liquid oxygen, kept in cryogenic conditions so that it remains liquid.
- AVATAR vehicle is being developed by ISRO & DRDO. It will be a space plane that can take off and land from airfields like commercial aircraft. It will collect air on its way up, separate oxygen from it and store the gas on-board for space use. It will bring down the cost of launching satellites drastically.

Multi-cropping

- Multi-cropping has economical and agronomic benefits
- As many as 12-15 crops in a single plot of 1-2 acres growing a wide variety of crops that are suited for rain fed agriculture.
- What some crop plants take from the soil can be given back by growing other crops.
- Apart from providing a fallback option, multi cropping helps in management of pests.

Electronic Nicotine Delivery System (ENDS)

- ENDS, vapes, and e-hookahs have been banned
- Now any production, import, export, sale, distribution or advertisement and storage of e-cigarettes is a cognizable offence punishable with imprisonment or fine or both.
- E-cigarettes, which were to aid smokers kick their habit, do not burn tobacco leaves. Instead these battery operated devices produce aerosol by heating a solution containing among other things, nicotine.
- Nicotine is an addictive substance that may function as a 'tumor promoter' and aid neuro-degeneration.

E- cigarettes

- WHO's Framework Convention on Tobacco Control (FCTC) said that e-cigarettes are unlikely to be harmless and long term use is expected to increase of chronic obstructive pulmonary disease , lung cancer, cardio vascular disease
- e-cigarettes and accessories valued at about \$1,91,780 were imported to India between 2016 and 2019
- E-cigarettes too deliver ultrafine particles and nicotine deep into the lungs, which is then absorbed by the blood.
- It release potential carcinogens such as acetaldehyde, formaldehyde and acetone.

Fall Armyworm (FAW)

- Fall army-worm got spread across the country, impacted the kharif maize crop
- Project Saffal (Project Safe-guarding Farmers and Agriculture against FAW) launched to create awareness among thousands of farmers across Karnataka, Maharashtra and Madhya Pradesh.
- The project, aimed at developing a suit of technologies, good agricultural practices and control measures along with educational material for various stakeholders.
- Three chemicals for control of this pest- Spinetoram 11.7% SC, Chlorantraniliprol 18.5% SC and Thiamethoxam.

Marshall Islands

- The United States conducted 67 nuclear tests on several small islands, called atolls, in the Marshall Islands between 1946 and 1958.
- The radiation level is found to be very high
- The radiations are higher than in areas affected by the Chernobyl and Fukushima nuclear disasters.
- The largest nuclear detonation 'Castle Bravo,' in 1954 at Bikini Atoll was 1000 times more powerful than either of the bombs dropped on the Japanese cities of Hiroshima and Nagasaki

World Hunger

- The number of people going hungry has risen for the third year (2018) running to more than 820 million, according to a UN report
- It is stated that conflict, climate change and weak economic growth are the reasons
- World population 7632.8 millions
- Africa and Asia account for more than 9 out of 10 of the world's stunted children at 39.5% and 54.9% respectively
- Source: The State of Food Security and Nutrition in the World 2019, United Nations.

Cotton Exports

- Cotton exports to Iran reported a jump of 1070% to 1.85 million kg during 2018-19
- The reason was favorable payment terms in rupee denomination and higher demand
- Other countries who are buying : Oman, Vietnam and Bangladesh.
- April-June 2019-20 India exported 5.03 million kg. of raw cotton to Iran
- Overall cotton export prospects are hampered by non-competitive prices of Indian cotton in the international market.

Regional Comprehensive Economic Partnership (RCEP)

- The Regional Comprehensive Economic Partnership (RCEP) is a proposed free trade agreement in the Asia-Pacific region between the ten member states of the Association of Southeast Asian Nations (ASEAN), namely Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, and four of ASEAN's FTA partners- Australia, China, Japan, New Zealand and South Korea.
- RCEP negotiations were formally launched in Nov. 2012 at the ASEAN Summit in Cambodia.
- In 2018, the 16 negotiating parties accounted for about half of the world's population and 39% of the World's GDP.

RCEP

- Without India, the 15 negotiating parties accounted for 30% of the world's population and just under 30% of the world's GDP.
- Once deal is implemented it would lead to zero-duty imports on most products between the participating countries.
- In November 2019, India pulled out of the deal primarily due to concerns of dumping of manufactured goods from China and agricultural and dairy products from Australia and New Zealand, potentially affecting its own domestic industrial and farming sectors.

RCEP

- Indian farmers and dairy producers were concerned about cheap imports from New Zealand and Australia that they fear could destroy their livelihoods.
- The growers of plantation commodities were also getting jittery
- India during 2018-19 had an overall trade surplus of Rs. 4368 crore with exports of plantation commodities such as tea, coffee and spices among others. However with respect to the RCEP countries, India faces a trade deficit of Rs. 5716 crore in plantation commodities
- India's plantation exports stood at Rs. 12361 crore in 2018-19, with coffee shipments accounting for Rs. 5905 crore, followed by tea at Rs. 5335 crore and pepper at Rs. 821 crore. Cardamom and rubber exports stood at Rs. 242 crore and Rs. 57 crore respectively

International Seabed Authority

- The International Seabed Authority (ISA) is an intergovernmental body based in Kingston, Jamaica.
- It was established to organize regulate and control all mineral-related activities in the international seabed area beyond the limits of national jurisdiction.
- ISA was established by the UN Convention on the Law of the Sea.
- The Authority has observer status to the United Nations.
- There are 167 members and the EU.
- Seven organizations have been permitted for exploration. Each has been allotted 150,000 square kilometers.

ISA

- The Government of India Signs Exploration Contract with the International Seabed Authority.
- The Government of India currently has an exploration contract with the Authority in the Indian Ocean for polymetallic nodules, which entered into force on 24 March 2002.
- Sea bed has Polymetallic nodules formed of concentric layers of iron and manganese hydroxides around core.
- The total estimation is 500 billion tons of nodules
- They have manganese 27-30%, Nickel 1.25-1.5%, Copper 1-1.4% Cobalt 0.2-0.25 %. Lesser amount of calcium, sodium, Magnesium, potassium, titanium, barium.

INDIA and RUSSIA teams up for DEEP SEA EXPLORATION

- The National Institute of Ocean Technology and Krylov State Research Centre in Russia jointly to develop machines to gather minerals from ocean floor.
- Samudrayaan: manned submersible vehicle is also being developed.
- The challenge is to work under 550 times the atmospheric pressure. Sea depth is 5.5 km.
- The area allotted to India is in the Central Indian Ocean Basin. Area is 75,000sq.km. in International Waters
- Another area for exploration secured by India is about 1000km from Madagascar , this area where metallic sulphides have seeped through vents in the tectonic plates and spread themselves as ridge. This area has lot of potential.

Why India Gives Subsidies to Fisheries- WTO

- Subsidies per fisherman amounted to less than \$0.10 per day
- Total subsidies are estimated at 14-20\$ billion annually
- Over subsidy result in over-fishing and depletion of marine resources.
- US and others are advocating to delink special & differential treatment (S&DT) for developing countries
- US argument is that 14 of the top 25 marine catch producers in the world are developing countries and one least-developed country.
- There are basically, six countries which include China, Taiwan, Japan, South Korea, Indonesia and Spain accounts for 80% of fishing outside territorial waters need to be disciplined.

Iran to Exceed 3.6% Enrichment Limit

- Iran had a nuclear deal in 2015 to have relief from US sanctions.
- Agreement has failed. US had put sanctions
- Earlier commitment was to have enrichment level upto 3.67%
- The agreement was the Joint Comprehensive Plan of Action (JCPOA) reached in Vienna on July 14, 2015 between Iran and P5+1 (P means five permanent members of UN Security Council and 1 means European Union).
- Under JCPOA Iran agreed to eliminate its stockpile of medium-enriched uranium by 98% and reduce by about two-thirds the number of its gas centrifuges for 13 years. Iran agreed to not to have fresh facility for Heavy-water. IAEA will have regular access to all Iranian nuclear facilities.

JCPOA

- Iran didn't disclosed a past covert nuclear weapons programme to AIEA, as required by 2015 deal
- On May 8 2018, Trump announced USA's withdrawal from JCPOA. In November 2018 USA imposed the sanctions again.
- January 5, USA Killed Iranian General Qassem Soleimani.
- **To make** a nuclear reactor, the **uranium** needs to be enriched so that 20% of it is **uranium 235**. For nuclear **bombs**, that figure needs to be nearer 80 or 90%. Get around 50kg of this enriched **uranium** - the critical mass - and you have a **bomb**

Women's Equality Day

- 26th August is observed as 'Women's Equality Day'
- The Representation of People Act 1918, UK granted women the right to vote. 8.5 million women in UK voted in the general election for the very first time.
- Women equality is the right to equal privileges opportunities and resources. In 2018, Iceland became the first country in the world to legalize equal pay for men and women
- Women in the US granted the right to vote in 1920
- Women in Saudi Arabia were granted the right to vote in 2011
- Women in Saudi Arab in 2018 granted permission to drive.

South China Sea Dispute

- The **disputes** include the islands, reefs, banks, and other features of the **South China Sea**, including the Spratly Islands, Paracel Islands, Scarborough Shoal, and various boundaries in the Gulf of Tonkin.
- 80 percent of **China's** energy imports and 39.5 percent of **China's** total trade passes through the **South China Sea**
- The sea has in recent years become a flashpoint for tensions between **China** and other nations which claim sovereignty over two largely uninhabited island chains, the Paracels and the Spratlys. **China** claims the largest portion of territory, saying its rights go back centuries.

South China Sea Dispute

- **China** says it has sovereignty over virtually all **South China Sea** islands and their adjacent waters. It hasn't defined those waters, but it issued a map that has what is called a **nine-dash line** that swoops down past Vietnam and the Philippines, and toward Indonesia, encompassing virtually all of the **South China Sea**.
- The **nine-dash line**—at various times also referred to as the **ten-dash line** and the **eleven-dash line**—refers to the undefined and vaguely located demarcation line used by **China (People's Republic of China)** and **Taiwan (Republic of China)**, for their claims of the major part of the **South China Sea**.

Why does China want Scarborough Shoal?

- Scarborough shoal is rich fishing ground for thousand of Filipinos, Vietnamese and Chinese fishermen.
- China wanted Scarborough to establish its Air Defence Identification Zone to control movement of ships and planes in the area.

UN Convention for the Law of the Sea (UNCLOS)

- The convention is also sometimes referred to as the Law of the Sea Convention or the Law of the Sea treaty. UNCLOS, as a law of the sea came into operation and became effective from 16th November 1982.
- The United Nations Convention on the Law of the Sea (UNCLOS) is established to define coastal and maritime boundaries, to regulate seabed exploration not within territorial claims, and to distribute revenue from regulated exploration.
- The law of the sea is a body of customs, treaties, and international agreements by which governments maintain order, productivity, and peaceful relations on the sea. NOAA's nautical charts provide the baseline that marks the inner limit of the territorial sea and the outer limit of internal waters.
- It has 168 members

International Sand Art Festival Chandrabhaga Beach, Odisha

- The Sand festival celebrates sand sculptures produced by skilful sand artists.
- The International Sand Art Festival was started in 2015 on the Chandrabhaga beach, a short distance from Konark. It was a part of the Konark Dance Festival that is organized during the same time. Every year, the theme for the Artists hover around the burgeoning issues of the Earth.
- The International Sand Artist Festival celebrates the spectacular displays of sand artists from India and from other many countries. As many as 30 Indian and 10 foreign artists participate in this Competition-turned-Festival. Best sand artists from Mexico, Spain, Singapore, France, Norway, Germany, Netherland & USA and remaining 20 artists are from different states of India usually grace the golden beach of Chandrabhaga.

Minimum Support Price (MSP)

- The MSP is the rate at which the government buys grains from farmers.
- Minimum Support Price (MSP) is a form of market intervention by the Government of India to insure agricultural producers against any sharp fall in farm prices
- Based on the recommendations of the Commission for Agricultural Costs and Prices, the Department of Agriculture and Co-operation, Government of India, declares Minimum Support Prices (MSP) for 22 crops before their sowing seasons.
- Cabinet Committee on Economic Affairs decides MSP
- The guaranteed price and assured market are expected to encourage higher investment and in adoption of modern farming practices.

MSP for Sugar

- In case of sugarcane, MSP has been assigned a statutory status and as such the announced
- Price is termed as statutory minimum price, rechristened as Fair Remunerative Price (FRP).
- There is statutory binding on sugar factories to pay the minimum announced price and all
- Those transactions or purchase at prices lower than this are considered illegal.

MSP Calculation

- The CACP has three formulae to arrive at the cost of production: A_2 , A_2+FL and C_2 .
- A_2 costs cover all paid-out expenses, both in cash and kind, incurred by farmers on seeds, fertilisers, chemicals, hired labour, fuel and irrigation, among others.
- A_2+FL covers actual paid-out costs plus an imputed value of unpaid family labour.
- C_2 costs are more comprehensive, accounting for the rentals and interest forgone on owned land and fixed capital assets respectively, on top of A_2+FL .

Bellbird

- Bellbirds have the loudest bird calls. Recorded 125
- Their mating song pack more decibels than the screams of howler monkeys and the bellows of bison.
- The mating call is given by male white bellbird.
- The males sang only their loudest songs, and swiveled dramatically while singing so as to blast the song's final note directly at the females
- Bellbird are found in forests in the Guianas with small numbers in Venezuela and Brazilian state of Para.

Rice Production & Export

- Rice is among the few commodities where India has a competitive advantage.
- India is the second largest producer of rice after China, but is currently the largest exporter of rice.

Year	Production (Million Tonnes)	Exports (Million Tonnes)
2012-13	105	10
2013-14	106	10.88
2014-15	105	11.97
2015-16	104	10.50
2016-17	109	10.75
2017-18	112	12.69
2018-19	116	12
2019-20	117	5* export was banned

Annual Import of Rice

- Philippines: 2 Million tonnes
- Indonesia : 2 Million tonnes
- Malaysia : 1 Million tonnes
- China : 3 Million tonnes

- Japan is currently importing all its rice requirements from US
- South Korea has duty of 513 percent on rice import.

- Both Japan and South Korea can be potential importers of rice from India.

Ease of Doing Business

- The ease of doing business Index calculated by World Bank
- India jumped to 63rd rank
- India put in place four new business reforms during the past year and earned a place among the world's top ten improvers for the third consecutive year.
- World Bank uses 10 parameters to rank nations ranked India at 52nd in resolving insolvencies last year (108)
Area of ease of starting a business needs improvement
India did better in dealing with construction permits, getting electricity, registering property, paying taxes, starting a business and trading across borders, its ranking went down in protecting minority investors and getting credit. Enforcing contracts same spot of 163
- At present World Banks take data from Delhi and Mumbai from next year Kolkata, and Bengaluru will be added

Genome India Project

- CSIR-Institute of Genomics and Integrative Biology (IGBI) and the CSIR- Centre for Cellular and Molecular Biology (CCMB) carries out genome sequencing to aid detection of genetic disorders
- Genome sequencing is the process of figuring out the order of DNA nucleotides, or bases, in a genome- the order of As, Cs, Gs, and Ts that make up of an organism's DNA.
- The human genome is made up of over 3 billion of these genetic letters.
- Application on whole genome sequencing: mostly related to clinical and biomedical purposes.

Genome India Project

- Biomedical purposes like: Newborn and Pediatric Disease, Drug Trials and Pharmacogenomics, Regulatory variation and eQTLs, Rare Tumor Types, Clan genomics, Family disease pedigrees, Large cohorts with extensive phenotyping
- Project's Purpose: Ensuring that India, with its unparalleled human diversity, is adequately represented in terms of genomic data and develops indigenous capacity to generate, maintain, analyse utilize and communicate large scale genome data in a scalable manner.
- 1008 Indians have genome sequencing done
- 55 variants of population found among them
- There are estimated 30,000 genes in human DNA.

New Right To Information (RTI) Rules

- Tenure of Information Commissioners reduced from 5 years to 3 years
- 'Condition of Service' government got the discretion
- The Chief Information Commissioner's salary has been fixed at Rs. 2.5 lakh and an information commissioner's as at Rs. 2.25 lakh

Uluru Rock

- Uluru is a large sandstone rock formation in the southern part of the Northern Territory in central Australia.
Height: 348 meters Total perimeter of 9.4 KM.
- Uluru is sacred to the local Aboriginal people of the area known as Anangu.
- Uluru is listed as a UNESCO World Heritage Site.
- The area around the formation is home to an abundance of springs, waterholes, rock caves and ancient paintings.
- Uluru is notable for appearing to change colour at different times of the day and year, most notably when it glows red at dawn and sunset.
- It is closed to climbers as locals demanded to close the trek.

Hunger Index

- India's ranking slips down from 93 to 102
- GHI score reflects data from 2014 to 2018 is based on the proportion of a country's child population that is undernourished, share of children under five years of age who have insufficient weight for their height or whose height is not commensurate to their age, and mortality rate of under 5 children.
- India's child wasting rate is extremely high at 20.8%
- Only 9.6% of children between 6-23 months in India were fed a minimum acceptable diet
- GHI ranks countries on a 100 point scale, with 0 being the best score and 100 being the worst. Values less than 10 reflect low hunger, values from 20-34.9 indicate serious hunger; values from 35 to 49.9 are alarming; and values of 50 or more are extremely alarming

Hunger Index

- The report warned that climate change was causing alarming levels of hunger and making it more difficult to feed people in the world's most vulnerable regions.
- Climate change is affecting the quality and safety of food and worsening the nutritional value of cultivated food.
- NGO CRY did the survey: 472 million children: 97 million are anemic and undernourished and that 40 of every 1000 infants don't get to celebrate their first birthday
- The Integrated Child Development Scheme (ICDS) is one of the largest public service schemes in India targeted at children below the age of 6 years but it covers half of the population

Import of Plastic Waste

- Import of plastic waste is a growing problem
- During April, 2018 to Feb, 2019 the quantity imported plastic flakes 99,545 tons
- Recycled PET flakes are used for Automotive parts such as luggage racks, fuse boxes, bumpers and door panels, polyester carpets, athletic shoes, sleeping bags, winter coats, and industrial strapping
- In India Plastic waste generation is 25,940 tons per day
- India has banned import of plastic waste
- This will help in getting collected domestic waste and recycling of the same. 40% of plastic waste is not getting collected.

WPI's tumbling BUT CPI rising

- Diverging WPI and CPI can be attributed to various factors including the difference in the weights of various items in the two indices.
- For example food articles have a higher weight in retail inflation than in wholesale inflation. So movement in food prices will have bigger impact on the CPI.
- Manufactured products have higher weight in WPI
- Fall in WPI indicates manufactured products are doing poorly- and manufacturers are gradually losing their pricing power

Why Britain wants to leave EU

- EU is union of 28 Nations. The member countries agreed to open their borders to other EU members, share a common market, and abide by various social and political policies.
- So, why Britons want out? There are three main issues:
 - Economics
 - Immigration
 - Identity
- UK sends money to Brussels which then gets distributed to the various member states.
- Other members argue UK has advantage of selling in common market under favorable terms
- UK says others are coming and grabbing the jobs which are scarce.
- Cost of leaving EU, UK to settle 39 billion pounds as 'Divorce Bill'

EU Rules Examples

- Proposed ban on high-powered house hold appliances like toasters, kettles Vacuum cleaners and hair dryers (Environment issues)
- European Union introduced strict restrictions on the quality of bananas and other fruit sold within the EU.
- Horse passports must show whether horses can be used for food at the end of their life.
- EU Rule: “children under eight cannot blow up balloons”.
- Britain can go back to using decent “60-watt, peach-coloured” light bulbs. EU classified them as not energy efficient
- EU rule tea bags can’t be recycled.

Major Port Authorities Bill 2020

- The **Bill** aims to replace the **Major Port Trusts Act, 1963**. It seeks to provide for regulation, operation and planning of **Major Ports** in India and to vest the administration, control and management of such **ports** upon the **Boards of Major Port Authorities**.
- This will empower the Major Ports to perform with greater efficiency on account of full autonomy in decision making and by modernizing the institutional frame work of Major Ports
- **Tariff Authority for Major Ports (TAMP)** has now been given powers to fix tariff which will act as a reference tariff for purposes of bidding for PPP projects. PPP operators will be free to fix tariff based on market conditions.
- The Board of each Major Port shall be entitled to create specific master plan in respect of any development or infrastructure established or proposed to be established within Port Limits

Landlord Model for Ports

- In the Landlord model port authority (Govt.) acts as a regulatory body and as landlord while private companies carry out port operations.
- Port authority maintains ownership of the port while infrastructure is leased to private firms that provide and maintain their own superstructure and install own equipment to handle cargo
- In return the land lord gets a share of the revenue from the private entity
- The role of the landlord port authority would be to carry out all public sector services and operations such as the award of bids for cargo terminals and dredging.

Port Bill

- These measures could lead to major ports becoming more attractive to the private sector, both in terms of investment and as service providers.
- These reforms are critical if the investments made in the last few years are to pay off.
- The recent measures like the Sagarmala project, developing port-based SEZs, etc., gave a boost to the shipping sector.
- With the approval of the Port Authority Bill by the Parliament, a critical missing link will finally be in place.
- This Bill seeks to replace a 1963 Act and it will be sunset time for the **Tariff Authority for Major Ports (TAMP)**.
- Centre may fix minimum distance between two ports .

‘BLOB’

- It is a single-celled organism. *Physarum polycephalum* which means many-headed slime
- It is estimated blobs precede human beings by 500 million years on earth
- It is able to move 1cm/h
- If cut in half it takes two minutes to heal itself. Blob is hard to kill
- Always looking to feed and procreate, which it does by producing and releasing spores that grow into new baby blobs. Blobs can grow upto 33 feet doubling their size everyday.
- Blob is really one of the most extraordinary things that live on Earth today. It has been here millions of years and we still don't really know if it's an animal, if it's a fungus or if it's something between the two.

Thank You