



CURRENT AFFAIRS
AUGUST 2017

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1. NATIONAL AND INTERNATIONAL IMPORTANT ISSUES

1.1 ECONOMIC DEVELOPMENT

1.1.1 Bitcoin Cash

- The Bitcoin block chain is forced to split in two.
- This creates two separate digital assets: the original Bitcoin and Bitcoin Cash.

Why split?

- To solve the scaling issue.
- Core developers want to keep the blocks limited in their size to protect against hacks.
- The miners want to increase the size of blocks to make the network faster.

What is Virtual Currency?

It is a type of unregulated, digital money, which is issued and usually controlled by its developers, and used and accepted among the members of a specific virtual community.

What is Crypto currency?

- A crypto currency is a digital or virtual currency that uses cryptography for security.

Benefits of Crypto currency:

- Crypto currencies make it easier to transfer funds between two parties in a transaction.
- Crypto currency gives Access to Everyone.
- Decentralization: A global network of computers uses blockchain technology to jointly manage the database that records transactions.
- People can't steal your information from merchants, impossible to counterfeit and recognition at universal level.

Disadvantages of crypto currencies:

- Irreversible payment there's no center point in payment processing.
- Not widely accepted.
- Crypto currencies are not completely immune to the threat of hacking.

What is a block chain?

- It is a distributed database
- Used to maintain a continuously growing list of records, called *blocks*.
- Each block contains a timestamp and a link to a previous block.
- By design, block chains are inherently resistant to modification of the data.

- Once recorded, the data in any given block cannot be altered retroactively without the alteration of all subsequent blocks

1.1.2 RBI reduces the Policy repo rate

The 25 basis points cut is taken by Monetary Policy Committee’s majority decision

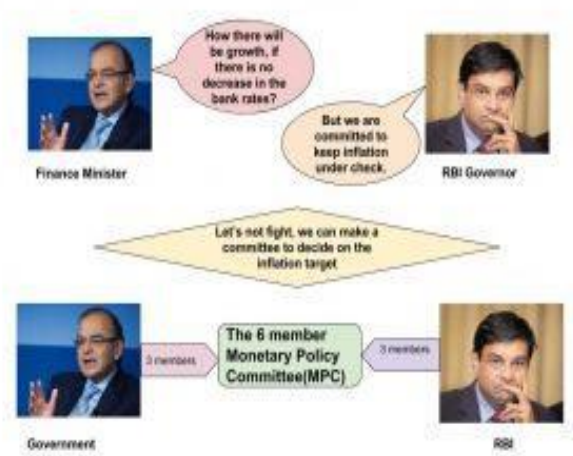
- There is significant slowdown over the past three months in *core inflation*(retail price inflation excluding those for food and fuel)

What is Repo rate?

- Also known as the benchmark interest rate
- Is the rate at which the RBI lends money to the banks for a short term against securities
- Repo rate is used to control inflation
- When the repo rate increases, borrowing from RBI becomes more expensive and if RBI wants to make it cheaper for banks to borrow money it reduces the repo rate

Monetary Policy Committee

- Entrusted with the task of fixing the benchmark policy rate (repo rate)
- Inflation Target: **Four per cent**. Upper tolerance level: **Six per cent**. Lower tolerance level: Two per cent.
- The meetings of the Monetary Policy Committee shall be held at least 4 times a year
- Three Members will be from the RBI and the other three Members of MPC will be appointed by the Central Government
- The Members of the Monetary Policy Committee appointed by the Central Government shall hold office for a period of four years



1.1.3 BRICS Agriculture Research Platform

The Union Cabinet has given approval for establishment of the BRICS Agriculture Research Platform (BRICS-ARP)

Aims:

- Promote sustainable agricultural development and poverty alleviation

- To provide food security in the BRICS member countries
- A natural global platform for science-led agriculture-based sustainable development for addressing the issues of world hunger, under-nutrition, poverty and inequality
- Enhancing agricultural trade, bio-security and climate resilient agriculture

1.1.4 Kishanganga, Ratle projects get World Bank nod

The World Bank permitted India to construct hydroelectric projects on Jhelum and Chenab rivers subject to constraints specified in the Indus Waters Treaty (IWT).

- Disagreement was over the technical design features
- IWT designates these two rivers as well as the Indus as the "Western Rivers" to which Pakistan has unrestricted use

1.1.5 First private sector anti-tank guided missile project

Kalyani Rafael Advanced Systems (KRAS), a joint venture between Kalyani Strategic Systems Limited and Israel's Rafael Advanced Defence Systems, opened its facility in Hyderabad

- Besides supplying to the Indian Army, the plan is to export to South East Asian countries
- Formed in line with the 'Make in India' initiative of the Centre and the policy to encourage private sector participation in defence production

1.1.6 Exchange Traded Fund (ETF) "BHARAT 22

Government is using ETF as a vehicle for further disinvestment of shares in PSUs

What is an ETF?

- Are Index Funds that are listed and traded on exchanges like stocks
- An index fund is a type of mutual fund
- Like a mutual fund, an ETF pools the assets of its investors and uses professional managers to invest the money
- ETFs can be bought and sold on a stock exchange throughout the trading day

Bharat 22

- Bharat 22 consists of 22 stocks of CPSE's, PSB's & strategic holding of SUUTI (Specified Undertaking of UTI)
- Is a well-Diversified portfolio with 6 sectors (Basic Materials, Energy, Finance, FMCG, Industrials & Utilities)

1.1.7 The Buckingham Canal

The Inland Waterways Authority of India (IWAI) aims revive this canal

- The project comprises of various canals in Andhra Pradesh, Tamil Nadu and Pondicherry
- North Buckingham Canal is partly tidal
- The special purpose vehicle for the project involves the Visakhapatnam Port Trust also



1.1.8 Chabahar Port

Once Chabahar Port in Iran becomes operational, it will be a gateway to golden opportunities.

- It is located in the Sistan-Balochistan province in Iran, lies outside the Persian Gulf and is easily accessed from India's western coast
- Talks are on for building railways and roads through Chabahar till Afghanistan and then to Russia
- The trilateral pact between India, Iran and Afghanistan envisages establishment of Transit and Transport Corridor in the three countries



1.1.9 Real Estate Regulation Act (RERA)

Banks, in consultation with the Reserve Bank of India, have decided not to extend loans to those projects which have not been registered under RERA.

- The government enacted RERA and all the sections of the Act have come into force with effect from May 1 this year
- Under this law, a developer will have to maintain 70% money collected from homebuyers in a separate account, to avoid diversion of funds
- Aims to improve transparency in real estate sector
- Builders are expected to disclose project-related information, including project plan, layout and government approvals-related information to prospective customers.

- Any major changes in the project can only be done after receiving the consent of two-thirds of homebuyers in that project.

1.1.10 ASEAN completed 50 years

- The Association of Southeast Asian Nations is a regional intergovernmental organization comprising ten Southeast Asian states.
- Since its formation on 8 August 1967 by Indonesia, Malaysia, the Philippines, Singapore, and Thailand, the organization's membership has expanded to include Brunei, Cambodia, Laos, Myanmar, and Vietnam.

India and ASEAN

- India's search for economic space resulted in the 'Look East Policy'.
- The Look East Policy has today matured into a dynamic and action oriented 'Act East Policy'.
- Relationship with ASEAN is a key pillar of India's foreign policy and the foundation of the Act East Policy.
- The India- ASEAN relationship was upgraded to a Strategic Partnership in 2012

1.1.11 Insolvency and Bankruptcy Code

The Insolvency and Bankruptcy Code was enacted in 2016.

- The Code aims to smoothen the insolvency process and to make it clear and certain.
- Bankruptcy is the status of a person who is legally declared as *incapable of paying their dues and obligations*(insolvency)

The Insolvency and Bankruptcy Board of India

- is the insolvency regulatory body in India

Insolvency professionals

- Such professionals sit at the heart of the insolvency system.
- Non-availability of adequate number of skilled and trained insolvency professionals is fast becoming a matter of concern.

UNCITRAL Model Law on Cross-Border Insolvency

- Is a model law issued by the secretariat of The United Nations Commission on International Trade Law (UNCITRAL)
- Aims to assist states in relation to the regulation of corporate insolvency and financial distress involving companies which have assets or creditors in more than one nation.

1.1.12 Cruise tourism in the country

India has a huge potential of hosting cruise tourists and is expected to create many jobs directly and indirectly

Bottlenecks:

- Absence of world class infrastructure
- lack of defined procedures for various government departments/agencies for dealing with cruise vessels and tourists

Initiatives to address this problem:

- Setting up of a task force comprising all relevant agencies like port, immigration, customs, port health authorities and security agencies was formed to study the present environment and procedures.
- A global consultant was hired to bring about a holistic approach and suggest the way forward.
- Allowing foreign flag vessels carrying passengers to call at Indian ports without obtaining license from DG (Shipping)
- Uniformity in port charges for cruise vessels at all Major Ports.

1.1.13 Banking Regulation (Amendment) Bill, 2017

It seeks to amend the Banking Regulation Act, 1949 to insert provisions for handling cases related to stressed assets.

Salient features:

- **Initiating insolvency proceedings:** Now on RBI authorized to issue directions to banks for initiating proceedings in case of a default in loan repayment.
- **Issuing directions on stressed assets:** The RBI may, from time to time, issue directions to banks for resolution of stressed assets.
- **Committee to advice banks:** The RBI may specify authorities or committees to advise banks on resolution of stressed assets.
- It will also be applicable to the State Bank of India, its subsidiaries, and Regional Rural Banks.

Need for the bill:

A majority of NPAs (88%) are in public sector banks. This new amendment gives RBI additional powers to direct banks to initiate recovery proceedings under the Insolvency and Bankruptcy Code, 2016.

1.1.14 Economic Survey 2016-17: Volume-II

Earlier two volumes of economic survey used to be released on the day before the Budget

- Volume 1 was analytical and policy and ideas-oriented
- Volume 2 featured a sectorial review and included historic data for first three quarters

Pattern changed due to advancement of budget calendar.

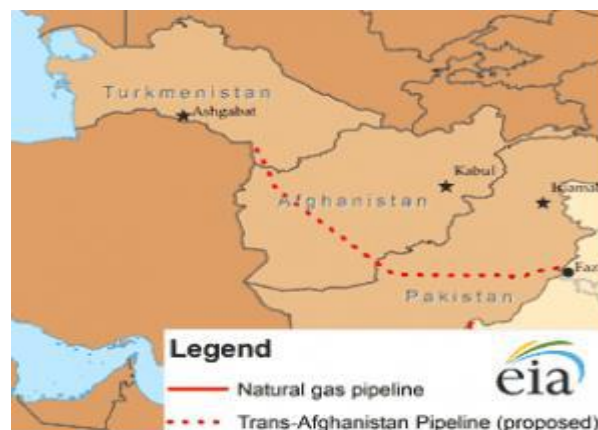
1.1.15 The Revolution in Banking Sector Technology

- The JAM (Jan Dhan-Aadhar-Mobile) technology trinity enabled by payments through the Unified Payments Interface (UPI), has made mobile banking simple
 - India is within the reach of '1 billion - 1 billion - 1 billion' vision of financial inclusion. That is 1 billion unique Aadhaar numbers linked to 1 billion bank accounts and 1 billion mobile phones.
 - **JAM** has brought together financial inclusion (PMJDY), biometric identification (Aadhaar) and mobile telecommunications
 - *Advantages of the scheme:* Allow poor to become part of digital mainstream and can transfer resources to citizens faster and more reliably and with less leakage
- Clearances using the National Electronics Transfer of Funds (NEFT), Real Time Gross Settlements (RTGS), Immediate Payment Service (IMPS) and Electronic Clearing System (ECS) are rapidly integrating into the mainstream banking sector activities.
- Fintech – the short form financial and technology has come to dominate the real world of banking.
- The Reserve Bank of India's medium term plan for financial inclusion by 2021

1.1.16 TAPI Pipeline

India will host the next steering committee meeting of the proposed 1,814 kilometer-long Turkmenistan-Afghanistan-Pakistan-India (TAPI) natural gas pipeline

- First proposed in 1995, had its ground-breaking ceremony in December 2015



- To tap Turkmenistan's Galkynysh gas fields, which are the fourth largest in the world.
- Being developed by the Asian Development Bank.
- In Afghanistan, TAPI pipeline will be constructed alongside the Kandahar–Herat Highway
- Passes via Quetta and Multan in Pakistan
- The final destination of the pipeline will be the Indian town of Fazilka, near the border between Pakistan and India

1.1.17 Road Sector

TOT - 'toll-operate-transfer'- Model

- pension funds and Private Equity firms are allowed to lease government-owned national highways for 30 years
- The lessee, in turn, gets the right to collect the toll, operate, manage and maintain the highway stretch.
- The National Highways Authority of India (NHAI) is likely to provide a risk cover to the lessee for any unforeseen circumstances such as a rapid fall in toll collection and any structural or engineering fault on the highway.

1.1.18 Job Generation

Small scale industries in Independent India

Medium, Small and Micro industries in the country account for nearly 40 per cent of India's manufacturing and 45 per cent of merchandise exports.

Increasing employment in rural India

Cottage industries:

- Cottage industries are key to providing jobs particularly in rural India.

Service sector:

- Service sector arises out of these industries is the key especially in rural India where there is dearth of jobs other than agriculture.
- This will prevent large scale migration to urban areas as well.
- Also allowing 100 per cent FDI in food processing will create more jobs in rural India apart from ensuring minimal wastage of food produce

Mudra Scheme (Fund the Unfunded):

It makes loans accessible to small entrepreneurs

- The Mudra scheme has ensured that large number of youth got jobs through self-employment.

- The youth of rural India not only get jobs for themselves but also become employers for few others in their start-ups.

1.1.19 Use Aadhaar for financial transactions

- Capital market regulator SEBI has plan to make Aadhaar compulsory for stock trading
- Already, large financial transactions are tagged to the tax department's Permanent Account Number (PAN).
- To weed out duplicate PANs, the government has mandated linking PAN with Aadhaar.
- Aadhaar should become the single identifier that should be tagged to all financial transactions.
- The tax deduction and collection number, or TAN, is mandatory for legal entities responsible for deducting or collecting tax.

The RBI has now introduced the legal entity identifier, a global reference number that uniquely identifies every legal entity or structure that is party to a financial transaction in any jurisdiction.

1.1.20 Core Sector Growth

The year-on-year growth of the core sector has slowed this quarter

What is core sector?

- Consists of the eight core industries - **Electricity , Steel, Refinery products, Crude oil, Coal, Cement, Natural gas and Fertilizers**
- Comprise 40.27% of the weight of items included in the *Index of Industrial Production (IIP)*

What is IIP?

- It is compiled and published monthly by the Central Statistical Organization (CSO)
- Measures growth of various sectors in an economy
- Shows the status of production in the industrial sector for a given period of time as compared to a reference period of time.
- The items included in IIP fall into three sectors - mining, manufacturing and electricity sectors.
- Maximum weightage is of Manufacturing items followed by Mining and Electricity

1.2 SOCIAL DEVELOPMENT

1.2.1 Skill Development

There is a proposal to develop an extensive rating criterion to benchmark skilled personnel

National Skills Qualification Framework (NSQF)

- NSQF is a quality assurance framework notified in 2013
- organizes all qualifications according to levels of knowledge, skills and aptitude
- Includes formal or informal learning
- Will enable mobility between vocational and general education
- Allow transition from non-formal to organized job market
- A five-year timeline is given to ensure all skills training, government or private, is NSQF-compliant

1.2.2 United Nations pact to ban nuclear weapons

- Aims to ban nuclear weapons worldwide and
- 122 nations have approved the treaty
- Outlaws the entire range of activity relating to the production, stockpiling and use of nuclear weapons
- bans the conduct of underground explosions
- Assistance for people exposed to extreme radiation and contamination of the environment has been spelt out explicitly
- *The world's nuclear powers had boycotted the negotiations*

1.2.3 Health - Tobacco consumption

- Nicotine does not directly cause cancers and other diseases that kill people, but is extremely addictive.

Regulation in India

- India follows WHO Framework Convention on Tobacco Control guidelines.
- Has banned tobacco advertisements, introduced pictorial warnings (covering 85% of the front and back of packages of tobacco products)
- Has prohibited the use of descriptors such as light, mild and low as well as the sale of flavored cigarettes
- India is yet to prohibit the sale of e-cigarettes to minors.

1.2.4 Task Force on employment data

India suffers from a lack of reliable, timely data on employment.

Existing Methods

- Data is collected and published by certain agencies including the Labor Bureau, but the coverage is very small.

The Task Force

- Under the chairmanship of the Vice Chairman, NITI Aayog to recommend solutions

1.2.5 Trade Related Entrepreneurship Assistance and Development (TREAD) Scheme

- Focus to promote self-employment for women SHGs (Self Help Groups) in non-farming sector
- There is provision for grant up to 30% of the loans

1.2.6 Housing Challenge

- A technology competition to give fillip to the Housing for All program.
- would be conducted by states to choose the cost-effective technology
- NBCC(National Buildings Construction Corporation) would assist the states

1.2.7 MGNREGS - Status

- The scheme has seen a significant demand for wage labour specially for water conservation works
- Now 98% payments are through the electronic Fund Management System (e-FMS)
- About 1.71 crore assets of MGNREGS have been geo-tagged so far
- Independent Social Audit Units have been set up in 24 States

What is geo-tagging?

- Is the process of adding geographical identification data to various media such as photograph or video, websites, SMS messages etc.
- It helps in the creation of a database on the assets
- National Remote Sensing Centre (NRSC), ISRO, Hyderabad, is geo-tagging the assets and Bhuvan project of ISRO facilitate this work

1.2.8 Socio Economic and Caste Census 2011 data application

The government plans to use the Socio Economic and Caste Census 2011 data to identify individual beneficiaries for all its schemes. It is as per the recommendations of Summit Bose committee

SECC data

- Provides for automatic exclusion on the basis of 14 parameters, automatic inclusion on the basis of five parameters
- Grades deprivation on the basis of seven criteria.
- According to SECC data, more than 62% of rural households are 'deprived'.

Programs that adopted above SECC data are

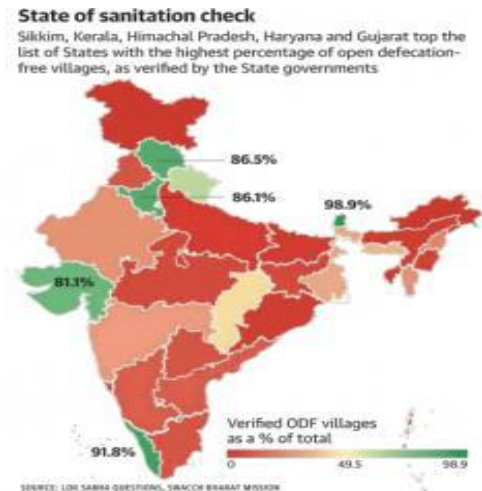
Pradhan Mantri Ujjwala Yojana: owes much of its success to SECC to accurately identify the households in need of an LPG connection

PM Awas Yojana: financial assistance to the poor

Deendayal Upadhyaya Power Scheme: electricity connection to the poor

Swachh Bharat Mission: for building toilets for the poor

Rural Employment Guarantee Act: to prepare Labor Budgets



1.2.9 Measles-Rubella (MR) Campaign

- India, along with ten other WHO South East Asia Region member countries, has resolved to eliminate measles and control rubella/congenital rubella syndrome (CRS) by 2020.
- Vaccination campaign in the age group of 9 months to less than 15 years is conducted in a phased manner across the nation
- MR vaccine will become a part of routine immunization and will replace the present measles vaccine

1.2.10 Border area projects

- A Border area needs special attention for development.
- The Border Infrastructure include - Border Roads, flood lights, Border Outposts (BOPs) and Integrated Check Posts (ICPs)
- Technological solutions will involve networking of equipment like High Resolution Cameras, Radars, Unattended Ground Sensors, Optical Fibers, Infra-Red Sensors, Aerostats and Hand-held Thermal Imagers etc.
- Necessary assistance is required in the field of education, health and other basic necessities also.

1.2.11 NITI Aayog selects 3 States for transformative change in Health & Education sectors

- Has selected Uttar Pradesh, Assam, and Karnataka to improve healthcare delivery and key outcomes in these States.
- In Education, Madhya Pradesh, Odisha, and Jharkhand have been selected
- Is part of ***the Sustainable Action for Transforming Human Capital (SATH) initiative*** of NITI Aayog.

1.2.12 New India - Manthan

- The first-of-its-kind interaction with district collectors by Prime minister, marked the occasion of the 75th anniversary of the Quit India Movement
- Is aimed at catalysing “New India – Manthan” at the grassroots level.
- PM emphasised “Sankalp se Siddhi” – “Achievement through Resolve.”

1.2.13 e-Shakti initiative of NABARD

Aims and Objectives:

- Digitization of all the SHG accounts
- Integrating SHG members with the national Financial Inclusion agenda
- Improving the quality of interface between SHG members and Banks for delivery of banking services
- Use Aadhaar linked identity.

1.2.14 Good Manufacturing Practices

- Is a system for ensuring that products are consistently produced and controlled according to quality standards.
- It is designed to minimize the risks involved in any pharmaceutical production that cannot be eliminated through testing the final product.
- Good manufacturing practices, along with good agricultural practices, good laboratory practices and good clinical practices are overseen by regulatory agencies in the United States, Canada, Europe, China, and other countries.

Why in news?

- Dr. Reddy’s Laboratories unit loses EU GMP tag

1.2.15 National Family Health Survey

- The indicator “Children under 5 years who are underweight (weight-for-age)” is one of the composite indicator for child malnutrition.

As per the National Family Health Survey (NFHS)-4 (2015-16),

- 35.7 per cent children below five years are underweight, has reduced from 42.5%
- 38.4 per cent are stunted and 21 per cent are wasted in the country
- In the State of Madhya Pradesh 42.8 per cent children below five years are underweight, 42 per cent are stunted and 25.8 per cent are wasted

Steps taken to tackle malnutrition

- MAA (Mothers Absolute Affection) to promote exclusive breast feeding;
- Pradhan Mantri Surakshit Matritva Abhiyan;
- National Iron Plus Initiative (NIPI) for anaemia control among children

1.2.16 Childhood Obesity

What is Junk Food?

- Is a term used for food containing high levels of calories from sugar or fat with little fiber, protein, vitamins or minerals.
- These foods lead to a rapid increase in blood sugar levels (high glycemic index) which forces the body to produce high levels of insulin to counter the rising blood sugar.

Steps taken

- Ministry of Women and Child Development had constituted a Working Group on addressing consumption of foods High in Fat, Salt and Sugar (HFSS) and promotion of healthy snacks in schools of India, which has given its report.
- ICMR, National Institute of Nutrition (NIN) and other institutions carry out research and studies related to food and healthy diet.
- The consumers are made aware of food safety through consumer awareness programmes launched jointly by the Department of Consumer Affairs and the Food Safety and Standards Authority of India (FSSAI)

1.2.17 Inclusive Development

- Financial Inclusion of the Poor: Prime Minister Jan Dhan Yojana.
- Expansion of Social Security Net. Through Pradhan Mantri Suraksha Bima Yojana (Accident Insurance), Atal Pension Yojana (Unorganized Sector) and Pradhan Mantri Jeevan Jyoti Yojana (Life Insurance),
- **Stand up India**- To boost the spirit of entrepreneurship among the Scheduled caste, scheduled tribes and women
- **Panchtirth**- 5 key places related with Babasaheb Ambedkar declared as Panchtirth

- **Schemes for farmers and farm labourers:** Jan Dhan, life and crop insurance and village irrigation schemes.
- **Subsidies:** Subsidized cooking gas, construction of toilets and priority lighting of rural households
- **Employment related schemes:** Make in India, Digital India, Start-up India, Skilled India

1.2.18 Revival of Integral Humanism

Advocated by Deendayal Upadhaya.

- Entire creation of living and nonliving is an integrated organic being; every unit is interconnected and dependent upon each other.
- Diversities arise from the basic unity and not that the diversity creates an illusory unity.

1.2.19 NE Integration

- A North Eastern Cultural and Information Centre will be set up in Delhi to act as a cultural and convention/information hub of the North Eastern Region
- “Venture Capital Fund” for the young Start-Ups and entrepreneurs, to initiate an enterprise in NE region
- ‘Dr. APJ Abdul Kalam Center for Policy Research and Analysis’ is launched at the Rajiv Gandhi Indian Institute of Management (RGIIM), Shillong
- Better connectivity to the region via rail networks, roads and waterways.

1.2.20 Health - Vector borne diseases

What are vector borne diseases?

Vector-Borne Disease: Disease that results from an infection transmitted to humans and other animals by blood-feeding arthropods, such as mosquitoes, ticks, and fleas.

Arthropod vectors are cold-blooded (ectothermic) and thus sensitive to climatic factors and normally see a spike during the monsoon season

Visceral leishmaniasis (VL) or kala-azar

- Is endemic to districts spanning West Bengal, Bihar, Jharkhand and eastern Uttar Pradesh in India also in Bangladesh, Bhutan, and Nepal
- India itself accounts for half the global burden of the disease.
- Caused by the *Leishmania donovani* parasite, harboured by an insect called the **sandfly**
- Disease is confined to humans

- India's National Vector Borne Disease Control Programme (NVBDCP) aims to eliminate the disease with funds from a World Bank-supported project
- 2016 was the first year that no **kala-azar** death was reported officially in India
- The 2015 elimination target was missed and postponed to September 2017

Treatment and Symptoms

- Resistance to the only drug (SSb injection) has led to frequent outbreaks and fatalities
- There are now two mainline drugs, **miltefosine** and **liposomal amphotericin B (LAmB)**
- A rapid diagnostic test, called **rK39** can indicate the presence of the parasite.
- The infection is painless and never known to trigger the fevers and pains typical of parasitical diseases, so normally goes untreated
- The blemished skin is the only sign of post-kala-azar dermal leishmaniasis (PKDL)

Swine flu

- Is called H1N1 influenza
- spreads from human to human
- similar to the symptoms of regular human flu and include fever, cough, sore throat, body aches, headache, chills and fatigue
- It's called swine flu because in the past, the people who caught it had direct contact with pigs.
- Vaccine available to protect against swine flu

Symptoms

- Cough, Fever, Sore throat, Headache, Fatigue

1.2.21 India's roads to be safer

National Highways Authority of India (NHAI) set to roll out an 'incident management system'.

- Ambulances will be stationed every 50 kilometres
- Keeps larger four-bedded ambulance with medical recovery systems

1.2.22 The Supreme Court bar instant talaq

- SC declared practice of instant triple talaq as unconstitutional
- Discriminatory practices does not deserve constitutional protection under Article 25

- The verdict does not address issues like polygamy, or other routes of divorces
- The government to bring legislation to govern marriage and divorce in the Muslim community.
- Most large Islamic nations that have already outlawed triple talaq, including Pakistan and Bangladesh.

Article 25

- Gives Freedom of conscience and free profession, practice and propagation of religion

Article 14

- Gives equality before the law or the equal protection of the laws within the territory of India
- Prohibition of discrimination on grounds of religion, race, caste, sex or place of birth

1.2.23 'Swasth Bachche, Swasth Bharat' Programme

- an initiative of Kendriya Vidyalaya Sangathan to prepare a physical Health and Fitness Profile Card
- make physical activity and recreational games an integral part of learning process ,
- using technology for data capture and analytics, and giving access to schools, parents and teachers

1.2.24 Protests after Dera chief convicted of rape

Supporters of the Dera Sacha Sauda sect went on the rampage as their chief Gurmeet Ram Rahim Singh had been convicted of rape by a CBI special court.

Lessons to learn:

- Crowd Management is very important task, especially in countries like India.
- There were huge loss of life because of stampedes.

Ethical dimensions:

- Religion became very powerful tool in the hands of politicians and also for self proclaimed godmen
- People carry blind beliefs and actions instead of embracing the basic tenets of any religion, like humanism and peace

1.3 INDUSTRIAL DEVELOPMENT

1.3.1 Launch of National Biopharma Mission

The program named *Innovate in India* (i3) will witness an investment of USD 250 million

- India has been an active player in the pharmaceutical industry and has contributed globally towards making life saving drugs and low cost pharmaceutical products.
- The mission is to be implemented by Biotechnology Industry Research Assistance Council (BIRAC), a Public Sector Undertaking of Department of Biotechnology

Aims

- to develop India's technological and product development capabilities in biopharmaceuticals
- to strengthen and support the entire product development value chain for accelerating the research

1.3.2 Pradhan Mantri Rojgar Protsahan Yojana (PMRPY)

- Has the objective of promoting employment generation, announced in 2016-17 budget and implemented by the Ministry of Labour and Employment
- The scheme is being the employers would be provided an incentive for enhancing employment by reimbursement of the 8.33% EPS contribution made by the employer in respect of new employment.

1.3.3 The Automotive Mission Plan 2016-26 (AMP 2026)

It is the collective vision of Government of India (Government) and the Indian Automotive Industry

- India has become a fastest growing auto-hub within a short span
- India is the fifth largest automobile manufacturing country in the world.
- Auto sector contribute to 7 per cent to the GDP and nearly 49 per cent to the manufacturing GDP.

The world is still largely dependent on fossil fuels for transportation. Electric mobility is seen as the way forward.

Electric mobility has multiple options which include

- pure electric vehicles (BEVs) that use energy stored in batteries obtained from the grid
- hybrid electric vehicles (HEVs)

- plug-in hybrid electric vehicles (PHEVs) and
- fuel cell vehicles (FCVs)

The policies suggested are

- lower taxes for BEVs
- investments for the establishment of charging infrastructure
- facilitation of battery-swapping business models
- setting up of advanced lithium ion battery manufacturing facilities

Technology-neutral approach

- It is based on the fact that HEVs and PHEVs do not compete but rather complement and support faster adoption of BEVs.
- That is because all these technologies have similar components that can together create necessary volumes to bring down the prices of these components.

1.3.4 Active Pharmaceutical Ingredient (API)

An active ingredient (AI) is the ingredient in a pharmaceutical drug that is biologically active.

Production of APIs has traditionally been done by the pharmaceutical companies themselves in their home countries.

Why in the news:

- India imports about 84% of the APIs it needs, China alone accounted for 65.3% of the total. This included ingredients for essential antibiotics.
- There is a concern that if the tensions continue over the border issue, this will hit pharma sector and it is worrying because we do not even have the API capacity to manufacture a paracetamol

The Drug Controller General of India (DCGI) has got local drug makers to draw up an emergency plan on dealing with any blockade

1.3.5 Does India need bullet trains?*History:*

- High speed rail or HSR, which basically means trains running on dedicated lines at 250 km/h.
- The first such system began operations in Japan in 1964 and was widely known as the bullet train.

High-speed rail in India:

India does not have any railways classified as high-speed rail (HSR). The fastest train in India is the Gatimaan Express with a top speed of 160 km/hr., which runs between Delhi and Agra.

HSR advantages:

- alternative to present systems
- Energy-efficient and environment friendly.
- A stimulus for the development of satellite towns, helping alleviate migration to metropolises.
- Gives easy access to tier-II and tier-III cities.

Arguments against HSR:

- Very expensive
- Land acquisition problem for dedicated and elevated tracks

1.3.6 Manufacturing of AYUSH drugs**Quality Control**

- As per the provisions of Drugs & Cosmetics Rules, 1945, quality standards prescribed in the pharmacopoeias are mandatory for the manufacturing of AYUSH drugs and the enforcement of these provisions is vested with the State Licensing Authorities/Drug Controllers appointed by the Government.
- The Government has established Pharmacopoeia Commission for Indian Medicine and Homoeopathy (PCIM) to develop and revise the norms of quality standards of AYUSH.
- Clinical practice of AYUSH is not allowed without registration of the practitioner

Medicinal Plants

- Good Agricultural & Collection Practices have been developed and financial support is provided to the states for large scale cultivation of medicinal plants under the Centrally Sponsored Scheme of National AYUSH Mission.
 - Providing financial assistance as subsidy to farmers to encourage cultivation of herbs/medicinal plants throughout the country.
- Central Sector Scheme on Conservation, Development and Sustainable Management of Medicinal Plants
 - The Scheme gives support for survey, inventorization, in-situ conservation and ex-situ conservation
 - Specific focus is given for conservation and development of threatened category of medicinal plants

1.3.7 Information Technology Investment Region (ITIR)

Department of Electronics & Information Technology, Govt. of India had notified setting up of ITIRs near Bengaluru and Hyderabad in 2009.

- The State Government would play the lead role in setting up of the ITIR, while the center pays the viability gap funding.
- To promote investment in the Information Technology (IT) / Information Technology Enabled Services (ITES)/ Electronic Hardware Manufacturing (EHM) units

1.3.8 Food Technology - microwave assisted thermal sterilization, or MATS

- The method involves placing sealed packages of food in pressurized water and heating them with microwaves for several minutes
- Unlike traditional processing methods, where packages are in pressure cookers for up to an hour until both bacteria and nutrients are largely gone, the dishes retain their natural flavor and texture
- They also can sit on a shelf for a year
- do not need refrigeration
- The technology first developed for the U.S. military

1.3.9 Transportation Sector Achievements

- The North East region, naxal affected areas, backward and interior areas are being given special attention in terms of building road connectivity.
- The Motor Vehicle (Amendment) Bill addresses **road safety issues** by providing for stiffer penalties, making fitness certification of vehicles and issue of driver's licenses transparent by computerizing it and minimizing human intervention, statutory provisions for protection of good Samaritans and recognition of IT enabled enforcement systems.
- **Reducing pollution**
 - programme for replacement of old vehicles,
 - adopting BS-VI emission norms from 1st April 2020,
 - developing plantations along highways
 - Electronic Toll Collection based on RFID tags called FASTags
 - The use of alternate fuel like Ethanol, Bio-CNG, Bio-Diesel, Methanol and electricity
- **The Sagarmala programme**
 - declaring 111 waterways as National Waterways.

- industrialize the port areas by developing 14 coastal economic zones.
- modernization and augmentation of the port infrastructure
- improving connectivity of ports with the hinterland through road, rail and waterways
- development of the coastal community

1.3.10 Defence Manufacturing

Indigenization

- **Technology Development Fund (TDF) Scheme:**
 - Aims at funding the development of defence and dual use technologies
- **Defence Procurement Procedure (DPP), 2016**
 - A new category of procurement and preference has been accorded to 'Buy (Indian) and 'Buy & Make (Indian)' categories of capital acquisition over 'Buy (Global)' and 'Buy & Make (Global)' categories.
- **'Buy & Make (Indian)' and 'Buy & Make' Categories of Capital Acquisition**
- **Army Design Bureau (ADB):**
 - Established in August - 2016 as a single point coordination with Industry & Academia which act as a central repository of technical know-how
- FDI up to 49% is allowed through automatic route and beyond 49% under Government approval route wherever it is likely to result in access to modern technology or for other reasons
- Light Combat Aircraft "TEJAS" and Advanced Light Helicopter (ALH) Dhruv are indigenously designed & developed

1.3.11 Kashmir saffron

India is a leading producer of premium and finest quality saffron in the world

- Spices Board has teamed up with the Jammu and Kashmir government to boost production and improve value addition of saffron
- Is making efforts to secure GI (geographical indication) registration
- Promoting the setting up of common mini-processing facilities and value



addition units

- Tries to address the issue of post-harvest management, especially for drying and storage, in order to retain the colour, aroma and flavour of the spice
- The Codex Committee on Spices and Culinary Herbs has initiated the development of Codex standard for saffron
 - The Codex Alimentarius is a collection of internationally recognized standards, codes of practice, guidelines, and recommendations relating to foods, food production, and food safety.

1.3.12 TRIFED celebrates World Honey Bee Day

- To create awareness about Beekeeping and uses of its products including Honey
- Honeybees/ beekeeping has been recognised as one of the important inputs for sustainable development of agriculture/ horticulture
- Beekeeping has been useful in pollination of crops
- Helps in increasing income of the farmers and serves a source of livelihood for rural poor

Tribal Cooperative Marketing Development Federation of India Limited (TRIFED)

- is an apex organisation at National Level and functioning under the administrative control of Ministry of Tribal Affairs.
- TRIFED works to ensure better remunerative price for the products
- Aims socio-economic betterment through Self Help Groups, Empanelled NGOs, State level Tribal Development Corporations, and Forest Development Corporations for undertaking marketing development of the tribal products.
- TRIFED is playing and lead role in protecting, promoting and multiplication of Honey Bees by Scientific, Non-destructive collection practices

2. ENERGY AND ENVIRONMENT

2.1 ENERGY

2.1.1 Methanol - a clean fuel

Advantages of Methanol

- It is clean, cheaper than fossil fuels and a good substitute for heavy fuels.
- Will help India use its vast reserves of coal, Can reduce the petroleum imports.
- Methanol can be produced from municipal waste as well
- It can be made from natural gas

How Methanol is produced ?

Methanol can be produced from natural gas, coal and renewable sources such as municipal waste, biomass and recycled carbon dioxide.

Role of NITI Aayog

NITI Aayog is working on a roadmap for conversion from coal to by studying Chinese model

Property	Methanol	Ethanol
appearance	colorless	colorless
physical effect	very poisonous and fatal when ingested	feel intoxicated when ingested
uses	Used in solvents and fuels, it is primarily used to make other chemicals.	for alcohol, cleaning, solvents, and fuels

2.1.2 LPG (Cooking gas)

- The central government has asked oil companies to raise domestic LPG prices by Rs.4 per cylinder every month until the entire subsidy is wiped out.

- The government had earlier asked the LPG retailers to revise prices by Rs2 per month, to gradually remove the subsidy involved. The move now is to fast-track the price revision, so as to better allocate scarce resources.
- The upfront subsidy (subsidy payment in advance) distorts the market, breeds corruption and comes in the way of efficiency improvement.
- Following the implementation of direct benefits transfer for LPG to below poverty line (BPL) households, it makes no sense to provide such consumption subsidies for the non-poor.
- Subsidized kerosene, needs to be promptly replaced with aids like solar lanterns. It should hugely improve public health.
- We also need to revamp market design for domestic LPG, complete with norms for sharing bulky infrastructure for supply and storage.
- Piped supply of gas in towns would be cheaper than distribution via cylinders. Composite cylinders would lower costs, as compared to steel ones.

Properties	Compressed natural gas(CNG)	Liquefied petroleum gas(Auto gas)
Constituents	Consists mostly of methane	Consists mainly of Propane and Butane
Source	Obtained from natural gas-and-condensate wells, oil wells, coal bed methane wells.	Automatically generated from gas fields when natural gas is extracted from the reservoir. By-product of cracking process during crude-oil refining.
Properties	It is lighter than air and hence disperses quickly in the event of spillage.	Highly inflammable. It is heavier than air and on leakage will settle to ground and accumulate in low lying areas.

Uses	Substitute gasoline automobiles.	for in	Heating and cooking in homes, refrigeration, industrial, agricultural, catering and automobile fuel.
Environmental effects	Releases less greenhouse gas.	less	Releases CO ₂ which is a greenhouse gas but is cleaner when compared to gasoline.

2.1.3 Green Airports and Light houses

- The Government of India encourages development of green airports.
- AAI has commenced installation of 1MWp solar power plant at Tirupathi and Vijayawada Airports.
- Earlier, the Cochin International Airport Limited (CIAL) became the first airport in the world, to be completely powered by solar energy.

2.1.4 The Energy Conservation Building Code (ECBC) 2017

- The 2017 ECBC is an update of the Code first introduced in 2007
- Compares very favourably with international best practices
- If implemented correctly, could make new buildings producers of electricity rather than simply consuming energy, according to the Green Business Certification Institute, USA
- The ECBC 2017 has three levels of adoption — basic, ECBC Plus, and Super ECBC
- While the Code is primarily designed for new commercial buildings, there are measures that existing buildings can adopt to reduce energy consumption
- The 2017 Codes have already been adopted by 12 states

2.1.5 Cheaper Solar Cells

Researchers at Australia's University of New South Wales recently set a new world record for solar cell efficiency by developing the largest single **perovskite photovoltaics cell**, which is 10 times bigger than the current certified high-efficiency perovskite solar cells.

Two technologies are

1. **The hydrogenation**

- Hydrogenated amorphous silicon (α -Si:H) is used for doping and as intrinsic absorber layers in thin-film silicon solar cells.
- α -Si:H is a very versatile material with properties that are of high interest for application in other devices such as heterojunction solar cells, detectors, or optoelectronic devices.

2. **Perovskite cells technology**

- Solar cell which includes a perovskite structured compound, as the light-harvesting active layer
- Solar cell efficiencies of devices using these materials have increased from 3.8% in 2009 to 22.1% in early 2016, making this the fastest-advancing solar technology to date

What is Passive solar technology?

In passive solar building design, windows, walls, and floors are made to collect, store, and distribute solar energy in the form of heat in the winter and reject solar heat in the summer. This technology has been used by humans since long time

2.1.6 Coalbed Methane

Coalbed methane (CBM or coal-bed methane), coalbed gas, coal seam gas (CSG), or coal-mine methane (CMM) is an unconventional source of natural gas is now considered as an alternative source for augmenting India's energy resource.

Riding upon Make-in-India, SMEs (Small and Medium Enterprises) can play a pivotal role in the national agenda by increasingly using natural gas in meeting domestic manufacturing goals in a clean and productive manner.

What is Coalbed Methane?

- It is a natural gas found in coal seams
- It mainly consists of **Methane (CH₄)** with minor amounts of nitrogen, carbon dioxide and heavier hydrocarbons like ethane
- Earlier the CBM was wasted and vented out into the atmosphere during mining but now CBM is considered as a precious energy resource
- Extraction requires drilling wells into the coal seams and removing water contained in the seam and release absorbed (and free) gas out of the coal

Why CBM is Referred as an Unconventional Gas ?

Conventional gas is found pooling within spaces of the rock formation. Because of this, extraction of conventional gas is simple but that is not the case with unconventional gases like CBM.

2.1.7 All Central Government offices to retrofit energy efficient appliances

The Ministry of Finance has issued guidelines for mandatory installation of energy efficient appliances in all Central Government buildings across India.

- Energy Efficiency Services Limited, a joint venture of PSUs under the Ministry of Power, to execute work
- Currently, EESL is the implementation agency for the Buildings Energy Efficiency Programme, which was launched in May 2017 by Minister of State (IC) FOR Power , Coal , Mines & New & Renewable Energy

Buildings Energy Efficiency Programme

- Apart from retrofitting, EESL also aims to widen its services in areas like centralized AC system, Energy Audits, and New Generation Energy Management System in buildings.

The National LED Programme

- To facilitate rapid adoption of LED based home and street lighting across the country.
- The programme components, **Unnat Jeevan** by Affordable LEDs and Appliances for All (UJALA) and Street Lighting National Programme (SNLP) of EESL are currently under implementation in 29 States and 7 Union Territories.

2.1.8 Digital Empowerment

The user-friendly apps of power ministry

- **GARV** - to know the village electrification status
- **GARV-II** -to know habitation-wise data down to the households
- **MERIT**
 - to know the price being paid by your power utility for electricity
 - to know whether states are actually giving priority to cheaper sources of power
 - provides data on individual state portfolios - power generation, demand met etc. on a daily basis
- **URJA Mitra** - notifications about power distribution such as power cuts
 - also gives information on release of connections and complaints
- **TAMRA** - track the status of projects and clearances
- **TARANG** - track the status of projects and clearances of transmission projects
- The **UJALA app** - ensuring the fastest rollout of LED bulbs

- **Mining Surveillance System (MSS) app** - allows reporting illegal mining
- **Coal Mitra** - identifies the most efficient thermal power plants
- **ARUN** - provides a DIY (Do It Yourself) guide for solar rooftop installations, and critical knowhow about government incentives, costs and methods of installation
- **Vidyut Pravah**
 - spot market prices of electricity updated on real time basis
 - to check the power availability status with the utilities

2.1.9 E- Vehicles

Shri Piyush Goyal, Union Minister recently announced that only electric vehicles (EVs) will be sold in India from 2030.

- The current National Electric Mobility Mission Plan (NEMMP) has set a sales target of 5-7 million EVs and hybrid electric vehicles annually by 2020. But actual demand is 23 million.
- The transition would require a battery capacity of about 400 GWh (gigawatt hours) each year

Bottlenecks

- Indian battery manufacturing chain is not aligned to the global value chain
- Currently, the domestic battery market is largely dominated by lead-acid battery technologies.
- There is an increasing import bill for electronics products

Resources Shortage

- Different variants of lithium-ion batteries are predominantly used in electric vehicles.
- Manufacturing lithium-ion batteries would require critical minerals such as cobalt, graphite, lithium and phosphate. Among them, lithium is of particular importance.
- The resource endowment is limited to only nine countries and 95% of global lithium production comes from Argentina, Australia, Chile and China.

Way forward

- A recent extension of the PTA with Chile provides India some tariff concessions for lithium carbonate imports, need PTAs with more countries
- Joint acquisition of mines in foreign lands can also be pursued
- Recycling of Lithium

Lithium

- Could become as precious as gold in this century, so can be called as new 'White Gold'
- With atomic number 3, is a soft, silvery-white alkali metal
- Like all alkali metals, lithium is highly reactive and flammable, and is stored in mineral oil
- It never occurs freely in nature, but only in (usually ionic) compounds, such as pegmatite minerals
- It is present in ocean water and is commonly obtained from brines
- Lithium metal is isolated electrolytically from a mixture of lithium chloride and potassium chloride
- Recycling is easy because of the low melting point (180 °C) of lithium metal and the very low water solubility of its fluoride, carbonate and phosphate salts

2.1.10 Tracing India's nuclear journey

Experimental reactors:

- **Apsara**, India's first nuclear reactor. This reactor was with the help from United Kingdom under a lease agreement.
- Our second reactor for research purposes, CIRUS, was built with cooperation with Canada and went into operation in the early 1960's.

Commercial reactors:

- The Tarapur Atomic Power Station (TAPS) which was built by General Electric of USA.
- Special materials like nuclear fuel, zirconium components and heavy water production required extensive work in the laboratories of the Bhabha Atomic Research Centre (BARC).

India now has twenty-one reactor units in service.

Agreements with other countries:

- India signed cooperation agreements with the Westinghouse of USA and AREVA of France in 2008.

2.1.11 World Renewable Energy Technology Congress

The Energy and Environment Foundation is organizing 8th World Renewable Energy Technology Congress & Expo-2017 in, Delhi.

The theme of the conference is "Renewable Energy: What Works".

3Ds, which today's global engagements need to focus their energy upon. These are -

- a common shared goal of De-carbonization of the energy space;
- to look at more Decentralization of energy space; and
- More and more Digitalization of the energy space.

2.1.12 Rooftop solar power

The government has set itself a target of 100 GW of solar power by 2022, of which 60 GW is to come from utilities and 40 GW from rooftop solar installations.

What is rooftop solar?

- Rooftop solar installations can be installed on the roofs of buildings
- They fall under two brackets: commercial and residential.

What are the benefits?

- Provides an alternative source of electricity to the grid
- Environment Friendly and very useful in remote locations

Hurdles

- Variability in supply.
 - efficiency depends on sunlight
 - No power generation during night
- Storage technology for electricity, however, is still underdeveloped and storage solutions are expensive.

Way forward

- Imports of cheap solar panels are continuously placing a downward pressure on prices and so this scenario could change in the future.

2.2 ENVIRONMENT

2.2.1 Climate Change - Geo engineering

What is geo engineering?

Geoengineering is the deliberate large-scale intervention in the Earth's natural systems to counteract climate change. The main advantage of geo engineering is that it costs less.

Recent Development

- A combination of two methods — stratospheric sulphate aerosol increase and cirrus cloud thinning could change both temperature and precipitation at the same rate at which they are being increased by carbon dioxide
- Hence could simultaneously restore both temperature and rainfall to pre-industrial levels



What is Stratospheric sulphate aerosol increase method?

- To spray minute sulphate aerosol into the stratosphere.
- Achieved using sulfide gases such as dimethyl sulfide, sulfur dioxide (SO₂), carbonyl sulfide, or hydrogen sulfide (H₂S)
- These aerosols reflect the incoming solar radiation, thus cooling the earth
- It can reduce the rate of precipitation but *at a much higher rate* than the required rate
- Possible side effects are
 - Ozone depletion, Tropopause warming, Stratospheric temperature change.

- Could potentially impact on the stratospheric circulation

What is Cirrus cloud thinning?

- Cirrus clouds trap the heat, so thinning them could cool down the Earth system.
- Seeding is done using aerosols, and ice crystals could grow rapidly around the aerosols and deplete water vapour in the clouds.

Cautions

There must be a strict governance framework set up while exploring these options, as they involve ethical and moral questions.

2.2.2 Calving of the iceberg at the Larsen C Ice Shelf

- NASA has released images which show the movement of one of the largest ever recorded the iceberg that recently broke off from Antarctica, which is called as Larsen C
- Icebergs will not raise the sea level, but the Land ice that have been blocked by the breaking iceberg, will drop into the ocean and eventually would raise the sea level.

What is an Ice shelf?

It is a floating extension of land-based glaciers which flow into the ocean.

2.2.3 Supreme Court bans toxic chemicals from crackers

- The chemicals banned are - **antimony, lithium, mercury, arsenic and lead** in any form
- These are labeled as toxic by the Central Pollution Control Board (CPCB) and it fixes the standards and regulations in the use of chemicals in firecrackers

Regulations

- There is a court ban on sale of firecrackers in the Delhi and NCR regions
- Continuous monitoring and random checks of firecrackers is the mandate of Petroleum and Explosives Safety Organization (PESO) and Controller of Explosives.

Ban on China firecrackers

- These contain potassium chlorate, which is highly unstable and can explode with just a sharp jolt

Ban was only on Chinese firecrackers?

- Use of potassium chlorate in fireworks has been banned in India since 1992.

- China is the world's largest manufacturer of fireworks, makes a wide range of these products, and was the source of most low-cost fireworks coming into India.

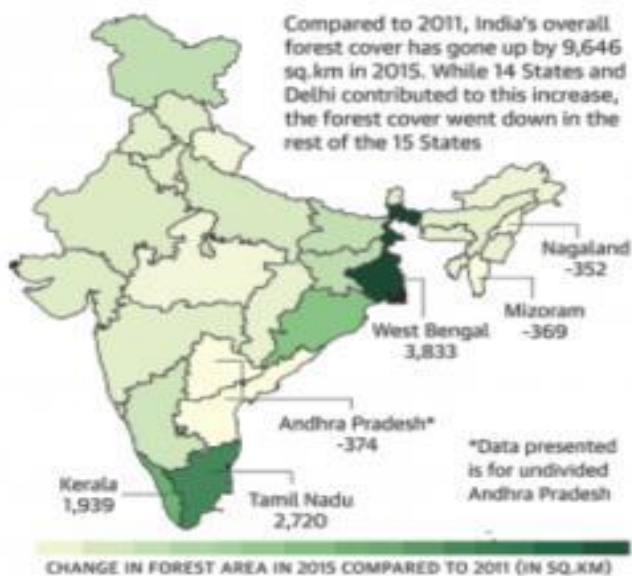
Are Indian firecrackers safe?

- Indian fireworks, by contrast, use potassium and sodium nitrates, which are more inert and, therefore, safer.

2.2.4 Forest Cover

DATA POINT

Change in green cover



GS

2.2.5 Cloud Observatory

A high altitude cloud physics observatory has been established at Munnar (Kerala). Another High altitude cloud physics laboratory is functional at Mahabaleshwar (Konkan)

Aims:

- To observe cloud and rain processes over the region in Western Ghats that will help in modeling of forecasting methods.
- To improve the skill of rainfall prediction for severe weather phenomena via, heavy rainfall, thunderstorm etc., not only over Kerala but for the whole country
- The four climate sensitive regions of the country are - Himalayan Region, Western Ghats, North Eastern Region and Coastal Areas

2.2.6 Global Initiative on Conflict Avoidance and Environment

Consciousness - "Samvad"

- The second edition organized in Yangon
- Conference, representing various religions and traditions, was held in New Delhi in 2015. "Samvad" means "dialogue"

2.2.7 Disaster Management - Floods - role of NDRF

- The National Disaster Response Force (NDRF) was formed in 2006
- Is a specialized force constituted under the Disaster Management Act, 2005.
- The Director Generals of NDRF are IPS officers on deputation from Indian police organizations
- Is a force of 12 battalions, organized on Para-military lines.

2.2.8 Biodiversity - "Living Fossils"

- *Cycas* are one of the most ancient plants whose fossils date to the Jurassic period and are often referred to as "living fossils".
- Andaman and Nicobar islands home to thriving adult populations of these slow growing trees
- Despite being a contemporary of the dinosaur, the genus continues to thrive

2.2.9 Ground water crisis

- Use of groundwater for irrigation exploded after Green Revolution
- Cheap electricity was primarily responsible for this explosion
- Water-intensive crops like sugarcane and paddy are mostly grown in the naturally water-starved areas of the country.

How to avoid the crisis?

- A new regulatory regime for groundwater, that provides for equitable use, is urgently needed
- Recognition of water as a public trust.

2.2.10 Cigarette butts Pollution

- Cigarette butts contain hazardous chemicals such as cadmium, arsenic and lead that are partially filtered out during smoking.
- But when the butt is discarded, these chemicals leach into the environment contaminating our waterways and land.

- Encapsulated cigarette butts with bitumen and paraffin wax can lock in the chemicals and prevent any leaching and also can be used in construction material.

2.2.11 National Forest Policy

Objective:

- 60% of the land in the hills and 20% in the plains and in all 33% of the total geographical area should be under forest/tree cover.

How to achieve:

- This can be done by stabilizing the forest use, afforestation, reducing the erosion of the soil and monitoring the forest produce use like firewood etc.

Recent government initiatives:

Ministry of Environment, Forest & Climate Change (MoEF&CC) is implementing two major afforestation/tree plantation schemes

- National Afforestation Programme (NAP) scheme - Quantitative
 - To implemented for afforestation of degraded forest lands
- National Mission for a Green India (GIM) - Qualitative
 - Improving the quality of forest/increase in forest cover
 - Cross-sectoral activities on landscape basis

2.2.12 Ban on Use of Polythene Bags

Salient features of Plastic Waste Management Rules (PWMR), 2016:

Producer-consumer responsibilities:

- the **generators** of waste have been mandated to take steps to minimize generation of plastic waste
- ensure segregated storage of waste at source to handover to local authorities.

Responsibilities of authorities:

Management of plastic waste lies on

- Responsibilities of local bodies, gram panchayats
- Waste generators, retailers and street vendors.

Plastic ban:

- The use of carry bags made from conventional plastic with thickness **less than 50 micron** is prohibited.
- The use of plastic for packaging gutkha, tobacco and pan masala is also prohibited. These are notified under PWMR, 2016.

Status:

- There is no proposal to impose ban on the use of polythene bags completely throughout the country but states are voluntarily banning.

2.2.13 Biosphere Reserves (BR)

- Biosphere Reserve (BR) is an international designation by UNESCO for representative parts of natural and cultural landscapes extending over large area of terrestrial or coastal/marine ecosystems or a combination.
- BRs are special environments for both people and the nature and are living examples of how human beings and nature can co-exist while respecting each other's' needs.
- This is over all development through partnerships between people and nature through innovative ideas

Structure of BR

Core zone:

It should be kept absolutely undisturbed and contain suitable habitat for numerous plant and animal species, including higher predator.

Buffer zone:

It is adjoins core zone with limited recreations, tourism, fishing and grazing and research will be allowed, without disturbing core area.

Transition zone:

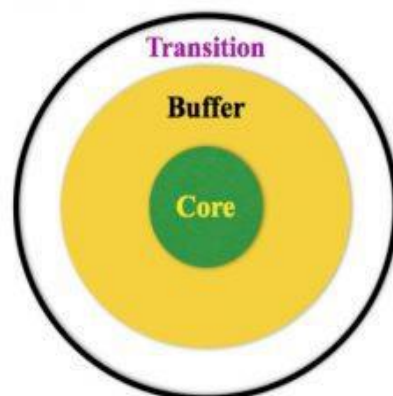
This is outermost part, which connect with settlements, crop lands etc.

How BR is different from protected areas?

- BR is for conservation of overall biodiversity and landscape, rather than some specific flagship species.
- Generally, BRs include of protected area but need not be always around them.

Criteria to select BR

- Primarily a site that must contain an effectively protected and minimally disturbed core area of nature value with additional land and water suitable for research and conservation efforts



Man and Biosphere (MAB) programme:

- It is a Intergovernmental scientific programme guided by UNESCO Man and Biosphere (MAB) programme for the improvement of the relationships between people and their environment globally
- India is a signatory to the landscape approach supported by MAB programme.

There are 18 biospheres recognised by UNESCO in India. Those are

Cold Desert (Himachal Pradesh), Nanda Devi (Uttarakhand), Khangchendzonga (Sikkim), Dehang Debang (Arunachal Pradesh), Manas (Assam), Dibru Saikhowa (Assam), Nokrek (Meghalaya), Panna (Madhya Pradesh), Pachmarhi (Madhya Pradesh), Achanakmar-Amarkantak (Madhya Pradesh-Chhattisgarh), Kachchh (Gujarat), Similipal (Odisha), Sundarban (West Bengal), Seshachalam (Andhra Pradesh), Agasthyamalai (Karnataka-Tamil Nadu-Kerala), Nilgiri (Tamil Nadu-Kerala), Gulf of Mannar (Tamil Nadu) Great Nicobar (Andaman & Nicobar Island)

2.2.14 Swachhathon 1.0

The Ministry of Drinking water and Sanitation, MDWS is organizing Swachhathon 1.0- the Swachh Bharat Hackathon.

This is to crowd source solutions for the pressing issues pertaining to Sanitation. The Primary target of this mission is to get innovative solutions to problems in the following categories:

- Innovative, Sustainable, Environmental-friendly and affordable toilet technology for hilly, dry, flood prone and remote areas.
- Monitor the usage of toilets, bringing behavioral change for toilet usage, maintenance of school toilets and hygiene, solutions for, early decomposition of faecal matter.

2.2.15 Draft National Energy Policy

- It focuses on air quality issue, renewable energy, natural gas, universal electrification and clean cooking fuel released by NITI Aayog.

Impact of energy choices on health

- According to WHO reports that air pollution is the number one environmental health risk especially for children and its risk is more in India and China

What is HIAP?

HIAP is an approach on health-related rights and obligations to improve accountability of policymakers for health impacts.

2.2.16 Steps to promote use of clean fuels in Indian Railways

Railways are taking the following steps to promote use of clean fuels and reduce carbon emissions:

- Use of B5 (5% Bio-Diesel) blends of biodiesel in the diesel locomotives.
- Use of Compressed Natural Gas (CNG) based dual fuel system on DEMU trains
- Development of CNG based dual fuel system with 40% substitution of diesel
- Process to establish two biodiesel manufacturing plants and promoting rooftop solar panels.

2.2.17 Himalayas losing rare fossils

- **Spiti valley** is called the “museum of Indian Geology”.
- The Spiti valley contains almost a continuous succession of fossils ranging from the Cambrian to the Cretaceous and the giant scorpion traces are unique and found only in Antarctica, Australia and Spiti Valley.
- The fossils are being mined and sold as cheap tourist souvenirs, destroying key links in the ancient geological history of the Indian subcontinent.

2.2.18 Environmental Disasters

The heavy monsoon rain is playing havoc in India, Nepal and Bangladesh.

Massive landslide in Himachal

- NHAI is asked to include soil stabilization, land protection wall, geo static and slope stabilization for all highway projects in Himachal

Floods

- The Kaziranga National Park (KNP) and the Pobitora Wildlife Sanctuary in Assam are getting submerged, rhinos and other animals have taken shelter on the highlands
- Flash floods in parts of Bihar, Arunachal Pradesh and West Bengal

Landslides

- It is a sudden fall of land mass due to acute slopes with lubricant action of water.
- vibrations due to earthquakes or volcanic activities and sudden downpour can trigger landslide

Cloudburst

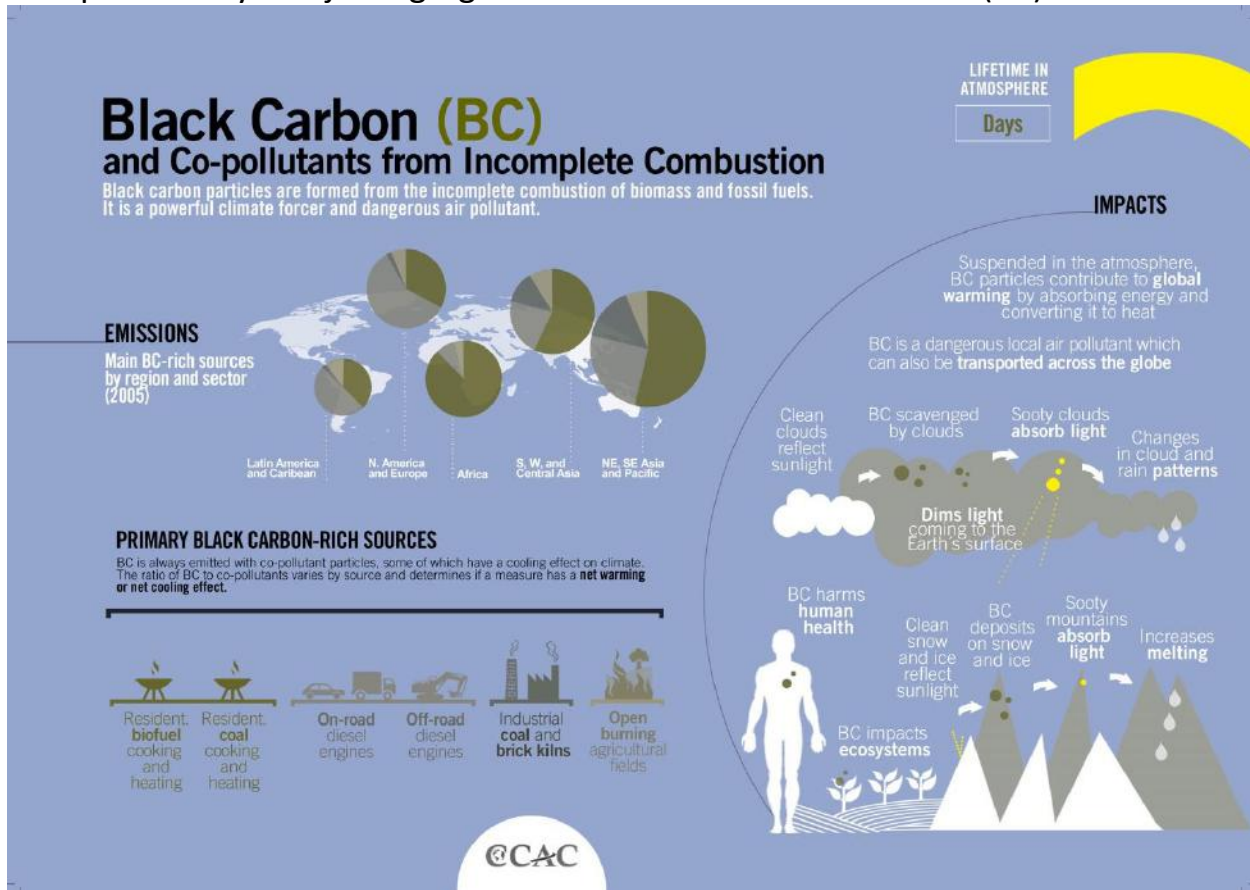
- A cloudburst is an extreme amount of precipitation, sometimes accompanied by hail and thunder that normally lasts no longer than a few minutes but is capable of creating flood conditions as like in Uttarakhand

HADR Operations

- Humanitarian Assistance and Disaster Relief (HADR) operations of Indian Armed forces have attracted the attention of the global community in recent years along with the Indian armed forces

2.2.19 Black carbon heats up atmosphere

Aeroplanes may be ejecting significant amounts of black carbon (BC)



What is Black Carbon?

- Black carbon consists of pure carbon in several linked forms.
- It is formed through the incomplete combustion of fossil fuels, biofuel, and biomass
- Is a pollutant known to aggravate breathing disorders, upset the monsoon and quicken glacier melt and a potential ozone depleter
- BC particles absorb heat, they warm the surrounding air, become lighter and rise to greater heights by a process called 'self lift' and persist in the air.

2.2.20 Judgement of the Supreme Court of India regarding illegal mining

The miners in Keonjhar, Sundergarh and Mayurbhanj in Odisha have rapaciously mined iron ore and manganese ore, and have apparently destroyed the environment and forests and perhaps caused untold misery to the tribals in the area.

- SC ordered heavy expenditure for the welfare of tribal people in affected areas.
- Supreme Court directs the Union of India to have a "fresh look at the National Mineral Policy, 2008 , particularly with regard to conservation and mineral development
 - As per act mining was deemed illegal only if ores were extracted without a mining lease and the penalty was equal to the entire output from such an operation.
 - But the penalty for environmental violations is a negligible Rs 50,000. This built a very strong business case to start mining without waiting for green clearances.
- Now Sc has held that extracting minerals without the necessary green clearance should be deemed illegal
- This means that even if you have a mining lease, any extraction without forest and environment clearance is illegal and the state must recover the value of the entire output from the defaulter.

2.2.21 Green bonds

- Emerging economies are increasingly selling green bonds to Western investors hungry for environmentally-friendly investments
- Green bonds are intended to finance green environmental projects such as solar and wind farms.
- **Malaysia's Tadau Energy** sold the world's first green Islamic bond, or sukuk.
- China accounts for over two-thirds of total emerging market green issuance
- About 62 per cent of the green bond proceeds have been allocated to renewable energy projects, followed by the low carbon transport sector and low carbon buildings.

Green Bonds in India

- In 2015, EXIM bank launched India's first dollar denominated green bond and SEBI published its official green bond guidelines and requirements for Indian issuers.

- India's first green masala bond (rupee-denominated bond), was by the International Financial Corporation in London Stock Exchange for investing in Yes Bank's green bond..

2.2.22 Ganesha idols immersion

Today's idols are usually gypsum plaster, calcinated hemihydrated calcium sulphate, more commonly known as plaster of Paris (PoP)

- PoP is easy to cast in a mould, yields a smooth surface, dries quicker, is friendlier to paint, and is much lighter and cheaper. So PoP is preferred over clay
- But PoP does not dissolve readily, and it turns water hard
- The bright paints and dyes contain toxic chemicals like mercury, zinc oxide, chromium, lead, and cadmium.
- They poison water bodies and aquatic life, and they can cause cancer, respiratory ailments, skin infections

2.2.23 Drones on a mission to restore Myanmar's mangrove cover

- Myanmar has lost more than 1 million hectares of mangroves since 1980.
- Myanmar's low-lying Ayeyarwady Delta, the mangroves are ravaged by decades of deforestation and conversion of land for agriculture and aquaculture

Characteristics of Mangroves

- Evergreen land plants growing on sheltered shores, typically on tidal flats, deltas, estuaries, bays, creeks and the barrier islands.
- They require high solar radiation and have the ability to absorb fresh water from saline/brackish water.
- It produces pneumatophores (blind roots) to overcome respiration problem in the anaerobic soil conditions.
- Mangroves exhibit viviparity mode of reproduction i.e. seeds germinate in the tree itself (before falling to the ground).

Mangrove profile in India

- The mangroves of Sundarbans are the largest single block of tidal halophytic mangroves of the world
- The mangroves of Bhitarkanika (Orissa), which is the second largest in the Indian sub-continent,

- Mangrove swamps occur in profusion in the intertidal mudflats on both sides of the creeks in the Godavari-Krishna deltaic regions of Andhra Pradesh.
- On the west coast of India, mangroves, mostly scrubby and degraded occur along the intertidal region of estuaries and creeks in Maharashtra, Goa and Karnataka.

Use of Mangroves

- Mangroves protect coastlines by
 - slowing coastal erosion and shielding against tsunamis and storm surges and rising sea levels
- Absorb carbon from the atmosphere
- Boost fish stocks and stem saltwater invasion of farmland

2.2.24 Bhupathy's purple frog

- Indian scientists have discovered a new species of frog that has a snout-shaped nose, just like a pig's named as *Nasikabatrachus bhupathi*, after the Indian herpetologist **S. Bhupathy**, in the eastern slopes of the Western Ghats, near the **Srivilliputhur Grizzled Giant Squirrel Wildlife Sanctuary in Tamil Nadu**
- Has comparisons with the Purple frog found in Seychelles, and it constitutes additional evidence in favour of the theory of continental drift.
- The discovery suggests that the Indian subcontinent was part of the ancient landmass of Gondwana before splitting from Seychelles 65 million years ago
-



2.2.25 Bellandur lake and the National Green Tribunal (NGT)

Problem in the lake

- Toxic foam came back to the surroundings of Bellandur lake
- It is suspected due to the presence of phosphorus in detergent waste flowing into the lake from residential complexes, something the existing sewage treatment plants are unable to treat.

The National Green Tribunal(NGT)

- Established under the National Green Tribunal Act 2010
- Deals with cases relating to environmental protection, conservation of forests and other natural resources
- Deals with enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property
- It follows *natural justice*

2.2.26 Bt cotton

- Bt stands for **Bacillus thuringiensis**, a bacteria whose genome codes for a protein that kills the *bollworm*, a pest that has perennially plagued the cotton plant.

Patents rules in India:

- Plants and animals are ineligible for patent protection in India, as are ordinary biological processes for creating them.
- However, microbiological processes (such as methods of creating transgenic varieties) and microorganisms are patentable under the terms of the Indian Patents Act.
- Monsanto, which invented this Genetically Modified technology, patents cover most of these components.

Controversy:

- Plants were treated with intensified chemical use
- As a result they are showing resistance to insecticides.
- For increasing chemical costs and decreasing price of cotton thousands of cotton farmers in India were pushed to debt in India

Why in the news?

A Parliamentary panel headed by Congress MP Renuka Chowdhury in a report said the government agencies have portrayed “a rosy picture” on Bt Cotton which is far removed from the truth.

2.2.27 Bonnet monkey soon to be endangered

Researchers have found that the common bonnet monkey of South India may soon become an endangered species

Habitat:

- they typically share their habitats with humans and endemic to the southern part of the country

Causes for their population decline

- Slow incursion of the larger, more aggressive rhesus monkey from the northern region.
- Many single roads have now been converted into lane roads and the dense vegetation of banyan trees has been replaced by barren lands and urban structures.

2.2.28 Cloud seeding

- It is a form of weather modification done by dispersing substances into the air that serve as cloud condensation or ice nuclei to change amount of precipitation.

Static cloud seeding

- Involves spreading a chemical like silver iodide into clouds.
- The moisture is already present in the clouds, but silver iodide essentially makes rain clouds more effective at dispensing their water by providing a crystal.

Dynamic cloud seeding

- Aims to boost vertical air currents, which encourages more water to pass through the clouds, translating into more rain.
- Up to 100 times more ice crystals are used in dynamic cloud seeding than in the static method.

Hygroscopic cloud seeding

- It disperses salts through flares or explosives in the lower portions of clouds and the salts grow in size as water joins with them.

Why in news?

Karnataka government planning to increase rainfall by seeding the clouds

3. ICT

3.1 Cyber Audit

The Reserve Bank of India is planning to conduct a cyber-audit of all banks in the country instead of just a few bigger banks as it did in the past because of increasing cyber-attacks.

Actions

- RBI have created a **cyber-cell** under the department of banking supervision to provide Cyber-security and IT audit on banks
- The cyber-security framework requires banks to report any breach within two-three hours even if there is a suspicious breach
- At national level there is CERT-in to handle the cyber attacks
- Now there will also be a **Fin-CERT**, which will deal with financial sector breaches and will start from RBI.

3.2 Data Protection

Justice BN Sri Krishna will head a committee for suggesting a Data Protection Framework for the country.

Why?

- With the advent of digitalization and big data technologies, protection of citizen's private data has become an issue in policy making.

3.3 Driverless Cars

There is opposition to the entry of driverless cars into India on the ground that it will make people jobless

- Disruptive technologies like this causes massive job losses
- But consumers will benefit from such technologies
- Earlier industrial and the technological revolutions were not achieved by saving jobs but by allowing their creative destruction

What is a driverless car?

- Is a vehicle that is capable of sensing its environment and navigating without human input.
- Use a variety of techniques to detect their surroundings, such as radar, laser light, GPS, odometry, and computer vision.
- **Odometry** is the use of data from motion sensors to estimate change in position over time

Among the potential benefits of autonomous cars is a significant reduction in traffic collisions

3.4 Data protection and Data residency

India needs laws on privacy and data protection.

Why?

- Once a person's biometrics have been compromised, they cannot be reissued like passwords
- Some technologies like blockchains are promising with the possibility of individual control over some crucial data.

Data residency

It refers to the physical or geographic location of data or information.

- Data residency legislation is required, to mandate that data on Indians should necessarily reside within India
- India has restrictive policies on data mobility, which has to be changed.
- Advances in artificial intelligence depend on access to all kinds of data, so India needs global best practices in data protection, for tapping the potential

3.5 Desi Global Positioning System

Indian Space Research Organisation (ISRO) has deployed an indigenous regional positioning system named as "Navigation with Indian Constellation" (NavIC).

- It consists of seven satellites in a constellation to provide Position, Navigation and Timing (PNT) services in Indian mainland and surrounding region up to 1500 Km.
- It provides two types of services viz. Standard Positioning Service (SPS) and Restricted Service (RS).
- It can support commercial civil applications.
- Indian entrepreneurs are being enabled for providing services through NavIC receiver system and requisite information has been made available in public domain.
- Mobile-Apps for navigational alerts across maritime jurisdictions is developed and tested for the Fishermen community using first generation NavIC receivers.
- It may take couple of years to become fully operational in the market

All three rubidium atomic clocks on IRNSS-1A failed in mid-2016. Indian Space Research Organisation will soon launch a replacement navigation satellite fitted with corrected atomic clocks

- The National Physical Laboratory (NPL) maintains accuracy of ± 20 nanoseconds through the Primary Time Scale, an ensemble of five caesium clocks and one hydrogen maser.

3.6 NASA-ISRO Synthetic Aperture Radar (NISAR) mission

ISRO and NASA have a framework agreement for cooperation in the exploration and use of outer space for peaceful purposes signed in 2008.

- NISAR mission is to co-develop and launch a dual frequency synthetic aperture radar satellite.
- NASA is responsible for development of L-band SAR and ISRO is responsible for development of S-band SAR.
- NISAR employs a futuristic SweepSAR technique, which enables very wide swath of more than 200 km and very high resolution of the order of 5-10m.
- The L & S band microwave data obtained from this satellite will be useful for variety of application, which include
 - estimating agricultural biomass over full duration of crop cycle
 - assessing soil moisture, monitoring of floods & oil slicks
 - coastal erosion, coastline changes
 - assessment of mangroves, etc.

What is a synthetic aperture radar satellite?

It is a form of radar that is used to create two- or three-dimensional images of objects, such as landscapes

- SAR uses the motion of the radar antenna over a target region to provide finer spatial resolution than conventional beam-scanning radars.
- Successive pulses of radio waves are transmitted to a target scene, and the echo of each pulse is received and recorded

3.7 Teleportation

Chinese researchers successfully teleporting a photon from an instrument on the Tibetan plateau to an orbiting satellite 1,400 km away in space through quantum entanglement.

How?

- The particles share their 'quantum states' — such as energy, motion and magnetic field — regardless of the distance separating them.
- If one particle changes, its co particle in the other location also changes
- It can be the basis of futuristic quantum internet, quantum information technology, quantum computing, quantum cryptography etc

- *Micius* is the the world's first quantum-enabled satellite launched by China

3.8 Social Media and Digital Technologies

India figures among the top two or three adopters of digital technologies and social media

- Has larger number of mobile Internet users and smartphone users and users of Facebook, Twitter and YouTube
- Has one of the cheapest data rates in the world
- Yet Internet is out of reach of millions
- There is lack of awareness about the Internet

3.9 e-RaKAM portal for selling agri produce

E-RaKAM is a first-of-its-kind initiative that leverages technology to connect farmers of the smallest villages to the biggest markets of the world through internet and e-RaKAM centres.

The portal is a joint initiative by state-run-auctioneer **MSTC** and **Central Warehousing Corporation arm CRWC**

- To auction 20 lakh tonnes of pulses in the first phase through the platform.
- Various crops whose price increases due to rainfall or bad weather conditions, will be managed and get the market.
- Farmers would be paid through e-Payment directly into their bank accounts.

3.10 Mobile data regulations

The telecom regulator has started a consultation process to assess whether the data rights of mobile phone users are adequately protected or not.

Why it is needed?

- Privacy and data is protected on the internet subjected to relevant laws.
- But in case of mobile phones, there are no such provisions despite of India having one of the largest mobile phone users.

TRAI consultation paper points:

- Issues pertaining to data protection in relation to delivery of digital services, including telecom and data services, as well as devices, networks and applications that collect and control data generated by users through telcos.
- The regulator wants to know if there should be greater parity in data protection norms applicable to carriers and internet-based voice and messaging services.

Objections by the industry:

Telcos questioned whether data ownership, security and privacy fall under the regulator's ambit, noting that the watchdog "may bite off more than it can chew".

3.11 Smartest things brewing in the Google labs**Google genomics**

It enables scoreboard and researchers to store, search and run vital simulations in vast amount of data. Run by Google X

Longevity

Calico is a licensed experimental drug as well as announced collaborations focused on the biology of ageing and therapeutic approaches. It is owned by Alphabet

Google Deep mind

What separate deep mind from other AI system is the way it's algorithms are built. Instead of focusing on a single task, Deep mind's algorithms are general, allowing it to perform well across a variety of tasks straight out of box

Project loon

These helium-filled balloons are designed by Google X to reach an altitude of almost 13 miles. Once airborne, the balloons provide a cost-effective way to beam internet services to places that lack it.

The liftware spoon

Enables patients who suffer from tremors (such as Parkinson's) to eat food without spills. Lift lab, which designed the this, availed by Google in 2014.

Project Soli

By ATAP(advanced technology and projects) uses radar to detect minute hand and finger movements, which could then be used to manipulate real devices, or even allow as unprecedented level of interactions in virtual Environmental

Lunar X prize

This is a \$30M prize money competition to develop low cost methods of robotics space exploration. To win the challenge, a privately funded team must put a spacecraft on the moon surface, which should travel at least 500 meters and should transmit high definition videos and images to the Earth.

3.12 GIS-enabled portal maps land-related information

Centre has brought out an online database of more than half a million hectares of land in February this year.

- The Geographic Information System (GIS) enabled database has details of close to 3,000 industrial parks/clusters, as well as area-wise availability of agricultural/horticultural crops, and mineral production.
- The portal will soon incorporate information on warehouses, power-grid and financial institutions as well as the demand for industrial infrastructure
- Can add database about government-approved technical institutions will indicate the availability of skilled and semi-skilled talent.
- The database is being developed by the Department of Industrial Policy and Promotion (DIPP) and the National e-Governance Division in the Ministry of Electronics and Information Technology as well as the BISAG – an institute for space applications and geo-informatics under the Gujarat Government.

3.13 Internet of Things-enabled ultrasound scans

- A system that will validate the data and do a preliminary scanning of the organ
- In the IoT-enabled remote scanning, if the scans are uploaded to the cloud without being first analysed, there is a possibility that the doctor sees a huge amount of data, which they may find difficult to interpret.
- So scanning devices must work more intelligently and do a preliminary classification of images
- Uses a deep-learning algorithm which can differentiate between cysts and stones in the kidney images

3.14 E-tolling

NHAI takes steps to facilitate availability of FASTags for Electronic Toll Collection

- Common Services Centre to set up sale points at Toll Plazas
- FASTags can also be purchased online from Issuer Banks websites / NHAI website / IHMCL website and will be delivered by courier
- Exclusive lane for FASTag vehicles to be operational at all toll plazas from 1st September, 2017.
- Two mobile apps -- MyFASTag and FASTag Partner -- is released
 - Agencies like common services centre, banking partners and vehicle dealers can sell and enrol FASTag through this app
 - In addition, the app can also be used to activate the RFID tags that came built in with around new cars

What is a FASTag?

- Is a reloadable tag affixed on a vehicle's windscreen having radio frequency identification (RFID) technology
- Is linked to a prepaid account for automatic deduction of toll charges and the vehicle is not required to stop at the toll booths for cash transaction

RFID

- Uses electromagnetic fields to automatically identify and track tags attached to objects.
- The tags contain electronically stored information.
- Uses radio waves
- Serves the same purpose as a bar code or a magnetic strip

3.15 ISRO-SAC develops advanced optical sensors

The Indian Space Research Organisation's Space Application Centre (Ahmedabad) has developed optical and microwave payloads, that has improved the optical observation capacity from 35 metres to 60 cm

- The sensor technology has changed from electrical transducers to integrated chips visible to microwave.
- Research was now on sensing applications at higher speeds with more accuracy.

3.16 CCTNS

The physical police verification for getting a passport may soon be dispensed with as the Centre plans to connect the procedure with Crime and **Criminal Tracking Network and Systems Project (CCTNS)**

CCTNS

- Is an exhaustive national database of crimes and criminals
- aims to connect the country's all 15,398 police stations
- mandate of the CCTNS had been expanded by incorporating citizen-centric services such as tenant verification, quick registration of FIR in any crime and connecting the network with criminal justice delivery system

Uses:

- Facilities citizens for online complaint registration, the portal will initially offer seven Public Delivery Services in 34 States & UTs.
- Central investigating and research agencies have also been provided logins to the digital police database to access crime statistics

- The Ministry of Home Affairs will undertake steps to integrate the various organs of the Criminal Justice System such as the Police, Courts, Prisons, Prosecution, Forensic Laboratories, Fingerprints Interpol, etc.

3.17 CSC to Play Major Role in The Making of New India

- Common Services Centers (CSCs) are a strategic cornerstone of the **Digital India programme** that works on PPP model
- They are the access points for delivery of various electronic services to villages in India, thereby contributing to a digitally and financially inclusive society.
- CSCs enable the three vision areas of the Digital India programme:



Village Level Entrepreneur (VLE)

- Is a CSC operator and she/he is key to success of CSC operations.
- There is a direct correlation between the quality of services offered at CSCs and entrepreneurial abilities of VLEs operating them.

The new services launched under CSC are

- **Launch of Patanjali products through CSCs**
- **Launch of Bharat Bill Pay service through CSCs:**
 - It is a unified bill payment system under the umbrella of National Payment Corporation of India (NPCI).
- **Launch of Deposit Service in Aadhaar Enabled Payment System – Digi Pay:**
 - To address need for financial services of rural people.
- **Exchange of MOU for Sale of IFFCO Products like Fertilizers, Seeds etc through CSCs:**
- **Exchange of MOU between CSC & IGNOU:**
 - Services like online admission form & examination form submissions etc.
- **Exchange of MOU for Tele-Radiology service through CSC:**
 - 5C Network, India's first diagnostic network that connects hospitals and diagnostic centers with X-Ray, CT and MRI to radiologists, is partnering with CSC
- **Exchange of MOU for Tally GST Service**

4. MATERIAL SCIENCE

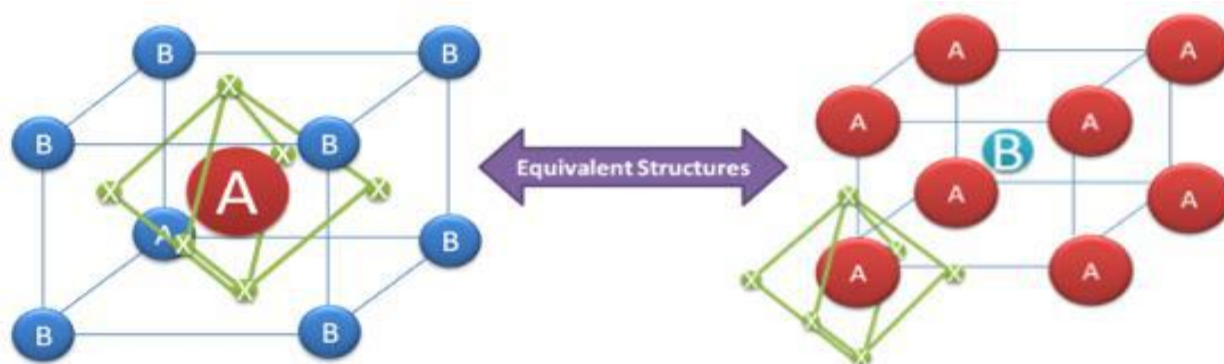
4.1 Plastic Converted In to Petrol

- CSIR laboratories are involved in R&D of converting waste plastics into fuel oil
- CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad has developed a catalyst that can be used for conversion of waste plastics to fuel oils.
- CSIR-Indian Institute of Petroleum (IIP), Dehradun in collaboration with GAIL (India) Ltd. has developed a process by which waste polyethylene and polypropylene type plastics can be converted into petrol and diesel.
- One kilogram of waste polyethylene and polypropylene can be converted to either about 600-650 ml of petrol or 700-750 ml of diesel along with LPG.

4.2 Perovskites

Technically, a Perovskite is a type of mineral that was first found in the Ural Mountains and named after Lev Perovski. A Perovskite structure is any compound that has the same structure as the Perovskite mineral.

- True Perovskite (the mineral) is composed of calcium, titanium and oxygen in the form CaTiO_3 . Meanwhile, a Perovskite structure is anything that has the generic form ABX_3 and the same crystallographic structure as Perovskite (the mineral).
- The Perovskite lattice arrangement is demonstrated below. The simplest way to think about a Perovskite is as a large atomic or molecular cation (positively-charged) of type A in the centre of a cube.
- The corners of the cube are then occupied by atoms B (also positively-charged cations) and the faces of the cube are occupied by a smaller atom X with negative charge (anion).



Depending on which atoms/molecules are used in the structure, Perovskites can have an impressive array of interesting properties including superconductivity, giant magneto resistance, spin-dependent transport (Spintronics) and catalytic properties. Perovskites therefore represent an exciting playground for physicists, chemists and material scientists.

In the case of Perovskite solar cells, the most efficient devices so far have been produced with the following combination of materials in the usual perovskite form ABX_3 :

- A = An organic cation - methylammonium (CH_3NH_3)⁺
- B = A big inorganic cation - usually lead(II) (Pb^{2+})
- X_3 = A slightly smaller halogen anion – usually chloride (Cl^-) or iodide (I^-)

4.3 New state of matter

Researchers from the Los Alamos National Laboratory in the U.S. showed that among superconducting materials in high magnetic fields, the phenomenon of electronic symmetry breaking is common.

- Heavy fermion superconductor $CeRhIn_5$ revealed a state in which the material's electrons aligned in such a way to apparently reduce the symmetry of the original crystal
- During the past few decades, several new classes of superconductors have been discovered that do not appear to be related to traditional superconductors.
- They are called **Unconventional superconductors**.

- The source of the superconductivity of these materials is likely different from the electron-ion interactions that are at the heart of conventional superconductivity

Superconductivity

- Superconductivity is the ability of certain materials to conduct electric current with practically zero resistance
- Superconductors are not only perfect conductors, but also exhibit the so-called Meissner effect, where they expel magnetic fields.
- Superconductivity is extensively used in magnetic resonance imaging (MRI), particle accelerators, magnetic fusion devices, and microwave filters.

4.4 Carbon nanotubes in water treatment

Scientists have developed carbon nanotubes over 50,000 times thinner than a human hair which can separate salt from seawater, an advance that may help solve the global water crisis.

Purifying mechanism:

- Current water purification technologies can benefit from the development of membranes with specialised pores that mimic highly efficient and water selective biological proteins.
- Scientist developed carbon nanotube pores that can exclude salt from seawater.
- The team found that water permeability in carbon nanotubes (CNTs) with diameters of 0.8 nanometre significantly exceeds that of wider carbon nanotubes.

Properties of carbon nanotubes

- The nanotubes, hollow structures made of carbon atoms in a unique arrangement, are more than 50,000 times thinner than a human hair.
- The super smooth inner surface of the nanotube is responsible for their remarkably high water permeability, while the tiny pore size blocks larger salt ions.
- The narrow hydrophobic channel forces water to translocate in a single-file arrangement, a phenomenon similar to that found in the most efficient biological water transporters

5. GENERAL KNOWLEDGE

5.1 Engineering babies

- Scientists in the United States have repaired a disease-causing mutation in the DNA of early-stage human embryos
- Is the successful use of the CRISPR “gene editing” tool in viable embryos
- With further improvement, the method can potentially be used to prevent transmission of genetic disease to future generations

5.2 Designer babies

- Designer baby is a human embryo that has been genetically modified, to produce desirable traits
- This technology is the subject of ethical debate

5.3 Three Parent babies

- Egg – with nuclear DNA from the mother and mitochondrial DNA from a donor – fertilized with the father’s sperm.
- Resulting child wouldn’t pass on defective mitochondrial DNA from its mother
- The controversial technique, is legally approved in the UK

5.4 State Tree for Goa

- The State Cabinet resolved to declare the coconut tree as the “State tree”.
- The act regulates felling of coconut trees

5.5 NOTA

Whether NOTA (None of the above) option should be there on the ballot paper for Rajya Sabha elections?

- The political parties requested to remove this option
- But the Supreme Court refused, saying that the provision has been in place since April 2014 after a direction by the EC

The Rajya Sabha Elections

- Open ballots are used
- Follow a proportional representation system based on the single transferable vote, unlike the general elections to the Lok Sabha, which are conducted with secret ballots (or votes) and based on the first-past-the-post principle
- If an MLA chooses NOTA, the vote is rendered ineffective

- The party high command can issue a whip for a Rajya Sabha candidate, but anti-defection law provisions do not apply, if the MLA does not obey the whip

5.6 Voter Verifiable Paper Audit Trail (VVPAT)

- The Election Commission of India to deploy VVPAT Units in all polling booths in the General Elections, 2019
- Is an additional layer of transparency for the satisfaction of voters, allaying any apprehension in the minds of the voters as to the fidelity and integrity of the EVMs
- VVPAT device functions like a printer to be attached to the ballot unit.

5.7 Hyperloop One

- High-speed transportation system Hyperloop One has successfully tested its prototype passenger pod 'XP-1', reaching a speed of up to 310 km per hour.
- Passengers and cargo are loaded into a pod, and accelerate gradually via electric propulsion through a low-pressure tube.
- The pod then lifts above the track using magnetic levitation and glides at airline speeds for long distances due to ultra-low aerodynamic drag.

5.8 National Agri-Food Biotechnology Institute

CIAB is the first institute dedicated to generation of secondary agriculture bio products through value addition to unutilized and underutilized biomass.

- Part of agri-food cluster in the Knowledge City, Mohali

5.9 Japanese Encephalitis in Gorakhpur

- Japanese Encephalitis (JE) is a mosquito-borne viral infection of the brain
- JE is one kind of encephalitis which falls under a spectrum of diseases called Acute Encephalitis Syndrome (AES).
- JE epidemics are reported from many parts of India however, it is highly endemic in Eastern Uttar Pradesh.

5.10 Article 35A

The Kashmir and Chenab Valleys on Saturday observed a shutdown over the issue of Article 35A.

- The Article accords special rights and privileges to the natives of J&K, and empower its legislature to frame any law without attracting a challenge on

grounds of violating right to equality of people from other states or any other right under the Indian Constitution.

- As per the state legislation gives exclusive rights of locals in J&K over jobs, immovable property and scholarships.

5.11 Scientists gene-edit piglets

- Scientists have successfully edited the genetic code of piglets to remove dormant viral infections, a breakthrough that could eventually pave the way for animal-to-human organ transplants.
- The process of grafting or transplanting organs or tissues between members of different species is called Xenotransplantation.

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