



Sleepy Classes
Free. Regular. Quality.

2- Minute Series

(A compilation of foundational Topics prerequisite for civil services)

Monthly Compilation

for

March 2021

Visit our website www.sleepyclasses.com or

our [YouTube channel](#) for entire GS Course **FREE** of cost

Also Available: Prelims Crash Course || Prelims Test Series

Table of Contents

1. Geography	1
1.1.Natural Capital Accounting and Valuation of Ecosystem services project	1
1.2.Global Risk Report	2
1.3.Thirty Meter Telescope Project.....	3
2. History & Culture	6
2.1.Rogan School of Art.....	6
2.2.Lala Lajpat Rai	7
3. Polity & Governance	9
3.1.National Commission for SCs	9
3.2.Postal Voting	10
3.3.Inner Line Permit Uttarakhand	11
3.4.Socially and Educationally Backward Class Reservation.....	12
4. Economy.....	14
4.1.What is a SCB.....	14
4.2.10 Important Terms of Monetary Policy.....	15
4.3.Production Linked Incentives Scheme.....	17
4.4.Prompt Corrective Action Framework (PCA)	20
5. Environment	22
5.1.Green Hydrogen	22
5.2.Indian Wild Ass.....	24
5.3.NDC Synthesis Report	26
5.4.World Water Day	27
6. Scienze & Technology	30
6.1.Endocrine Glands.....	30
6.2.Types of Covid - 19 Tests in India.....	31
6.3.Square Kilometre Array	32
6.4.Doppler Weather Radar	33
7. International Relations	36
7.1.Internet Connectivity in Far Flung Areas.....	36

1. Geography

1.1. Natural Capital Accounting and Valuation of Ecosystem services project

Natural Capital Accounting

- Natural capital accounting is the process of calculating the total stocks and flows of natural resources and services in a given ecosystem or region.
- Accounting for such goods may occur in physical or monetary terms.

Ecosystem Services

- Ecosystem services are the many and varied benefits to humans provided by the natural environment and from healthy ecosystems.
- Such ecosystems include, for example, agro ecosystems, forest ecosystems, grassland ecosystems and aquatic ecosystems.
- Collectively, these benefits are becoming known as 'ecosystem services', and are often integral to the provisioning of clean drinking water, the decomposition of wastes, and resilience and productivity of food ecosystems.
- The United Nations Statistics Division, the United Nations Environment Programme, the Secretariat of the Convention on Biological Diversity, and the European Union have launched the project "Natural Capital Accounting and Valuation of Ecosystem Services" (NCAVES).
- The project funded by the European Union through its Partnership Instrument (PI), aims to assist the five participating partner countries, namely Brazil, China, India, Mexico and South Africa.

Objective

- to advance the knowledge agenda on environmental-economic accounting, in particular ecosystem accounting.

Framework

- The System of Environmental-Economic Accounting (SEEA) provides a framework for measuring the link between the environment and the economy.
- It will initiate pilot testing of SEEA Experimental Ecosystem
- Accounting (SEEA EEA) with a view to:
 - ✓ Improving the measurement of ecosystems and their services (both in physical and monetary terms) at the (sub)national level;
 - ✓ Mainstreaming biodiversity and ecosystems at (sub)national level policy planning and implementation;
 - ✓ Contribute to the development of internationally agreed methodology and its use in partner countries.
- The project will have a duration until the end of 2021.

Context

- The MoSPI has taken up several initiatives under the project “Natural Capital Accounting and Valuation of Ecosystem Services (NCAVES)” which aims to advance the theory and practice of ecosystem accounting in India.
- Natural Capital Accounting and Valuation of the Ecosystem Services (NCAVES) India Forum-2021 is being organised by the Ministry of Statistics and Programme Implementation (MoSPI) in virtual format.

Additional Info

Initiatives

- EnviStats India:
 - ✓ Releases environmental accounts in its publication “EnviStats India” on an annual basis since 2018.
- India-EVL Tool:
 - ✓ Essentially a look-up tool giving a snapshot of the values of various ecosystem services in the different States of the country

1.2.Global Risk Report

- World Economic Forum – 16th edition
- The report describes changes occurring in the global risks landscape from year to year.
- The report also explores the interconnectedness of risks, and considers how the strategies for the mitigation of global risks might be structured.
- The report was released based on the Global Risks Perception Survey undertaken by more than 650 members of World Economic Forum , followed by analysis of growing social, economic and industrial divisions, their interconnections, and their implications on our ability to resolve major global risks requiring societal cohesion and global cooperation.
- The report is concluded with proposals for enhancing resilience, drawing from the lessons of the pandemic as well as historical risk analysis.

Key Findings

- Economic fragility and societal divisions are set to increase.
- Growing digital divides and technology adoption pose concerns which are further accelerated by COVID-19.
- A polarized industrial landscape may emerge in the post-pandemic economy.
- Climate continues to be a looming risk as global cooperation weakens

Recommendations

- According to the report, Response to COVID-19 offers four governance opportunities to strengthen overall resilience of countries, businesses and international community:
 - ✓ Formulating analytical frameworks that take a holistic and systems-based view of risk impacts.

- ✓ Investing in high-profile risk champions to encourage national leadership and international co-operation.
- ✓ Improving risk communications and combating misinformation.
- ✓ Exploring new forms of public-private partnership on risk preparedness.

Important Reports (WEf)

- Global Competitiveness Report
- Global Gender Gap Report
- Global Travel and Tourism Report

Top Risks

by likelihood

- 1 Extreme weather
- 2 Climate action failure
- 3 Human environmental damage
- 4 Infectious diseases
- 5 Biodiversity loss
- 6 Digital power concentration
- 7 Digital inequality
- 8 Interstate relations fracture
- 9 Cybersecurity failure
- 10 Livelihood crises

Top Risks

by impact

- 1 Infectious diseases
- 2 Climate action failure
- 3 Weapons of mass destruction
- 4 Biodiversity loss
- 5 Natural resource crises
- 6 Human environmental damage
- 7 Livelihood crises
- 8 Extreme weather
- 9 Debt crises
- 10 IT infrastructure breakdown

1.3.Thirty Meter Telescope Project

- The Thirty Meter Telescope is a new class of extremely large telescopes that will allow us to see deeper into space and observe cosmic objects with unprecedented sensitivity.
- The Thirty-meter telescope (TMT) project is an international partnership between the USA, Canada, Japan, China, and India.
- It will produce 12 times sharper images than the Hubble Space Telescope, which is the largest and most versatile telescope in the world till date.
- Location : Maunakea in Hawaii.

Facts About Mauna Kea

- Mauna Kea is a dormant volcano on the island of Hawaii.
- Its peak is 4,207.3 m (13,803 ft) above sea level, making it the highest point in the state of Hawaii and second-highest peak of an island on Earth.
- Alternate Sites



Application

- India's achievements in the field of Space /Science and Technology
- Religion

● Case Studies



Question Of The Day

1. Which of the following are false?

1. Semeru Volcano: Indonesia
2. Sangay Volcano: Ecuador
3. Cotopaxi: Ecuador
4. Krakatau Volcano: Chile

- A. Only 1
- B. Only 2
- C. Only 3
- D. Only 4





2. History & Culture

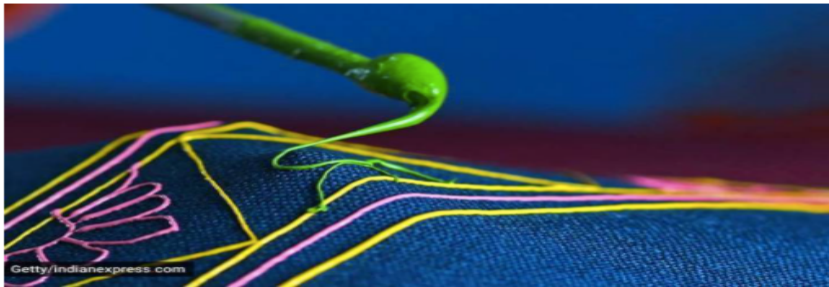
2.1.Rogan School of Art

Dying crafts of India: Into the world of colourful Rogan textile art

Initially, Rogan graced mainly ghaghra-cholis, bridal trousseaus, bedsheets, and tablecloths but they now adorn more contemporary items



Written by **Anjali Jha** | New Delhi |
July 8, 2020 7:10:50 pm



About

- It is an art of cloth printing practised in the Kutch District of Gujarat, India.
- In this craft, paint made from boiled oil and vegetable dyes is laid down on fabric using either a metal block or a stylus.
- The craft nearly died out in the late 20th century, with Rogan painting being practiced by only two families in the same village.

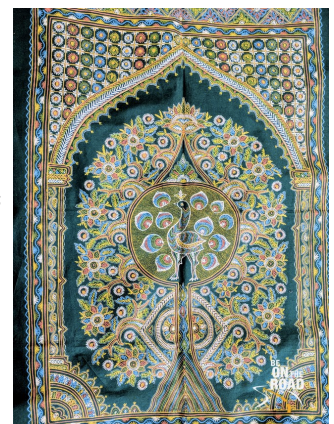
Resurgence of the Art

- In 2014, PM Narendra Modi visited the US White House and gave President Obama two rogan paintings including "A Tree of Life".
- "Tree of life painting" or "Kalp Variksha" is a famous work of Rogan school of Art.



Process

- Rogan Art is produced by boiling castor oil for about two days and then adding vegetable pigments and a binding agent, thus the resulting paint is thick and shiny.
- The pattern is applied using metal blocks with patterns carved on them.
- Elaborate designs are produced freehand, by trailing thread like strands of paint off a stylus.
- Unique feature - half of a design is painted, then the cloth is folded in half, transferring a mirror image to the other half of the fabric. The designs include floral motifs, animals, and local folk art.



2.2.Lala Lajpat Rai

Lala Lajpat Rai Birth Anniversary: PM Modi Pays Tribute

Lala Lajpat Rai Jayanti: Prime Minister Narendra Modi paid tribute to freedom fighter Lala Lajpat Rai on his birth anniversary today.

All India | Edited by Debjani Chatterjee | Updated: January 28, 2021 11:40 am IST

TRENDING



Anushka-Virat With Baby Vamika, Hardik-Natasa With Son Agastya Fly To Pune



"Minister Was In Hospital When...": Sharad Pawar On Letter Bomb- 10 Facts



Actor Harman Baweja Marries Sasha Ramchandani. See Pics And Videos



Lala Lajpat Rai Jayanti: PM Modi pays tribute

- "If I had the power to influence Indian journals, I would have the following lines printed in bold letters on the first page: Milk for the Infants, food for the Adults and Education for all"

Points to Remember

- Belonged to Dudhike village in Punjab's Ferozpur District and was a lawyer by Profession, practices at Lahore High Court
- Known as "Punjab Kesari" and 'Lion of Punjab'.
- Influenced by Swami Dayanand Saraswati and joined the Arya Samaj at Lahore.
- Believed that ideals in Hinduism combined with nationalism will lead to establishment of a secular state.
- Was involved with the Hindu Mahasabha.
- Co-Founded the Punjab National Bank in 1894.
- Lead out a strong struggle against Untouchability and worked towards an egalitarian society.
- He was elected President of INC in the Calcutta Special Session of 1920.egalitarian society.
- Elected Deputy leader of the Central Legislative Assembly in 1926.

Contributions - Political

- Part of INC and Opposed the partition of Bengal and for his political agitation was deported to Burma without trial in 1907, but due to lack of evidence against him he was released.
- Founded Home Rule League of America in 1917 in New York.

- In 1920, was elected as the President of All India Trade Union Congress.
- In 1928, moved a resolution in the assembly refusing cooperation with the
- Simon Commission as it has no Indian members.

Contributions - Social

- Founded Hindu Relief movement in 1897.
- Founded Servants of People Society in 1921.
- Contributions - Literary
- Books written by Him -
- The Story of My Deportation, 1908.
- Arya Samaj, 1915.
- The United States of America: A Hindu's Impression, 1916. The problem of National Education in India, 1920 Unhappy India, 1928.
- England's Debt to India
- The Story of My Deportation, 1908.
- Arya Samaj, 1915.
- The United States of America: A Hindu's Impression, 1916.
- The problem of National Education in India, 1920 Unhappy India, 1928.
- England's Debt to India

Contributions - Literary

- Founded Arya Gazette as its editor and regularly contributed to major Hindi, Punjabi, English and Urdu Newspapers.
- Autobiographical Writing -
 - ✓ Young India: An Interpretation and a History of the Nationalist Movement from Within.
- He also wrote biographies of Mazzini, Garibaldi, Shivaji, and Srikrishna.

Death

- 1928, while protesting against the Simon Commission in Lahore, He was brutally lathi-charged by Superintendent of Police, James Scott and thus dies of injuries few weeks later.
- He remarked - "I declare that the blows struck at me today will be the last nails in the coffin of British rule in India"

3. Polity & Governance

3.1. National Commission for SCs

- It is a constitutional body in the sense that it is directly established by Article 338 of the Constitution.
- On the other hand, the other national commissions like the National Commission for Women (1992), the National Commission for
- Minorities (1993), the National Commission for Backward Classes (1993), the National Human Rights Commission (1993) and the National Commission for Protection of Child Rights (2007) are statutory bodies in the sense that they are established by acts of the Parliament.

Evolution of the Commission

- Originally, Article 338 of the Constitution provided for the appointment of a Special Officer for Scheduled Castes (SCs) and Scheduled Tribes (STs) to investigate all matters relating to the constitutional safeguards for the SCs and STs and to report to the President on their working.
- He was designated as the Commissioner for SCs and STs and assigned the said duty.
- In 1978, the Government (through a Resolution) set up a non- statutory multi-member Commission for SCs and STs; the Office of Commissioner for SCs and STs also continued to exist.
- In 1987, the Government (through another Resolution) modified the functions of the Commission and renamed it as the National Commission for SCs and STs.
- Later, the 65th Constitutional Amendment Act of 1990 provided for the establishment of a high-level multi-member National Commission for SCs and STs in the place of a single Special Officer for SCs and STs.
- This constitutional body replaced the Commissioner for SCs and STs as well as the Commission set up under the Resolution of 1987.
- Again, the 89th Constitutional Amendment Act of 2003 bifurcated the combined National Commission for SCs and STs into two separate bodies, namely, National Commission for Scheduled Castes (under Article 338) and National Commission for Scheduled Tribes (under Article 338-A).
- The separate National Commission for SCs came into existence in 2004. It consists of a chairperson, a vice-chairperson and three other members. They are appointed by the President by warrant.

Report of the Commission

- The commission presents an annual report to the president. It can also submit a report as and when it thinks necessary.
- The President places all such reports before the Parliament, along with a memorandum explaining the action taken on the recommendations made by the Commission.
- The memorandum should also contain the reasons for the non- acceptance of any of such recommendations.
- The President also forwards any report of the Commission pertaining to a state government to the state governor.

- The governor places it before the state legislature, along with a
- memorandum explaining the action taken on the recommendations of the Commission.
- The memorandum should also contain the reasons for the non- acceptance of any of such recommendations.

Powers of the Commission

- The Commission is vested with the power to regulate its own procedure.
- The Commission, while investigating any matter or inquiring into any complaint, has all the powers of a civil court trying a suit and in particular in respect of the following matters:
 - ✓ summoning and enforcing the attendance of any person from any part of India and examining him on oath;
 - ✓ requiring the discovery and production of any document;
 - ✓ receiving evidence on affidavits;
 - ✓ requisitioning any public record from any court or office issuing summons for the examination of witnesses and documents; and
 - ✓ any other matter which the President may determine.
- The Central government and the state governments are required to consult the Commission on all major policy matters affecting the SCs.
- The Commission is also required to discharge similar functions with regard to the other backward classes (OBCs) and the Anglo- Indian Community as it does with respect to the SCs.
- In other words, the Commission has to investigate all matters relating to the constitutional and other legal safeguards for the OBCs and the Anglo-Indian Community and report to the President upon their working.
- Relevance Of The Topic: Former Union minister Vijay Sampla took charge as the chairman of the National Commission for Scheduled Castes (NCSC).

3.2.Postal Voting

- A restricted set of voters can exercise postal voting. Through this facility, a voter can cast her vote remotely by recording her preference on the ballot paper and sending it back to the election officer before counting.
- This facility is available to:
 - ✓ Members of the armed forces like the Army, Navy and Air Force
 - ✓ Members of the armed police force of a state (serving outside the state)
 - ✓ Government employees posted outside India and their spouses
 - ✓ Voters under preventive detention
- Special voters such as the President of India, Vice President, Governors, Union Cabinet ministers, Speaker of the House and government officers on poll duty have the option to vote by post.

- But they have to apply through a prescribed form to avail this facility.
- Recently, the Law Ministry, at the Election Commission's behest, introduced a new category of 'absentee voters', who can now also opt for postal voting.
- ✓ These are voters employed in essential services and unable to cast their vote due to their service conditions.



Procedure

- The Returning Officer is supposed to print ballot papers within 24 hours of the last date of nomination withdrawal and dispatch them within a day.
- ✓ This is done so that the ballot papers reach the concerned voter well before the polling date and she has enough time to send it back before the counting day.
- Postal ballot papers for members of the Armed Forces are sent through their record offices.
- For members of the armed police force of a state (serving outside the state), government employees posted outside India and their spouses, the ballot paper can be sent through post or electronically.
- For remaining categories ballot papers can be delivered personally or through post.
- After receiving it, the voter can mark her preference with a tick mark or cross mark against the candidate's name.
- They also have to fill up a duly attested declaration to the effect that they have marked the ballot paper.
- The ballot paper and the declaration are then placed in a sealed cover and sent back to the Returning Officer before the time fixed for the commencement of counting of votes.

Opposition

- Few political parties has described it as an "arbitrary, malafide, unconstitutional" move against free and fair elections.
- It might lead to malpractices and foul play by those parties which are in power and having resources.
- By allowing those aged 65 and above to vote by postal ballot violates secrecy in voting as a large segment of the population is uneducated and they might seek assistance from others at numerous stages, ending up disclosing their preferred candidate.

3.3.Inner Line Permit Uttarakhand

Removal of ILP in Uttarakhand

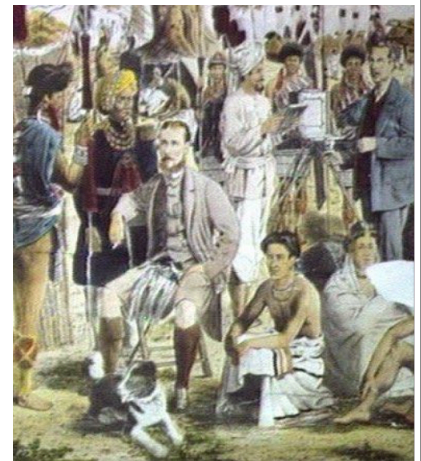
- The Uttarakhand government, in a recent meeting with Union Home Minister Amit Shah, had sought withdrawal of "inner-line permit" (ILP) system in Niti Valley of Chamoli district and Nelang Valley of Uttarkashi.

Why

- They have requested the same for better border management and expansion of tourism and other economic activities in villages located there.
- The ILP system restricts movement in areas close to the border for everyone other than those with a formal permission. In Uttarakhand, tourists have to obtain ILP for locations near China border, at least in the three districts of Uttarkashi, Pithoragarh and Chamoli.
- Local authorities in these districts say there shouldn't be any ILP for other places as well so that economic activities increase and villages are rehabilitated so that locals could also act as 'eyes' and 'ears' at border for surveillance.
- It will also stop outward migration. According to officials in these districts, most of the border villages see outward migration owing to lack of livelihood opportunities.
- Uttarakhand shares a 350-km border with China and a 275-km boundary with Nepal. Five of the state's 13 districts are border districts.

What is ILP

- The Constitution of India provides for all Indian citizens are free to live and work in any state of the country, but entry to certain states with a protected status requires authorisation by the concerned state government i.e special permissions are required to visit these areas.
- Inner Line Permit (ILP) is an official travel document issued by the concerned state government to allow inward travel of an Indian citizen into a protected area for a limited period.
- The concept comes from the colonial area. Under the Bengal Eastern Frontier Regulation Act, 1873, the British framed regulations restricting the entry and regulating the stay of outsiders in designated areas.
- This was to protect the Crown's own commercial interests by preventing "British subjects" (Indians) from trading within these regions. In 1950, the Indian government replaced "British subjects" with "Citizen of India".
- This was to address local concerns about protecting the interests of the indigenous people from outsiders belonging to other Indian states.



3.4.Socially and Educationally Backward Class Reservation

Marathas Issue of Sub-Categorisation

- A five judge Constitutional Bench on challenging the validity of the Maharashtra State Reservation for Socially and Educationally Backward Classes (SEBC) Act, which had extended a 16% reservation for the Maratha community declared the Maratha Community to be socially and politically dominant.

What is a Constitutional Bench?

- Constitution bench is the name given to the benches of the Supreme Court of India which consist of at least five judges of the court which sit to decide any case "involving a substantial question of law as to the interpretation" of the Constitution of India or "for the purpose of hearing any reference" made by the President of India under Article 143.
- The provision for a constitutional bench has been mandated by Article 145 (3) of the Constitution of India. The Chief Justice of India has the power to constitute a Constitution Bench and refer cases to it.
- The bench refuted the findings of 2018 report of the M.G. Gaikwad Committee and pointed that almost 40% MPs and MLAs of Maharashtra are from this community.
- The M.G. Gaikwad Committee was the 11 member Maharashtra Backward Classes Commission headed by Justice (retd.) Gaikwad that declared Maratha class of citizens as socially and educationally backward class, entitled to benefits and advantages enshrined in Article 15 (4) and 16(4) of Indian Constitution.
- The bench had earlier also decided to hear all States in the matter, after a question of whether the Indra Sawhney case should be reconsidered cropped up.

What is the Indira Sawhney case?

- The Indira Sawhney case also popularly known as the Mandal Judgment upheld 27% reservation for OBCs in public employment and education. It excluded those belonging to the "creamy layer" (the forward section of a backward class, above a certain income). At the same time, it underlined that at no point should the reservation exceed 50%.

Need for OBC sub-categorisation?

- In September 2020, a Constitution Bench of the Supreme Court reopened the legal debate on sub-categorisation of Scheduled Castes and Scheduled Tribes for reservations. The argument for sub-categorisation, is that it would ensure "equitable distribution" of representation among all OBC communities.
- To examine this, the Rohini Commission was constituted on October 2, 2017. The Rohini Commission operates out of an office at Vigyan Bhawan Annexure and its expenses are borne by the NCBC. In data of central jobs surveyed, the Commission pointed that 97% of all jobs and educational seats have gone to just 25% of all sub-castes classified as OBCs.

4. Economy

4.1. What is a SCB

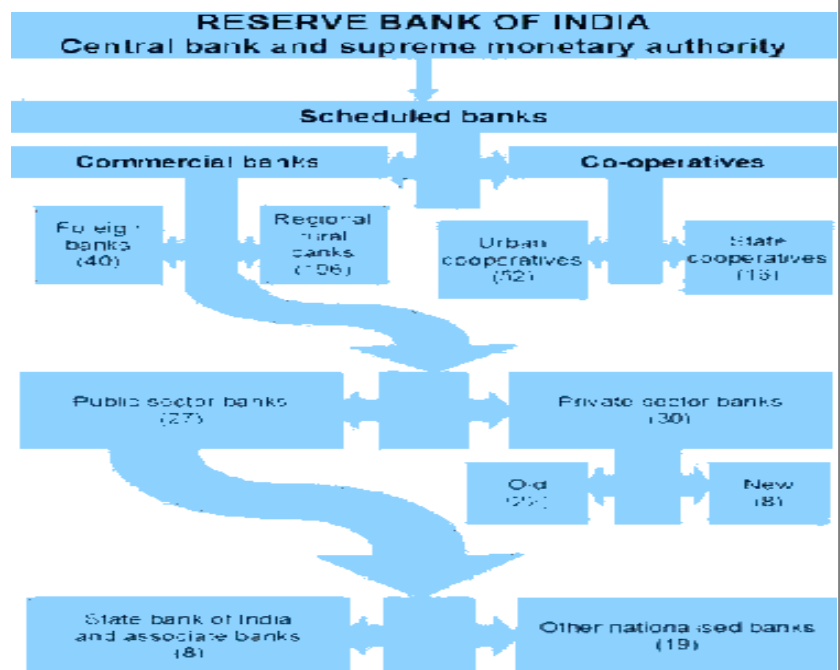
- Any bank which is listed in the 2nd schedule of the Reserve Bank of India Act, 1934.
- The list includes the State Bank of India and its subsidiaries (like State Bank of Travancore), all nationalised banks (Bank of Baroda, Bank of India etc), regional rural banks (RRBs), foreign banks (HSBC Holdings Plc, Citibank NA) and some co-operative banks.
- Please see that Co-Operative banks are also part of Scheduled Banks, but they are mostly run on no-profit, no-loss mandate.

What all Banks are included

- Scheduled Public Sector Banks
- Scheduled Private Sector Banks
- Scheduled Small Finance Banks
- Scheduled Payments Banks
- Scheduled Regional Rural Banks
- Scheduled Foreign Banks in India

To Qualify as a Scheduled Bank

- Paid up capital and collected funds of the bank must not be less than Rs5 lakh
- These banks are eligible for loans from the Reserve Bank of India at bank rate
- They are given membership to clearing houses



SCBs & LAF

- Liquidity Adjustment Facility (LAF) is a facility extended by the Reserve Bank of India to the scheduled commercial banks (excluding RRBs) and primary dealers.
- It is given so as to avail of liquidity in case of requirement or park excess funds with the RBI in case of excess liquidity on an overnight basis against the collateral of Government securities including State Government securities.

CRR & LAF

- As per the RBI Act 1934, all Scheduled Commercial Banks (that includes public and private sector banks, foreign banks, regional rural banks and co-operative banks) are required to maintain a cash balance on average with the RBI on a fortnightly basis to cater to the CRR requirement.
- Non Bank Financial Corporations (NBFCs) are outside the purview of this reserve requirement.
- Act also authorizes RBI to stipulate an additional or incremental CRR, which, however, has not been put in place by RBI.

4.2.10 Important Terms of Monetary Policy

- The Terms
 - ✓ Repo Rate
 - ✓ Reverse Repo Rate
 - ✓ Liquidity Adjustment Facility (LAF)
 - ✓ Marginal Standing Facility (MSF)
 - ✓ Corridor
 - ✓ Bank Rate
 - ✓ Cash Reserve Ratio (CRR)
 - ✓ Statutory Liquidity Ratio (SLR)
 - ✓ Open Market Operations (OMOs)
 - ✓ Market Stabilisation Scheme (MSS)

Repo Rate

- The (fixed) interest rate at which the Reserve Bank provides overnight liquidity to banks against the collateral of government and other approved securities under the liquidity adjustment facility (LAF).

Reverse Repo Rate

- The (fixed) interest rate at which the Reserve Bank absorbs liquidity, on an overnight basis, from banks against the collateral of eligible government securities under the LAF.

Liquidity Adjustment Facility (LAF)

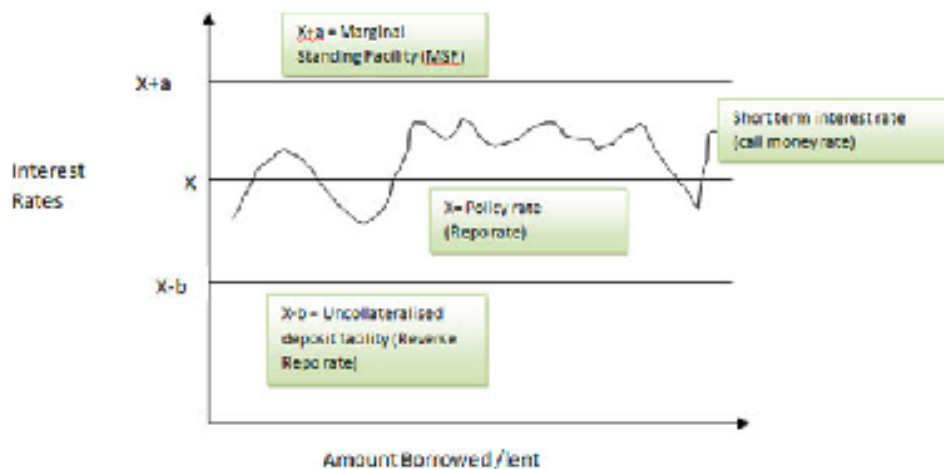
- The LAF consists of overnight as well as term repo auctions.
- Progressively, the Reserve Bank has increased the proportion of liquidity injected under fine-tuning variable rate repo auctions of range of tenors.
- The aim of term repo is to help develop the inter- bank term money market, which in turn can set market based benchmarks for pricing of loans and deposits, and hence improve transmission of monetary policy.
- The Reserve Bank also conducts variable interest rate reverse repo auctions, as necessitated under the market conditions.

Marginal Standing Facility (MSF)

- A facility under which scheduled commercial banks can borrow additional amount of overnight money from the Reserve Bank by dipping into their Statutory Liquidity Ratio (SLR) portfolio up to a limit at a penal rate of interest.
- This provides a safety valve against unanticipated liquidity shocks to the banking system.

Corridor

- The MSF rate and reverse repo rate determine the corridor for the daily movement in the weighted average call money rate.



Bank Rate

- It is the rate at which the Reserve Bank is ready to buy or rediscount bills of exchange or other commercial papers.
- The Bank Rate is published under Section 49 of the Reserve Bank of India Act, 1934.
- This rate has been aligned to the MSF rate and, therefore, changes automatically as and when the MSF rate changes alongside policy repo rate changes.

Cash Reserve Ratio (CRR)

- The average daily balance that a bank is required to maintain with the Reserve Bank as a share of such per cent of its Net demand and time liabilities (NDTL) that the Reserve Bank may notify from time to time in the Gazette of India.

Statutory Liquidity Ratio (SLR)

- The share of NDTL that a bank is required to maintain in safe and liquid assets, such as, unencumbered government securities, cash and gold.
- Changes in SLR often influence the availability of resources in the banking system for lending to the private sector.

Open Market Operations (OMOs)

- These include both, outright purchase and sale of government securities, for injection and absorption of durable liquidity, respectively.

Market Stabilisation Scheme (MSS)

- This instrument for monetary management was introduced in 2004.
- Surplus liquidity of a more enduring nature arising from large capital inflows is absorbed through sale of short-dated government securities and treasury bills.
- The cash so mobilised is held in a separate government account with the Reserve Bank.

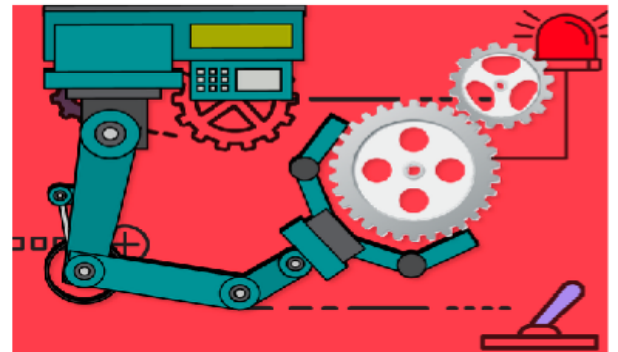
4.3. Production Linked Incentives Scheme

What is the PLI Scheme ?

- Production-Linked Incentive or PLI scheme is a scheme that aims to give companies incentives on incremental sales from products manufactured in domestic units.



- PLIs are provided by the Central government to identified sectors, in order to encourage manufacturing in India.
- The scheme invites foreign companies to set up units in India while also aiming to encourage local companies to set up or expand existing manufacturing units.
- It will also generate more employment and cut down the country's reliance on imports from other countries.



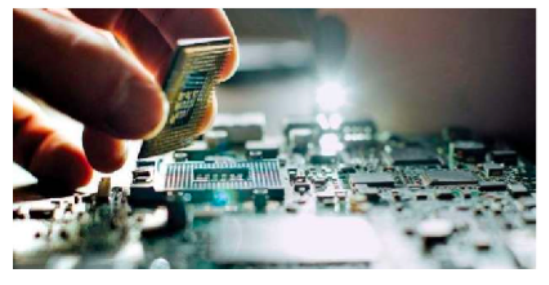
How does the scheme work ?

- Companies registered in India and having one or more manufacturing locations in the country are eligible for the scheme.
- These companies receive an incentive in the form of a cash subsidy on the new sales of goods manufactured in India for about five years from the base year.
- The incentive is tied to incremental investments made during the period.



Start of the Scheme

- As a part of the National Policy on Electronics, In April 2020, the IT Ministry notified a scheme which would give incentives of 4-6% to electronics companies which manufacture mobile phones and other electronic components (such as transistors, diodes, thyristors, resistors, capacitors and nano-electronic components such as micro electromechanical systems).
- According to the scheme, companies that make mobile phones which sell for a certain value or more will receive an incentive of up to 6 per cent on incremental sales of all such mobile phones made in India.



Benefits of the Scheme

- The scheme is believed to attract foreign investment in the sector, while also encouraging domestic mobile phone makers to expand their units and presence in India.



- Previously, the PLI Scheme was for select sectors such as mobile phones and allied equipment manufacturing, pharmaceutical ingredients and medical devices.
- ✓ To protect identified product areas
- ✓ To introduce non-tariff measures that make imports more expensive.
- ✓ To acknowledge the relevance of exports in overall growth strategy but focus more on the domestic market
- ✓ To promote manufacturing at home by offering production incentives and encourage investments both from within and outside.

Expanding Reach
Scheme proposed to be extended to:

Textiles, food processing, auto components, battery mfg & network products

India has core competence in these sectors

Fiscal incentives worth ₹ 50,000 cr likely on incremental production

HOW WILL IT HELP?

- Attract investments in India
- Help draw firms from China
- Help them penetrate global markets

WHAT THE SCHEME SEEKS TO ACHIEVE

- Make domestic mfg competitive & efficient
- Create economies of scale
- Make India part of global supply chain
- Attract investment in core mfg & cutting edge tech
- Competitive mfg would in turn lift exports

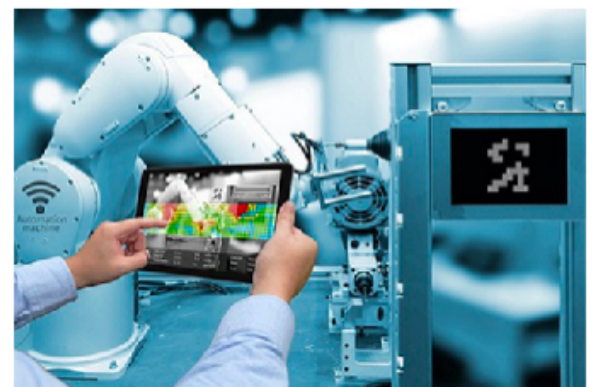
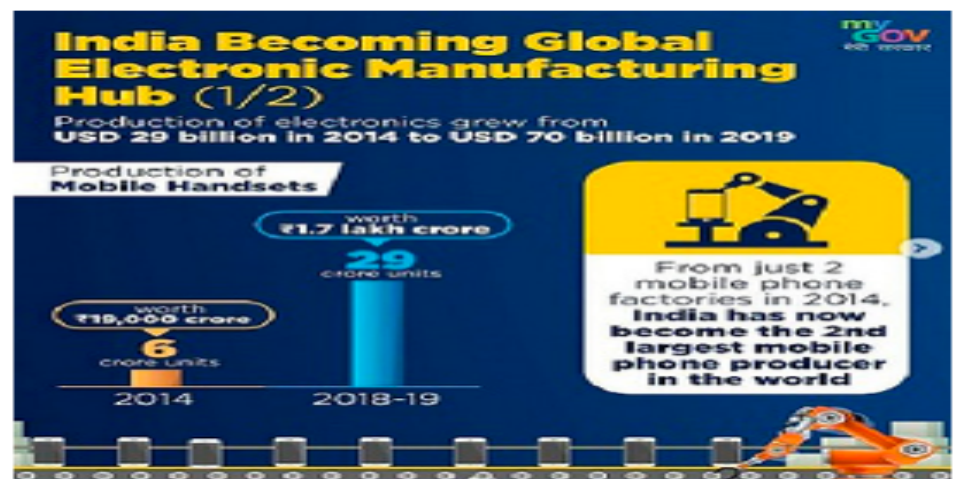
Eligibility criteria of the PLI scheme

- Companies have to be registered in India.
- An applicant must meet threshold criteria (i.e. incremental investment) that is a minimum of INR 10 crore (MSME) or INR 100 crore (Others) and a maximum of INR 1000 crore to be eligible for disbursement of incentive.
- To meet the threshold criteria of Incremental Investment for any year, the cumulative value of investment done till such year (including the year under consideration) over the Base Year (2019-20) shall be considered.
- Some sectors also have threshold criteria for incremental sales.
- The applicant can operate existing or new manufacturing unit at one or more locations in the country.
- Any additional expenditure incurred by companies on plant, machinery, equipment, research and development and transfer of technology for manufacture in the target segments will be eligible for the incentive scheme.

Production-Linked Incentive (PLI) Scheme			
Priority	Sectors	Implementing Ministry/Department	Approved financial outlay over a five-year period
1.	Advance Chemistry Cell (ACC) Battery	NITI Aayog and Department of Heavy Industries	Rs 18,100 crore
2.	Electronic/Technology Products	Ministry of Electronics and Information Technology	Rs 5,000 crore
3.	Automobiles and Auto Components	Department of Heavy Industries	Rs 57,042 crore
4.	Pharmaceuticals drugs	Department of Pharmaceuticals	Rs 15,000 crore
5.	Telecom & Networking Products	Department of Telecom	Rs 12,195 crore
6.	Textile Products: MMF segment and technical textiles	Ministry of Textiles	Rs 10,683 crore
7.	Food Products	Ministry of Food Processing Industries	Rs 10,900 crore
8.	High Efficiency Solar PV Modules	Ministry of New and Renewable Energy	Rs 4,500 crore
9.	White Goods (ACs & LED)	Department for Promotion of Industry and Internal Trade	Rs 6,238 crore
10.	Speciality Steel	Ministry of Steel	Rs 6,322 crore
Total			Rs 145,980 crore

Some additional points to consider

- PLI aims to encourage local manufacturing alongwith other initiatives like 15 per cent tax rate for new manufacturing companies, increase in import duties on various goods.
- PLI also provides an opportunity for India to take on China in the global supply chain.
- PLI for solar PV panels will reduce the import dependence.
- The domestic electronics hardware manufacturing sector faces lack of a level playing field vis-à-vis competing nations.
- The sector suffers disability of around 8.5% to 11% on account of lack of adequate infrastructure, domestic supply chain and logistics; high cost of finance; inadequate availability of quality power; limited design capabilities and focus on R&D by the industry; and inadequacies in skill development.
- The vision of National Policy on Electronics 2019 (NPE 2019) aimed to position India as a global hub for Electronics System Design and Manufacturing (ESDM) by encouraging and driving capabilities in the country for developing core components and creating an enabling environment for the industry to compete globally.
- Scheme is also applicable on Assembly, Testing, Marking and Packaging (ATMP) units of electronics.



4.4.Prompt Corrective Action Framework (PCA)

Impact of PCA

- If PCA is triggered Banks are not allowed to renew or access costly deposits or take steps to increase their fee-based income.
- Banks will also have to launch a special drive to reduce the stock of NPAs and contain generation of fresh NPAs.
- They will also not be allowed to enter into new lines of business.
- RBI also imposes restrictions on the bank on borrowings from interbank market.

What are PCA Norms ?

- PCA norms allow the regulator to place certain restrictions such as halting branch expansion and stopping dividend payment.
- It can even cap a bank's lending limit to one entity or sector.
- Other corrective action that can be imposed on banks include special audit, restructuring operations and activation of recovery plan.
- Banks' promoters can be asked to bring in new management, too. The RBI can also supersede the bank's board.
- The PCA is invoked when certain risk thresholds are breached.

Three Risk Thresholds

- There are three risk thresholds which are based on certain levels of asset quality, profitability, capital and the like.
- The third such threshold, which is maximum tolerance limit, sets net NPA at over 12 per cent and negative return on assets for four consecutive years.

Two type of Restrictions

- There are two type of restrictions:
 - ✓ Mandatory
 - ✓ Discretionary
- Mandatory: Restrictions on dividend, branch expansion, directors' compensation.
- Discretionary: Restrictions could include curbs on lending and deposit.

RBI & Regulatory Trigger Points

- The Reserve Bank has specified certain regulatory trigger points, as a part of prompt corrective action (PCA) Framework, in terms of three parameters, i.e.
 - ✓ Capital to risk weighted assets ratio (CRAR)
 - ✓ Net non-performing assets (NPA)
 - ✓ Return on Assets (RoA),

- For initiation of certain structured and discretionary actions in respect of banks hitting such trigger points.

Important Points

- The PCA framework is applicable only to commercial banks and not extended to co-operative banks, non-banking financial companies (NBFCs) and FMs.

RISK THRESHOLDS AND CORRECTIVE ACTIONS		
RISK THRESHOLD 1	RISK THRESHOLD 2	RISK THRESHOLD 3
<p>RESTRICTION ON DIVIDEND / DISTRIBUTION/REMITTANCE OF PROFITS.</p> <p>MORE CAPITAL TO BE BROUGHT IN BY OWNER / PROMOTERS IN CASE OF FOREIGN BANKS.</p> <p>DISCRETIONARY ACTIONS BY REGULATOR.</p>	<p>IN ADDITION OF ACTIONS UNDER RISK THRESHOLD 1,</p> <p>RESTRICTIONS ON BRANCH EXPANSION - DOMESTIC / OR OVERSEAS</p> <p>HIGHER PROVISIONS AS PART OF COVERAGE REGIME</p> <p>DISCRETIONARY ACTIONS BY REGULATOR.</p>	<p>RESTRICTIONS ON DIVIDEND, RESTRICTIONS ON BRANCH EXPANSION.</p> <p>RESTRICTIONS ON MANAGEMENT COMPENSATION AND DIRECTOR'S FEES.</p> <p>DISCRETIONARY ACTIONS BY REGULATOR.</p>

5. Environment

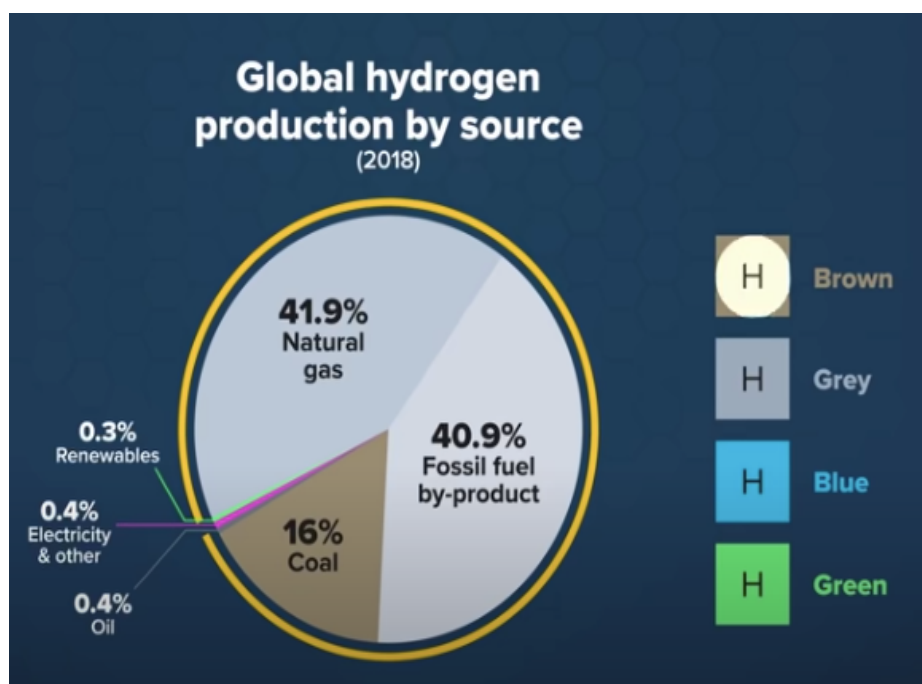
5.1.Green Hydrogen

Introduction

- Hydrogen is an appealing fuel.
- A kilogram of hydrogen has about three times as much energy as a comparable amount of diesel or gasoline.
- Hydrogen is the universe's most abundant element, but here on Earth it doesn't appear pure in nature, and requires energy to separate.
- The most common technique is to extract hydrogen from water, which is two parts hydrogen and one part oxygen (hence H_2O).
- If it can be made cleanly and cheaply, it could be the key to cleaning up an array of tricky vital sectors.
- Today, most manufactured hydrogen is made by combining natural gas with steam at high temperatures.
- It's an energy-intensive process that emits considerable amounts of carbon dioxide, the main greenhouse gas driving climate change.
- But a small and growing percentage is made by splitting water into its constituent elements by zapping it with electricity, a process known as electrolysis.
- This also takes a lot of energy, but if the electricity comes from a renewable source like wind or solar power, it produces minimal harmful emissions.
- This is known as Green Hydrogen.

Types of Hydrogen

- Where the hydrogen comes from is important.
- Hydrogen, in itself, is a clean fuel.
- Manufacturing hydrogen fuel, however, is energy-intensive and has carbon byproducts.
- What is now called brown hydrogen is created through coal gasification.
- At the moment, it's mainly produced industrially from natural gas, which generates significant carbon emissions.
- That type is known as "grey" hydrogen.



- A cleaner version is “blue” hydrogen, for which the carbon emissions are captured and stored, or reused.
- The cleanest one of all is “green” hydrogen, which is generated by renewable energy sources without producing carbon emissions in the first place.

How it is produced

- With electrolysis, all you need to produce large amounts of hydrogen is water, a big electrolyzer and plentiful supplies of electricity.
- If the electricity comes from renewable sources such as wind, solar or hydro, then the hydrogen is effectively green; the only carbon emissions are from those embodied in the generation infrastructure.
- The challenge right now is that big electrolyzers are in short supply, and plentiful supplies of renewable electricity still come at a significant price.
- Compared to more established production processes, electrolysis is very expensive, so the market for electrolyzers has been small.

Expensive but getting cheaper

- Conventional hydrogen and blue hydrogen cost about \$2 per kilogram (though the price varies depending on where it's produced), while green hydrogen is around twice as much.
- That price, however, is falling steeply with renewable energy prices and cheaper costs to make equipment used for electrolysis, called electrolyzers.

Uses

- Oil refining
- Methanol production
- Ammonia production
- Steel production
- Conventional hydrogen and blue hydrogen cost about \$2 per kilogram (though the price varies depending on where it's produced), while green hydrogen is around twice as much.
- That price, however, is falling steeply with renewable energy prices and cheaper costs to make equipment used for electrolysis, called electrolyzers.

Potential Uses

- Fuel-cell hydrogen electric cars and trucks
- container ships powered by liquid ammonia made from hydrogen
- "green steel" refineries burning hydrogen as a heat source rather than coal
- hydrogen-powered electricity turbines that can generate electricity at times of peak demand to help firm the electricity grid
- as a substitute for natural gas for cooking and heating in homes.

Issues

- Like any gas, hydrogen can be compressed and stored in tanks, then used as needed. However, the volume of hydrogen is much larger than that of other hydrocarbons; nearly four times as much as natural gas, for instance.
- Its storage requires compression to 700 times normal atmospheric pressure or refrigeration to minus 253 degrees Celsius, which is near absolute zero.
- It's estimated that the cost of doing this could add anything from 60 cents to \$7 per kg, making it less competitive with other fuels.
- On top of the cost of storage, there's a problem with pipes.
- Hydrogen atoms under pressure are small enough to slip through solid steel, meaning natural gas plumbing often cannot be easily converted for pumping hydrogen.
- Appliances set up for natural gas, like stoves and heaters, would also need to be replaced or refitted to handle hydrogen.

Turquoise Hydrogen

- A more recent addition to the hydrogen-production palette is turquoise.
- This is produced by breaking methane down into hydrogen and solid carbon using a process called pyrolysis.
- Turquoise hydrogen might seem relatively low in terms of emissions because the carbon can either be buried or used for industrial processes such as steelmaking or battery manufacturing, so it doesn't escape into the atmosphere.

5.2.Indian Wild Ass

Introduction

- The Indian Wild Ass (*Equus hemionus khur*), also called Ghor Khar or Ghud Khur is found predominantly in the Little Rann of Kutch and its surrounding areas in Gujarat.
- It is also found in southern Pakistan, Afghanistan, and south-eastern Iran.
- Saline deserts (Rann), arid grasslands and shrub lands are its preferred environment.



Feature

- It is one of the fastest Indian animals (60 kmph)
- The coat of the animal is usually sandy and may vary from reddish grey, fawn, to pale chestnut.
- It feeds on grass, leaves and fruits of plant, crop and saline vegetation.
- Wild asses graze between dawn and dusk.
- They live either solitarily, or in small groups of twos and threes while family herds remain large.

Threats

- Threats to Wild Ass in the Little Rann of Kutch stem from increasing human activities.
- Land use patterns have changed since the Mega Narmada Dam Project which resulted in the Sardar Sarovar canals all around the protected area.
- Uninformed release of Sardar Sarovar canal excess waters into the Rann is having an impact on the micro-habitat, the short grasslands and is restricting the movement of Wild Ass and other species across the saline desert.
- In recent years Wild Ass have also been increasingly hit on the major express highway.
- The International Boundary with Pakistan has been fenced thus restricting any possibility of Wild Ass movement beyond borders.
- Although the population has somewhat increased over the past years, foaling rates in Wild Ass have been on the decline in recent years.
- Increased agricultural practices have converted lands into irrigation fields, resulting in shrinking habitat for the existing Wild Ass population.
- Religious activities, cattle breeding and influx of people have accelerated on the Islands or Bets of the Rann.
- Prosopis juliflora invasion is an additional threat to the habitat.
- An estimated 30-35% of the Wild Ass population lives outside the protected area and human-Wild Ass conflicts are increasing, particularly crop raiding.

Conservation Status

- In August 2015, the IUCN Red List has moved the Indian wild ass from the 'vulnerable' to 'endangered' category, indicating the need for heightened protection measures.
- It has been classified as 'nearly threatened' animal by IUCN in 2016.
- It is protected under Schedule 1 of the Wildlife Protection Act 1972.
- Included on Appendix I of the Convention on International Trade in Endangered Species (CITES), making international trade in this species illegal.
- Indian Wild Ass Sanctuary located in the Little Rann of Kutch is the largest wildlife sanctuary in India.
- A few years back, the Gujarat Ecological Education and Research Foundation (GEER) report had recommended that the Thar desert in Rajasthan should be developed as an alternative site for re-establishing the Indian wild ass by reintroduction a few of them.
- However, currently, the Indian wild ass sanctuary (4900 km²), located in the Little and Great Rann of Kutch in Gujarat, is the ultimate refugia of the Asiatic wild ass population in southern Asia.

Present status

- The population of the wild ass in Gujarat has seen a significant rise of over 36% in the last five years, a population estimation report published by the state forest department in 2019 has claimed.

- The population estimation exercise conducted in March 2019 counted a total of 6,082 wild asses in the Little Rann Of Kutch (LRK).
- Five years back, the population was estimated to be 4,451.
- The counting of wild ass population, kept under Schedule-I of the Wildlife Protection Act, 1972, takes place once every five years.
- GPS tracking devices and drone cameras were part of the 9th Wild Ass population estimation.



5.3.NDC Synthesis Report

Introduction

- The NDC synthesis report is prepared in response to the requests from COP 21 (Paris, 2015) and CMA 2 (Madrid, 2019) to the secretariat to prepare a synthesis report of the NDCs submitted by Parties before COP 26.
- In view of the postponement of COP 26 to November 2021 and the impact of the COVID-19 pandemic on the NDC preparation process, the secretariat decided to issue the NDC synthesis report in two editions:
 - ✓ an initial version by 28 February 2021 and the final version in advance of COP 26 (date to be determined yet).
- This report was released by the UNFCCC.
- This report measures the progress of national climate action plans in the backdrop of upcoming 26th session of Conference of its Parties (COP26) in November 2021 in Glasgow.
- This report has also urged the other countries to initiate more ambitious plans in order to reach the Paris Agreement goals.
- 2021 is a make or break year to confront the global climate emergency. The science is clear, to limit global temperature rise to 1.5C, we must cut global emissions by 45% by 2030 from 2010 levels.
- The interim report from the UNFCCC is a red alert for our planet.
- It shows governments are nowhere close to the level of ambition needed to limit climate change to 1.5 degrees and meet the goals of the Paris Agreement.
- The major emitters must step up with much more ambitious emissions reductions targets for 2030 in their Nationally Determined Contributions well before the November UN Climate Conference in Glasgow.
- This report covered the submissions from countries up to December 31, 2020.
- As per the submission, 75 countries which are Parties to the Framework Convention communicated a new or updated NDC which represents 30 per cent of global greenhouse gas emissions.

Features

- The United Kingdom and the European Union are the only regions among 18 of the world's biggest emitters that have significantly increased their greenhouse gas reduction targets.
- Of the 197 Parties to the United Nations Framework Convention on Climate Change (UNFCCC), only 75 have submitted new or updated nationally determined contributions (NDC) till December 31, 2020.
- These Parties account for 30 per cent of the global greenhouse emissions.
- Other major emitters either submitted NDCs presenting a very low increase in their ambition level or have not presented NDCs yet.
- Sixteen of the world's biggest emitters have not increased their emission reduction targets substantially or at all.
- More countries reported on mitigation co-benefits of adaptation action and economic diversification plans.
- Adaptation actions and economic diversification plans with mitigation co-benefits include -
- climate-smart agriculture, adapting coastal ecosystems, increasing the share of renewable sources in energy generation, carbon dioxide capture and storage, fuel switch and fuel price reforms in the transport sector, and moving to a circular economy for better waste management.
- While a majority of countries increased their individual levels of ambition to reduce emissions, their combined impact will help achieve only a 1 per cent reduction by 2030 compared to 2010 levels.
- Global emissions, however, need to reduce by 45 per cent in order to meet the 1.5°C goal, according to Intergovernmental Panel on Climate Change.

Conclusion

- Participating nations will get more time to review and update their NDCs.
- This will be compiled in the final synthesis report to be brought out ahead of COP 26.
- This report has shown that nations must redouble efforts and submit stronger, more ambitious national climate action plans in 2021 if they're to achieve the Paris Agreement goal of limiting global temperature rise by 2°C—ideally 1.5°C—by the end of the century.

5.4. World Water Day

Introduction

- To focus on the importance of freshwater, the United Nations marks March 22 every year as World Water Day.
- The theme of World Water Day 2021 is "Valuing Water".
- It celebrates water and raises awareness of the 2.2 billion people living without access to safe water.
- A core focus of World Water Day is to support the achievement of Sustainable Development Goal 6: water and sanitation for all by 2030.

Theme

- Valuing Water.



✓ The value of water is about much more than its price – water has enormous and complex value for our households, food, culture, health, education, economics and the integrity of our natural environment.

✓ If we overlook any of these values, we risk mismanaging this finite, irreplaceable resource.

Celebrated Why?

- As per the UN website, the idea for this international day goes back to 1992, the year in which the United Nations Conference on Environment and Development in Rio de Janeiro took place.
- That same year, the United Nations General Assembly adopted a resolution by which March 22 of each year was declared World Day for Water, to be observed starting in 1993.
- Later on, other celebrations and events were added.
- For instance, the International Year of Cooperation in the Water Sphere 2013, and the current International Decade for Action on Water for Sustainable Development, 2018-2028.
- These observances aim to highlight that water and sanitation measures are key to poverty reduction, economic growth, and environmental sustainability.

India

- In 2017, the average annual per capita water availability fell from 1820 cubic meters assessed in 2001 to 1545 cubic meters in 2011, and could reduce further to 1341 and 1140 in the years 2025 and 2050 respectively.
- Annual per-capita water availability of less than 1700 cubic meters is considered as water stressed condition, whereas annual per- capita water availability below 1,000 cubic meters is considered as a water scarcity condition.
- Due to high temporal and spatial variation of precipitation, the water availability of many regions of the country is much below the national average and can be considered as water stressed/water scarce,.
- In a 2018 report, the water and sanitation advocacy group WaterAid ranked India at the top of 10 countries with the lowest access to clean water close to home, with 16.3 crore people not having such access.
- The same report also took note of government efforts, saying, “(India) is also one of the world’s most-improved nations for reaching the most people with clean water, but faces challenges with falling groundwater levels, drought, demand from agriculture and industry, pollution and poor water resource management – challenges that will intensify as climate change contributes to more extreme weather shocks.”

Water In The Constitution

- Under Article 246, the Indian Constitution allocates responsibilities of the States and the Centre into three lists– Union List, State List, and Concurrent List.
- As most of the rivers in the country are inter-State, the regulation and development of waters of these rivers, is a source of inter-State differences and disputes.
- In the Constitution, water is a matter included in Entry 17 of List-II i.e. State List.

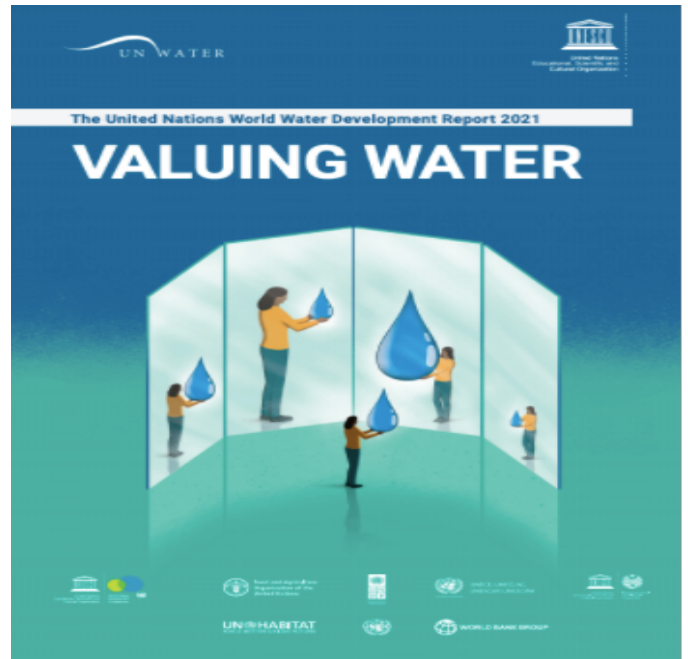
- This entry is subject to the provision of Entry 56 of List-I i.e. Union List.

UN WWDR 2021

- On World Water Day, 22 March, the UN World Water Development Report 2021 on 'Valuing Water' was launched.

India

- India uses the largest amount of groundwater - 24% of the global total.
- India is the third largest exporter of virtual water (groundwater that is used to grow export-oriented, water-intensive crops) -12% of the global total.



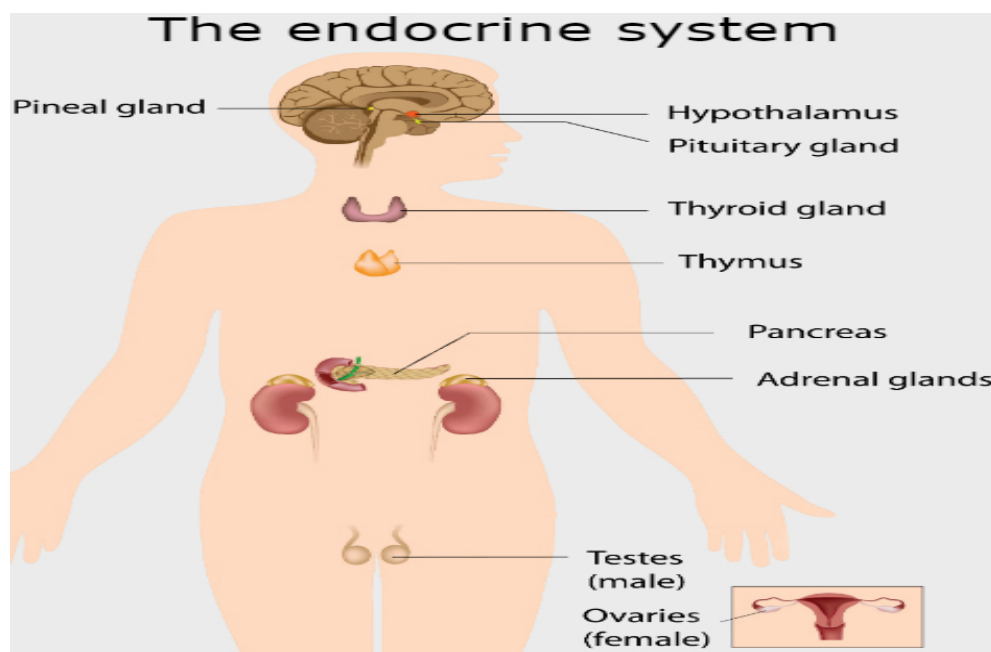
Catch The Rain Campaign

- Prime Minister has launched 'Jal Shakti Abhiyan - Catch the Rain' campaign for conserving water and stressed that every penny of MGNREGA funds be spent on rain water conservation till the monsoon arrives.
- The 'Catch the Rain' campaign will be undertaken across the country, in both rural and urban areas.
- It will be implemented from March 22 to November 30 - the pre- monsoon and monsoon period in the country.
- The campaign aims to take water conservation at grass-root level through people's participation.
- It is intended to nudge all stakeholders to create rainwater harvesting structures suitable to the climatic conditions and subsoil strata, to ensure proper storage of rainwater.

6. Scienze & Technology

6.1. Endocrine Glands

- The endocrine system is a chemical messenger system comprising feedback loops of the hormones released by internal glands of an organism directly into the circulatory system, regulating distant target organs.



1	Adrenaline	Adrenal	Increases blood pressure, heart rate and metabolism in reaction to stress
2	Aldosterone		Controls salt and water balance in body
3	Cortisol		Stress response
4	Dehydroepiandrosterone sulphate (DHEA)		Aids in production of body odour and growth of body hair during puberty
5	Estrogen	Ovary	Regulates menstrual cycle, maintain pregnancy and develop female sex characteristics
6	Progesterone		Prepare the body for pregnancy when egg is fertilised
7	Follicle Stimulating Hormone (FSH)	Pituitary	Controls production of eggs and sperm
8	Luteinizing Hormone (LH)		Control estrogen and testosterone production as well
9	Prolactin		Promotes breast-milk production
10	Oxytocin		Lactation, childbirth and mother-child bonding
11	Melatonin	Pineal	Sleep wake cycles
12	Testosterone	Ovary, Teste, Adrenal	Contributes to sex drive and body density in males and females as well as development of male sex characteristics
13	Thyroid Hormone	Thyroid	Control several body functions, including rate of metabolism and energy levels

6.2.Types of Covid - 19 Tests in India

- India's strategy to combat COVID-19 is 'test, track and treat'
- RT-PCR tests are considered the most accurate method available for detection of the pathogen
- Antibody tests are only for surveillance purposes, and can determine if a patient has previously had coronavirus
- ICMR has advised antibody testing as "supplementary" to RT-PCR testing

RT- PCR (Reverse Transcription-Polymerase Chain Reaction) Test

- Requires nasal and throat swabs and are used to directly detect the presence of the virus rather than antibodies
- Detects the virus' RNA, which will be present in the body before antibodies form or symptoms of the disease are present
- Test proceeds by converting RNA to DNA through 'reverse transcription', before detecting the virus
- Time taken: three hours

Rapid Antibody Tests

- Antibody tests are fast, inexpensive, and can be used to gauge the extent of infection within a community
- Unlike RT-PCR, antibody tests require a blood sample to determine whether the human body has antibodies for coronavirus
 - ✓ Antibodies are proteins produced by the body, and used by the immune system to identify and neutralise bacteria and viruses
- Blood is then examined for two types of antibodies — IgM antibodies, which appear early in an infection, and IgG antibodies, which are more likely to show up later
- ICMR has advised its use as sero-surveys on workers who have returned from other states, those who live in dense settings, people in containment zones, police and paramilitary personnel, among others
- Time: 20-30 minutes

Rapid Antigen Tests

- Like RT-PCR, the rapid antigen detection test too, seeks to detect the virus rather than the antibodies produced by the body
- Nasal samples are collected and tested for antigens, which are found in the SARS-CoV-2 virus
 - ✓ An antigen refers to any toxin in the body that triggers an immune response.
- Approved by ICMR for use in containment zones and healthcare settings
- Time: 30 minutes

TruNat Tests

- Used for detecting tuberculosis and HIV, and works on the same principle as RT-PCR, but with smaller kit and faster results
- TrueNat machine is chip-based, small and portable, and mostly runs on batteries. It detects the virus in nasal or oral swabs. The machines are equipped to detect the RdRp enzyme found in the virus RNA
- Time: 60 minutes

FELUDA(FNCAS9 Editor-Limited Uniform Detection Assay) Test

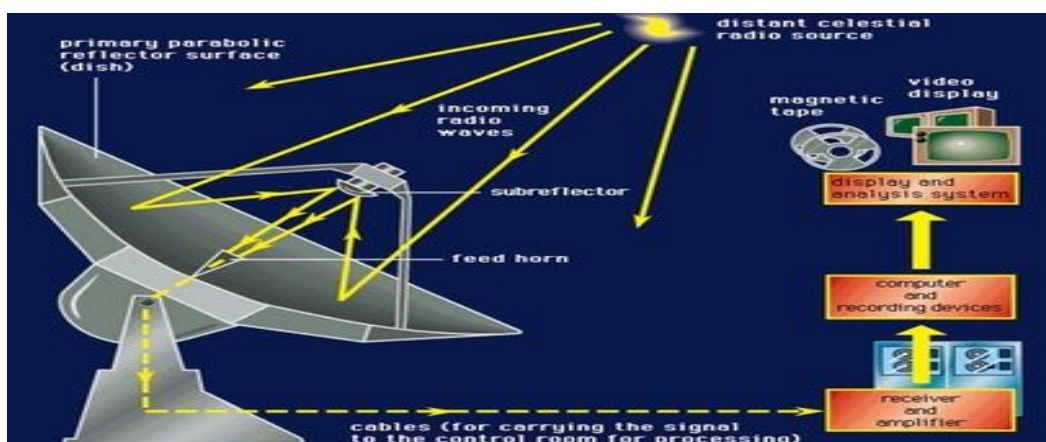
- It uses CRISPR-Cas technology for detection of genes specific to SARS-CoV-2 virus
- A protein called FnCas9 and a guide RNA(gRNA) which helps in recognising the viral genes is used
- If the patient sample has the viral gene, this gRNA- FnCas9 complex binds to the gene and using a paper strip this binding can be visualised
- Nasopharyngeal swab sample is collected to extract RNA

6.3.Square Kilometre Array

- Recently, the Square Kilometre Array Observatory (SKAO) Council held its maiden meeting and approved the establishment of the world's largest radio telescope.
- SKAO is a new intergovernmental organisation dedicated to radio astronomy and is headquartered in the UK.
- At the moment, organisations from ten countries are a part of the SKAO. These include Australia, Canada, China, India, Italy, New Zealand, South Africa, Sweden, the Netherlands and the UK.

Radio Telescopes

- Unlike optical telescopes, radio telescopes can detect invisible gas and, therefore, they can reveal areas of space that may be obscured by cosmic dust.
- Significantly, since the first radio signals were detected by physicist Karl Jansky in the 1930s, astronomers have used radio telescopes to detect radio waves emitted by different objects in the universe and explore it.
- According to NASA, the field of radio astronomy evolved after World War II and became one of the most important tools for making astronomical observations since.

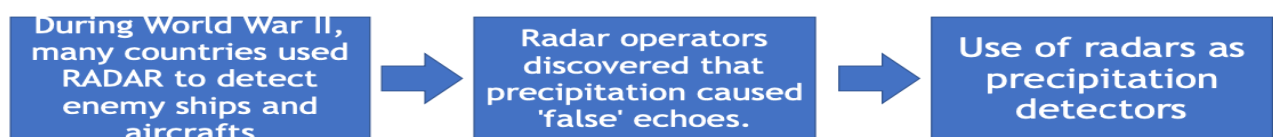


- The Arecibo telescope in Puerto Rico, which was the second-largest single-dish radio telescope in the world, collapsed in December 2020.

Significance

- The telescope, proposed to be the largest radio telescope in the world, will be located in Africa and Australia whose operation, maintenance and construction will be overseen by SKAO.
- The completion is expected to take nearly a decade at a cost of over £1.8 billion.
- As per NASA, the telescope will accomplish its scientific goals by measuring neutral hydrogen over cosmic time, accurately timing the signals from pulsars in the Milky Way, and detecting millions of galaxies out to high redshifts.
 - ✓ Scientists hope to address following concepts using this telescope
 - ✓ the beginning of the universe,
 - ✓ how and when the first stars were born,
 - ✓ the life-cycle of a galaxy,
 - ✓ exploring the possibility of detecting technologically-active civilisations elsewhere in our galaxy
 - ✓ and understanding where gravitational waves come from.
- Significantly, the development of SKA will use the results of various surveys undertaken using another powerful telescope called the Australian Square Kilometre Array Pathfinder (ASKAP), which is developed and operated by the country's science agency CSIRO.
- This telescope, which has been fully operational since February 2019 mapped over three million galaxies in a record 300 hours during its first all-sky survey conducted late last year.
- ASKAP surveys are designed to map the structure and evolution of the Universe, which it does by observing galaxies and the hydrogen gas that they contain.

6.4. Doppler Weather Radar



- Since this time, the modern weather radar has evolved and improved a great deal, incorporating better data retrieval methods and higher resolution data.
- In fact, most modern weather radars are now pulse-Doppler radars, and are capable of detecting the motion of rain droplets in addition to the intensity of the precipitation.
- Context: Union Ministry for Earth Sciences commissioned two of the ten indigenously built Doppler weather radars which will closely monitor the weather changes over the Himalayas.
- Services of X-band Doppler radars at Mukteshwar in Uttarakhand and Kufri in Himachal Pradesh were virtually inaugurated on the 146th foundation day of the India Meteorological Department (IMD).



- Covering the central and western Himalayas, these dual polarised radars will gather atmospheric variations and pick signals of extreme weather events.
- Both Uttarakhand and Himachal Pradesh are highly prone to cloud bursts, landslides, heavy rain and snowfall. Timely weather forecasts and warnings would ensure the governments make advance plans and initiate rescue measures.

How radar works?

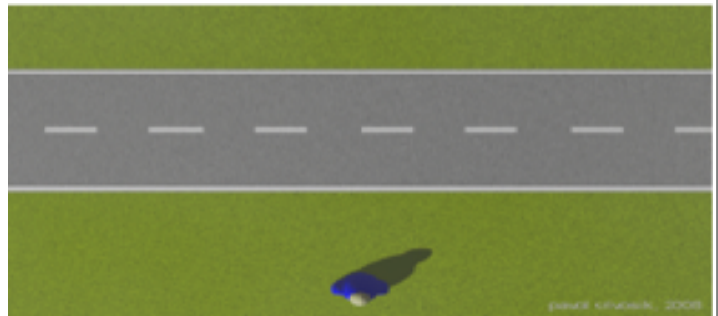
- The basics of radars is that a beam of energy, called radio waves, is emitted from an antenna. As they strike objects in the atmosphere, the energy is scattered in all directions with some of the energy reflected directly back to the radar.



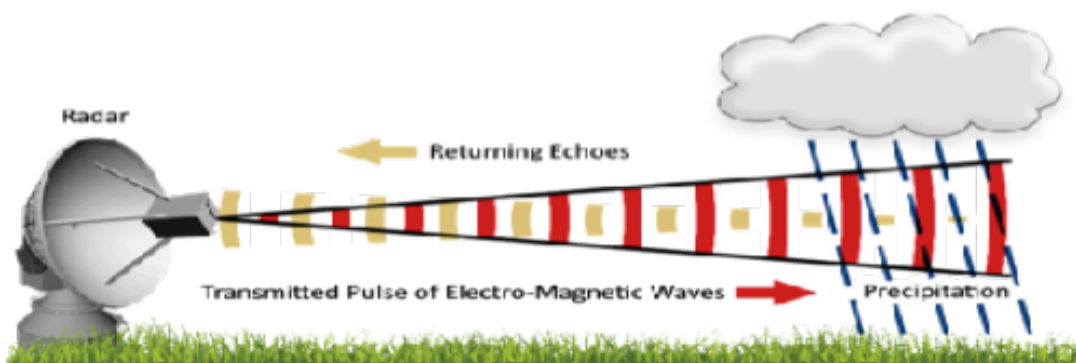
- The larger the object, the greater the amount of energy that is returned to the radar. That provides us with the ability to "see" rain drops in the atmosphere.

Doppler Radar

- Doppler radar systems can provide information regarding the movement of targets as well as their position.
- Doppler Effect: The Doppler effect is the change in frequency of a wave in relation to an observer who is moving relative to the wave source.



- By measuring the shift (or change) in phase between a transmitted pulse and a received echo, the target's movement directly toward or away from the radar is calculated.
- This then provides a velocity along the direction the radar is pointing, called radial velocity.
- A positive phase shift implies motion toward the radar and a negative shift indicates motion away from the radar.



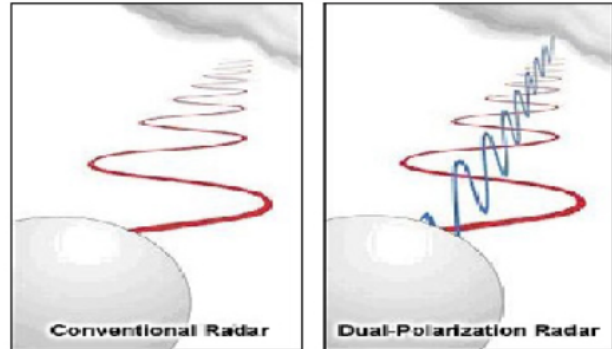
Types of Radar

- Doppler radar can be divided into several different categories according to the wavelength of the radar. The different bands are L,S,C,X,K. The names of the radars originate from the days of WWII.

- X band radars operate on a wavelength of 2.5-4 cm and a frequency of 8-12 GHz. Because of the smaller wavelength, the X band radar is more sensitive and can detect smaller particles.
- These radars are used for studies on cloud development because they can detect the tiny water particles and also used to detect light precipitation such as snow.

Dual-Polarized Radar

- While conventional radars emit and receive pulses in the horizontal direction, dual-polarization radars go a step further and transmit and receive waves in the horizontal and in the vertical direction.
- This provides a more complete picture of targets in the atmosphere, allowing forecasters to differentiate between rain, snow/melting snow, and even hail.



NOAA

7. International Relations

7.1. Internet Connectivity in Far Flung Areas

Project Loon

- Google's parent company Alphabet has shut down project Loon in January 2021, that gave internet service from high-altitude balloons, after the unit failed to develop a viable business mode
- It was a part of Alphabet's X team, the moonshot factory
 - ✓ Loon was part of Moonshot until 2018 after which it moved on to become an independent company within Alphabet
- It was first unveiled in 2013 and aimed to give internet connections using giant helium balloons drifting on currents high in the stratosphere

Facebook Aquila

- Aquila was Facebook's bold stratosphere internet project that imagined gigantic drones running partially on solar power that could remain in flight for long periods of time and beam down LTE service to remote parts of the world
- Facebook abandoned its project in 2018