WEEKLY CURRENT AFFAIRS JANUARY 2023 FIRST WEEK

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REMOTE ELECTRONIC VOTING MACHINE (RVM)

1.Background

Soon after assuming office as Chief Election Commissioner, Shri Kumar's learning of domestic migration issues first hand from his trek to Dumak village in Chamoli district, focused his attention on enabling the migrant voters to exercise their franchise from their current place of residence.

2.Objective

Objective of finding a technological solution which is credible, accessible and acceptable to all stakeholders, the Commission headed by Chief Election Commissioner has now explored the option of using a modified version of the time-tested model of M3 EVMs to enable voting at remote polling stations i.e., polling stations outside home constituency, for domestic migrants

The migrant voter would thus need not travel back to his/her home district to exercise his/her franchise of voting.

3.Challenges

Administrative challenges	Legal challenges	Technological challenges
Enumerating remote voter self-voter declaration	Laws/rules needing amendments • RP Act, 1950, 1951 • The conduction of Election rules, 1961 • The registration of Electors rules,	Method of remote voting

	1960	
Providing controlled environment -ensuring secrecy of voting at remote locations	Defining migrant Voter • Poll day abscence to permanantly shifted • Retain registration at original place in the context of 'ordinary residency' &temporary abscence' legal construct	Familiarity of the voters with the methods/ Multi constituency Remote EVM or any other technology

	Define Remote Voting • Dealing with territorial constitutional concept • Defining remoteness: outside constituency, outside district or outside state	
Provision of polling agents at remote voting booths& ensuring identification of voters to avoid impersonation		Counting of votes cast at remote booths and transmit to RO located in the state
Number of booths to be set up & locations		
Appointment of polling personnel for remote polling stations and supervision thereof		
Implementation of MCC in remote location (other state)		

4.Way forward

The Commission in association with a renowned Public Sector Undertaking is now ready to pilot a Multi Constituency Remote Electronic Voting Machine (RVM) for facilitating participation of domestic migrants from their remote locations itself i.e., the places of their current residence for purposes of education/employment, etc., for voting for their home constituencies.

This modified form of EVM can handle up to 72 multiple constituencies from a single remote polling booth. The initiative, if implemented, can lead to a social transformation for the migrants and connect with their roots as many times they are reluctant to get themselves enrolled at their place of work for various reasons such

as frequently changing residences, not enough social and emotional connect with the issues of area of migration, unwillingness to get their name deleted in electoral roll of their home/native constituencies as they have permanent residence/property etc.

GS II: Governance

CAST CENSUS

1. Context

Following an order by the Allahabad High Court directing that local body elections be held in Uttar Pradesh without any reservation for the Other Backward Classes (OBC), Deputy Chief Minister Keshav Prasad Maurya said the state government was ready to approach the supreme court, if required, regarding the matter. The High court had added that the state had not done enough to follow the "triple test formula" as suggested by the supreme court.

2. Cast Census

- The socio-economic and caste census (SECC) was conducted in 2011 for the first time since 1931.
- SECC is meant to canvass every Indian Family, both in rural and urban India, and ask about their economic status to allow central and state authorities to come up with a range of indicators of deprivation, permutations, and combinations that could be used by each authority to define a poor or deprived person.
- It is also meant to ask every person their specific caste name to allow the government to re-evaluate which caste groups were economically worse off and which were better off.
- SECC has the potential to allow for a mapping of inequalities at a broader level.

3. History of Caste Census

The caste census is the demand to include the caste-wise tabulation of India's population in the upcoming exercise.

3.1 Caste census in Colonial Era:

- The First Census conducted in 1871 included questions about caste. This data was then used to divide and conquer India.
- It first privileged Brahmins are interpreters of Indian culture and then targeted them as the root of caste-based oppression and inequality.
- This classification was also a source of anti-Brahmin movements of the 20th century.
- Every census until 1931 had data on caste.
- The practice was stopped by the British with the 1941 Census, citing financial constraints. The Indian government did not pick up the dropped parameter.

3.2 Caste data published in the Census post-independence:

- Since the first exercise in independent India in 1951, India has published separate data on Scheduled Castes (SC) and Scheduled Tribes (ST).
- The Census does not include data on other castes.
- The Government of India had decided on the policy of official discouragement of Caste.
- It was decided that in general, no race/caste/tribe inquiries should be made and such enquires should be restricted to the Scheduled Castes and Tribes notified by the President of India in pursuance of Articles 341 and 342 of the Constitution.

4. Importance of Caste Census

4.1 Promote Rational Decision Making

o A caste census, which will generate exhaustive data will allow policymakers to develop better policies, and implementation strategies, and will also enable a more rational debate on sensitive issues.

4.2 Promotes Democratic Policymaking

o Advocates of its inclusion believe that the activity will be a pro-poor exercise that will help plan better and more targeted welfare schemes in the country.
o A caste census would bring forward a large number of issues that any democratic country needs to pay attention to.
o For instance, this census will reveal information regarding caste-based marginalization, deprivation, the kind of jobs pursued by a caste, etc.
o So, the caste census is nothing but the collection of data that is necessary for any democratic policymaking.

4.3 The rationale for the Reservation Policy

o Some proponents also suggest that a Caste Census will also help reservation policymakers have a more accurate idea of the affirmative action needed.
o While this data is currently available for SC and ST populations, the OBC population is estimated widely as per the number noted by the Mandal Commission at 52%.
o The Justice Rohini Committee was appointed in 2017 to look into the sub-categorization of the OBC communities; however, in the absence of data, there can be no data bank or any proper sub-categorization.
o All commissions have had to rely on data from the last caste census (1931). There have been substantive demographic changes since then and therefore, the data has to be updated.

4.4 Constitutional Mandate

o Indian Constitution also favors conducting a caste census.

o Article 340 mandates for appointment of a commission to investigate the conditions of socially and educationally backward classes and make recommendations as to the steps that should be taken by the governments.

5. Last Cast Census and redundancy

- A separate Socio-Economic and Caste Census (SECC) was conducted by the Ministry of Rural Development in rural areas and the Ministry of Housing & Urban Poverty Alleviation in urban areas in 2011.
- It was the largest exercise of the listing of castes and has the potential of finding inequalities at a broader level.
- SECC was a tool to identify beneficiaries of state support and it is open for use by Government departments to grant and/ or restrict benefits to households.
- However, the SECC data excluded caste data and was published by the two ministries in 2016.
- The raw caste data was handed over to the Ministry of Social Justice and Empowerment.
- The ministry formed an Expert Group under the Former NITI Aayog Vice-Chairperson Arvind Pangaria for the classification and categorization of data.
- The Pubic data eventually released gave numbers of different castes in India but not the population-wise data as was the demand.
- Only the details of the economic conditions of the people in rural and urban households were released. The caste data has not been released till now.
- The Centre says that an analysis of the data showed "that the caste enumeration...was fraught with mistakes and inaccuracies" and "is not reliable".

6. Way Forward

- A Caste census without data integrity would be much worse. Instead of going behind the caste bases census, the government can subclassify the Backward classes like in Tamilnadu, Andhra Pradesh, West Bengal, etc. This will provide the benefit to intended beneficiaries.

- Since the government has already appointed Justice G Rohini's panel on the sub-categorization of OBCs. The panel has to fast-pace the sub-classification process.
- The Government can use technologies like Artificial Intelligence and machine learning to assess the SECC data and condense them into meaningful categories and some important caste-based information. This will provide the necessary time to analyze the need for a caste census.

GS II: Governance

MIGRANT LABOURS

1. Context

December 18 was observed as International Migrants Day, It must be seen in the backdrop of unprecedented volatility that began in 2020 as a result of the Covid-19 pandemic.
Besides this infectious disease outbreak, there were events such as the Taliban takeover of Afghanistan, Russia's invasion of Ukraine, worsening poverty in the sub-Saharan region and also climate change, resulting in large-scale migration.

2. Migration Data

- According to the International Organization of Migration (IOM)'s World Migration Report 2022, there were 281 million international migrants globally in 2020, with nearly two-thirds being labour migrants.
- While there were 169 million labour migrants in 2019, the figure touched 164 million in 2020.
- In the larger pool of migrants, South Asia's share is nearly 40 per cent.
- Further, the South Asia-Gulf Migratory corridor is the world's largest migrant corridor.

Long-term data on international migration show that "migration is not uniform across the world and is shaped by economic, geographic, demographic and other factors, resulting in distinct migration patterns, such as migration corridors developed over many years".

2.1 Kerala Government data

- Some 1.7 million Keralites returned from abroad during the pandemic between June 2020 and June 2021.
- 1.5 million had suffered job losses.
- None of them had a proper plan to survive and was staring at no jobs or self-employment opportunities in Kerala.

3. Migration policy

- Unfortunately, despite India being the largest migrant-sending and remittance-receiving country, the welfare of Indian Migrants abroad is hardly a priority for the Government and policymakers.
- It is a matter of serious concern that India has yet to have a tangible and comprehensive migration policy to ensure decent living and safe movement of migrants.
- India manages or governs Indians migrating abroad using the Emigration Act, of 1983.
- In the last 40 years, migration has witnessed sea changes.
- However, the Indian government has been silent on the issue of updating the Act.
- The authorities have still to initiate discussions for the smooth passage of a robust Emigration Bill in Parliament.
- In the winter session of Parliament, a document tabled shows that around nine million Indian migrants are working in the Cooperation Council for the Arab States of the Gulf (GCC) countries.
- Though some of the GCC states have passed reforms to safeguard the rights of migrants and to protect them from discrimination, the situation at the grass-roots level is a different story.

4. Kafala system

The COVID-19 pandemic has exposed the existing exploitative nature of the Kafala system (a sponsorship system that regulates the relationship between employers and migrant workers) which has invariably resulted in the mass retrenchment of the labour force.

4.1 Recurring problems

The recurring problems that migrant labourers face are:

1. Irregular payment
2. Poor working conditions
3. Negation of labour rights
4. The Absence of proper grievance redress mechanisms and
5. Access to a transparent judicial system.

- Irregular payment and non-payment of wages and abuse at the workplace have been long-term problems in the GCC countries.
- This has been exacerbated during the COVID-19 pandemic.
- Countries such as the Philippines which have recorded the wage theft of their migrants are taking up the issue legally.

4.2 Incidence of Trafficking

- Recently, there were cases of around 300 Indian engineers from Tamil Nadu who were trafficked to Myanmar to work for a crypto-scam and nearly 20 Indian nurses trafficked to the UAE for fake job offers.
- Both groups had migrated after a desperate **"Post COVID-19 job hunt"**.

4.3 An Asian-led campaign

- Presently, South Asian Countries, including their civil society organisations, scholars and migrant activists are leading a **"justice for wage theft"**

campaign for the disbursement of the pending salary benefits and other related dues of labour.

- The pandemic has resulted in unemployment, under-employment, a reduction in salaries and more importantly, in the non-payment of salaries, compensation and residual dues.
- It must be noted that rich employers in GCC nations who violate basic labour laws and refuse regular salaries and dues are from different nationalities including Indians.

5. Focus on women workers

- Attention needs to be focussed on the women migrant workforce, largely limited to GCC countries and also to the Organisation for Economic Co-operation and Development countries to some extent.
- Interestingly, Indian nurses and caregivers have been working in the most volatile countries such as Iraq, Syria, Libya, Yemen and Israel and even remote Papua New Guinea.
- Women workers venture to these countries using the services of recruiting agencies on account of major domestic problems.
- Therefore, the government should comprehensively assess the situation of migrant women and create women-centric, rights-based policies.

6. The way forward

- Finally, the COVID-19 pandemic has rerouted global migration patterns, restructured migratory corridors and exposed the untold vulnerabilities and miseries of international migrant labour.
- The United Nations, through its non-binding resolution, **"Global Compact for Safe, Orderly Migration and Regular Migration"**, recognises the challenges migrant labour faces across the world.
- In this context, the Government of India has to revisit its policies in the post-pandemic migratory scenario by engaging all stakeholders and bypassing the Emigration Bill 2021.

TRADEMARK

1. Context

The Delhi High Court, in the case of Hamdard National Foundation (India) vs Sadar Laboratories Pvt. Ltd., restrained Sadar Laboratories from manufacturing and selling beverages under the impugned trademark 'Dil Afza'. The court observed that the trademark 'Rooh Afza' is prima facie a strong mark requiring a high degree of protection as it has acquired immense goodwill.

2. What is the dispute?

- The manufacturers of 'Rooh Afza' moved an appeal against the rejection of its application seeking an interim injunction against Sadar Laboratories Pvt. Ltd. for their product 'Dil Afza'.
- The appellant stated before the court that the trademark 'Rooh Afza' is a highly reputed mark in the market with regard to sharbat (sweet beverage).
- Furthermore, it was claimed about of the product 'Dil Afza' is deceptively similar to the get-up and trade dress of the appellant's product.

3. What is a Trademark?

- Trademark refers to the graphical representation of goods or services to make them distinguishable from others.
- It can be words, symbols, sounds, colors, the shape of goods, graphics representation or packaging, etc.
- It protects the owner against unfair competition and prevents damage to the reputation of the owner and consumer welfare.
- In India, trademarks are governed under the Trademarks Act, 1999 (it deals with the precise nature of rights one can acquire in respect of trademarks),

under the aegis of the Department of Industrial Policy & Promotion (DIPP), Ministry of Commerce.
- The implementing body is the Controller General of Patents, Designs, and Trademarks.

3.1 Trademark Act, 1999

- Trademark Act, of 1999 was implemented by the government of India by complying with TRIPS obligation recommended by the World Trade Organisation.
- The Trademark Act, of 1999 gives the right to police to arrest in case of infringement of the trademark. The Act gives a complete definition for the term infringement which is frequently used.
- The act was amended in the year 2010 to include the provisions of International Registration of Trademarks, wherein the entire chapter 4A was included in the Act.
- The act was bought in consonance with the Madrid Protocol, which was adopted in 1989 by World Intellectual Property Organisation (WIPO).

3.2 Refusal of registration

Section 11 of the Act, gives relative grounds for the refusal of registration of a trademark.
A trademark cannot be registered because of (i) Its identity with an earlier trademark and similarity of goods and services, (ii) its similarity to an earlier trademark and the similarity of the goods, and confusion is probable.

3.3 Section 29

- Section 29 of the Trademark Act 1999 deals with trademark infringement. It says that if a person uses the same trademark which is registered by another company or person and creates confusion in the minds of people, they will be liable for trademark infringement.
- Difference between Passing Off and Trademark infringement.

- Trademark protects registered goods and services whereas Passing Off protects unregistered goods and services.
- Passing off is a common law remedy whereas Trademark infringement is a statutory remedy.

4. Madrid Protocol

- India Parliament has passed the Trade Marks (Amendment) Bill, 2009 for enacting special provisions relating to the protection of trademarks through international registration under the Madrid Protocol.
- As per the Amendment Bill, from the date of the international registration of a trademark where India has been designated or the date of the recording in the register of the International Bureau about the extension of the protection resulting from an international registration of a trademark to India, the protection of the trademark in India shall be the same as if the trademark had been registered in India.
- The Amendment bill is yet to be notified. India acceded to this protocol in 2013.

5. Courts verdict

- A Division bench of the Delhi High Court restrained the respondent (Sadar Laboratories Pvt. Ltd.) from manufacturing and selling any product under the trademark 'Dil Afza' till the final disposal of the trademark infringement suit.
- The court held that "it is not difficult to conceive that a person who looks at the label of 'Dil Afza' may recall the label of 'Rooh Afza' as the word 'Afza' is common and the meaning of the words 'Rooh' and 'Dil', when translated in English, are commonly used in conjunction.
- The court also said that as the product is a low-priced consumable item, "the average customer would not deliberate on the details of the product as one would do while taking a high-value investment decision.

6. Strong Trademark

A mark is said to be strong when it is well-known and has acquired a high degree of goodwill. The degree of the protection of any trademark changes with the strength of the mark; the stronger the mark, the higher the requirement to protect it.

GS III: Science & technology

DARK PATTERNS

1. Context

Some Internet-based firms have been tricking users into agreeing to certain conditions or clicking a few links. The unsuspecting users would not have accepted such terms or clicked URLs (uniform resource locator), but for the deceptive tactics of tech firms. Such acceptance and clicks are flooding the inboxes of the users with promotional emails they never wanted.

2. Dark Patterns

- A dark pattern is a user interface crafted to trick or manipulate users into making choices detrimental to their interests.
- The term 'Dark Patterns' was coined by user experience designer Harry Brignull in 2010.
- By using dark patterns, digital platforms take away a user's right to full information about the services they are using and their control over their browsing experience.

3. Types of Dark patterns

Several kinds of dark patterns exist in the online space, and many have been identified as causing some consumer harm.
ASCI has recognized four dark patterns and these are the proposed areas of extension to the ASCI code on misleading ads.
Drip Pricing-It is a pattern when the total price is only revealed at the very end of the buying process.

Bait and switch- It is a pattern that occurs when a user takes an action expecting one outcome but instead is served an outcome they didn't want.
False urgency- It is a dark pattern that refers to misleading information on quantities of a particular product.
Disguised advertising- It is a pattern when an advertisement mimics editorial content.

4. Some examples of companies use Dark Patterns

- Social media companies and Big Tech Firms such as Apple, Amazon, Skype, Facebook, LinkedIn, Microsoft, and Google use dark or deceptive patterns to downgrade the user experience to their advantage.
- Amazon came under fire in the EU for its confusing, multi-step canceling process for Amazon Prime Subscriptions. After communication with consumer regulators, Amazon this year made its cancellation process easier for online customers in European countries.
- In social media, LinkedIn users often receive unsolicited, sponsored messages from influencers. Disabling this option is a difficult process with multiple steps that require users to be familiar with the platform controls.
- As Meta-owned Instagram pivots to Video-based content to compete against TikTok, users have complained that they are being shown suggested posts they did not wish to see and that they were unable to permanently set preferences.
- Another dark pattern on the application is sponsored video ads getting scattered between reels and storied users originally opted to view, tricking them for several seconds before they can see the small "sponsored" label.
- Google-owned YouTube nags users to sign up for YouTube Premium with pop-ups, obscuring the final seconds of a video with thumbnails of other videos- a way of disrupting what should have been an otherwise smooth user experience.

5. Disadvantages of Dark Patterns

- Dark patterns endanger the experience of Internet users and make them more vulnerable to financial and data exploitation by Big Tech firms.

- Dark patterns confuse users, introduce online obstacles, make simple tasks time-consuming, have users sign up for unwanted services/products and force them to pay more money or share more personal information than they intended.
- These include "baseless" countdowns for online deals, conditions in fine print that add on to costs, making cancellation buttons hard to see or click, making ads appear as news reports or celebrity endorsements, auto-playing videos, focusing users to create accounts to finish a transaction, silently charging credit cards after free trails end, and using dull colors to hide information that users should know about.
- The FTC report has warned that as Augmented reality (AR) and virtual reality (VR) platforms and devices grow in usage, dark patterns will likely follow users to these new channels as well.
- Internet users who can identify and recognize dark patterns in their daily lives can choose more user-friendly platforms that will respect their right to choose and privacy.

INFRARED ABSORPTION TECHNOLOGIES

1.Background
A new method to confine and absorb infrared (IR) light with GaN nanostructures can help develop highly efficient infrared absorbers, emitters, and modulators that are useful in defense technologies, energy technologies, imaging, sensing, and so on.

2.Key take aways

- GaN, a widely used material for blue light emission, is one of the most advanced semiconductors. Though visible and ultraviolet light applications of GaN have already been realized, with LEDs and laser diodes

commercially available, utilization of GaN for IR light harvesting or development of GaN-based IR optical elements is lacking

- Researchers in Bengaluru's Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute of the Department of Science and Technology, have shown for the first time infrared light emission and absorption with GaN nanostructures

- Though blue light emission from GaN has been known for some time, and it is used in LEDs, this is the first time that infrared light-matter interactions are demonstrated in GaN

- GaN nanostructures **offer stable operation under various radiation and in space conditions**. They operate at room-temperature and can also tolerate large variations of temperature and humidity as compared to metal-oxides

- For this demonstration, they have utilized a scientific phenomenon called surface polariton excitations in GaN nanostructures that lead to light-matter interactions at IR spectral range.

- Surface polaritons are special modes of electromagnetic waves traveling at the interface of a conductor and an insulator such as air.

- By altering the morphology and shape of the nanostructures, they are also able to excite plasmon polaritons in GaN, which results in extending the light-matter coupling to further reaches of the electromagnetic spectrum these polaritons are quasi-particles which have both light and matter characteristics.

- To grow these GaN nanostructures, the researchers utilized a specialized material deposition instrument called molecular beam epitaxy in the International Centre for Materials Science in JNCASR.

- This instrument uses ultra-high vacuum, similar to the conditions of outer space, to grow high-quality material nanostructures with dimensions about 100000 times smaller than the width of a human hair

- Such cutting-edge materials allow the creation of polariton-based devices, which offer several advantages to conventional electronic devices.

- Polaritonic technologies have attracted a wide range of applications, such as secure high-speed light-based communication (LiFi), next-generation light sources, solar energy converters, quantum computers, and waste-heat converters.
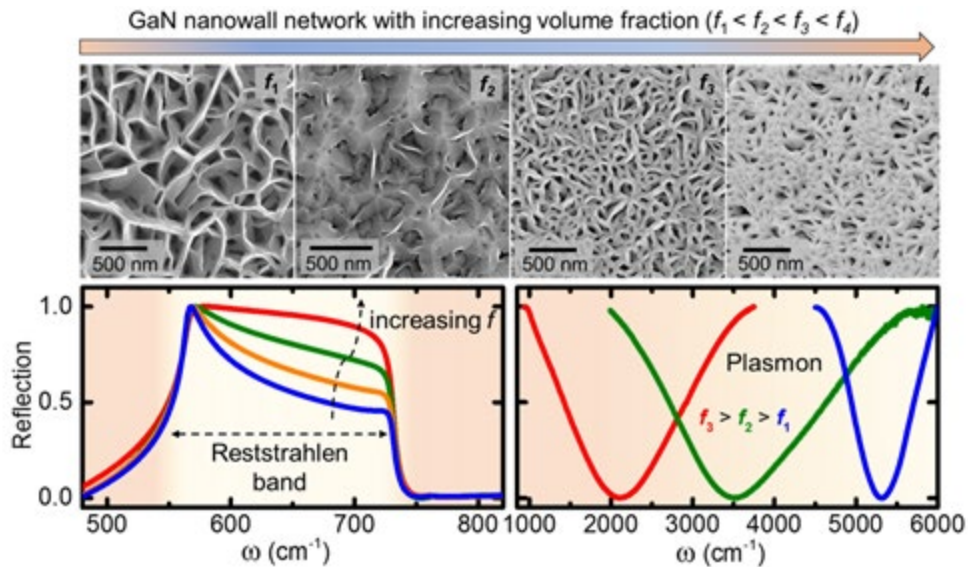
Figure: Light manipulation via exciting the polaritons in GaN nanostructured. By controlling the morphology of the GaN nanostructures, the polariton excitations are

NASAL VACCINE

1. Context

Bharat Biotech's **COVID-19 recombinant nasal vaccine** has been approved by the Ministry of Health's Central Drugs Standard Control Organisation for primary immunisation of those aged 18 years and above in emergencies

2. What is a nasal vaccine

Vaccines are usually given through different routes, with the most common being injectable shots delivered into the muscles (intramuscular) or the tissue just between the skin and the muscles (subcutaneous).

There are also other routes of delivery, especially in some vaccines for infants, that include administering the liquid solution orally instead of injecting

In the intranasal route, the vaccine is sprayed into the nostrils and inhaled.

Many viruses, including the coronavirus, enter the body through mucosa-wet, squishy tissues that line the nose, mouth, lungs and digestive tract triggering a unique immune response from cells and molecules there.
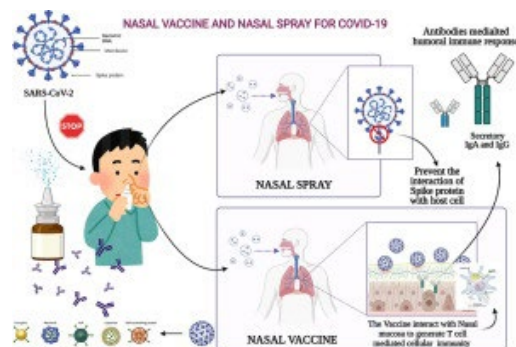
Image Source: Science Direct

3. How does a nasal vaccine work

In the case of both delivery routes, vaccines trigger a response in the blood.

B cells, for example, would churn out antibodies including a particularly potent disease-fighter called IgG to roam the body in search of the virus

Other cells, called T cells, would either help B cells produce antibodies or seek out and destroy the infected cells.

But vaccines that are injected through the nose or mouth also tap into another set of immune cells that hang around mucosal tissues.

The B cells that reside there can make another type of antibody, called IgA, which plays a key role in destroying airway pathogens.

In addition, the T cells that are residing nearby will be able to memorise the pathogens that they encountered and will lifelong scout the areas where these were first encountered.

4. Importance of nasal vaccine

These vaccines aim to overcome potential difficulties with mass vaccination and reduce the cost by doing away with the need for needles and syringes

Intranasal vaccines are also expected to cut down on the dependence on various trained personnel to administer the vaccine

GS III:Science&technology

VOICE TECHNOLOGY

1. Context
Bank and cyber frauds in India are on the rise. According to data from the Reserve Bank of India, frauds have cost the country an estimated 100 crore a day over the last seven years. The frauds reported in 2021-22 were 23.69% higher than in the previous year (9,103 cases reported compared there was a decline in the amount involved.

2. Voice Technology

- An emerging technology, it uses the unique characteristics of a person's voice as identification. The technology creates a digital voice print and compares it to a caller's voice.

- Voice authentication can significantly improve security over knowledge-based authentication methods, which fraudsters have exploited to scam people.
- One way to reduce losses is by adopting Voice Technology(VT), which encompasses voice biometrics or voice/speech recognition technology.
- The global adoption of smartphones has led to a dramatic increase in biometrics for security. However, these methods are cumbersome, not entirely secure, and vulnerable to deep fakes.
- With banks and establishments looking for ways to reduce fraud and identity theft risks, one of the best ways to do this is through the use of voice biometrics.
- Compared to other biometrics, voice use is the cheapest technology, and does not require a reader or special device. It is also non-invasive, and portable and affords remote identification.
- Banks have traditionally relied on the use of passwords, passwords are the weakest link in security (81% of hacking-related breaches involve weak passwords).
- Unlike a password, a customer's voice is impossible to spoof or copy and is far more challenging to hack.
- Voice Technology verifies a caller swiftly in seconds by analyzing the caller's voice and fags suspicious calls.
- Voice Technology allows privacy because it does not require users to reveal personal information.

3. Applications of Voice Technology

Health care- It can provide personalized medicine and x-ray readings. Personal health care assistants can act as life coaches, reminding you to take your pills, exercise, or eat healthier.

Manufacturing- AI can analyze factory IoT data as it streams from connected equipment to forecast expected load and demand using recurrent networks, a specific type of deep learning network used with the sequence of data.

Home automation- It can interact with smart home appliances and run the show. Eg: Marvel comic-based Iron man's virtual assistant Jarvis.

Food ordering- Voice assistant can be used to order food just by voice command. Eg-Many companies have collaborated with Alexa and their website support Alexa like Domino's Pizza hut, Starbucks, etc.

Entertainment-Voice assistant can recognize the command and play music. Ex- Alexa, Siri can play music from streaming services such as Apple Music and Google Play Music from a phone or tablet. Also allows the user to hear updates on supported sports teams.

Messaging and Email- Voice assistants can help in sending text messages and Emails without any need for physical interference. Ex: Messages can be sent from one Alexa application to another as well as Echo devices.

Weather- It can help in controlling indoor temperature depending on the command given. It can also provide weather reports.

Operating appliances- It can help in operating appliances at home like making coffee, switching on/off lights, and also probably parking cars, among others.

4. Way forward

Voice biometrics tech is making waves in the world of fraud protection by providing an extra layer of protection for data. Although the technology is not yet perfect, the potential benefits are significant.

While the technology still has a long way to go to deliver super smart assistants, it is clear it's no longer the joke it used to be when it was launched. Moreover, with the rise of artificial intelligence and the Internet of Things (IoT), they will become even more advanced and better at helping their users handle their daily tasks.

GS III: Economy

NATIONAL FOOD SECURITY

1. Context

In a Cabinet decision, the Center decided to provide 5kg of free food grains per month for the 81 crore beneficiaries of the National Food Security Act (NFSA) during 2023, rather than charging them a subsidized amount of 3 rupees a kg of rice, 2 rupees a kg of wheat and 1 rupee a kg of coarse cereal as is currently done.

2. What is the impact of this measure on the food subsidy bill?

- During the pre-Covid years, the Centre's food subsidy bill on account of the NFSA amounted to around ₹2 lakh crore.
- During covid-19 years (2020-2022) the amount has doubled.
- Now the center has to spend an additional ₹15,000 crore to ₹16,000 crores on providing free food grains under the NFSA for a year.
- However, the center will save around ₹2 lakh crore by ending the PMGKAY scheme.

3. Prandhan Manthri Gaaribkalyan Anna Yojana (PMGKAY)

- PMGKAY is a part of the Pradhan Mantri Garib Kalyan Package (PMGKP) to help the poor fight the battle against Covid-19.
- The scheme aimed at providing each person covered under the National Food Security Act 2013 with an additional 5 kg of grain (wheat or rice) for free, in addition to the 5 kg of subsidized food grain already provided through the Public Distribution System (PDS).
- It was initially announced for three months (April, May, and June 2020), covering 80 crore ration cardholders. Later it was extended till September 2022.
- Its nodal ministry is the Ministry of Finance.
- The benefit of the free ration can be availed through portability by any migrant labour or beneficiary under the One Nation One Ration Card (ONORC) plan from nearly 5 lakh ration shops across the country.

Cost: The overall expenditure of PMGKAY will be about Rs. 3.91 lakh crore for all the phases.

Challenges: The beneficiaries of the National Food Security Act are based on the last census (2011). The number of food-insecure people has increased since then and they remain uncovered.

Issues

Expensive: It's very expensive for the government to sustain, increasing the need for an abundant supply of cheap grains. In 2022, India has had to restrict exports of wheat and rice after erratic weather hurt harvest, adding to pressure on food prices, and rattling global agricultural markets.

Increase Fiscal Deficit: It could pose a risk to the government's target to further narrow the fiscal deficit to 6.4% of gross domestic product.

Inflation: The decision on the program could also affect inflation. The prices of rice and wheat, which make up about 10% of India's retail inflation, are seeing an uptick due to lower production amid a heatwave and patchy monsoon.

4. National Food Security Act (NFSA), 2013

It was notified on 10th September 2013.

Objective: To provide for food and nutritional security in the human life cycle approach, by ensuring access to adequate quantities of quality food at affordable prices to people to live a life with dignity.

Coverage: 75% of the rural population and up to 50% of the urban population for receiving subsidized food grains under the Targeted Public Distribution System (TPDS). Overall, NFSA caters to 67% of the total population.

Eligibility: Priority Households to be covered under TPDS, according to guidelines by the state government. Households covered under the existing Antyodaya Anna Yojana.

Provisions:

- 5Kgs of food grains per person per month at Rs.3/2/1 per Kg for rice/wheat/coarse grains.
- The existing AAY household will continue to receive 35 Kg of foodgrains per household per month.
- Meal and maternity benefits of not less than Rs. 6000 to pregnant women and lactating mothers during pregnancy and six months after childbirth.

- Meals for children up to 14 years of age.
- Food security allowance to beneficiaries in case of non-supply of entitled foodgrains or meals.
- Setting up grievance redressal mechanisms at the district and state levels.

GS III: Economy

GLOBAL EXPENDITURE ON R&D

1. Context

The Economic Survey 2020-21 released last year took note of the fact that India made it to the coveted list of top 50 innovative countries for the first time in 2020, ranking 48th among 131 countries in the Global Innovation Index (GII). It further pointed out that there is a need for more push toward innovation and the need for the business sector's contribution to gross domestic expenditure on R&D.

2. R&D in India

- According to UNESCO's stats, the global expenditure on research and development (R&D) has crossed $1.7 trillion. Where does India stand in terms of spending on R&D? The most used indicator to measure country-wise investments in R&D is the gross domestic expenditure on R&D (GERD) as the percentage of gross domestic product (GDP).
- A comparison of the R&D spending of some of the countries representing different regions of the world and India in terms of GERD as a percentage of GDP (see graph) shows India to be a low spender (only 0.66 percent of the GDP) in comparison to the developed countries and emerging economic powers of East Asia.
- The percentage expenditure for the last couple of years is showing a downward trend.
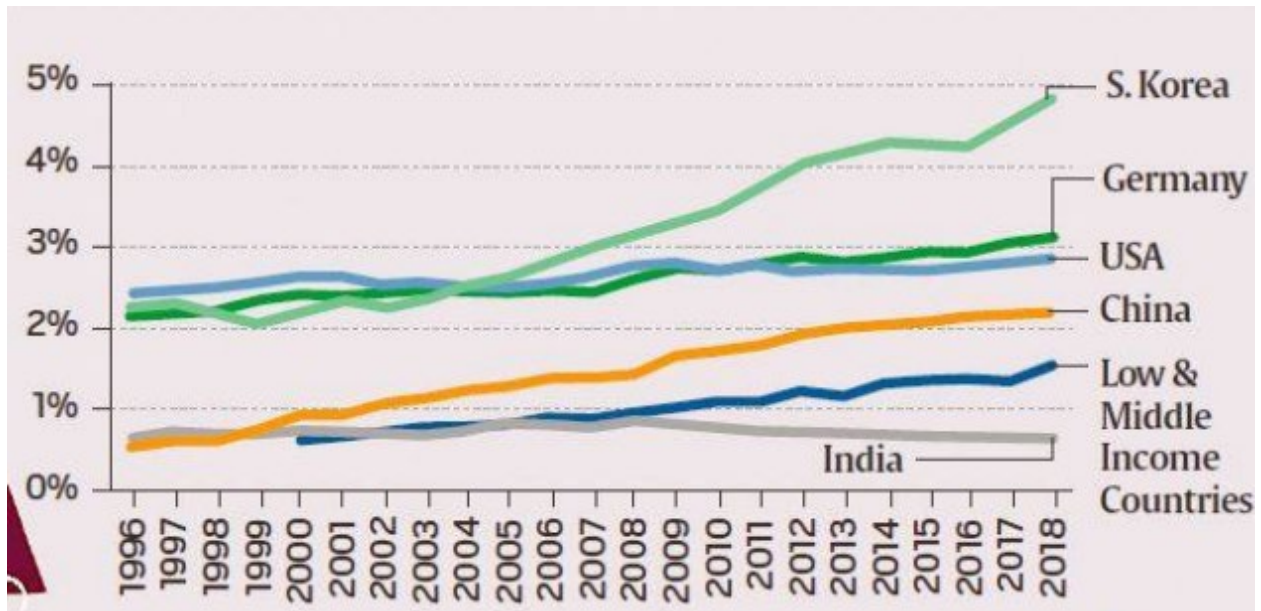
Image Source: The Indian Express

3. Budget 2022-23 allocations of R&D

- The finance minister's budget speech for 2022-23 contains two references to R&D related issues. One, defense R&D will be opened for industry, start-ups, and academia with 25 percent of the defense budget earmarked for such activities.
- The other is the identification of sunrise opportunities in areas like artificial intelligence,
  geospatial systems and drones, semiconductors, space, genomics and pharmaceuticals, green energy, and clean mobility systems.
- For R&D in these sunrise opportunities, in addition to efforts of collaboration among academia,
  industry and public institutions, government contribution will be provided.
- However, the budget has no extra provisions for R&D in the flagged sunrise opportunities.

4. Measures Required

- Economic survey 2020-21 suggested that the country needs to increase its GERD from around 0.7 percent to over 2 percent of its GDP as in the situation with the Western and East Asian economies.
- The survey suggested that the private sector needs to raise its share of spending from 37 percent to 68 percent of the total spending on R&D like the other high spenders.
- National Educational Policy (NEP) 2020 suggested the establishment of a National Research Foundation (NRF) to fund competitive, peer-reviewed grant proposals from universities, colleges, and institutions of higher learning.
- Budget 2021 proposed an allocation of Rs 50,000 crore over the next five years, however, in the actual budget, no such provision was made.
- Cater to the present and future needs by committing to raise the spending on R&D to 1 percent of the GDP.
- The amount of Rs 50,000 crore committed in the 2020-21 budget to establish NRF could be immediately used to plug the deficits in the extramural grants provided to the autonomous universities and Institutions by CSIR, DST, SERB, DBT, ICMR, ICAR, and other agencies.
- Globally, the most R&D-intensive areas funded by the private sector are pharmaceuticals and biotechnology, IT hardware and software, automobiles, materials and chemicals, and aerospace and defence.
- The ratio of private to public spending in R&D was 19:81 in 2001-02, it improved to 35:65 in 2011-12 but continues to stagnate since then. Higher spending in R&D by the private sector will happen as the manufacturing sector expands in the country.
- With increased allocations, joint R&D projects between public institutions and start-ups/ Industries can also be supported. Funding of projects could become comprehensive and cover their entire expenditure. Almost all developed countries follow this practice.
- Joint projects with some of the leading laboratories worldwide could also be funded by enhanced funding allocations in India.
- To make India self-reliant, the country requires the upgradation of human resources in R&D. Currently, there is a lack of adequate expertise in many emerging areas.

- o In the next five to six years, around 5,000 students/scientists need to be trained at the doctoral and post-doctoral level in the best laboratories abroad in areas of R&D where India needs to do better for national prosperity and areas of strategic importance.
- o If India has good relations with the economically developed democratic world, then it would help in collaborating on research on technology like India has with USA and UK.

  Post-doctoral work in India should be encouraged by providing better remuneration to young scientists.

- o The SERB (Science Engineering Research Board), that's already performing the job of funding projects on a competitive basis, can be upgraded to play the role envisaged for NRF. A virtual platform that will hold all the information on the projects granted with public funding could be developed for better information sharing.

5. Way Forward

To move from stagnation in R&D to a more dynamic ecosystem would require action on many fronts. Science and technology departments will have to work out how to fast-track decision-making, and information sharing, and allow investigators more flexibility in utilizing the funds. It will be useful if the science academies of India become more communicative, both with the public and government, on issues related to R&D.

GS III: Agriculture

MILLETS

1. Context

2023 has been declared the "International Year of Millets" by the United Nations after a proposal from India in 2019. To raise awareness on millets and prepare for

2023, the Indian Prime Minister along with fellow parliamentarians enjoyed a lunch where millets were served.

2. What are Millets, India's indigenous foodgrains?

- The term millet is used to describe small-grained cereals like sorghum (jowar), pearl millet (bajra), foxtail millet (kangni/ Italian millet), little millet (kutki), Kodo millet, finger millet (ragi/mandua), Proso millet (cheena/common millet), barnyard millet (sawa/jhangora), and brown top millet (korale).
- Millets were among the first crops to be domesticated. There is evidence for the consumption of millets in the Indus-Saraswati civilization (3,300 to 1300 BCE). Several varieties that are now grown around the world were first cultivated in India.
- Millets are now grown in more than 130 countries and are the traditional food for more than half a billion people in Asia and Africa. Globally, Sorghum (jowar) is the biggest millet crop. The major producers of jowar are the United States, China, Australia, India, Argentina, Nigeria, and Sudan. Bajra is another major millet crop; India and some African countries are major producers.
- In India, millets are mainly a Kharif crop. During 2018-19, three millet crops-bajra (3.67%), jowar (2.13%), and ragi (0.48%) accounted for about 7 percent of the gross cropped area in the country, Agriculture Ministry data show.

3. Where are Millets Produced in India?

3.1 Jowar

- Jowar is mainly grown in Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Andhra Pradesh, Uttar Pradesh, Telengana, and Madhya Pradesh.
- In 2020-21, the area under jowar stood at 4.24 million hectares, while production was 4.78 million tonnes.
- Maharashtra accounted for the largest area (1.94 mn ha) and production (1.76 million tonnes) of jowar during 2020-21.

3.2 Bajra

- o Bajra is mainly grown in Rajasthan, Uttar Pradesh, Haryana, Gujrat, Madhya Pradesh, Maharashtra, and Karnataka.
- o Of the total 7.75 mn ha under bajra in 2020-21, the highest (4.32mn ha) was in Rajasthan.
- o The state also produced the most bajra in the country (4.53 million tonnes of the total 10.86 million tonnes) in 2020-21.

The consumption of millets was reported mainly from these states Gujrat (jowar and bajra), Karnataka (jowar and ragi), Maharashtra (jowar and bajra), Rajasthan (bajra), and Uttarakhand (ragi).

4. Benefits of Millets

- ▪ Millets are eco-friendly crops-they require much less water than rice and wheat and can be grown in rainfed areas without additional irrigation.

- According to a 2019 study, "wheat and rice have the lowest green water footprints but the highest blue water footprints, while millets were exactly opposite."
- Green water footprint refers to water from precipitation whereas blue water refers to water from land sources. Thus, millets require the least amount of irrigation to be grown.
- They are also highly nutritious. On April 10, 2018, the Agriculture ministry declared certain varieties of millet as "Nutri Cereals" for production, consumption, and trade.
- These include Jowar, bajra, ragi/ mandua, the minor millets-kangani/kakun, cheena, kodo, sawa/sanwa/jhangora, and kukti- and the two pseudo millets, buckwheat (kuttu) and amarnath (chaulai).

5. 2023: The year of Millets

- The United Nations General Assembly (UNGA) adopted a resolution to declare 2023 as the International Year of Millets. The proposal, moved by India, was supported by 72 countries.
- several events and activities, including conferences and field activities, and the issuing of stamps and coins, are expected as part of the celebration aimed at spreading awareness about millets, inspiring stakeholders to improve production and quality, and attracting investments.

GS I: INDIAN SOCIETY

UNTOUCHABILITY

1. Introduction

- Untouchability is the practice of discrimination against various individuals and groups based on their caste and occupation. Untouchability has been practiced for an extremely nonperiodic. It is based on the Indian caste system. Untouchables frequently face inhuman treatment as a result of their lower caste status. They have borne the brunt of various forms of discrimination in almost all aspects.
- The term Dalit, which refers to untouchables, is derived from the Sanskrit word for broken or despised. The common belief that untouchability exists only in India is not true, as it also exists in other countries like Japan, Tibet, and Korea.

2. A rigid occupational hierarchy

- While there is some debate about British colonialism amplifying it, the origins of India's caste system go back thousands of years and are deeply entwined in Hinduism, the religion followed by about 80 percent of India's population.'
- Caste is essentially the stratification of people into a rigid occupational hierarchy.
- According to the manusmriti, considered one of Hinduism's most important books for law, people are born into one of four castes, depending on their conduct in past lives.
- The most virtuous come back as Brahmins, the caste of priests and scholars. Next are the Kshatriyas, who are ascribed to be rulers and warriors. Third are the Viashya, the artists and traders. Fourth is the Shudras, only good enough to do manual labor.
- Below all of them are the Dalits, the "untouchable", excluded from all jobs except the worst-paid and most degrading on the pretext of maintaining the spiritual purity of those in higher castes.
- India officially outlawed caste-based discrimination in 1950. But it continues to be a fact of life for the estimated 200 million of India's 1.4 billion population who are Dalits. They are even discriminated against when applying for programs established to help them.
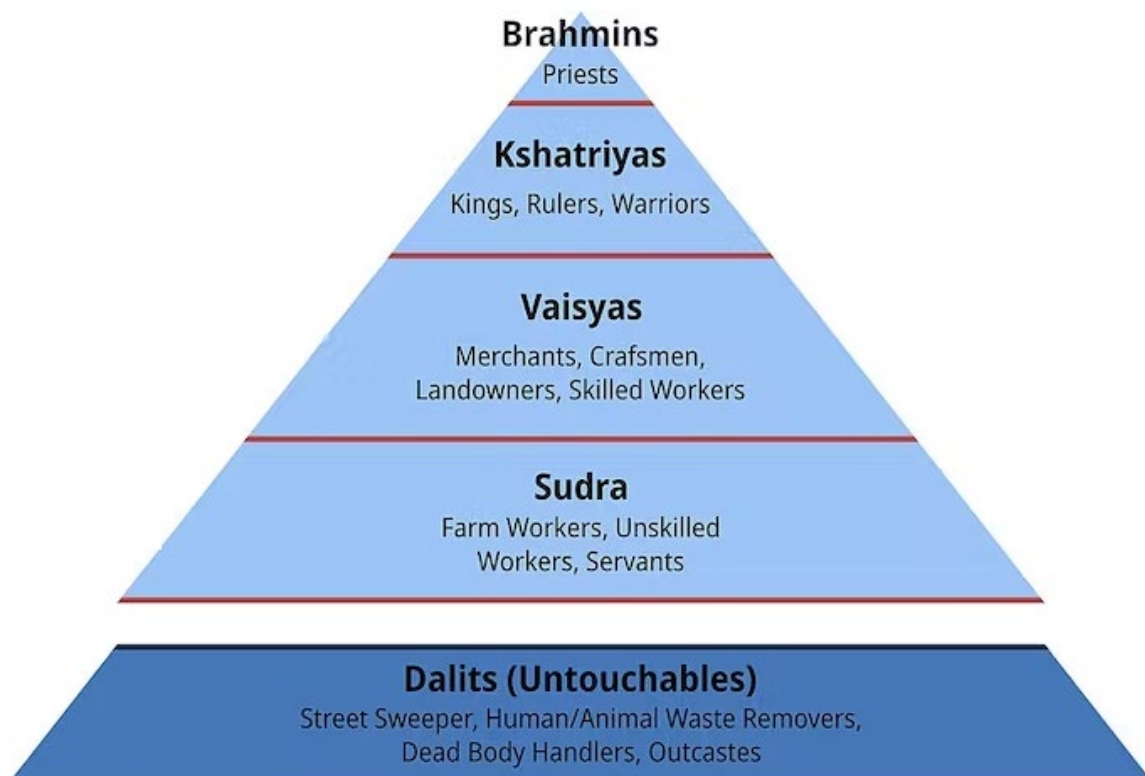
Indian Caste System

Brahmins
Priests

Kshatriyas
Kings, Rulers, Warriors

Vaisyas
Merchants, Crafsmen,
Landowners, Skilled Workers

Sudra
Farm Workers, Unskilled
Workers, Servants

Dalits (Untouchables)
Street Sweeper, Human/Animal Waste Removers,
Dead Body Handlers, Outcastes

Image Source: Down to Earth

3. Abolishing Untouchability

- Two leaders whose names cannot go unmentioned while talking about the abolishment of untouchability are Mahatma Gandhi and Dr.Bhimrao Ambedkar. Mahatma Gandhi called them 'Harijans', meaning the children of god. Dr. B.R. Ambedkar called them 'Dalits', the term still widely used today. Social activists like Jyotirao Phule and Savitribai Phule worked tirelessly to put an end to untouchability.

- Mahatma Gandhi and Dr. Ambedkar had their differences while fighting for abolishing untouchability, but their end goal was the same. Gandhi wanted to abolish untouchability, whereas Ambedkar wanted to abolish the root of the problem which was the caste system.
- After numerous movements and struggles, the Indian constitution adopted the motion that untouchability should be abolished. Dr. B.R. Ambedkar the man who drafted the constitution put enough provisions for their upliftment in society.
- There is a dedicated article in the Indian constitution that protects their rights. Article 17 of the constitution aims to empower Dalits, and makes untouchability a punishable offense. If any person practices untouchability, then they would be punished by the court no questions asked.
- Reservation system: To ensure that Dalits are not denied entry into educational institutions and government jobs and that they are not at a disadvantage because of their social and economical conditions, there is a reservation system in place. As per this, the marginalized communities like the Other Backward Communities (OBC), Scheduled Tribes (ST), and Scheduled Castes(SC) are provided reservation, i.e., a certain percentage of seats would be reserved for them.

4. Conclusion

It is a tool for the oppression of a group of people based on their caste, something which they have no control over. People belonging to lower castes are subjected to discrimination and expected to do jobs that are considered demeaning. For their upliftment and to create a society that is equal and just, untouchability has been recognized as a grave crime by the Indian Constitution.

GS I: World geography

FOG

1. Context

The dense fog has enveloped northwestern India, including Delhi, Punjab, Haryana, parts of Uttar Pradesh and parts of Rajasthan.
The fog which follows a comparatively warm start to the winter is likely to recur over the Indo-Gangetic Plain and keep visibility poor in the hours before and after daybreak.

2. Fog formation

- Fog forms like clouds do when water vapour condenses.
- The presence of moisture and a fall in the temperature are key factors for the formation of fog.
- With the land surface cooling down at night, the air close to the surface also cools down.
- Since cooler air cannot hold as much moisture as warm air, the water vapour in the air condenses to form fog.
- Fog begins to form in the early hours of the morning when the temperature is at its lowest.
- On Monday, for instance, fog in Delhi began to form around 1.30 am.
- Fog can have "high spatial variability and its intensity can depend on factors like humidity, wind and temperature".
- Areas near water bodies, for instance, may see denser fog because of the higher humidity.

3. Types of Fog

3.1. Radiation fog

- An update from the SAFAR forecasting system on Monday categorised the fog episode in Delhi on Monday as **"radiation fog".**
- Radiation fog (or ground fog) episodes last for a few mornings on account of calm winds and western disturbances, resulting in localised fog formation.

3.2. Advection fog

- Advection fog is larger in scale both in terms of the area covered and duration.
- Advection fog forms when warm, moist air passes over a cool surface, causing water vapour to condense.
- Advection fog mostly occurs where warm, tropical air meets cooler ocean water.
- If the wind blows in the right direction, sea fog can be transported over coastal land areas.

3.3. Valley fog

It is the result of mountains preventing dense air from escaping, in which the fog is trapped in the bowl of the valley and can last for several days.

3.4. Freezing fog

It is the result of liquid droplets freezing on solid surfaces. Cloud-Covered mountain tops often see freezing fog. These do not apply to the Indo-Gangetic Plain.
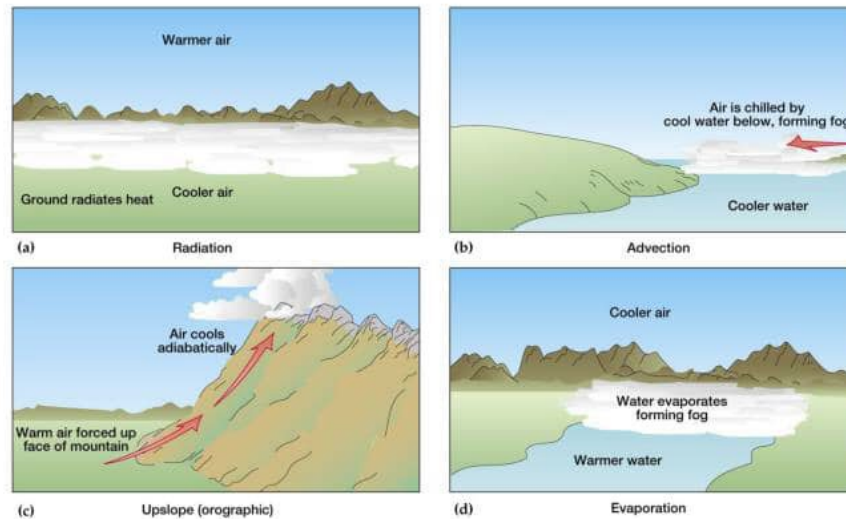
Image source: Astro star aviation

4. The temperature in northwestern India

- Temperatures have begun to dip over northwestern India.
- On December 17, Delhi recorded the lowest minimum temperature of the season so far 6 degrees Celsius.
- Cold wave conditions, in which the minimum temperature is significantly lower than normal have been recorded recently over Punjab, Haryana and parts of Rajasthan.
- The fall in temperature along with moisture and light winds over the Indo-Gangetic Plain has resulted in dense fog over the region, according to Indian Metrological Department (IMD).

5. Western disturbances

o   Western disturbances, which are storms that originate in the Mediterranean Sea, bring moisture-bearing winds to northwest India.

- o This can result in increased moisture levels over the region.
- o In the absence of western disturbances, local moisture sources like water vapour from rivers and soil moisture can also cause fog.

> The Indo-Gangetic Plain is most vulnerable to fog occurrences, with major, weeks-long spells of dense fog in December and January. These foggy spells are linked to wind and temperature patterns.

6. Characteristics of the fog over Delhi

- Delhi saw a warmer start to the winter this year, with maximum temperatures remaining above normal till around mid-December.
- Scientists attributed this to a lower number of western disturbances affecting the city.
- This means that northwesterly winds did not bring much moisture and did not lead to any significant fog formation until December 19.
- Fog episodes over Delhi are highly variable, according to the IMD. "Season to season, it shows very high variability with extreme fog of 25 to 35 days (200 to 285 hours) of dense fog like in 2017-18.
- On the other hand, in some years like in December 2021, Delhi hardly sees dense fog events.
- The highest number of dense fog (when visibility is less than 200m) and very dense fog (visibility less than 50 m) days are usually seen in January in Delhi.
- Going by a 31-year average till 2021, Delhi records around 25.3 hours of **"very dense"** fog in December and 38.3 such hours in January.

7. The link between pollution levels and fog

- Delhi is more polluted, and records, more fog days compared to others.
- On Monday, Delhi recorded a spike in pollution levels with AQI in the severe category.
- As temperature declines, local wind speed also falls. The inversion layer comes down and vertical mixing reduces.

- This results in fog formation and particulate matter hangs on the boundary layer, increasing pollution levels.
- Once the temperature increases during the day, the fog dissipates. This is the radiation fog that we are seeing in Delhi.
- Pollution levels can also impact fog a situation that Delhi is yet to witness this year.
- The second situation which has not yet arrived, but which we are likely to see in the last week of December and in January, is advection fog when the humidity is much higher.
- These fog episodes last longer and secondary particulate formation then begins leading to a rapid build-up of pollutants.
- Lower temperatures across the Indo-Gangetic Plain in January can cause such fog episodes. Winter has only just arrived in Delhi.

Mains Corner

1. **Millets production comes with a lot of health, agricultural and nutritional benefits. Discuss**

2. **Explain the mechanism behind the formation of fog and the various factors that aid the formation of smog and its impact?**

3. **India needs more push toward innovation and the need for the private sector's contribution to gross domestic expenditure on R&D. Discuss**

4. **What are Dark Patterns? How do companies use Dark patterns and illustrate them with some examples?**

5. **What is recession and discuss the remedial measures to tackle recession?**

Prelims Corner

1. Consider the following statements:

1. Between Census 1951 and Census 2001, the density of the population of India has increased more than three times.

2. Between Census 1951 and Census 2001, the annual growth rate (exponential) of the population of India has doubled.

Which of the statements given above is/are correct?

A) 1 only   B) 2 only   C) Both 1 and 2   D) Neither 1 nor 2

Answer (D)

The rate of population density increase in India is as follows: Density 1951 – 117 per sq km, 2001 – 324 per sq km; Annual growth rate in population density : 1951 – 1.25%, 2001 – 1.93%

2. With reference to the cultural history of India, the memorizing of chronicles, dynastic histories and Epictales was the profession of who of the following?

A) Shramana

B) Parivraajaka

C) Agrahaarika

D) Magadha

Answer (D)

Magadha is supposed to be a courtier with these roles to perform. The memorising of chromicles, dynastic histories or epic tales was the work of a different group of people, the Sutas and Magadhas. During the first stage (from 4th century BC to the 4th century AD), the task of collecting information and presenting it in literary form was the special task assigned to the Sutas and Magadhas (bards and chroniders), who were the descendants of priestly families of the Vedic period.

3. In which one of the following groups are all the four countries members of G20?

A) Argentina, Mexico, South Africa and Turkey

B) Australia, Canada, Malaysia and New Zealand

C) Brazil, Iran, Saudi Arabia and Vietnam

D) Indonesia, Japan, Singapore and South Korea

Answer (A)

The G20 comprises Argentina, Australia, Brazil, Canada, China, EU, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, UK and USA. The G20 Countries together represent around 90% of global GDP, 80% of global trade, and two thirds of the world's population

4. Which of the following is the largest remittance-receiving country in the world?

A. China   B.Philippines   C.India   D.Nigeria

Answer (C)

Unfortunately, despite India being the largest migrant-sending and remittance-receiving country, the welfare of Indian migrants abroad is hardly a priority for the Government and policymakers

5. Which state has planned to set up India's first Graphene Innovation Centre?

A.Kerala   B.Gujarat   C.Telangana   D.Maharashtra

Answer (A)

The (Kerala) government also plans to set up the first Graphene Innovation Centre in India

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