Prelim Bits 20-02-2022 & 21-02-2022 | Daily UPSC Current Affairs

Blue Blob

A recent study theorises that the Blue Blob could slow glacial melting until 2050 by temporarily stalling the melting of Arctic sea ice.

- The Blue Blob is an unusually cold patch located south of Iceland and Greenland in the North Atlantic Ocean.
- This patch was most prominent during the winter of 2014-2015 when the sea surface temperature was 1.4 degrees Celsius colder than normal.
- The Arctic region is reportedly warming four times faster than the global average.
- Starting in 2011, the speed of Iceland's glaciers melting slowed, resulting in about half as much ice loss. But, this trend was not seen in nearby, larger glaciers across Greenland and Svalbard.

  The new study predicts cooler water will persist in the North Atlantic, sparing Iceland's glaciers until about 2050.

  Ocean and air temperatures are predicted to increase between 2050 and 2100, leading to accelerated melting.

  But the effects of climate change will catch up to the massive ice chunks if temperatures are not kept in check.

- Before the Blue Blob (2011), a long-term cooling trend called the Atlantic Warming Hole occurred in Iceland.
- This Warming Hole reduced the sea surface temperatures by 0.4 to 0.8 degrees Celsius during the last century and may continue to cool the region in the future.
- A possible explanation for the Warming Hole is that the climate change has slowed the Atlantic Meridional Overturning Circulation.
- Atlantic Meridional Overturning Circulation is an ocean current that brings warm water up from the tropics to the Arctic, thus reducing the amount of heat delivered to the region.

Reference

1. https://www.thehindu.com/sci-tech/science/what-is-the-blue-blob-science-for-all-newsletter/article6505566ece
2. https://scitechdaily.com/blue-blob-near-iceland-could-slow-glacial-melting-until-2050/
3. https://www.livescience.com/blue-blob-slows-melting-of-iceland-glaciers

Synthetic Biology

The Central government is working on a national policy on synthetic biology.

- Synthetic Biology is a field of science that involves **redesigning organisms** by engineering them to have new abilities.
- It designs and constructs new biological parts, devices, and systems, and re-designs the existing, natural biological systems for useful purposes.
- It harnesses the power of nature to solve problems in medicine, manufacturing and agriculture.
- Some examples of use of Synthetic Biology are,
    - Microorganisms harnessed for bioremediation to clean pollutants from our water, soil and air.
    - Rice modified to produce beta-carotene, a nutrient usually associated with carrots that prevents vitamin A deficiency.
    - Yeast engineered to produce rose oil as an eco-friendly substitute for real roses that perfumers use to make luxury scents.
- **Difference** - In some ways, synthetic biology is similar to "genome editing" because both involve changing an organism's genetic code.
- However, there is a distinction between these two approaches based on how that change is made.
- In synthetic biology, scientists typically stitch together long stretches of DNA and insert them into an organism's genome.
- These synthesized pieces of DNA could be genes that are found in other organisms or they could be entirely novel.
- In genome editing, scientists typically use genome editing tools to make smaller changes to the organism's own DNA. These tools can also be used to delete or add small stretches of DNA in the genome.
- **Concern** - Synthetic biology can be used to synthesize an organism's entire genome. It could be used to develop biological weapons.
- The first synthetic bacterial genome was completed in 2008 with the synthesis of the genome of *Mycoplasm genitalium*, a bacterium that can cause urinary and genital tract infections in humans.

As part of the 12th Five-Year Plan, India had set up a task force on systems biology and synthetic biology research in 2011.

This body underlined the potential benefits from synthetic biotechnology in bio fuels, bioremediation, biosensors, food and health and made a strong case for a push for the technology.

It highlighted that India could be a world leader as a protector and supporter of “open source biological platforms”.

Reference

1. https://www.thehindu.com/news/national/centre-moots-policy-on-synthetic-biology/article65068405.ece?homepage=true
2. https://www.genome.gov/about-genomics/policy-issues/Synthetic-Biology#:~:text=Synthetic%20biology%20is%20a%20field,in%20medicine%2C%20manufacturing%20and%20agriculture.

3. https://www.nature.com/subjects/synthetic-biology

Obstructive Sleep Apnoea

Singer and music composer Bappi Lahiri (69) passed away following complications from Obstructive Sleep Apnoea (OSA).

- OSA is a widely prevalent but under-diagnosed medical condition.
- OSA occurs when muscles in the throat and upper airway relax intermittently during sleep and block the airway.
- When a person is obese, they develop extra fat on their larynx and pharynx (muscles in the throat) that can close off their airway in sleep.
- The muscles start relaxing in sleep and it is a garden hose like situation (when there is no water, it flattens out and no air can go through).
- **Cycle** - When no air enters the lungs, the oxygen saturation starts falling. When it is critical, the brain wakes the person up.
- They wake up subconsciously, the breathing restarts.
- This cycle keeps repeating through the night.
- **Impacts** - Although the condition doesn't kill by itself, it can lead to heart attacks and strokes due to the low oxygen level.
- In the long run, it can also result in increasing blood pressure, abnormal heart rhythms, and other metabolic disorders.
- It further leads to an increase in obesity, compounding the problem.
- It may also lead to depression.

OSA is the most common cause of road accident in the US as people with OSA tend to doze off while driving.

- **Prevalence** - The prevalence of OSA is 4% among women and 13.4% among men. (less common in women than men).
- The prevalence in people younger than 40 years of age is about 10% and in those over age 40 is 17%.
- The prevalence of OSA in India is going up hand in hand with increasing obesity. However, it is underdiagnosed, especially in smaller cities.
- **Check up time** – Snoring and choking are the most common symptoms of OSA. But not everyone who snores has it.
- One should definitely check in with the doctor if they feel groggy or sleepy in the morning and doze off during the day.
- To check whether someone has OSA, doctors look answer for something they call the 'STOP BANG'. It is a series of 8 questions.
- If your answer to >5 of these 8 questions is a YES, there is a high risk for a person to have OSA.
- **Prevention** - Studies have shown that a 10% increase in body weight increases the incidence of OSA six-fold.
- However, if the patients shed 10% weight, the incidence goes down by 20%. So, the best way to reduce the symptoms of OSA is to lose weight.
- **Treatment** - The best method to treat is to use a Continuous Positive Airway Pressure (CPAP) therapy. It is akin to letting the water run in the garden hose to help it maintain the structure.
- In addition, some surgeries may be offered if there are structural anomalies in the mouth.

The Uvulopalatopharyngoplasty is a surgery to open the upper airways by taking out extra tissue in the throat.

It just reduces the snoring, but doesn't really treat sleep apnoea.

Reference

https://indianexpress.com/article/explained/explained-obstructive-sleep-apnea-bappi-lahiri-death-7779562/

First Information Report

- The term first information report (FIR) is not defined in the Indian Penal Code (IPC), Code of Criminal Procedure (CrPC), or in any other law.
- But in police regulations or rules, FIR is the information recorded under Section 154 ("Information in cognizable cases") of CrPC.
- As per the Section 154, there are 3 important elements of an FIR,
    1. The information must relate to the commission of a cognizable offence,
    2. It should be given in writing or orally to the head of the police station and,
    3. It must be written down and signed by the informant, and its key points should be recorded in a daily diary.
- A copy of the information as recorded shall be given forthwith, free of cost to the informant.

Cognizable Offence

- It is one in which a police officer may, in accordance with the First Schedule of the CrPC, or under any other law for the time being in force, make an arrest without a warrant.
- In the First Schedule,
    1. The word 'cognizable' stands for 'a police officer may arrest without warrant'; and
    2. The word 'non-cognizable' stands for 'a police officer shall not arrest without warrant'.

Difference between a complaint and an FIR

- The CrPC has defined the term "complaint".
- The term "complaint" as any allegation made orally or in writing to a Magistrate, with a view to his taking action under this Code, that some person has committed an offence, but does not include a police report.
- However, an FIR is the document that has been prepared by the police after verifying the facts of the complaint.
- The FIR may contain details of the crime and the alleged criminal.
- If, on the basis of a complaint, it appears that a cognizable offence has been committed, then an FIR under Section 154 CrPC will be registered.
- If no offence is found, the police will close the inquiry.
- In case of non-cognizable offences, an FIR under **Section 155 CrPC** ("Information as to non-cognizable cases and investigation of such cases"), commonly called "NCR", is registered.
- The complainant will be asked to approach a court for an order.
- The court may then direct the police to conduct an investigation on the complaint.

Zero FIR

- When a police station receives a complaint regarding an alleged offence that has been

committed in the jurisdiction of another police station, it registers an FIR.
- Then this FIR is transferred to the concerned police station for further investigation. This is called a Zero FIR.
- No regular FIR number is given. After receiving the Zero FIR, the concerned police station registers a fresh FIR and starts the investigation.

Reference

https://indianexpress.com/article/explained/everyday-explainers/fir-cognizable-offence-ipc-explained-7780266/

Star Campaigners

The Election Commission of India restored the maximum limit on the number of star campaigners a party can field in the ongoing Assembly elections in 5 States,.

- In 2020, the commission had reduced the number of star campaigners for recognised national and State parties from 40 to 30 and unrecognised parties from 20 to 15.
- This reduction was done in order to prevent large crowds from gathering during campaigning.
- The commission said it had decided to restore the maximum limit of star campaigners, citing the fall in COVID-19 cases in the country.
- To know more about the Star Campaigners, click here.

Reference

https://www.thehindu.com/todays-paper/tp-national/eci-restores-maximum-limit-on-star-campaigners/article65069494.ece

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