



PLUTUS IAS

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1. Harvesting Water from Air

Context in Current Affairs: A team of researchers at the Indian Institute of Technology-Guwahati (IIT-G) have developed a method for harvesting water from humid air.

[About the Method](#)

This method involves spraying a sponge-like porous polymeric material on a normal printer paper. As per the researchers, this method can also be used in underwater hulls of ships and submarines to prevent biofouling; and to prevent icing on aircraft windows. The method mainly uses the principle of hydrophobicity. The lotus leaves exhibit the property of hydrophobicity.

The Researchers have used the action of the insect-eating pitcher plant whose slippery surface makes insects landing on it to fall into itself to be digested. They used 'Slippery liquid-infused porous surface' (SLIPS) to effectively harvest water from foggy air. The SLIPS are capable of harvesting water from air without the use of an external cooling arrangement.

Conventionally, the Atmospheric water generator (AWG) that extracts water from humid ambient air, uses condensation, exposing desiccants or pressurizing water.

[Atmospheric Water Generator](#)

The main principle of operation is condensation. Here the water vapour in the air is extracted as water by pressuring the air, cooling the air below its dew point and exposing the air to desiccants. A Desiccant is a hygroscopic substance. Dew Point is the point at which air should be cooled to make its saturated with water vapour. When cooled further, it will condense into liquid water (or dew).

[Water Scarcity in India](#)

India is currently facing one of the biggest water crises in the world. More than 50% of Indian population has no safe access to drinking water. More than 200,000 people die of lack of access to safe water. More than 82% of households are without piped water supply. The Composite Water Management Index, 2018 noted that India will lose 6% of its economic GDP by 2050.

2. Frothing in River Yamuna

Context in Current Affairs: For the last decade, frothing has been observed in River Yamuna and the same has been on the rise for the last 5 years. This is seen as a major indicator of the degradation of the Yamuna River Ecosystem. Both physical and chemical factors are responsible for the phenomenon.

Why is River Yamuna Frothing?

Froth means a mass of small bubbles on a liquid surface. It is also referred to as aggregation of bubbles on an agitated liquid. Since Yamuna River water falls from a great height in Okhla barrage, it leads to bubble formation. Also, during winters the temperature dips to near zero. Hence, foam formation is accompanied. The chemical factors responsible for foam formation and frothing is Ammonia increase from untreated household waste containing detergent and phosphorus increase in effluent released from industries etc. The froth on Yamuna river reflects the adverse impact of manmade activities on the environment and urgent steps are to be made in this regard to prevent further deterioration.

How and where do the effluents enter River Yamuna?

Most of the pollution of river Yamuna comes from Wazirabad where it enters Delhi. According to the Delhi Pollution Control Committee and the CPCB (Central Pollution Control Board), 90% of the domestic wastewater in the city flows into river Yamuna. Around 58% of the waste of the national capital is dumped into the river. The wastewater mainly comes from household activities and therefore it is highly rich in phosphate compounds, laundry chemicals and detergents.

The samples collected show that the phosphate concentration in the river is 0.51 mg/litre. It should be between 0.005 and 0.05 mg/litre.

More than 800 million litres of untreated sewage is dumped into Yamuna every day. Also, around 44 million litres of industrial effluents are discharged into the river. CPCB says that the river water contains 1.1 billion faecal coliform bacteria per 100 millilitres of water. The permissible level is 500 coliform bacteria per 100 millilitres.

3. What is Go for Zero policy?

Context in Current Affairs: The “Go for Zero” policy of Australia helped the country to bring down its COVID-19 cases.

About Go for Zero Policy of Australia

The Go for zero policy of Australia was proposed by a non-profit think tank Grattan Institute that advises the government. Under the policy besides expanding the testing of covid-19, Australia also increased contact tracing and mandatory isolation. The government had introduced a QR code-based system to tackle the issue of travellers breaking quarantines. This system helped to track the related person. Certain states of Australia such as Victoria even deployed police to carry out spot checks of people instructed to be in isolation.

Hot hotels or health hotels were established. These hotels are set up for symptomatic travellers. This prevented the emergence of clusters.

Australia under the policy also supported workers and businesses. Subsidies are provided to firms to keep people employed and also increased unemployment benefits. As the cases of covid-19 began to decrease in the month of September, Australia lifted the lockdown in a tiered manner.

Now schools and businesses have been reopened in Australia. Also, funerals, weddings and religious gatherings have been allowed to go ahead with bigger attendances.

Background

In the past week Australia has reported just 10 cases everyday. The decrease has been evidently noticed in the state of Victoria which is the second most populous state of the country. Earlier in August 2020 Victoria witnessed 700 daily infections according to Johns Hopkins University. Also, after October 27, 2020 Australia reported only one covid-19 related death. Out of 28000 infections reported in the country only 44 are currently active.

During the second wave of covid-19 Australia followed the strategy of eliminating the virus rather than just pulling down the case numbers. Australia achieved 20 numbers mainly because of the zero policy.

4.What is 5G NR?

Context in Current Affairs: Nokia has begun its production of the next generation of 5G Equipment in India. It is the first in India to manufacture 5G NR in India.

What is 5G NR?

- **5G NR is 5G New Radio. It is a new radio access technology developed for the fifth-generation mobile network. It was designed to be the standard for the interface of 5G networks. The 5G New Radio (NR) is a recent development in**

telecommunication system and has been designed to become the benchmark for the air interface of 5G networks.

- The study regarding the 5G NR commenced in 2015 and is now adopted by leading telecommunication companies like Nokia, Ericson etc.
- The 5G NR provides significant enhancements like better operational flexibility, scalability and efficiency, both in terms of power usage and spectrum.
- The new technology can provide high bandwidth communications like streaming very high-quality video as well as low latency communications like remote control vehicle communications, machinery control etc.

Mobile usage is rapidly increasing in the world and 5G will accelerate this trend. In general, the advantage of using higher frequency is that they are much wider and allow higher signal bandwidths. They support higher data throughput rates.

Background

Nokia has launched the production after it recently solved the antenna problems faced by 5G New Radio. Nokia along with CommScope has developed a new interleaved passive-active antenna (IPAA) radio platform. This antenna supports frequencies in the range of 700 MHz and also 3.4 to 3.8 GHz.

Frequency Interleaving has been used to solve the problem.

5G in India

In 2019, South Korea became the first country to roll out 5G network. Indian Government had earlier set a target of commercialising 5G network by 2020. 5G network will help to enable Industrial Revolution 4.0. However, India shouldn't hurry in implementing 5G as it is expensive, its infrastructures are still critical deliberating it to cyber-attacks.

5.UK: First country to launch COVID-19 vaccine

Context in Current Affairs: The United Kingdom has become the first country to roll out the covid-19 vaccine in the world. The British government recently rolled out the covid-19 vaccine developed by Pfizer and BioNTech.

What is the plan?

More than 70 Hospital hubs in the United Kingdom are to inoculate people over 80 years. The vaccine is to be provided as two injections within a time gap of 21 days. The person administered with the vaccine will obtain complete immunity after seven days of the second dose.

Russia and China

China and Russia have started to provide vaccine to their population before even completing the final safety and efficacy trials.

COVID-19 vaccine

According to the World Health Organization, the average time taken for a vaccine to become publicly available till now has been 16 years. The vaccine that comes close to COVID-19 vaccine has been the mumps vaccine. The mumps vaccine took four years to get all necessary permissions and licensing.

Pfizer Vaccine

The Pfizer vaccine evaluated more than 94 COVID-19 infections among the 43,538 participants. The Pfizer vaccine uses mRNA technology. It has proved well above 50% of effectiveness as set by the US Food and Drug Administration for a COVID-19 vaccine.

Why is Oxford Vaccine better than the Pfizer vaccine?

The Oxford Vaccine showed better efficacy than the Pfizer vaccine. The Moderna and Pfizer BioNTech vaccine must be transported at negative 20 to 80 degree Celsius unlike Oxford vaccine. The Oxford vaccines can be refrigerated at normal two to eight degrees Celsius.

Pfizer has to mandatorily distribute its vaccine in a specially designed “thermal shipper” that uses dry ice to maintain the negative eighty degrees Celsius.

Also, it was recently proved that half dose of Oxford vaccine is likely to give higher protection. This will make more doses available to the general public.

6. United Nations approves Epidemic Preparedness Day

Context in Current Affairs: The United Nations General Assembly recently approved the resolution that proclaimed to mark December 27 as the the International Day of epidemic preparedness.

The day is to be marked to facilitate exchange of information, transmission of scientific knowledge and best practices locally, regionally, nationally and internationally. This will help to prevent and respond to the epidemics. The resolution Adopted expressed grave concern stating impacts created by epidemics and infectious diseases. The covid-19 was exemplified during the consensus.

The day mainly aims to prevent COVID-19 like situations and to equip the world to fight such scenarios.

Major epidemics in the world

The epidemics mostly include infectious diseases. The cancer and cardiovascular diseases and other non-communicable diseases are not included. An epidemic is a disease that spreads rapidly to a large number of people within a short period of time.

- In 1200 BC, the Babilone influenza epidemic hit the Persians, mesopotamians, Central Asia and South Asia.
- Between 429 BC and 426 BC plague infected the regions of Libya, Greece, Egypt and Ethiopia. Since then different forms of plague began to infect a large number of people till the 14th century. They were predominantly Bubonic plague.
- In 737 BCE, smallpox infected Japan.
- In 2019, a Lassa Fever outbreak occurred in Nigeria.
- A new type of measles called Samoa measles infected Samoa. Kuala Koh measles affected Malaysia in 2019.
- In 2018, Nipah virus infected several Keralites in India.
- In 2017, Japanese Encephalitis infected the state of UP in India.
- In 2016, Yemen Cholera outbreak occurred in Yemen and is continuing till date.
- Between 2015 and 2016, Zika virus affected different regions of the world.
- In 2015, India faced a swine flu outbreak.
- In 2014, the Odisha state of India faced a Jaundice outbreak mainly due to Hepatitis A.
- In 2013, a Chinkungunya outbreak affected the US.
- In 2011, the hand, foot and mouth disease outbreak occurred in Vietnam.
- In 2010, the African Meningitis outbreak occurred in West Africa.