Current Affairs search results for tag: science-and-technology

1. Entire country to be covered by doppler weather radar network by 2025 (Jan. 16, 2023)

doppler weather radar network by 2025
Union Minister of State for Earth Sciences, **Dr Jitendra Singh** on 15 January informed that **by 2025**, the entire country will be covered by **Doppler weather radar network** so that extreme weather events can be predicted more accurately.

An overview of the news

- The accuracy of the meteorological department's forecast regarding severe weather has improved by about **40 per cent** in the last eight to nine years.
- In this sequence, by 2025, there will be a Doppler radar network across the country. The number of Doppler radars in the country has increased from **15 in 2013 to 37 in 2023.**
- India will set up **25 more radars** in the next two to three years, taking the number to **62.**
- Speaking on the occasion of the **148th Foundation Day of the India Meteorological Department (IMD)**, the minister said with the improvement in forecasting, the disaster-related death rate has come down to single digit.
- IMD commissioned **four Doppler Weather Radars (DWRs) in Himachal Pradesh, Uttarakhand and Jammu and Kashmir.** This will strengthen the weather monitoring capabilities in the Western Himalayan region.
- These were installed at **Surkanda Devi in Uttarakhand, Jot and Murari Devi in Himachal and Banihal Top in Jammu and Kashmir.**

What is Doppler Weather Radar?

- It is a special type of radar that uses the **Doppler effect** to generate velocity data about objects at a distance.
- It is designed to improve accuracy in long range weather forecasting and monitoring using a parabolic dish antenna and a foam sandwich spherical radome.

What is Radar (Radio Detection and Ranging)?

- It is a device that uses electromagnetic waves in the microwave region to detect the location, height, intensity, and speed of moving and non-moving objects.

What is the Doppler effect?

- It refers to the change in wave frequency during the relative motion between a wave source and its observer.
- It was discovered by Johann Doppler, who described it as a process of increasing or decreasing the luminosity of stars depending on the relative motion of the star.

2. Dr Jitendra Singh launches “Geospatial Hackathon” (Jan. 14, 2023)

Union Minister of State (Independent Charge) Science & Technology **Dr Jitendra Singh** on 14th January launched “**Geospatial Hackathon**” to promote Innovation and Start-Ups in India’s **Geospatial ecosystem.**

An overview of the news

- The hackathon will promote innovation and startups in the geospatial ecosystem of India.
- The objective of this hackathon is not only to foster partnerships between the **public and private geospatial sectors**, but also to strengthen the **geospatial start-up ecosystem** of our country.
- The "**Geospatial Hackathon**" will end on **March 10, 2023** and will have two sets of challenges - **Research Challenge and Startup Challenge.**
- There will be **4 winners** to be found for the best solution to the geospatial select problem statements.
- The minister invited the youth of the country to participate and contribute in building the country's geospatial economy.
- Half of India's population is below 40 years of age and very ambitious.
- The Indian start-up economy has crossed a major milestone as **India's 100th start-up** joins the **unicorn club in 2022.**

3. EU Inaugurates First Mainland Satellite Launch Port (Jan. 14, 2023)

European officials and Swedish King **Carl XVI Gustaf** inaugurated the **EU's first mainland orbital launch complex** on 13 January during a visit to **Sweden** by members of the European Commission, which is the **27-nation bloc's executive arm.**

An overview of the news

- The European Union is looking to boost its ability to launch **small satellites** into space with a new launchpad in arctic Sweden.
- The new facility inaugurated at the **Esrange Space Center** near the **city of Kiruna** will complement the EU's current launching capabilities in French Guiana.
- The tiny satellites are vital for tracking natural disasters in real time and helping to guarantee **global security** in light of Russia's war in Ukraine.
- The total number of satellites could reach **100,000 by 2040** as compared to the current **5,000 operational satellites.**

European Union (EU)

- It is an international organisation made up of European countries, which was **formed in 1993.**
- It is a group of **27 countries** that act as a cohesive economic and political bloc.
- 19 of these countries use the **euro** as their official currency.
- Its goal is to promote peace and the well-being of all citizens of the EU.
- Headquarters: **Brussels, Belgium**

4. Startup firm IG Drones develops India's first 5G-enabled drone (Jan. 13, 2023)

Tech startup firm **IG Drones** has developed **India's first 5G-enabled drone** capable of vertical take-off and landing.

An overview of the news

- This drone has been named **Skyhawk.**
- It can be used in other areas apart from defence and medical applications.
- The Skyhawk can fly for about five hours with a **payload of 10 kg**, as this drone is also equipped with capabilities like artificial intelligence and thermal imaging.
- Due to the facility of **vertical take-off and landing (VTOL)**, it does not require any special runway or track for take-off or landing, so it can be operated in any area.
- The drone is **IP67** rated and can be controlled through a combination of **NavIC + GPS navigational satellites.**
- This drone can travel **100 km in 12 to 15 minutes** at its maximum speed.

About IG Drones

- IG Drones is an India-based tech company providing drone survey, mapping and inspection services.
- It was established at **Veer Surendra Sai University of Technology in Sambalpur, Odisha.**
- Its headquarter is located in **New Delhi.**

5. India to send three person to 6,000 metre below sea level under Samudrayaan Mission (Jan. 13, 2023)

India will send three men **six thousand metres** below sea level to search for mineral resources under the **Samudrayaan mission.**

An overview of the news

- Earth Sciences Minister **Dr Jitendra Singh** said, a vehicle named **MATSYA 6000** will carry three people and this mission is expected to be realized in the next three years.
- The vehicle is being designed and developed by the **National Institute of Ocean Technology, Chennai.**
- It can bear 12 hours under normal operation and 96 hours under emergency for human safety.
- PM Narendra Modi mentioned the **Deep Ocean Mission** in his Independence Day address for two consecutive years in 2021 and 2022.

About Samudrayaan Mission

- It is a part of the **Deep Ocean Mission.**
- It was announced by the **National Institute of Ocean Technology (NIOT)** with ISRO's **Gaganyaan mission.**
- It aims to develop a self-propelled manned submersible to carry **3 humans** to a **depth of 6000 meters** in the ocean with scientific sensors and equipment for deep sea exploration.
- Under this mission, a manned submersible vehicle named **MATSYA 6000** will be sent for deep underwater studies.

What is the Deep Ocean Mission?

- It was approved by the **Ministry of Earth Sciences** in June 2021.
- It aims to explore deep sea marine resources, develop deep sea technology for sustainable utilization of ocean resources and support the blue economy initiatives of the Government of India.
- The cost of the mission is about **Rs 4,077 crore** over a period of five years and will be implemented in phases.

6. CMPDIL Invents New Dust Control Technology (Jan. 12, 2023)

In order to minimize and control the **fugitive dust** in mining areas, **Central Mine Planning and Design Institute Limited (CMPDIL), Ranchi** has invented a "**System and Method for Controlling Generation and Movement of Fugitive Dust ''.**

An overview of the news

- CMPDIL, Ranchi is a consultancy subsidiary of **Coal India Limited.**
- It has obtained a **patent** for the invention in December, 2022 (Patent No. 416055).
- This system can be used in mines, thermal power plants, railway sidings, ports, construction sites where coal or other mineral/fugitive material is stored under open sky.

About invention

- The invention relates to the synchronized application of **windbreak (WB)** and **vertical greenery system (VGS**) for reducing generation and dispersion of fugitive dust.
- WB and VGS are positioned in the **upwind and downwind directions** with respect to the blown dust source, respectively.
- WB reduces the speed of the **oncoming wind towards the source** and hence, reduces the intensity of the ambient air to pick up dust while it blows over the source.
- The VGS acts as a filter and reduces the amount of **residual dust** moving towards the receptors in the downward direction along with the air.
- Therefore, there is a significant reduction in the dust concentration in the ambient air at various **receptors** located in the down-wind direction.

What is Fugitive Dust?

- Fugitive dust is a form of **particulate matter** that contributes to air pollution.
- It refers to the dust particles which like to run in the air without a directed place.
- It is produced from various sources that come in contact with the air.

7. Successful training launch of Prithvi-2 at Chandipur, Odisha (Jan. 11, 2023)

Prithvi-2 was successfully trained on 10 January 2023 from the **Integrated Test Range at Chandipur off the Odisha coast.**

An overview of the news

- Prithvi-II is an indigenously developed surface-to-surface **short-range ballistic missile (SRBM)** with a range of approximately 250-350 km. and it can carry one ton payload.

- The **Prithvi-II class** is a single-stage liquid-fueled missile with a payload of 500–1000 kg. has warhead mounting capability.
- The missile system is capable of **hitting targets** with a very high degree of accuracy.
- The state-of-the-art missile uses an **advanced inertial guidance system** with an efficient trajectory to hit its target.
- It was initially developed for the Indian Air Force as the primary user and was later inducted into the Indian Army as well.
- While the missile was first inducted into India's Strategic Forces Command in 2003, it was the first missile developed under the IGMDP.

Five missiles developed under IGMDP

- The **5 missiles (P-A-T-N-A)** developed under this program are:
- **Prithvi:** Short-range surface-to-surface ballistic missile.
- **Agni:** Surface-to-surface medium-range ballistic missile i.e. Agni (1,2,3,4,5).
- **Trishul:** Short-range surface-to-air missile.
- **Nag**: Third generation anti-tank missile.
- **Akash:** Medium-range surface-to-air missile.

8. DRDO develops unmanned vehicle for operations in Himalayan regions (Jan. 11, 2023)

Research and Development Organization (DRDO) has developed an unmanned aerial vehicle with the aim of **targeting logistics operations on the Himalayan border.**

An overview of the news

- This aircraft has been displayed by DRDO at the **108th Indian Science Congress held in Nagpur, Maharashtra.**
- This UAV can fly with a load of **5 to 25 kg**. and is also capable of dropping bombs in enemy territory.
- The aircraft can conduct autonomous missions within a radius of **five kilometres** and automatically return to the origin after delivering the cargo to the designated location.
- This UAV is equipped with **landing accuracy** as well as ground vehicle follow mode and **modular design**, due to which this UAV can prove to be very useful during the war.
- This **multi-copter payload** has been successfully tested by **DRDO at an altitude of 14 thousand feet in Sikkim**. After two more trials, this UAV will be inducted into the Armed Forces.

Defence Research and Development Organization (DRDO)

- It is a premier **defence research and development agency** under the **Ministry of Defence, Government of India.**
- It aims to make India self-reliant in critical defence technology and systems.
- It was established in **1958.**
- Headquarters - **New Delhi**
- Chairman - **Sameer V Kamath**

9. World's first vaccine for honeybees approved for use by United States (Jan. 10, 2023)

The **US Department of Agriculture (USDA)** has approved the **world's first insect vaccine**, which has been developed to protect bees from a devastating bacterial disease.

An overview of the news

- US researchers have developed a vaccine to target a disease called **American foulbrood.**
- The disease is caused by **Paenibacillus larval bacteria** and once it reaches a bee population, it has the potential to completely destroy the colony.
- **Dalil Freitak** of the **University of Helsinki** and his colleagues discovered an important **egg yolk protein** called **vitellogenin.**
- This fundamental discovery laid the groundwork for a new type of insect vaccine, and the team's first target was honey bees.

Effectiveness of vaccine

- The vaccine works by binding to the **vitellogenin protein** in **inactivated bacterial cells** so that when consumed by the **queen bee** it can be transferred directly to her **larvae.**
- This vaccine is given to the queen bees in the form of **royal jelly**. She swallows it, and fragments of the vaccine get deposited in her **ovaries.**
- After exposure to the vaccine, **immunity develops** in the developing larvae.
- A successful clinical trial demonstrated that the vaccine is both **safe and effective.**
- **Progeny** from a vaccinated queen bee are much less likely to contract bacterial disease.

10. All 37 CSIR Labs in India to turn into Global Centers of Research & Innovation (Jan. 7, 2023)

All 37 CSIR Labs in India to turn into Global Centers of Research & Innovation

Union Minister of State (Independent Charge) Science & Technology **Dr. Jitendra Singh** said all **37 CSIR Labs in India** will be turned into **Global Centers of Research and Innovation in their fields of specialisation.**

An overview of the news

- He was speaking at the launch of **"One Week One Lab**" campaign in New Delhi.
- On this occasion, Dr. Jitendra Singh also released the **logo of CSIR's One Week One Lab campaign.**
- The Council of Scientific and Industrial Research (CSIR) has **37 laboratories** spread across the country dedicated to various specialised areas of work.
- Each of the 37 CSIR laboratories is unique in itself and specialises in diverse areas such as genomes to geology, food to fuels, minerals to materials etc.
- Dr Jitendra Singh inaugurates workshop and exhibition on "**Innovation and Sustainable Construction Materials and Technologies"** organised by CSIR-Central Building Research Institute (CSIR-CBRI), Roorkee with the aim of moving towards Net Zero Emission and Zero Waste.

About CSIR

- CSIR was established on **26 September 1942** and was registered as the CSIR Society under the **Societies Registration Act, 1860.**
- The first meeting of the Governing Body was held on 09 March 1942 in which the bye-laws for the Council were framed.
- It is the largest public funded **R&D organisation** in India.
- Started with 5 laboratories in 1942, CSIR in its journey of eight decades has grown into an organisation consisting of 3521 scientists with 37 laboratories supported by 4162 technical staff.