

## Haemoglobin is not used only in blood, scientists find in major discovery

- A new study reported that **chondrocytes**-cells that make cartilage (connecting tissue between bones) make haemoglobin and form **haemoglobin bodies**, or **Hedy**.
  - ⊕ Previously, it was understood that haemoglobin was used only by **Red Blood Cells (RBCs)**.
- **Functions of Chondrocytes**
  - ⊕ It releases substances to make cartilage strong yet flexible.
  - ⊕ **Haemoglobin in Chondrocytes** carries oxygen and is essential for their survival.
  - ⊕ Haemoglobin in the chondrocytes stores oxygen and supplies it to the cells when required.
- **Haemoglobin** is an iron-containing protein in the blood of animals that transports oxygen to the tissues. It is present in **RBCs** of vertebrates.
  - ⊕ All vertebrates **except cold-water ice fish** transport oxygen via haemoglobin.
  - ⊕ Haemoglobin forms an **unstable reversible bond with oxygen**. In oxygenated state, it is called **oxyhemoglobin** (bright red) and in **reduced state** it is called **deoxyhemoglobin** (purple-blue).
  - ⊕ Haemoglobin develops in cells in **bone marrow that become RBCs**.
- RBC (aka **erythrocytes**) carries oxygen from lungs to every cell in body.
  - ⊕ RBC is covered with a membrane composed of proteins and lipids, **lacks a nucleus, and contains haemoglobin**.

### Haemoglobin Associated Diseases

- **Haemoglobin S** is a variant form of haemoglobin that is present in persons who have **Sickle Cell Anaemia (SCA)**.
  - ◆ SCA is a severe hereditary form of anaemia in which cells become **crescent-shaped when oxygen is lacking**.
- **Thalassemia**: A group of inherited blood disorders characterized by a **deficiency of haemoglobin**.

## 11 Countries Signed first-of-its-kind Global Declaration of River Dolphins by 2030

- Declaration was adopted by River dolphin range states namely **Bangladesh, Bolivia, Brazil, Cambodia, Colombia, Ecuador, India, Nepal, Pakistan, Peru and Venezuela**.
- Global Declaration for River Dolphins aims to
  - ⊕ **Halt and reverse the decline of all river dolphin species in both Asia and South America.**
  - ⊕ Scale up collective efforts to **safeguard remaining river dolphin species** by developing and funding measures to **eradicate gillnets, reduce pollution, expand research, and increase protected areas.**
  - ⊕ **Enhance the health of rivers**, which are the lifeblood of many communities and economies as well as **sustaining critical ecosystems from rainforests to deltas.**
- **Eight pillars of the Declaration are**
  - ⊕ Creating a network of protected areas
  - ⊕ Enhancing management of river dolphin sites
  - ⊕ Expanding research and monitoring
  - ⊕ Engaging local communities and Indigenous Peoples
  - ⊕ Eradicating unsustainable fishing practices
  - ⊕ Improving water quality and quantity
  - ⊕ Celebrating World River Dolphin Day to raise awareness
  - ⊕ Increasing resource allocation and partnerships
- River Dolphins are **top predators in some of the world's greatest river systems and important indicators of river's health.**
  - ⊕ Since 1980s, their population numbers have **reduced by 73 percent.**

### Surviving species of River Dolphin

- **Amazon** (aka pink river dolphin or boto) lives only in **freshwater**.
  - ◆ IUCN Status: **Endangered**
- **Ganges** (commonly known as **susu**) found mainly in **Ganges and Brahmaputra** river systems in **India and Bangladesh**.
  - ◆ IUCN Status: **Endangered**
- **Indus** (aka **bhulan**) found in **Pakistan and River Beas**, a tributary of **Indus River in Punjab**.
  - ◆ IUCN Status: **Endangered**
- **Irrawaddy** found in **coastal areas in South and Southeast Asia**, and in three river i.e. **Ayeyarwady (Myanmar), Mahakam (Indonesian Borneo), Mekong and Chilka lake (India)**.
  - ◆ IUCN Status: **Endangered**
- **Tucuxi** freshwater dolphin species that lives in **Amazon River system in Brazil, Colombia, Ecuador and Peru**.
  - ◆ IUCN Status: **Endangered**
- **Yangtze finless porpoise** only freshwater porpoise in world and **only found in Yangtze River** (longest river in Asia).
  - ◆ IUCN Status: **Critically Endangered**

## Biogas can be a solution for India's decarbonisation goals: Institute for Energy Economics and Financial Analysis (IEEFA)

- ▶ According to IEEFA replacing natural gas with biogas and biomethane incrementally to 20% would help India cut natural gas import bills by **US\$29 billion between 2025- 2030**.
- ▶ **Biogas** (a mixture of methane, CO<sup>2</sup> and small quantities of other gases) is a renewable source of energy,
  - ⊕ It is produced by **anaerobic digestion** (oxygen-free environment) of organic matter.
  - ⊕ Its **precise composition depends** on the **type of feedstock** and the production pathway.
  - ⊕ **Removing CO<sup>2</sup>** and other impurities like hydrogen sulfide can **upgrade its methane content to 90%**, making it equivalent to natural gas in calorific value.
- ▶ **Benefits of biogas:** Waste management, reducing greenhouse gas emissions, etc.
- ▶ **Challenges for biogas:**
  - ⊕ **Lack of a comprehensive market ecosystem** in terms of pricing and offtake.
  - ⊕ **Complicated process for obtaining clearances** for setting up projects
- ▶ **Policy recommendations**
  - ⊕ **Increasing Market Viability** for biogas
  - ⊕ **Feedstock mapping** and aligning them with biogas plants
  - ⊕ **Encourage private sector**, by clear market for the end product and clear supply chains.
  - ⊕ **Increased access to finance** at more affordable rates, for the Development of Plants.

### Initiatives for biogas promotion

- ▶ **Galvanizing Organic Bio-Agro Resources Dhan (GOBARDhan) scheme** for effective Solid and Liquid Waste Management
- ▶ Announcement of **500 Waste-to-Wealth plants under GOBARDhan scheme**.
- ▶ **Global Biofuel Alliance**, an initiative by India as the G20 Chair.

## Closing Childcare Policy Gaps offers high return on investment: International Labour Organization (ILO)

- ▶ Childcare Policy Gap (CPG) refers to the **period between the end of statutory childcare-related leave and starting age for free, universal early childhood care and education or primary education**.
  - ⊕ It affects **90% of actual and potential parents worldwide**.
- ▶ **Average CPG** is approximately **4.2 years globally**.
  - ⊕ Maternity, paternity and combined **parental leave** available to household's **average 6.1 months globally**.
  - ⊕ Average starting age for **free and universal early childhood care and education is 4.7 years**.
- ▶ **Benefits of closing CPG:**
  - ⊕ **1 dollar invested** in closing the CPG would give **3.76 times return** in global GDP by 2035.
  - ⊕ **Reductions** in gender and other **inequalities** and **generation of decent jobs**
    - ◆ **84% of such new employment would go to women**, as they exchange unpaid care work for paid and formal employment.
  - ⊕ Improvements in **health and wellbeing**
- ▶ **Investment needed to close CPG: 1.5% of global GDP**, in addition to current public spending of **0.3% of global GDP** is needed for providing universal, high-quality, childcare services.
- ▶ **Recommendations:**
  - ⊕ **Invest in care economy**.
  - ⊕ Better **sharing of care responsibilities** between men and women.
  - ⊕ **Designing rights-based programmes**.



### International Labour Organisation (ILO)



- Genesis:** Established in **1919**.
- About:** **Only tripartite U.N. agency** that brings together **governments, employers and workers** of member countries together.
- Objectives:** Promote **standards and fundamental principles and rights** at work, create **greater opportunities** for income and **enhance coverage and effectiveness of social protection** for all.
- Functions:** To set **labour standards, develop policies and devise programmes promoting decent work** for all women and men.
- Members:** **187 Member States** .
- Other**
  - ◆ Its '**Decent Work agenda**' helps advance the economic and working conditions.
  - ◆ **Report:** World Employment and Social Outlook; Social Dialogue Report

## User Manual on PMMVY 2.0 and New PMMVY Portal & Mobile App launched

- Pradhan Mantri Matru Vandana Yojana (PMMVY) is a **conditional cash transfer scheme for Pregnant Women & Lactating Mothers (PW&LM)**.
  - ⊕ It was launched in 2017 in accordance with provision of **National Food Security Act, 2013**.
  - ⊕ In 2022, it was revised as **PMMVY 2.0** and incorporated in **Mission Shakti** (umbrella scheme for **safety, security and empowerment of women**).
  - ⊕ So far **more than 14,000 crore rupees** was transferred to more than **3 crore beneficiaries**.
- **About PMMVY 2.0**
  - ⊕ **Ministry:** Minister of Women and Child Development
  - ⊕ **Type:** Centrally Sponsored Scheme
  - ⊕ **Objectives:** To provide financial incentives to **compensate for wage loss during pregnancy**, enabling women to **rest adequately** before and after childbirth.
  - ⊕ **Beneficiaries:** PW&LM of **at least 19 years of age in informal and unorganized sectors**.
  - ⊕ **Benefits:**
    - ◆ **Conditional Maternity benefit** of ₹ 5,000 for first living child of family.
    - ◆ **Institutional delivery** and incentive available **Janani Suraksha Yojana (JSY)** are also provided. Therefore, on an average, a woman gets ₹ 6000.
    - ◆ **Support to girl child:** Incentive of ₹6,000 in a single instalment is provided following birth of the second girl child.
  - ⊕ **Implementation:** Through **Angan Wadi Centre (AWC)** under Angan Wadi Services Scheme.

## Scientists fired up Nanophotonic Electron Accelerator (NEA), World's smallest particle accelerator

- NEA consists of a **small microchip containing an even smaller vacuum tube** which is made up of thousands of individual pillars.
  - ⊕ Main goal of creating these accelerators is to **utilise the energy given by accelerated electrons in targeted medical treatments for cancer**.
- **NEA is similar to Large Hadron Collider (LHC)** as both create a magnetic field to accelerate particles.
  - ⊕ However, main acceleration tube of NEA (~0.02 inches long) is 54 million times shorter than 27-kilometre ring of CERN's LHC.
  - ⊕ Also, **LHC uses more than 9,000 magnets** to create magnetic fields and NEA works by firing light beams at pillars in vacuum tube.
- **Particle accelerators** are devices that **speed up charged particles**, (protons or electrons), **at high speeds**, close to speed of light. They are then **smashed either onto a target** or against other particles circulating in opposite direction.
  - ⊕ They are essential for **fundamental research for an improved understanding of matter, discovery for particle and nuclear physics** and for sciences that use x-rays and neutrons.
  - ⊕ They also have **applications** related to health, environmental monitoring, food quality, etc.

- **LHC: Most powerful particle accelerator ever built** that pushes protons or ions to near speed of light.
- **CERN:** Founded in 1954, CERN laboratory is situated at Franco-Swiss border near Geneva. It has 23 member states with **India as an Associate Member State**.

## Also in News



### Air Transport Circular (ATC)

- Air Transport Circular ATC 01 of 2021 **allows charging for "preferential" seats**.
  - ⊕ **ATC 01 of 2021 allowed unbundling of services** since not all services are availed by **every traveler** and unbundling could reduce the basic airfare.
  - ⊕ It led to application of **preferential charges for preferred seats, food and drinks** (except water), and baggage, etc.
  - ⊕ **However**, since there is **no cap on number of seats** that can be under **preferential charge** even the middle seats (typically not the preferred) are also charged.
- **ATC** are issued and revised by **Directorate General of Civil Aviation**.



### Cardamom

- North-East monsoon revives hopes of cardamom growers.
- Cardamom (**Queen of Spices**) is native to tropical areas of **India, Burma, and Sri Lanka**.
  - ⊕ **Commonly found in evergreen rainy forests of Western Ghats** in South India (Kerala, Karnataka and Tamil Nadu).
  - ⊕ Contains **vitamin C, niacin, magnesium, and potassium**.
  - ⊕ **Type:** **Herbaceous, evergreen perennial of ginger family**.
  - ⊕ **Soil:** Forest loamy soils which are usually **acidic in nature** with a pH range of 5.0 – 6.5
  - ⊕ **Annual rainfall ranges:** 1500 to 4000 mm
  - ⊕ **Temperature range:** 10 to 35 degree C
  - ⊕ **Uses:** Food flavoring, Beverages, Perfumes, Medicines, Cosmetics etc.



### Coal Ministry, MNRE collaborate for green energy expansion

- Ministry of Coal (MoC) and Ministry of New & Renewable Energy (MNRE) will jointly promote Green Energy expansion.
- MoC will provide **land, capital and undertake implementation** of renewable energy projects.
  - ⊕ **De-coaled** (Lands from which coal has been mined out) **surplus land masses** of Coal companies can be offered for **setting up of green hydrogen projects** by the private investors.
- MNRE will support the MoC and its CPSEs in **capacity building** training of engineers, technicians and other functionaries through **National Institute of Solar Energy (NISE)**.



### Ejecta halo

- When the **Vikram lander** of the Chandrayaan-3 mission made a **soft landing** on the moon it **raised a lot of dust**.
- This led to **creation of a bright patch**, called as the **ejecta halo** (a **reflectance anomaly**), **around the spacecraft**.
  - ⊕ About **2.06 tonnes** of lunar **epi regolith** were **ejected and displaced** over an area of 108.4 m<sup>2</sup> around the landing site.
- The ejecta halo phenomenon has been documented in the case of almost all lunar landings.



### Banni Festival

- Banni' festival witnessed at Devaragattu in Andhra Pradesh's Kurnool district.
- **Banni Festival is a traditional stick-fighting festival.**
  - ⊕ Every year, it is celebrated on the **night of Vijayadasami**.
  - ⊕ It celebrates the **victory of Lord Mala Malleswara Swamy and Goddess Parvati over demon Mani and Mallasura**, who troubled the people at Devaragattu region.
  - ⊕ It is held on **premises of Mala Malleswara Swamy Temple** (situated at border of Andhra Pradesh and Karnataka).



### Pliosaur

- Fossils of a 170-million-year-old ancient marine reptile from Age of Dinosaurs have been identified as **oldest-known mega-predatory Pliosaur**.
- **Pliosaur**s were a **group of ocean-dwelling reptiles with short necks and massive skulls**.
  - ⊕ They appeared over 200 million years ago, but remained minor components of marine ecosystems until suddenly developing into enormous apex predators.
- **Lorrainosaurus** is the **oldest large-bodied pliosaur** represented by an associated skeleton.



### Betelgeuse star

- By using **MATISSE (Multi Aperture mid-Infrared Spectroscopic Experiment)** instrument, Scientists found that **dimming of Betelgeuse star was due to a burst of dust, in form of silicon monoxide, coming from star**.
- Betelgeuse star (**Alpha Orionis**) is **second brightest star in Orion constellation and one of the brightest star(s) in sky** (7,500 to 14,000 times brighter than Sun).
  - ⊕ Also known as **'Thiruvathirai' or 'Ardra'** in Indian astronomy.
  - ⊕ It is a **supergiant star, distinctly red in colour**, located at an approximate distance of **643 light years from Earth**.



### Gudavi Bird Sanctuary

- Several birds die at Gudavi bird sanctuary.
- Gudavi Bird Sanctuary is located in Soraba Taluk of **Shimoga District in Karnataka**.
  - ⊕ **Main bird species** that nest here are White ibis, Egrets, Cormorants, Snake birds (Darters), Spoon bills, Herons and Ducks.

## Places in News



### Bering Sea

- A recent study revealed a link between **declining Bering Sea ice and increasing wildfire hazard in northeast China**.
- Bering Sea is a **marginal sea** (located along the continental margins) in **northern Pacific Ocean and separates North America and Asia**.
  - ⊕ It is bordered by **US, Kamchatka Peninsula, Russia**, chain of the **Aleutian Islands**.
  - ⊕ It is **connected with the Chukchi Sea of the Arctic Ocean via the Bering Strait**.
  - ⊕ **Deepest point: in Bowers Basin** at a depth of 4,097 m.
  - ⊕ **Rivers draining: Anadyr and Yukon Rivers**.

