

## Prelim Bits 14-12-2023 | UPSC Daily Current Affairs

### Graph Networks for Materials Exploration (GNoME)

*GNoME, an AI tool, is accelerating the materials discovery using artificial intelligence (AI).*

- It is a state-of-the-art **graph neural network (GNN)** model that uses '**active learning**' to enhance its performance, allowing it to predict the stability of new materials.
- **Launched by - Google DeepMind**
- **Aim** - To generate novel candidate crystals and to predict their stability.

*Deep learning is a method of artificial intelligence (AI) where it is taught to process data in a way that is inspired by a human computer.*

- **Working** - GnoME can generate predictions for the structures of novel, stable crystals which were then tested, resulting in high-quality training data fed back into model training.
- The final step in their approach exploits **Density Functional Theory (DFT)**, a method to verify the stability of the new structures, which are then used as new training datasets for the tool.
- **The Materials Project** is the original datasheet for GNoME.

*The Materials Project is a multi-institution, multi-national endeavour to compute the properties of all inorganic materials and provide the data for every materials researcher free of charge.*

- **Significance** - It has **boosted the precision rate** for predicting materials stability from 50% to around 80%.
- It **increases the number of 'stable materials'** by 10-fold including inorganic crystals that modern tech applications use.
  - It has published a list of 381,000 of the 2.2 million crystal structures that it predicts to be most stable.

### References

1. [The Indian Express | Graph Networks for Material Exploration](#)
2. [AI Magazine | GNoME](#)

## UN Resolution demanding Gaza Ceasefire

India votes in favour of UN resolution demanding Gaza ceasefire in an UNGA Emergency Special Session.

- **UN Resolution** - The **193-member United Nations** General Assembly (UNGA) expressed grave concern over the catastrophic humanitarian situation in the Gaza Strip and the suffering of the Palestinian civilian population.
- **2 key demands**
  - An immediate *humanitarian ceasefire*.
  - Immediate and unconditional *release of all hostages*, as well as ensuring *humanitarian access*.
- It also reiterated that all parties shall comply with international humanitarian law to protect the civilians.
- **Voting** - It was adopted with **153 nations voting in its favour**, **10 voting against** (including the US) and **23 abstentions**.

This is the 1st time India supported such a resolution since the Israel-Hamas conflict began in 2023. India had [abstained from the earlier resolution](#).

- **Impact** - Unlike UN Security Council resolution, UNGA resolution are **not legally binding** but the overwhelming support of the resolution serves as *an indicator of global opinion*.

### UNGA Emergency Special Session

- It happens *when the UNSC is deadlocked*.
- UN Member States can *request the Assembly President* to convene such a session to make appropriate recommendations for collective measures, including calling for ceasefires, use of armed force, etc.
- If adopted by a **two-thirds majority**, the non-binding General Assembly resolution *provides guidance for nations*.

## Reference

[The Indian Express| India supports for Gaza ceasefire](#)

## Kidney Transplants in India

The Indian government has ordered a probe into an allegation that poor Myanmar villagers were being lured into giving their kidneys to rich patients.

- **Regulated by- Transplantation of Human Organs and Tissues Act, 1994.**
- A transplant can be either
  - From organs of *deceased persons* donated by their relatives
  - From a *living person* the recipient knows

Only 16% of the total transplants in the India use deceased organs.

- **Types of donations**

- Donations from close relatives
- Donations from unrelated persons (**Altruistic donations**)

Donations from close relatives	Donations from unrelated persons
<ul style="list-style-type: none"><li>• The 1994 Act allows living donations, in most cases, from close relatives (parents, siblings, children, spouse, grandparents, grandchildren).</li><li>• For donations involving either Indians or foreigners, documents establishing their identities, family tree, proving the donor-recipient relationship and financial standing of the donor have to be submitted.</li></ul>	<ul style="list-style-type: none"><li>• It involves donations from distant relatives, in-laws, or long-time friends are allowed after additional scrutiny.</li><li>• For donations from unrelated persons, documents and photographic evidence showing their long-term association have to be submitted which is then <u>examined by an external committee</u>.</li></ul>

- Organ donations and transplants in **exchange for money are forbidden** in India.
- **Punishment** - Offering to pay for organs or document forgery is punishable by jail up to 10 years and a fine of up to Rs 1 crore.

**National Organ and Tissue Transplant Organization (NOTTO)** under the Ministry of Health and Family Welfare, is the apex centre for coordination and networking for the registry, donation and transplantation of organs and tissues in India.

- **Reasons for higher kidney transplantation scam**

- Higher demand for kidney due to increase in kidney failures
- Least risk to the donor
- Cheaper than other transplantations
- Higher survival time of kidneys

Kidney can survive up to 24-36 hours outside the body, the largest among other organs while the lungs remain viable only for 4-6 hours, and the liver for 8-12 hours.

## Reference

[The Indian Express| Kidney transplants in India](#)

## Global Status Report on Road Safety 2023

According to the 5<sup>th</sup> edition of Global Status Report on Road Safety, road fatalities dropped globally, but India sees a rise.

- **Launch year** - 2009
- **Released by** - World Health Organisation (WHO)
- **Objectives** - To describe the *road safety situation* in United Nations (UN) Member States and *assess the changes* with a particular focus on the evolution of the burden and responses since 2010.
- **Data source** - Based on survey and review of legislation in which *170 UN Member States and 2 territories* participated.
- **2023 Report**- It provides the first complete overview of progress made during 2011-2020 and sets a baseline for the Decade of Action for Road Safety 2021-2030.

## Key Findings

- **Road traffic deaths** - **108 UN member nations** reported a drop with 10 countries succeeded in reducing by over 50%.
  - *WHO's South-East Asia Region* tops while the European Region reports the largest drop in deaths since 2010
  - Top cause of deaths for children and youth between the ages of *5 to 29 years*
  - 92% of deaths occur in *low- and middle-income countries*.
- **Status of India** - It registered a **15% increase in fatalities** (1.34 lakh in 2010 to 1.54 lakh in 2021).
- **Share of fatalities** - **30% by 4-wheel vehicle occupants** followed by pedestrians, 2- and 3-wheeler users, respectively.

*Only 6 countries have reached WHO best practice legislation on 5 risk factors - speeding, drink driving, motorcycle helmet use, and seat-belts and child restraint systems.*

## References

1. [The Hindu| A decline in road fatalities globally](#)
2. [WHO| Global Status Report on Road Safety 2023](#)

## Budgett Frog

*Researchers from the Indian Institute of Science's (IISc) have identified that peptides (short protein) produced from Budgett's frog can combat enzymes of disease causing pathogens.*

- Other common names are **Hippo Frog** and the **Freddie Kruger Frog**.
- **Scientific name** - *Lepdibatrachus laevis*
- **Habitat** - In inland waters in Paraguay, Argentina and Bolivia.
- **Growing condition** - Being **carnivorous**, they mainly feed on other frogs (particularly tadpoles), snails and insects.
- During dry season, it remains in burrows and they will shed skin layers from to **form a waterproof cocoon** to keep them moist.
- In rainy season, it will go back into the water to breed and feed.

- **Characteristics** - They are ***highly intelligent*** and very aggressive.
- When frightened, they inflate themselves, stand up on their short legs and attack the potential with an open huge mouth followed up by a ***high-pitched scream***.
- They do not have teeth, but they do have two sharp-edged structures in the jaws.
- **Protection status**
  - ***Least Concern*** in the IUCN Red List.

**Frogs** are the ***1<sup>st</sup> vertebrates to conquer the land*** and because of this, they have developed a ***defensive mechanism through their skin*** to generally combat the ***microorganisms and other harmful things***.

## Reference

[The Hindu| Budgett frog's defence mechanism](#)

### Other Important News

#### 'AKTOCYTE'

- AKTOCYTE is a nutraceutical developed by the Department of Atomic Energy (DAE) and IDRS Labs.
- The tablets are intended for radiotherapy patients, especially those with pelvic cancer suffering from radiotherapy-induced Cystitis (Blood in urine).

#### 'Mission Antarctica'

- Union Minister of State for Defence flagged in a team of Himalayan Mountaineering Institute, Darjeeling that carried out 'Mission Antarctica' in New Delhi Recently.
- The team hoisted the national flag atop Mt Rhenock in Sikkim Himalayas, recorded in the Asia Book of Records and India Book of Records.
- During the expedition, the team also displayed the Tri-colour over Mount Vinson Peak, which is the ***highest peak of the South Pole***.

#### Pro Bono Legal Service Programme

- It is an initiative of the Department of Justice, launched in April 2017.
- It aimed at enhancing "access to justice" for marginalised sections of the society and the state's constitutional obligation of providing "free legal aid" for all.
- Pro bono is a Latin phrase that means "***for the good of the people***".

### **Women in Science and Engineering-KIRAN (WISE-KIRAN)**

- WISE-KIRAN is a program from the Department of Science and Technology (DST).
- The scheme's goal is to increase women's participation in science and technology (S&T) and achieve gender parity.

### **Valparai plateau**

- The Valparai plateau is situated in the Coimbatore district of Tamil Nadu.
- It is surrounded on all sides by protected areas Anamalai Tiger Reserve, Parambikulam Tiger Reserve and Eravikulam National Park.
- Valparai is known for its tea and coffee plantations, around 7-8 national and international companies spread over 54 tea and coffee estates in Valparai.

### **Koodankulam Nuclear Power Plant (KKNPP)**

- Kudankulam Nuclear Power Plant is the largest nuclear power station with a current installed capacity of **2GW** in India.
- It is situated in Kudankulam, Tirunelveli district of Tamil Nadu.
- It is a Civilian Nuclear Power Plant, built by India in joint-collaboration with Russia.
- It is being developed by the ***Nuclear Power Corporation of India (NPCIL)***.

### **Nyholm prize**

- Professor Savita Ladage received the Royal Society of Chemistry's Nyholm Prize recently.
- It is an ***annual award*** from the Royal Society of Chemistry that recognizes achievements in chemical sciences education.
- The prize honors the life and work of Sir Ronald Nyholm, an Australian-born chemist who served as president of the Royal Society of Chemistry from 1968 to 1970.
- The prize alternates between being open to international nominations and being open only to nominations from the UK and Ireland.

### **International Debt Report**

- The report is released by ***World Bank*** recently.
- **Recent Findings** - Currently, about 60% of low-income countries are at high risk of debt distress.
- Debt-service payments, which include principal and interest, increased by 5% over the previous year for all developing countries.
- The 75 countries eligible to borrow from the World Bank's International Development Association, which supports the poorest countries in 2022.

### **Pension Fund Regulatory and Development Authority (PFRDA)**

- The Pension Fund Regulatory and Development Authority (PFRDA) is a regulatory body that oversees and regulates pensions in India.
- It was established in 2003 and operates under the Ministry of Finance.
- In 2003, the PFRDA launched the National Pension Scheme (NPS), which was extended to all citizens in 2009.
- The PFRDA regulates the NPS ecosystem, which is subscribed to by employees of the Government of India, State Governments, and private institutions.

### **Kanduri Urs Festival**

- The annual 'Kanduri Urs' festival starts with the flag-hoisting ceremony in Nagapattinam district of Tamil Nadu recently.
- The 14-day festival commemorates the ***death anniversary of saint Abdul Qadir*** and attracts followers from different faiths across the world.

