UPSC Daily Current Affairs | Prelim Bits 31-07-2024

Atomic Energy Regulatory Board (AERB)

The Atomic Energy Regulatory Board (AERB) has approved for the "First Approach to Criticality" of the 500 MWe Prototype Fast Breeder Reactor (PFBR) at Kalpakkam, Tamil Nadu

- **Aim -**To ensure that ionizing radiation and nuclear energy are safe and do not pose undue risk to public health.
- The Atomic Energy Regulatory Board (AERB) develops and oversees the design and operation of facilities safety regulations for ***nuclear and radiation facilities.***
- **Capacity-** 500 Mwe.
- **Location-** Kalpakkam, Tamil Nadu.
- **Establishment-** 1983.
- **Headquarters-** Mumbai, India.
- **Act -** It operates under the ***Atomic Energy Act of 1962.***
- **Key Functions-** It enforces safety standards for nuclear and radiation facilities.
    - It grants licenses for nuclear facilities and radiation applications.
    - It conducts safety inspections and assessments of nuclear plants and radiation facilities.
    - It develops and updates safety standards, codes, and guides.
    - It promotes research in nuclear and radiation safety.
    - It also Investigates and analyses nuclear incidents and accidents.
- **Organizational Structure-** The AERB is headed by a chairman Including the Board members who are experts from various fields.
- **Significance-** This authorization marks a major step towards operationalizing the PFBR, a key element of India's nuclear power program, and signifies significant progress in enhancing the country's nuclear energy capabilities.

Prototype Fast Breeder Reactor
• The Prototype Fast Breeder Reactor (PFBR) is a nuclear reactor design that is part of India's nuclear power program. • It represents an important step in the country's pursuit of advanced nuclear technology. • Unlike conventional nuclear reactors, breeder reactors generate more fissile material than they consume. • The PFBR is designed to convert fertile materials like Uranium-238 into fissile materials like Plutonium-239. • The PFBR typically uses mixed oxide (MOX) fuel, a blend of plutonium oxide and uranium oxide.

References

1. PIB| AERB

2. AERB | About AERB

Kindlins

A recent study of Kindlins has uncovered significant and novel pathways to cancer treatment.

- Kindlins are a family of ***proteins*** that play crucial roles in cellular processes, particularly ***cell adhesion, migration, and signaling.***
- There are 3 members in the Kindlin family - Kindlin-1, Kindlin-2, and Kindlin-3.

Kindlin family	
Kindlin-1	• **Gene-** FERMT1 • **Function-** Kindlin-1 is primarily expressed in epithelial cells. • It is involved in the regulation of integrin activation, which is essential for cell adhesion, migration, and wound healing. • **Clinical Relevance-** Mutations in the FERMT1 gene are associated with ***Kindler syndrome***, a rare genetic disorder characterized by skin fragility, blistering, and progressive skin atrophy.
• **Kindlin-2**	• **Gene-** FERMT2 • **Function-** Kindlin-2 is ubiquitously expressed and plays a significant role in integrin-mediated cell adhesion and signaling. • It is involved in various cellular processes, including cell spreading, migration, and survival. • **Clinical Relevance-** Kindlin-2 is implicated in several diseases, including cancer, where it can influence ***tumor cell adhesion***, migration, and invasion.
Kindlin-3	• **Gene-** FERMT3 • **Function-** Kindlin-3 is predominantly expressed in hematopoietic cells (blood cells). • It is crucial for the activation of integrins in these cells, impacting processes like leukocyte adhesion and platelet aggregation. • **Clinical Relevance-** Mutations in the FERMT3 gene lead to a condition known as ***leukocyte adhesion deficiency type III (LAD-III)***, which results in severe immunodeficiency due to the inability of leukocytes to adhere and migrate properly.

- **Functions-** Kindlins interact with the cytoplasmic tails of integrins, helping to activate them and promote their ***binding to ECM proteins.***
- It influences cell adhesion to the ECM and subsequent cell migration, which is critical in processes like wound healing and immune responses.
- It participates in ***signaling pathways*** that regulate cell survival, proliferation, and differentiation.

References

1. PIB | Kindlins
2. Current Biology | Kindlins

PM-PRANAM

The Cabinet Committee on Economic Affairs (CCEA) has recently approved the PM-PRANAM scheme.

- **PM-PRANAM**- PM Programme for Restoration, Awareness Generation, Nourishment, and Amelioration of Mother-Earth.
- **Aim**- It aims to protect the environment by encouraging the sustainable use of fertilizers, adopting alternative fertilizers, and promoting organic and natural farming.
- **Nodal agency**- Ministry of Chemicals and Fertilizers.
- **Background**- It was launched in Union Budget 2023–24.
- **Coverage-** All States/UTs are covered under the PM- PRANAM.
- **Funding**- The scheme will not have a separate budget and will be financed by the savings of existing fertilizer subsidy.
- **Benefits**- If a State/UT reduces its chemical fertilizer consumption (Urea, DAP, NPK, MOP) in a financial year compared to the previous three years' average, 50% of the saved subsidy will be granted to that State/UT.
    - 70% of the grant provided under the scheme can be used for asset creation related to technological adoption of alternate fertilisers and alternate fertiliser production units.
    - 30% grant money can be used for incentivizing farmers, panchayats, farmer producer organizations, self-help groups, etc.
- **Data**- ***iFMS (Integrated fertilisers Management System)*** data available in the Fertiliser Ministry dashboard will be used for this purpose.

References

1. PIB | PM-PRANAM
2. The Indian Express | PM PRANAM scheme

Extreme Weather Events in India

India has recently experienced extreme weather conditions, including heavy rain, floods, droughts, and cyclones, which some experts attribute to climate change.

Extreme weather events

- It refers to significant variations in weather that can lead to severe and often destructive conditions.
- Examples include heatwaves, cold waves, heavy precipitation (like floods), tornadoes,

tropical cyclones, and droughts.
- These events are often short-lived but can have devastating impacts on communities and ecosystems.
- **Causes**
    - Climate Change
    - Natural Climate Variability
    - Atmospheric Conditions
    - Geographical Factors
    - Human Activities
    - Seasonal Changes

Extreme weather events in India

Events	Location	Impacts
Heatwave and Floods, 2023	**New Delhi**	Casualties
Storms and Floods, 2023	**Mumbai**	Casualties
Flooding and Landslides, 2023	**Assam**	Animal population decreased including rare one-horned rhinoceroses, drowned in ***Kaziranga National Park***.
Cyclone, 2023	**Southern India**	Casualties
Himalayan Glacial Lake Outburst, 2023	**Sikkim**	High Casualties
Landslide, 2021	**Uttarakhand**	Destroyed 2 Hydro-electric projects
Landslide, 2023	**Near Mumbai**	Casualties
Floods, 2018	**Kerala**	40% more rainfall than usual with Heavy casualties

Reference

The Indian Express | Extreme Weather Events in India

National Metallurgist Awards, 2024

Union Ministry of Steel invites applications for the National Metallurgist Awards, 2024.

- **Objective -** To recognize the outstanding contributions in the metallurgical field, covering Operations, Research & Development, Waste Management, and Energy Conservation.
- The awards are given on an ***annual*** basis.
- The 1st award was given in the year ***1963***.
- **Categories –** The Awards are given in the following ***5 categories.***

    - Lifetime Achievement Award
    - National Metallurgist Award
    - Young Metallurgist(Metal Science) Award
    - Young Metallurgist(Environment) Award
    - Award for R&D in Iron & Steel Sector.
- **Eligibility -** This scheme is *only for Indian nationals*, who have contributed to the field of metallurgy in India through their work in Industry, R&D or Academia.
- **Mode of Nominations -** Nominations will be through companies/organizations or from the public through self-nomination.
- **Assessment Criteria & Weightage -** Awards shall be considered only on a minimum score of 75 out of 100.

Sl.No		Details	Weightage
Criteria I	Work-related achievements/ accomplishments	Performance, outcome and impact in the specified line of business.	30%
Criteria II	Service to the profession	Public education and creating awareness of the role of metallurgy in India; active participation in various Industry, Academic & Research domain.	30%
Criteria III	Service to society and the community beyond the nominee's regular employment	Apart from technical competence, Community Services & Volunteer work carried out for redressal of socially oriented problems with the aim of alleviating the conditions of people & community in general.	10%
Criteria IV	Technical Publications/ Patents/ Copyrights	Indicates the peer recognitions of the work carried out and published/ utilised for industrial applications. The significance and quality of such articles/ patents would be an added merit.	30%

References

1. PIB | National Metallurgist Awards -2024
2. Ministry of Steel | National Metallurgist Award Scheme