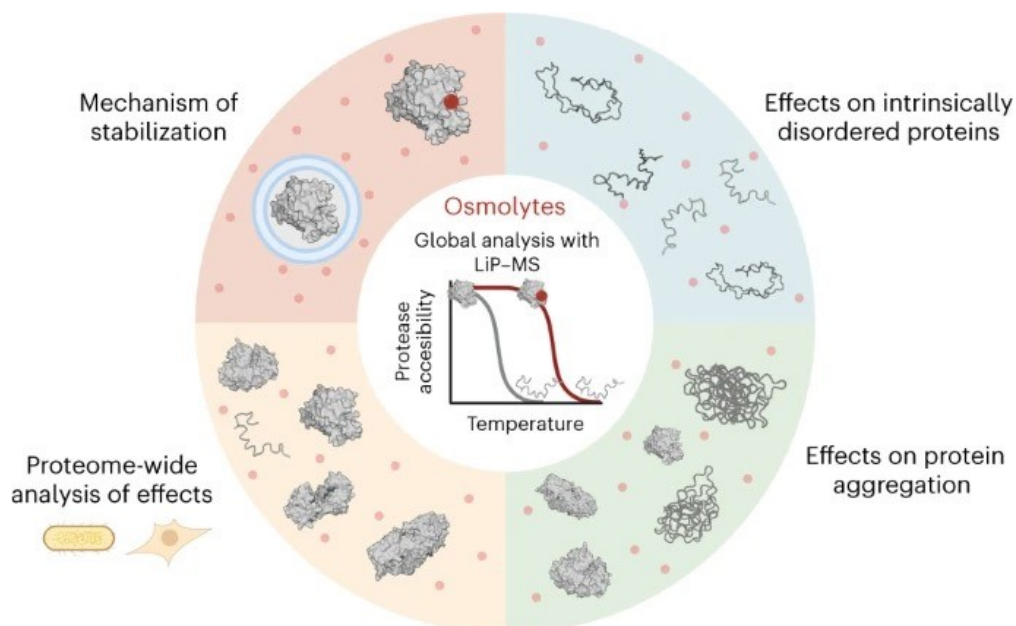


## UPSC Daily Current Affairs | Prelim Bits 06-08-2024

### Osmolyte

Recent research reveals that small molecules known as osmolytes help proteins stay stable and functional under stress.

- **Osmolytes**- These are **small molecules** that stabilize proteins and preventing them from misfolding and ensuring proper function.
- They help cells survive stress and maintain protein stability.
- This makes them potential targets for drug development.



- **Technique Used**- **Covalent magnetic tweezers** to observe protein folding and interaction with osmolytes.
- **Types of osmolytes**
  - **Compatible Osmolytes**- These molecules help stabilize proteins without disrupting their normal function.
  - Examples include urea and glycerol.
  - **Counteracting Osmolytes**- These molecules protect proteins by counteracting the effects of denaturing conditions.
  - Examples - Trimethylamine N-oxide (TMAO) and certain types of amino acids.
- **Findings** - Different osmolytes have varied effects on proteins.
  - **TMAO** -At high concentrations (1.5M), it significantly increases the strength of Protein L, enhancing its resistance to unfolding.
  - Low concentrations have minimal effect on protein unfolding.
  - High levels of TMAO are associated with heart diseases.
  - **Trehalose**- Stabilizes the unfolded state of Protein L.

- **Implications** - Insights into osmolyte-protein interactions can guide the ***development of new drugs*** for neurodegenerative diseases and conditions related to protein misfolding.
- This finding could advance treatments for diseases like ***Alzheimer's and Parkinson's***.

## Reference

[PIB | Osmolyte](#)

## Extended Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA)

The extended Pradhan Mantri Surakshit Matritva Abhiyan has been recently launched by the Ministry of Health & Family Welfare (MoHFW).

- **Launch year**- 2016
- **Nodal agency**- Ministry of Health & Family Welfare.
- **Objectives**- To improving the quality and coverage of Antenatal Care (ANC) including diagnostics and counselling services as part of the *Reproductive Maternal Neonatal Child and Adolescent Health (RMNCH+A) Strategy*.
- To provide free, comprehensive ***antenatal care*** on the ***9th of every month to all pregnant women*** in their ***2nd/3rd trimesters*** at designated public health facilities by medical officers.
- Identification and line-listing of high risk pregnancies.
- Appropriate birth planning and complication readiness for each pregnant woman.
- Diagnostic services for conditions like anemia, gestational diabetes, and hypertension.
- Special focus on adolescent and early pregnancies.
- Providing nutritional supplements at health centers.



**Objectives of  
Pradhan Mantri Surakshit Matritva Abhiyan**

- 1 Antenatal checkup for pregnant women in second or third trimester
- 2 Improve the quality of care during ante-natal visits
- 3 Appropriate birth planning and complication readiness
- 4 Identification & line-listing of high risk pregnancies based on medical history
- 5 Emphasis on early diagnosis, appropriate mngt of women with malnutrition

**9<sup>th</sup> of every month to  
PREGNANT WOMEN'S  
HEALTH**

Website: <http://www.nhp.gov.in/> Toll Free no.: 1800-180-1104

- **Recent changes** - The Government has ***expanded the list of high-risk pregnancy categories*** from ***10 to 25***.
- **High Risk Pregnancy (HRP) categories**- HIV, syphilis, severe anemia, pregnancy-induced hypertension, gestational diabetes mellitus, hypothyroidism, tuberculosis, malaria, previous LSCS, cephalo-pelvic disproportion, bad obstetric history, twins/multiple pregnancy, hepatitis B, abnormal fetal heart rate, teenage pregnancy, high fever, RTI/STI, history of stillbirth, congenital malformation, negative blood group, early primi, elderly primi, grand multipara, and short stature.

***PMSMA's 'I Pledge For 9' Achievers Awards*** 'was initiated to recognize the contribution of private sector doctors who volunteered for the PMSMA scheme.

## References

1. [PIB | Pradhan Mantri Surakshit Matritva Abhiyan \(PMSMA\)](#)
2. [Ministry of Health | Pradhan Mantri Surakshit Matritva Abhiyan](#)

## National Plan for Conservation of Aquatic Ecosystems

*The central government is implementing the National Plan for Conservation of Aquatic Ecosystems (NPCA) to conserve and manage wetlands nationwide.*

- **NPCA** - It is a conservation program for ***wetlands and lakes***.
- It is formed by merging the National Lake Conservation Plan and the National Wetlands Conservation Programme.
- **Objectives** - To holistically ***conserve and restore the wetlands*** for achieving the desired water quality enhancement, besides improvement in ***biodiversity and ecosystems***.
- To promote ***mainstreaming of wetlands*** in developmental programming with States by ***supporting formulation and implementation*** of integrated management plans, capacity development and research.
- **Mode** - It is a ***centrally sponsored scheme***.
- Central assistance is provided ***based on state government proposals***, aligned with guidelines and ***budget availability***.
- **Regulated by-** The ***Wetlands (Conservation and Management) Rules, 2017***, established under the Environment (Protection) Act, 1986.
- **Implemented by-** Ministry of Environment, Forest and Climate Change.
- **NPCA Guidelines** - To facilitate implementation of NPCA by outlining the different steps to be undertaken for preparing and submitting plans before implementation.
- Activities covered - Wastewater treatment, shoreline protection, lakefront development, desilting, stormwater management, bioremediation, catchment area treatment, lake beautification, survey and demarcation, bio-fencing, fisheries development, weed control, biodiversity conservation, education, and community participation.

- It aims on *Restoration & Rejuvenation of at least 100 major wetlands* across the country.
- It is structured based on 4 pronged approach.
- **Wetland Brief Document** - Developing baseline information
- **Wetland Health Card** - Rapid assessment of wetlands condition
- **Wetlands Mitras** - Stakeholder platforms to enable collaborative and participatory management
- **Wetland Integrated Management Plan** - Management planning addressing wetlands' biodiversity and ecosystem services, values and threats.
- In continuation to the first cycle, it is now being scaled up to 1,000 wetlands, reaching out to all districts of the country.

## Reference

[PIB | National Plan for Conservation of Aquatic](#)

## NUE rice variety

*The scientists have identified major natural variations in rice nitrogen use efficiency (NUE), along with key traits and genes linked to this efficiency.*

- **Nitrogen use efficiency (NUE)** - It's the ratio between grain yield or nitrogen uptake by plants to the amount of urea used as input.
- On average, rice plants use only 20-50% of the nitrogen fertilizer applied to them.
- **Significance** - It is used to measure how well rice plants use nitrogen and is crucial for reducing fertiliser waste and environmental pollution.

## NUE rice varieties

- Long duration High NUE rice varieties - Khira and CR Dhan 301.
- Short duration High NUE rice variety - Dhala Heera variety.
- Short duration high NUE varieties are better than long duration varieties.

- **Economic Impact** - Poor NUE causes fertiliser waste worth Rs 1 lakh crore annually in India and \$170 billion globally.
- **Environmental Impact**- Less NUE crops cause greenhouse gas emissions and eutrophication in water bodies.
- **Benefits of High NUE varieties** - Enhanced agricultural sustainability by lowering fertiliser input costs, increased farmer productivity and profitability, and reduced environmental pollution.

*India is a signatory to the Kunming-Montreal Global Biodiversity Framework (2022), which mandates countries to halve their nutrient waste from all sources by 2030.*

## Reference

[Down to Earth | Rice nitrogen use efficiency](#)

