DAILY CURRENT AFFAIRS 05-03-2024

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GS-3

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4. **Graphene Innovation Center**
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Mission Utkarsh

Syllabus: GS-2: Social Justice – Health sector.

Context:

- **Mission Utkarsh Against Anaemia** *is a joint initiative by the Ministry of Ayush (AYUSH) and the* **Ministry of Women and Child Development** *(WCD) in India.*

More about Mission Utkarsh:

- *It aims to* **improve the nutritional status of adolescent girls** *(aged 14-18 years) in five aspirational districts across five states, ultimately working towards an* **"Anaemia Mukt Bharat" (Anaemia Free India).**
- **The five target districts are:**
  - *Dhubri, Assam*
  - *Bastar, Chhattisgarh*
  - *Paschimi Singhbhum, Jharkhand*
  - *Gadchiroli, Maharashtra*
  - *Dhaulpur, Rajasthan*
- *The project uses Ayurvedic interventions to address anaemia in these girls.*

The specific Ayurvedic interventions used in Mission Utkarsh may include:

- **Herbal formulations:** *These may be given to improve iron absorption and address other nutritional deficiencies.*
- **Dietary modifications:** *This may involve guidance on incorporating iron-rich foods and other healthy options into the girls' diets.*
- **Lifestyle changes:** *This may include recommendations for getting adequate sleep and exercise.*
- **Mission Utkarsh is a pilot project**, *and its success will be evaluated to determine whether it can be scaled up to other parts of India.*
- *The project is expected to benefit* **not only the targeted girls but also their families** *and communities.*
- **By addressing anaemia**, *Mission Utkarsh can help to improve the overall health and well-being of adolescent girls in India.*

Exercise MILAN 2024

Syllabus: GS-2: Multilateral Relations – Military exercises.

Context:

- **MILAN 2024 Closure:** *The culmination of Exercise MILAN 2024 recently took place during the closing ceremony aboard the INS Vikrant, concluding the Sea Phase off Visakhapatnam.*

Understanding MILAN 2024:

- **12th Edition:** *MILAN 2024 represents the 12th instalment of the biennial Multilateral Naval Exercise conducted at Visakhapatnam, under the Eastern Naval Command's jurisdiction.*
- **Objective:** *MILAN aims to foster professional engagement among friendly navies and to cultivate expertise in multilateral large-force operations at sea.*
- **Inception:** *Originating in the Andaman and Nicobar Islands in 1995, this edition saw participation from the navies of Indonesia, Singapore, Sri Lanka, and Thailand.*

Exercise Phases:

- **Harbour Phase:** *Featuring an International Maritime Seminar, city parades, tech exhibitions, expert exchanges, youth officer gatherings, and sports events. The seminar's theme was* **'Partners across Oceans: Collaboration, Synergy, Growth**.'
- **Sea Phase:** *Involving ships and aircraft from friendly nations alongside Indian Navy carriers and other units.*

Nano Urea

Syllabus: Agriculture – Fertiliser.

Context:

- *India to replace 2.5 million tonnes of conventional urea with nano urea in FY24, minister says.*

About Nano Urea:

- *Nano Urea is an* **innovative Agri-input utilizing nanotechnology** *to deliver nitrogen to plants.*

- *Developed and patented by the Indian Farmers Fertiliser Cooperative Limited* **(IFFCO).**
- *IFFCO Nano Urea holds the distinction of being the* **sole nano fertilizer endorsed by the Government of India** *and incorporated into the Fertilizer Control Order (FCO).*

Features:

- *Nano Urea boasts a particle size* **ranging from 20-50 nm**, *offering significantly more surface area compared to conventional urea prills (10,000 times greater than 1 mm urea prill) and a higher number of particles (55,000 nitrogen particles over 1 mm urea prill).*
- *It contains 4.0 % total nitrogen (w/v).*

Benefits:

- *Manufactured through an* **energy-efficient, environmentally friendly process** *with reduced carbon footprints.*
- **Enhances nutrient availability** *to crops by over 80%, leading to increased nutrient use efficiency.*
- *Expected to* **enhance crop productivity**, *promote soil health, and improve the nutritional quality of produce while addressing concerns regarding the imbalanced and excessive use of conventional fertilizers.*

Indian Farmers Fertiliser Cooperative Limited (IFFCO):

- *India's largest* **multi-state cooperative society**, *wholly owned by Indian cooperatives.*
- *Primarily focused on fertilizer production and distribution.*
- *Headquarters located in* **New Delhi, India.**

Graphene Innovation Center

Syllabus: GS-3: Science and Technology –Electronics.

Context:

Recently, MeitY Secretary S Krishnan launched a Centre of Excellence (CoE) in Intelligent Internet of Things (IIoT) Sensors and India's first graphene centre - India Innovation Centre for Graphene (IICG) in Kerala.

About IICG

- *The* **India Innovation Centre for Graphene** *(IICG) is a collaborative initiative funded by the* **Ministry of Electronics and Information Technology** *(MeitY), the Government of India, the State Government of Kerala, and Tata Steel Limited, along with various industries.*
- *Implemented jointly by the* **Centre for Materials for Electronics Technology** *(C-MET),* **Digital University Kerala (DUK),** *and Tata Steel Limited, IICG aims to explore the science and technology of graphene and other 2D materials.*
- *It seeks to* **foster partnerships between industry and academia** *to promote innovative research with a focus on practical applications.*
- *IICG aims to* **attract leading international research** *on graphene to India and bridge the gap between scientific advancements and industrial applications of graphene in the country.*
- *The* **center plans to establish facilities** *and acquire sophisticated equipment to support research aligned with industry needs.*

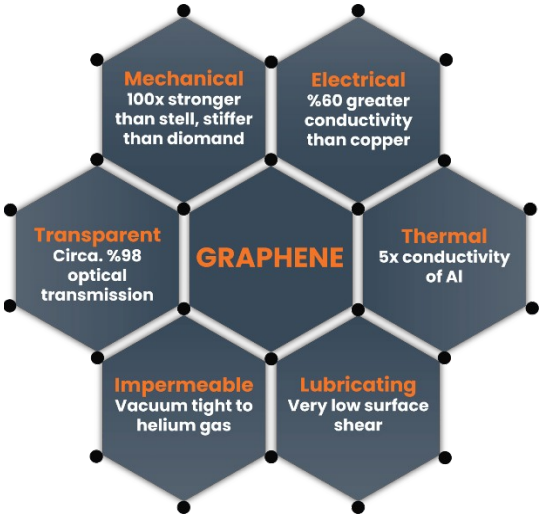
Main research areas include:

- **Large-scale and large area single/few-layer graphene production** *in collaboration with Indian graphene industries.*
- **Nanoscale carbon** *and other 2D material composite technology.*
- **Research and development** *of graphene optoelectronic products such as graphene intelligent windows and touch screens.*
- *Development of* **graphene-based smart integrated devices** *on flexible/transparent substrates with energy storage capabilities.*
- **Exploration of graphene energy** *conversion devices like supercapacitors, fuel cells, and batteries.*
- **Advanced lithographic techniques** *for device fabrication.*

What is Graphene?

- *Graphene is a* **one-atom-thick layer of carbon atoms** *arranged in a* **hexagonal lattice structure.**
- *It is* **derived from graphite** *but possesses unique properties.*
- *Graphene is* **incredibly thin, flexible, transparent***, and* **exceptionally strong***.*
- *It holds the title of being the* **thinnest, most electrically and thermally conductive** *material known.*
- *Considered a* **wonder material,** *graphene has remarkable electrical and electronics properties.*
- *Studies suggest it could* **replace Indium in smartphone OLED screens***, potentially reducing costs.*

- **Graphene shows promise** *in various applications including anti-corrosion coatings, precise sensors, faster electronics, flexible displays, efficient solar panels, rapid DNA sequencing, drug delivery, and more.*



Applications:

- **Anti-corrosion coatings and paints:** *Graphene's impermeable structure makes it an excellent barrier against moisture and chemicals, making it useful for protecting surfaces from corrosion.*
- **Efficient and precise sensors:** *Graphene's high surface area and conductivity make it ideal for sensors, enabling the detection of various substances with high sensitivity and accuracy.*
- **Faster and more efficient electronics:** *Graphene's exceptional electrical conductivity allows for the development of faster and more energy-efficient electronic devices, potentially revolutionizing the electronics industry.*
- **Flexible displays:** *Graphene's flexibility and transparency make it suitable for flexible and bendable display screens, leading to the development of foldable smartphones, wearable electronics, and other innovative devices.*
- **Efficient solar panels:** *Graphene's high electrical conductivity and light-absorbing properties make it an ideal material for enhancing the efficiency of solar panels, enabling more effective conversion of sunlight into electricity.*
- **Rapid DNA sequencing:** *Graphene-based nanopores can be used to sequence DNA rapidly and accurately, offering significant advancements in genomic research and personalized medicine.*
- **Drug delivery systems:** *Graphene-based materials can be engineered to deliver drugs with precision, targeting specific cells or tissues, thereby enhancing drug efficacy and reducing side effects.*

Indian Leopard population

Syllabus: GS-3: Wildlife – protection and conservation.

Context:

- *India's leopard numbers rose by 8% from 12,852 in 2018 to 13,874 in 2022, according to a report made public by the Environment Ministry on 29th February 2024.*

Leopard Population Growth in India (2018-2022)

- *Overall Increase: India's leopard numbers rose by 8% from 12,852 in 2018 to 13,874 in 2022.*

Distribution by States

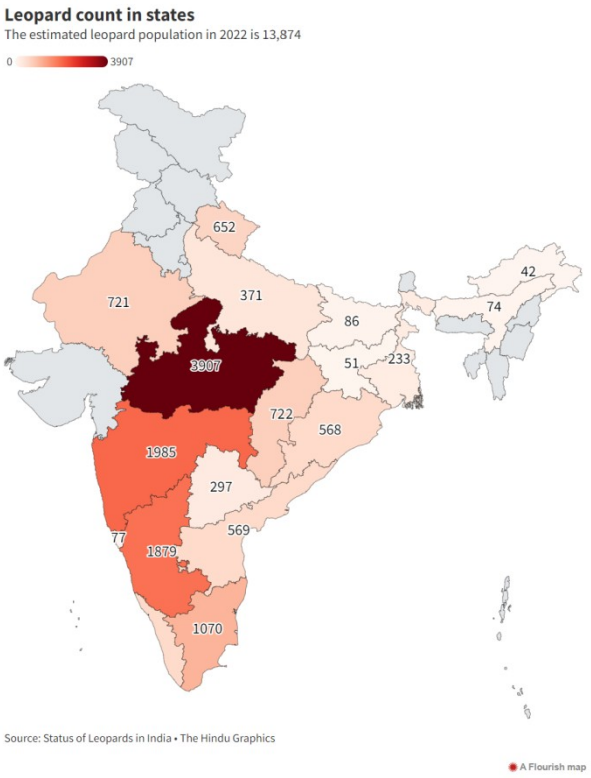
- *Madhya Pradesh: Highest number of leopards reported (3,907).*
- *Maharashtra: 1,985 leopards.*
- *Karnataka: 1,879 leopards.*
- *Tamil Nadu: 1,070 leopards.*

Decline and Rise in Specific Regions

- **Uttarakhand:** *Reported a 22% decline due to poaching and man-animal conflict.*
- *Arunachal Pradesh, Assam, West Bengal: Saw a collective 150% rise to 349 animals.*

Habitat Conservation Efforts

- **Protected Areas:** *About a third of the leopards are within protected areas.*
- *Efforts to conserve leopard habitat are integral to tiger reserves conservation.*



Habitat and Population Dynamics

- **Habitat Diversity:** *Leopards are found in diverse habitats, including villages and cities.*
- *Their adaptability contributes to conflict situations and higher mortality.*

Population Trends and Analysis

- **Population Stability***: Population in the last four years remained stable, with minimal growth.*
- **Regional Variations***: Different regions showed different growth rates or declines.*

Methodology of Survey

- **Survey Coverage:** *Covered 20 States and about 70% of expected habitat.*
- *Method: Surveyors travelled extensive distances for carnivore signs and prey abundance estimation, utilizing camera traps extensively.*

Explanation for Northeastern Rise

Sampling Artefact: *Sharp rise in northeastern States attributed to limited previous systematic surveys and fewer camera installations*