DAILY CURRENT AFFAIRS 31-07-2024

GS-1

1. **Lithium**

GS-2

2. **A Case for legal advisory council**

GS-3

3. **Global Capability Centres (GCCs)**
4. **Agarwood**
5. **Dark Oxygen**

Lithium

Syllabus: GS-1; Minerals

Context

1. *Union Minister Dr. Jitendra Singh, who oversees multiple portfolios including Science and Technology and Earth Sciences, announced the discovery of lithium resources in Karnataka's Mandya and Yadgiri districts.*
2. *investors did not pick up Jammu and Kashmir lithium block in auction*

Reason

- *Difficulty in extracting and processing lithium, and sub-par reporting standards have kept investors away*

About

- *Lithium, a silvery-white alkali metal, is renowned for its unique properties and diverse applications. As the lightest solid element, it has gained immense importance in various industries, particularly in the burgeoning energy sector.*

Properties

- *Symbol: Li*
- *Atomic number: 3*
- *Atomic mass: 6.941 u*
- *Appearance: Soft, silvery-white metal*
- *Density: Lowest of any solid element*
- *Reactivity: Highly reactive with water and air*
- *Isotopes: Two stable isotopes, lithium-6 and lithium-7*

Occurrence

- **Natural state:** *Does not occur in its pure form*
- **Primary sources:**
  - *Pegmatite minerals (spodumene, petalite, lepidolite)*
  - *Brines (salt lakes, geothermal waters)*
  - *Clay minerals*

Production

- **Mining***: Extraction from mineral deposits*
- **Brine extraction***: Pumping brine solutions and evaporating to obtain lithium compounds*
- **Refining:** *Conversion of lithium compounds into lithium carbonate or hydroxide*

Applications

- *Energy Storage*
  - **Lithium-ion batteries:** *The cornerstone of portable electronics (smartphones, laptops), electric vehicles, and grid-scale energy storage.*
  - **Rechargeable batteries:** *High energy density and long cycle life make lithium-ion batteries the preferred choice.*

Other Applications

- **Metallurgy:** *Lithium alloys improve the strength and weight-to-strength ratio of aluminum and magnesium.*
- **Ceramics and glass:** *Lithium compounds enhance the properties of glass and ceramics.*
- **Lubricants:** *Lithium-based greases are resistant to high temperatures and pressures.*
- **Pharmaceuticals***: Lithium carbonate is used to treat bipolar disorder.*
- **Nuclear technology:** *Lithium-6 is used in nuclear reactors.*

Environmental and Economic Considerations

- **Supply chain:** *Concerns over the environmental impact of lithium mining and processing.*
- **Price volatility:** *Fluctuations in lithium prices due to market demand and supply.*
- **Recycling:** *Efforts to recover lithium from used batteries to reduce environmental impact and secure supply.*

A Case for legal advisory council

Syllabus: GS-2: Indian Polity – Laws and Policies.

Context:

- *In this context, continuous, informed, and empirically valid legal inputs to the government from well-structured think tanks could be vital in clarifying the real intent of certain legislation.*
- *There is a case to be made for the establishment of a Legal Advisory Council (LAC) to the Prime Minister akin to the Economic Advisory Council (EAC).*

Need for Enhanced Legal Consultancy

- **Review Process:**
  - *Need for continuous, informed, and empirically valid legal inputs.*
  - *Establishment of well-structured think tanks to clarify legislative intent.*
- **Legal Advisory Council (LAC):**
  - *Proposal for LAC to the Prime Minister, similar to the Economic Advisory Council (EAC).*

Recent Legal Issues

- **Electoral Bonds Scheme:**
  - *Declared unconstitutional by the Supreme Court.*
  - *Violation of the right to information of voters.*
  - *Foreseeable challenge if proportionality test conducted earlier.*
- **Aadhaar Act (2016):**
  - *Supreme Court intervention in K.S. Puttaswamy v. Union of India (2018) could have been avoided with prior examination.*
- **Transporter Strike:**
  - *Provisions under section 106(2) of Bharatiya Nyaya Sanhita, 2023.*
  - *Penalty for fleeing accident scene raised disproportionate law application concerns.*
  - *Nationwide strikes called off after government agreed to amend the provision.*

Addressing Legal Viability and Impact Assessments

- **Role of National Law Universities:**
  - *Equipped with expertise to assist in formulating constitutionally viable and socially acceptable laws.*
  - *National Law University Delhi Act, 2008 emphasizes law, legislation, and judicial institutions study and training.*
- **Utilizing Academic Expertise:**

- *Regular research references from national law universities to Central and State governments.*
- *Example: Committee for Reforms in Criminal Laws at National Law University Delhi.*

Proposing a Legal Advisory Council (LAC)

- **Functions of LAC:**
  - *Legal analysis of issues referred by the Government of India.*
  - *Impact and outcome analysis of contemplated laws.*
  - *Suo motu legal research on contemporary issues.*
- **Composition:**
  - *Legal luminaries, jurists, academicians, and researchers.*
  - *Specializations in criminal law, trade law, international law, business laws, and taxation laws.*

Differentiation from Law Commission of India (LCI)

- **Operational Differences:**
  - *LCI functions under Ministry of Law and Justice, reactive role.*
  - *LAC to work with PMO, anticipatory role in legislative impact analysis.*
- **Engagement and Effectiveness:**
  - *Low engagement between government and LCI.*
  - *Only four reports by 22nd Law Commission (2020-2024).*
  - *Only 50% implementation of LCI recommendations.*
  - *Average of 4.19 reports per year since inception.*

Conclusion

- **Need for Dynamic Legal Bodies:**
  - *Leveraging academic potential of national law universities.*
  - *Creation of LAC for navigating legal challenges.*
  - *Not the only solutions but crucial for proactive legal consultancy.*

Global Capability Centres (GCCs)

Syllabus: GS-3: Indian Economy – growth and development

Context:

- *Indians now hold 10-13% of leadership spots in global capability centres.*

Economic Contribution

- **GDP Contribution***: GCCs contribute over 1% to India's GDP.*
- **Services Exports***: In FY24, GCCs accounted for 26% of services exports under 'other business services,' second only to IT services at 48%.*

Employment and Sectors

- **Employment***: GCCs employ approximately 3.2 million professionals.*
- **Key Areas***:*
    - **Engineering, Research, and Development (ER&D)**
    - **Business Process Management (BPM)**
    - **IT Services**

Geographic Expansion

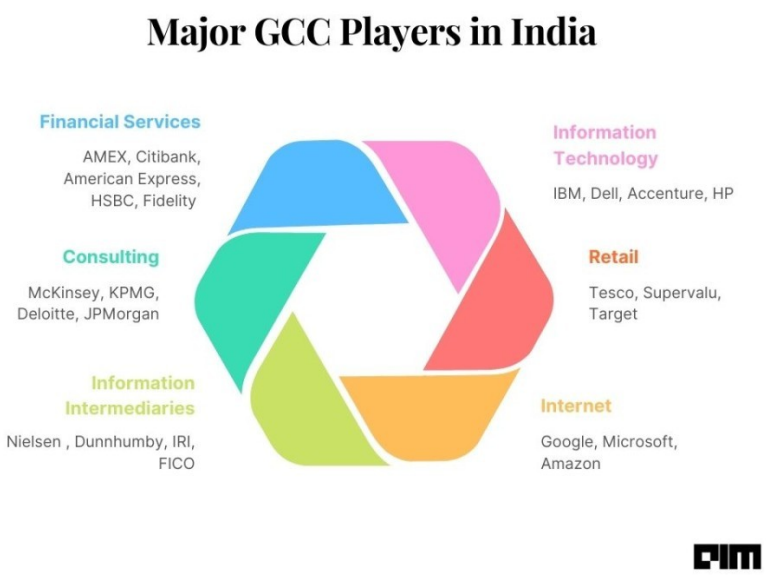
- **Tier-II Cities***: Increasingly establishing operations in tier-II cities due to cost advantages and access to fresh talent pools.*

Government Support

- **Initiatives***:*
    - **Digital India***: Facilitates digital infrastructure and connectivity.*
    - **Supportive State Policies***: Particularly in Karnataka, Telangana, and Tamil Nadu.*
- **Sectors Benefiting***:*
    - *Automotive*
    - *Electric Vehicles*
    - *Electronics*
    - *Pharmaceuticals*
    - *Life Sciences*

Key Points

- **Significant Contributor***: GCCs are a major part of India's economic framework.*
- **Employment Generation***: Providing jobs to millions of skilled professionals.*
- **Government Support***: Benefiting from national and state-level initiatives.*
- **Regional Expansion***: Moving to tier-II cities for strategic advantages.*



Analysis

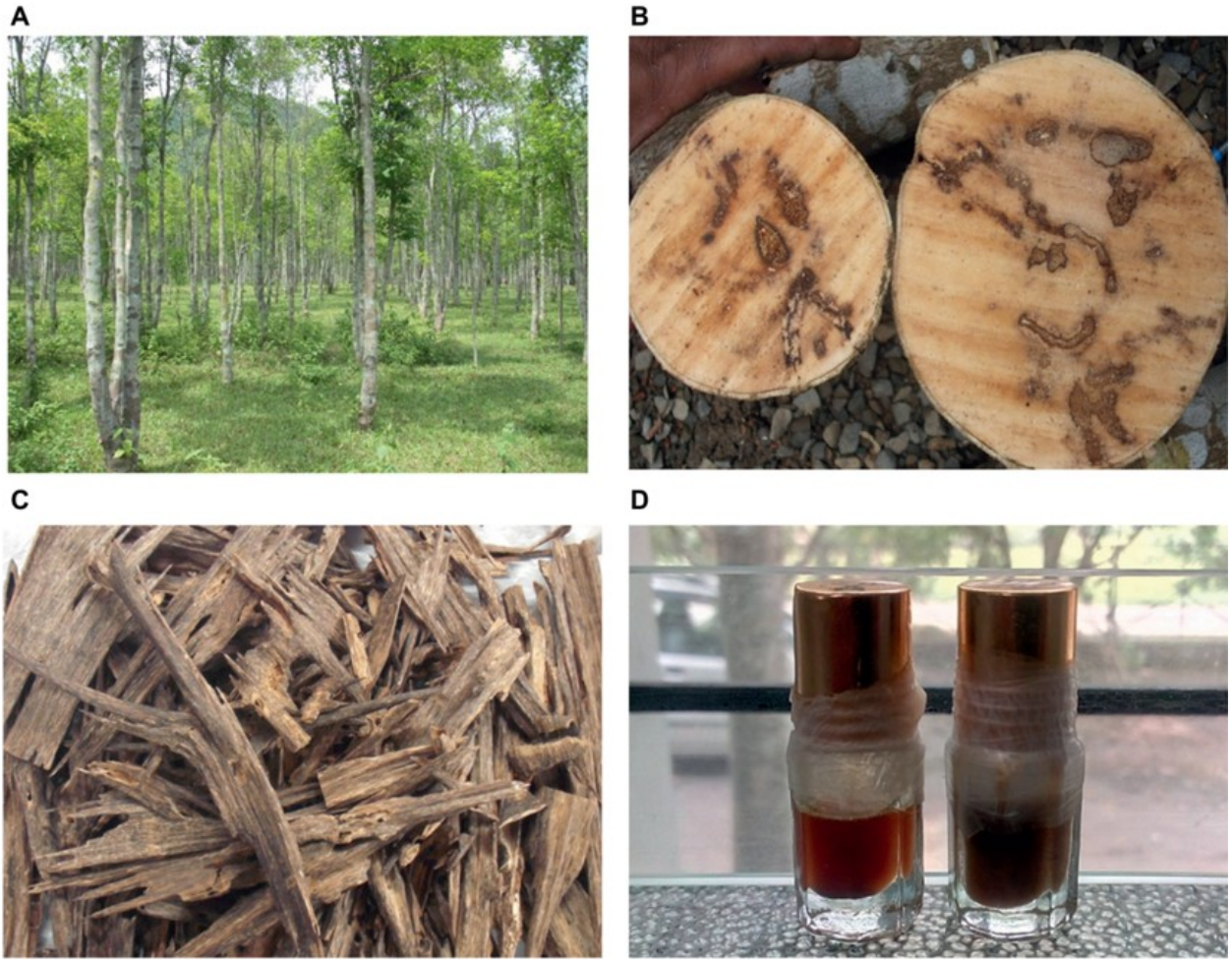
- *GCCs have a* **significant role in driving India's economic growth***, especially in the services sector.*
- *Their contribution* **to exports and employment** *showcases their importance.*
- *The trend of* **expanding into tier-II cities** *indicates a strategic approach to leverage cost efficiencies and tap into new talent pools.*
- *Government initiatives further bolster this growth, highlighting a synergistic relationship between policy and industry.*
- *This dynamic is* **particularly evident in technologically** *advanced and high-growth sectors, ensuring continued relevance and expansion of GCCs in India.*

Agarwood

Syllabus: GS-3; Agriculture

Context

- *CITES eases export of agarwood from India, move to benefit lakhs of farmers*
- *Given that agarwood is cultivated in different parts of India, especially in the northeast, the development is going to benefit lakhs of farmers in Assam, Manipur, Nagaland, and Tripura*



About

- *Agarwood, also known as oud, is a highly valued resinous wood formed in trees of the Aquilaria genus. It is used in a variety of ways, including incense, perfume, and traditional medicine. Agarwood has a long history of use in many cultures, dating back thousands of years.*

Formation

- *Agarwood forms when a tree becomes infected with a type of mold, which causes the tree to produce a resin in response. This resin is what gives agarwood its distinctive fragrance.*

Uses

- *Incense: Agarwood is burned as incense in many religious and cultural ceremonies. It is also used in homes and businesses for its pleasant aroma.*
- *Perfume: Agarwood is a popular ingredient in perfumes, both for its fragrance and its perceived aphrodisiac qualities.*
- *Traditional medicine: Agarwood has been used in traditional medicine for centuries to treat a variety of ailments, including anxiety, insomnia, and digestive problems.*

Benefits

- *Relaxation: The aroma of agarwood is said to have a calming and relaxing effect on the mind and body.*
- *Improved mood: Agarwood is believed to help improve mood and reduce stress.*
- *Aphrodisiac: Agarwood is often used as an aphrodisiac in many cultures.*
- *Antioxidant: Agarwood contains antioxidants, which can help protect cells from damage.*

Safety

- *Agarwood is generally considered safe when used in moderation. However, it can cause allergic reactions in some people. It is also important to note that agarwood is a very expensive ingredient, so it is important to be careful when purchasing agarwood products.*

Conclusion

- *Agarwood is a valuable and versatile natural resource with a long history of use. It is prized for its fragrance, its perceived health benefits, and its cultural significance.*

Know more

CITES: Protecting Wildlife Through Trade Regulation

- *CITES stands for the* **Convention on International Trade in Endangered Species of Wild Fauna and Flora.**
- *It's an international agreement between governments to regulate or ban international trade in species under threat.*

How CITES Works

- **Lists species:** *CITES categorizes species into three appendices based on their level of threat:*
  - **Appendix I:** *Species facing extinction, trade is strictly prohibited except in exceptional circumstances.*
  - **Appendix II:** *Species not necessarily threatened with extinction but trade must be monitored to avoid exploitation.*
  - **Appendix III***: Species protected in at least one country and require cooperation for trade control.*
- **Permits and certificates***: Trade in CITES-listed species requires permits or certificates issued by the exporting and importing countries.*
- **Enforcement:** *CITES relies on member countries to enforce its regulations and cooperate in combating illegal wildlife trade.*

Importance of CITES

- **Conservation:** *By regulating trade, CITES helps protect endangered species from overexploitation.*
- **Sustainability:** *It promotes sustainable use of wildlife resources.*
- **International cooperation:** *It fosters collaboration among countries to combat illegal wildlife trade.*

Dark Oxygen

Syllabus: GS-3: Environment – Deep Sea region

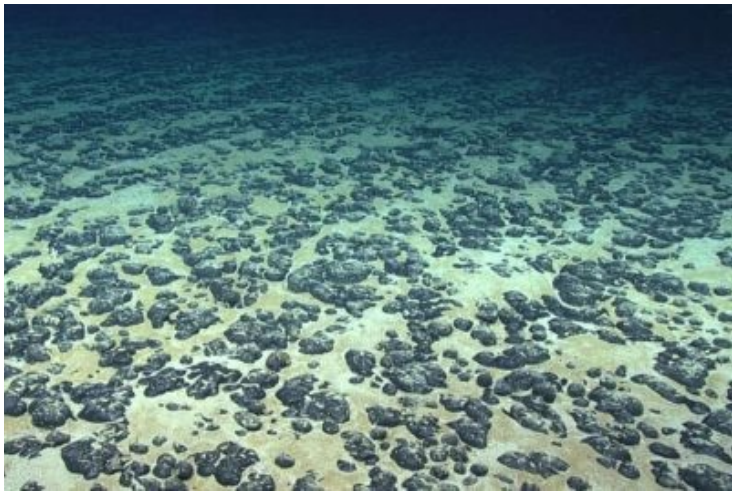
Context:

- *Scientists have discovered an* **unknown process producing oxygen** *deep in the oceans where it is* **too dark for photosynthesis to occur.**
- *This discovery was reported on July 22, 2024 in the* **journal Nature Geoscience.**
- *The finding* **is significant as oxygen supports life***, implying the existence of previously unknown ecosystems in these dark ocean depths.*

Source of Oxygen Production

- *One explanation for the oxygen production is that* **polymetallic nodules on the ocean floor** *might be* **transporting electric charges***, which split water molecules and release oxygen.*

- *Polymetallic nodules are* **lumps of iron, manganese hydroxides,** *and rock, partially submerged in many parts of the ocean floor.*



Economic and Strategic Implications

Mining Feasibility

- *Mining these nodules is considered economically feasible* **if their concentration exceeds 10 kg per square meter.**
- *Many countries are planning to* **mine these nodules as a new resource***.*

India's Deep Ocean Mission

- *On July 22, 2024, Reuters reported that* **India plans to apply for licenses to explore for deep-sea minerals** *in the Pacific Ocean.*
- *India's Ministry of Earth Sciences is* **building a submersible vehicle** *to look for and mine similar resources in the Indian Ocean as part of* **its 'Deep Ocean Mission'.**

Study Details

Research Location

- *The study was conducted in the* **Clarion-Clipperton Zone***, a part of the ocean floor off Mexico's west coast.*
- *This zone covers an area larger than India and contains the* **world's highest concentration of polymetallic nodules,** *including 6 billion tonnes of manganese and over 200 million tonnes each of copper and nickel.*

Experimental Findings

- *While conducting* **experiments at a depth of 4 km***, scientists noticed that oxygen concentrations in some places increased rapidly instead of decreasing.*

- *They used a device that isolated a* **small volume of the ocean floor** *and measured oxygen levels, finding that oxygen sometimes tripled in just two days.*

Understanding the Abyssal Zone

Characteristics

- *The abyssal zone is an* **underwater region** *that receives too little sunlight for photosynthesis.*
- *Life forms in this zone get oxygen from water brought in by a global circulation called the* **'Great Conveyor Belt'.**
- *Despite the expected low oxygen levels, the scientists* **found local oxygen production.**

Nodule Characteristics

- *The surfaces of the nodules had a* **voltage of up to 0.95 V.**
- *Although splitting one water* **molecule requires 1.5 V,** *the researchers suspected that the voltage could build up if many nodules are close together, like cells of a battery, potentially producing oxygen.*

Implications for Deep-Sea Mining

Environmental Concerns

- *The discovery of 'dark oxygen' raises concerns about* **how deep-sea mining could affect marine ecosystems that rely on this oxygen.**
- *Historical data from the* **Disturbance and Recolonisation** *(DISCOL) Experiment in the Peru Basin showed long-term environmental impacts from simulated mining activities.*

Potential Risks

- *A 2019 study found that the* **effects of simulated mining impacts** *were still evident after 26 years, with significantly lower biodiversity in disturbed areas.*
- *If these results can be extrapolated to the* **Clarion-Clipperton Zone,** *mining impacts could lead to irreversible loss of some ecosystem functions.*

Future Considerations

Knowledge Gaps

- *Scientists know less* **about ecosystems in the abyssal zone** *compared to those aboveground.*
- *Models used to predict the* **fate of these ecosystems** *and their role in global climate processes could be unreliable.*

Insurance and Policy Responses

- *On July 20, three* **major European insurance companies** *announced they would exclude deep-sea mining from their underwriting portfolios due to environmental concerns.*
- *Finding* **sustainable ways to conduct deep-sea mining** *is crucial to avoid rendering the practice altogether infeasible.*