

DAILY CURRENT AFFAIRS (DCA)

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RAKHIGARHI FINDINGS IN NCERT BOOKS ADDED

Context

- The National Council of Educational Research and Training (NCERT) has proposed to add findings from the archaeological site of Rakhigarhi in Haryana.

What are the DNA Findings?

- The study of ancient DNA from archaeological sources in Rakhigarhi, Haryana suggests that the genetic roots of the Harappans go back to 10,000 BCE.
- The DNA of the Harappans has continued till today and a majority of the south Asian population appears to be their descendants.
- The study indicates **genetic continuity** without large-scale immigration.
- People from bordering areas and distant regions were **absorbed into Indian society**.

Rakhigarhi

- Site location:** The present-day Rakhigarhi is located 27 km from the Ghaggar river, in the Ghaggar-Hakra river plain.
- The archaeological site, dating back to **2600-1900 BCE**.
- It is the **largest Harappans site** in the Indian Subcontinent.
- Findings**
 - Granary:** A granary belonging to the mature Harappan phase (2600 BCE to 2000 BCE) has been found here. It has 7 rectangular or square chambers.
 - Culture, clothing and worship:** Fire altars and apsidal structures were revealed in Rakhigarhi.
 - Cemetery and burial sites:** A cemetery of Mature Harappan period is discovered at Rakhigarhi, with eight graves found.



Source: TH

INDIA'S COAL AND LIGNITE PRODUCTION HITS ALL-TIME HIGH

In News

- India has for the first time crossed the milestone of 1 billion tonnes of coal and lignite production in the financial year 2023-24.

About the Coal Deposits

- The Indian coal deposits are primarily concentrated in the **Gondwana sediments** occurring mainly in the **eastern and central parts of Peninsular India**, although Gondwana coal deposits also occur in **Assam and Sikkim** in the north eastern part of the country.
 - The Tertiary coal-bearing sediments are found in **Assam, Arunachal Pradesh, Nagaland and Meghalaya**.
- Coal resources have been found mainly in West Bengal, Jharkhand, Bihar, Odisha, Chhattisgarh, Madhya Pradesh, Andhra Pradesh, Telangana, Maharashtra and a few states of North-Eastern Region.

Do you know ?

- Lignite is a low grade brown coal**, which is soft with high moisture content.
- The principal lignite reserves are in **Neyveli in Tamil Nadu** and are used for generation of electricity.
 - Other areas where lignite deposits have been located are Gujarat, Jammu & Kashmir, Kerala, Rajasthan, West Bengal and Puducherry
- Coal that has been buried deep and subjected to **increased temperatures is bituminous coal**.
 - It is the most popular coal in commercial use.
 - Anthracite is the highest quality hard coal.

Status

- India's total **coal and lignite** output was at 937 million tonnes (MT) in the preceding 2022-23 fiscal, as per official figures.
- Owing to favourable support from the Government resulting in capacity expansion, coal and lignite production has grown by more than 70 per cent over the last 10 years.
- The world's second largest consumer, after China, had produced 937.22 mt of coal and lignite in FY23.

- ♦ India surpassed the one billion tonnes production milestone on March 22, 2024, going past FY23's entire production 25 days in advance.
- **Majorly imports:** Indonesia, Australia and South Africa

Importance

- Coal is the most important and abundant fossil fuel in India. It accounts for 55% of the country's energy needs.
 - ♦ The country's industrial heritage was built upon indigenous coal.
- Coal accounts for over **70% of India's electricity output**, and utilities account for about 75% of India's coal consumption.
- Coal plays a pivotal role in sustainable development and an essential input to most steel production
- In addition, other industries like cement, fertilizer, chemical, paper and thousands of medium and small-scale industries are dependent on coal for their process and energy requirements
- Apart from creating direct employment opportunities, mining activities also generate significant indirect employment, contributing to socio-economic development.

Issues and Challenges

- **Environmental:** From mining to coal cleaning, from transportation to electricity generation to disposal, coal releases numerous toxic pollutants into the air, water and land.
 - ♦ These disrupt ecosystems and endanger human health
- **Shortage :**
 - ♦ As coal production is increasing, resource is depleting at a faster rate
 - ♦ The biggest reason for coal shortage is the increasing power demand.
- Un-seasonal and extended Rainfall in the coal bearing areas.
- Non-Payment of commensurate Coal value along with huge outstanding dues by Power Sector consumers.
- Frequent Labour/ Industrial Relation (IR) issues in the Coal fields.
- Land acquisition issues.

Conclusion and Way Forward

- India is increasing renewable capacity but it will also have to rely on coal power until it achieves developed country status
 - ♦ Countries reached a historic deal on a 'transition away from fossil fuels' at COP28 in Dubai while emerging economies like India and China strongly resisted the targeting of coal.
- There is a need to revise the emission standards for coal power plants for particulates and introduce new emission standards for other pollutants.
 - ♦ Reuse and recycling can also reduce the environmental effects of coal production and use.
- India's long-term goal of reaching net-zero by 2070, it must continue to implement clean coal technologies to reduce the power sector's emissions.

Recent Coal Sector Reforms

- **1973:** Nationalisation of Coal mining was done.
 - ♦ Pvt. Sector only uses it for captive (own) purpose.
- **2014:** SC cancels Coal blocks.
- **2015:** Coal Mines (Special provisions) (CMSP) Act introduced (Pvt Sector involved through auctioning)
- **2020:** Mineral Laws (Amendment) Act (Removal of restriction on end-use of coal)
 - ♦ Right to exploit **coal bed methane (CBM)** and minor minerals have been provided
- **Others: Prakash Portal** for coordination, Infra under AtmaNirbhar Policy.
 - ♦ Online single-window clearance system.

Source: Air

COMBATING ANTIMICROBIAL RESISTANCE (AMR)

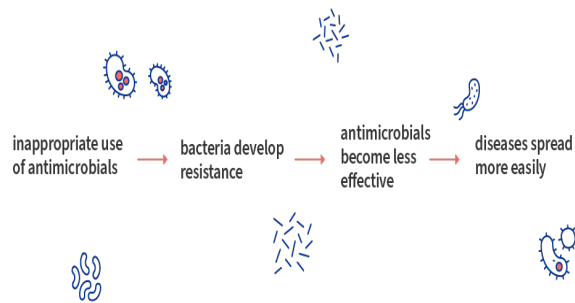
Context:

- Recently, the **Global Steering Group on Antimicrobial Resistance** published a report highlighting the urgent need for action to combat antimicrobial resistance (AMR).

Antimicrobial Resistance (AMR)

- It is a significant global health threat that is rapidly escalating. It occurs when **microorganisms such as bacteria, viruses, fungi, and parasites** change in ways that render the medications used to cure the infections they cause ineffective.

- It does not mean our body is resistant to antibiotics or antifungals.
 - ♦ It means the bacteria or fungi causing the infection are resistant to the antibiotic or antifungal treatment.
- When the microorganisms become resistant to most antimicrobials, they are often referred to as 'superbugs'.



Do you know?

- Most germs are harmless and even helpful to people, but some can cause infections, and make people, crops, or animals sick.
 - ♦ Harmful germs are called pathogens.
- Antimicrobials is a term used to describe drugs that treat many types of infections by killing or slowing the growth of pathogens causing the infection.

For Example:

- **Bacteria** cause infections such as strep throat, foodborne illnesses, and other serious infections.
 - ♦ Antibiotics treat bacterial infections.
- **Fungi** cause infections like athlete's foot, yeast infections, and other serious infections.
 - ♦ Antifungals treat fungal infections.

Causes of AMR

- The **misuse and overuse** of antimicrobials in humans, animals, and plants are the main drivers in the development of drug-resistant pathogens.
- **In India**, hospitals generally lack effective mechanisms to prevent the spread of infections from one patient to the other.
 - ♦ Hence, they rely on the widespread use of antibiotics to achieve this purpose.
- The second, and major, contributor to **antibiotic resistance is agriculture**.
- Sectors like **poultry**, where antimicrobials are injected into animals to resist diseases due to poor sanitation and other infectious environments, fuel antimicrobial resistance extensively.

The Scale of the Problem

- **Leading Cause of Death:** AMR is already one of the world's leading causes of death, **directly responsible for 1.27 million deaths a year**, including one in five in children under five, mainly in low - and middle - income countries.
 - ♦ In India alone, nearly 300,000 deaths were due to AMR in 2019.
- **Life Expectancy:** If left unchecked, AMR is expected to **reduce life expectancy by an average of 1.8 years by 2035**, leading to unprecedented healthcare costs and economic losses.
- **Existential Threat:** AMR represents an existential threat to modern medicine. Without functional antimicrobials to treat bacterial and fungal infections, even the most common surgical procedures, as well as cancer chemotherapy, will become fraught with risk from untreatable infections.
- **Rapidly Increasing Threats:** The world now has a limited and critical window of opportunity to respond at the scale and with the urgency proportionate to the rapidly increasing threats posed by AMR.
- **Medical Procedures and Treatments:** AMR puts many of the gains of modern medicine at risk. It makes infections harder to treat and makes other medical procedures and treatments – such as surgery, caesarean sections, and cancer chemotherapy – much riskier.
- **Economic Impact:** Within a decade, AMR is estimated to cost the world \$412 billion a year in additional health costs and \$443 billion a year in lost labour productivity.
 - ♦ The **World Bank** estimates that AMR could result in US\$ 1 trillion additional healthcare costs by 2050, and US\$ 1 trillion to US\$ 3.4 trillion gross domestic product (GDP) losses per year by 2030.

Measures to Combat AMR

- **Preventing Infections:** Implementing effective infection prevention and control practices is crucial.
 - ♦ It includes observing proper hand hygiene, environmental cleaning, and triaging and isolating patients with antibiotic-resistant infections.

- **Improving Antibiotic Use:** Ensuring access to and improving the use of antibiotics is vital.
 - ♦ It involves promoting the appropriate use of antimicrobials in humans, animals, and plants, and discouraging misuse and overuse.
- **Implementing Data and Tracking Systems:** Establishing robust data and tracking systems to monitor resistance, guide prevention strategies, and report results at the local and global level is essential.
- **Enhancing Laboratory Capacity:** Improving lab capacity to identify resistant bacteria is a key measure.
 - ♦ It helps in detecting and reporting resistance that has global health implications.
- **Research and Development:** There is an urgent need for additional measures to ensure equitable access to new and existing vaccines, diagnostics, and medicines.
 - ♦ It includes joining the global effort to develop new drugs, diagnostics, vaccines, and other interventions to treat infections.
- **Antibiotic Resistance Solutions Initiative by Centres for Disease Control and Prevention (CDC):** It works with world leaders and experts to implement the **U.S. National Action Plan for Combating Antibiotic-Resistant Bacteria**.
 - ♦ It supports activities in high burden countries throughout the world to improve antibiotic use, track resistance, and implement infection prevention and control activities.
- **Effective Measures:** Effective measures against the scourge are expected to cost an average of **46 billion dollars a year** but will yield up to 13 dollars for every dollar spent by 2050.

India Specific Measures

- **The National Action Plan on Antimicrobial Resistance (NAP-AMR):** It focuses on **One Health approach** with the aim of involving various stakeholder ministries/departments.
- **AMR Surveillance and Research Network:** It was established by the **Indian Council of Medical Research (ICMR)** to generate evidence and capture trends and patterns of drug-resistant infections in the country.
- **Antibiotic Stewardship Program (AMSP):** It was launched by **ICMR** on a pilot project basis in **tertiary care hospitals** across India to control misuse and overuse of antibiotics in hospital wards and ICUs.

Conclusion

- Antimicrobial resistance is a complex problem that requires a coordinated global response. It is crucial to continue research and development for novel vaccines, diagnostics, and medicines.
- At the same time, it is equally important to ensure equitable access to new and existing vaccines, diagnostics, and medicines.
 - ♦ The fight against AMR must be personal, local, national, and global.

Source: TH

SHUKRE PANEL ON MARATHA QUOTA

Context

- The Panel under Justice Sunil B Shukre has found an “alarming” rise in the girl child marriage rate within the Marathas, in response to the petitions challenging the 10 per cent reservation granted to Marathas.

Background

- The Maharashtra Assembly unanimously passed a Bill granting **10% reservation** in education and government jobs to the Maratha community.
- The law has been formulated based on a report of the Justice Sunil B Shukre-led Maharashtra State Backward Class Commission.
- It opined that “exceptional circumstances and extraordinary situations” justify granting reservation to the community beyond the Supreme Court-approved 50% limit.

Reservation in India

- As per existing instructions, reservation is provided to Scheduled Castes (SCs), Scheduled Tribes (STs) and Other Backward Classes (OBCs) at the rate of **15%, 7.5% and 27%**, respectively, in case of direct recruitment on all India basis by open competition.
 - ♦ In direct recruitment on an all India basis, other than by open competition, the percentage fixed is 16.66% for SCs, 7.5% for STs and 25.84% for OBCs.
- **The Constitution (103rd Amendment) Act 2019** enables the State (i.e., both the Central and State Governments) to provide reservation to the Economically Weaker Sections (EWS) of the society.

- ◆ Whether or not to provide reservation to the EWS or appointment in States is to be decided by the State Government.
- Since the 1992 order, several states have passed laws breaching the 50% ceiling, including Haryana, Telangana, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Uttar Pradesh, Rajasthan, Chhattisgarh and Maharashtra.
 - ◆ Laws made by many of these states have either stayed or are facing legal challenges.
- Many deem poverty to be eligible for reservations in education and employment over caste-based marginalization.
- Reservations should only exist to level the playing field initially; they should be discontinued for higher positions/promotions.
- Economically well-off members of marginalized communities should not avail benefits of reservation.

Constitutional Provisions

- **Article 16:** It provides for equality of opportunity for all citizens but as an exception the State can provide for reservation of appointments or posts in favor of any backward class that is not adequately represented in the state services.
- **Article 16 (4A):** Provides that the State can make any provision for reservation in matters of promotion in favor of the Scheduled Castes and the Scheduled Tribes if they are not adequately represented in the services under the State.
- **Article 335:** It recognises that special measures need to be adopted for considering the claims of SCs and STs to services and posts, in order to bring them at par.
- **103 Amendment of the Constitution of India:** Introduced 10% reservation for Economically Weaker Sections (EWS) of society by amending Article 15 and Article 16 of the Constitution.

Arguments in Favour

- Caste-based reservations address the roots of social injustice — and shouldn't be replaced by economic status-based reservations.
- The Constitution mandates realization of substantive equality in the engagement of the fundamental rights with the directive principles.
- It is a stereotypical assumption that the promotions drawn from the SCs and STs are not efficient or that efficiency is reduced by appointing them.
- The main reason for giving reservations and even promotions is that there are very few SC/ST candidates in the higher echelons of government.

Argument Against

- Reservations discourage merit and genuine talent by providing an unfair advantage to reserved candidates.

- Low-cutoffs and eligibility criteria for reserved candidates brings down the overall caliber of an institution or organization.
- Continued reservation in education and public service were only a temporary measure.

Way ahead

- Allocating quotas often result in more cases of discrimination and hard feelings towards other communities. The purpose of reservation is not to isolate a particular section but to make them part of mainstream society.
- The policy makers while dealing with sensitive matters like Reservation policies must act wisely.

Indira Sawhney judgment

- The Indira Sawhney case is also known as the **Mandal Commission** case. In this case, the Supreme Court stated that:
 - ◆ Backward Classes of the Citizens of in **Article 16(4)** can be identified on the basis of caste and not only on the economic basis.
 - ◆ The Supreme Court upheld the **Mandal Commission's 27 percent quota** for backward classes, as well as the principle that the combined scheduled-caste, scheduled-tribe, and backward-class beneficiaries should not exceed 50 percent of India's population.
 - ◆ Reservation for backward classes should be confined to initial appointments only and not extend to promotions.
 - ◆ State governments were called upon to identify creamy layer amongst the backward classes and exclude them from the purview of reservation.

Source: IE

INDIA PLANNING TO OPT LIVING WAGE INSTEAD OF MINIMUM WAGE

Context

- India plans to **replace the minimum wage with living wages** by next year with the assistance of the International Labour Organisation (ILO).

About the Living Wage

- A living wage tends to be more than the minimum wage as it is the necessary level to afford a decent standard of living.
- According to the ILO**, the living wage is defined as 'the wage level necessary to afford a decent standard of living for workers and their families, taking into account the country's circumstances and calculated for the work performed during normal hours'.
- It tends to be **more than the minimum wage**, which is the lowest amount of remuneration required by law to be paid by employers to employees for work performed during a given period.

Global Trends

- Several countries have increased their minimum wages to protect the workforce against inflation.
 - The UK has increased its national living wage by 9.8%.
 - Canada's federal minimum wages have increased 3.9%.
 - Belgium increased minimum wage surpassing Rs 2,000 per month.

India and Living Wage

- While many earn **a daily minimum wage of ₹176 or more**, the **national wage floor**, stagnant since 2017, lacks enforceability across states and leads to wage payment discrepancies.
- Its lack of upward movement in wages has led to disparities in wage payments across different states.
- However, the exact amount of the living wage in India varies depending on the cost of living in different regions.
- As of 2018, the living wage for an individual in India was reported to be ₹10,300 per month.

Impacts of Living Wage on Contractual Staff

- Data sourced from Prime Database regarding more than 1,000 top listed companies show that it is the non-permanent workers that are least likely to get paid anything above the minimum wages right now.
- In FY23, these 1,062 companies together employed nearly three million non-permanent workers and employees.
- Only 208, or 20%, companies paid all their non-permanent workers more than the minimum wages.

Impacts of Living Wage on Indian Economy

- Increased Consumption:** If the minimum wage accounts for decent living, then the wages will go up, consumption will increase, and demand for goods will surge.
 - It could potentially stimulate economic growth.
- Wage-Push Inflation:** On the flip side, it could result in wage-push inflation, resulting in a cascading effect on the overall prices going up.
 - It could lead to increased cost of living, particularly for those not covered by the living wage.
- Income Inequality:** The transition to a living wage could help address income inequality, which has been a growing concern in India.
 - By ensuring that workers earn a wage that can support a decent standard of living, the gap between the rich and the poor could potentially be narrowed.
- Financial Strain on Businesses:** Some businesses, particularly small and medium enterprises, may face financial strain due to increased labour costs.
 - It could potentially impact their profitability and sustainability.
- Economic Slowdown:** The recent reports indicate a significant increase in inequality in India since the early 2000s.
 - To address this inequity, India requires a more thoughtfully planned pay system.
- young people in the labour market.

International Labour Organisation (ILO)

- It is a specialised agency of the United Nations.
- It was established in 1919 by the **Treaty of Versailles** as an affiliated agency of the **League of Nations**, and became the first affiliated specialised agency of the **United Nations in 1946**.
- **Headquarter:** Geneva, Switzerland.
- **India is a founder member of the ILO.**
- **Aim:** To promote rights at work, encourage decent employment opportunities, enhance social protection and strengthen dialogue on work-related issues.
 - ◆ It is the only tripartite UN Agency that brings together governments, employers and workers of 187 member States, to set labour standards, develop policies and devise programmes promoting decent work for all women and men.
- **Recognition:**
 - ◆ **Nobel Peace Prize (1969):** For improving peace among classes, pursuing decent work and justice for workers, and for providing technical assistance to other developing nations.
- **Flagship Reports of ILO:**
 - ◆ Global Wage Report;
 - ◆ World Employment and Social Outlook (WESO);
 - ◆ World Social Protection Report;
 - ◆ World of Work Report;

Conclusion

- The transition to a living wage represents a significant step towards improving the lives of Indian workers, particularly those on contractual terms.
- It aimed at accelerating efforts to lift millions out of poverty and ensure their well-being.
- India's commitment to developing a well-defined and operational system, with technical assistance from the ILO, is crucial for the successful implementation of this policy.

Source: ET

RBI'S MONETARY POLICY

Context

- The **Monetary Policy Committee (MPC)** of the Reserve Bank of India (RBI), decided to keep the **repo rate unchanged at 6.5 percent**.

Key decisions/Highlights from April MPC:

- RBI has forecast the Indian economy to grow at 7 percent in FY25.
 - ◆ The Committee sees Q1FY25 growth rate at 7.1%, Q2 at 6.9%, Q3 and Q4 at 7% each, with risks evenly balanced.
- Forex reserves at an all time high of \$645.6 billion as of March 29.
- **Inflation:** Core inflation has declined steadily over the past 9 months to its lowest level in the series.
- **Indian Rupee:** The Indian rupee (INR) was most stable in FY24 among major economies.
 - ◆ As compared to the previous 3 years, INR exhibited lowest volatility in 2023-24.
 - ◆ INR stability mirrors strong fundamentals, financial stability, and external improvements.
- **Food prices:** An expected normal south-west monsoon should support agricultural activity.
 - ◆ Low reservoir levels, especially in the southern states and outlook of above normal temperatures during April-June, also pose concern.
 - ◆ Pulses and vegetable prices require close monitoring.

About RBI Monetary Policy Committee

- The Monetary Policy Committee or the MPC is a **6 member committee** that is led by the **RBI governor**.
- The first such MPC was constituted in **2016**.
- The MPC determines the **policy repo rate** required to achieve the **inflation target**.
- The MPC is required to meet at least **four times in a year**. The quorum for the meeting of the MPC is four members.
- Each member of the MPC has **one vote**, and in the event of an **equality of votes**, the **Governor has a second or casting vote**.
- Each Member of the Monetary Policy Committee writes a statement specifying the reasons for voting in favour of, or against the proposed resolution.

What is Monetary Policy?

- It is the **use of operating instruments** available to central banks to achieve stated objectives.
- The central bank, such as India's Reserve Bank of India (RBI), formulates and implements policy measures to achieve these objectives.
- The instruments available to CBs include fractional reserve banking, Liquidity Adjustment Facility, Open Market Operations, Forward Guidance, and Policy Communication.
- In an "Inflation Targeting" (IT) framework the CB is mandated to manage inflation.
 - ♦ India adopted IT in 2016 and **targets 4% of inflation** with a band of **2%**.

Instruments of Monetary Policy

- **Fractional Reserve Banking:**
 - ♦ **CRR:** RBI mandates banks to keep a fraction of deposits with RBI. This rate is called the **Cash Reserve Rate**. An increase in CRR would reduce the money at the disbursement of banks to lend, **reducing overall money supply**.
 - ♦ **SLR:** RBI also has made it statutorily mandatory for banks to invest in government bonds and safe deposits. This mandated fraction is called the **Statutory Liquid Ratio (SLR)**. Currently, the SLR is **18%**.
- **Liquidity Adjustment Facility (LAF):**
 - ♦ **Repo Rate:** It is the interest rate at which the **bank can raise money from RBI** on an overnight basis against the collateral of government securities. **Lower Repo rate** will make it easier for the bank to borrow and inject more money in the economy.
- **Reverse Repo Rate:** The rate at which the bank can park their collateral of government securities with RBI is called the Reverse Repo rate.
- **Standing Deposit Facility (SDF) Rate:** It is the rate at which RBI accepts non collateralized deposits, on an overnight basis, from all LAF participants. It is fixed 25 bps below the repo rate.
 - ♦ **Marginal Standing Facility (MSF) rate:** It is the additional rate- fixed 25 bps above the repo rate- at which banks can borrow, on an overnight basis, from the RBI dipping into their Statutory Liquidity Ratio (SLR) portfolio up to a predefined limit of 2 percent.

- ♦ **Bank Rate:** The Bank Rate is the additional rate the bank has to incur for not meeting the CRR and SLR norms. It is aligned with the MSF.
- **Open Market Operations:** From time to time, RBI uses the **sale and purchase of Government Securities** intending to **inject liquidity into the economy**. This is called open market operations.

Source: IE

VIABILITY OF GREEN HYDROGEN

Context

- The **Ministry of New and Renewable Energy (MNRE)** has announced to support efforts to **test the viability of green hydrogen as a fuel for cars and heavy vehicles**.

Scheme Guidelines for Pilot Project

- The scheme will support development of technologies for use of Green Hydrogen as a fuel in Buses, Trucks and 4-wheelers, based on **fuel cell/internal combustion engine**-based propulsion technology.
- The other thrust area for the scheme is to support development of infrastructure such as **hydrogen refueling stations**.
- The scheme will also seek to support any other innovative use of hydrogen for reducing carbon emissions in the transport sector, such as blending of methanol/ethanol, based on green hydrogen and other synthetic fuels derived from green hydrogen in automobile fuels.

What is hydrogen

- Hydrogen is the chemical element with the **symbol H** and **atomic number 1**.
- Hydrogen is the **lightest element** and the most abundant chemical substance in the universe, **constituting roughly 75%** of all normal matter.
- It is colorless, odorless, tasteless, non-toxic, and highly combustible gas.

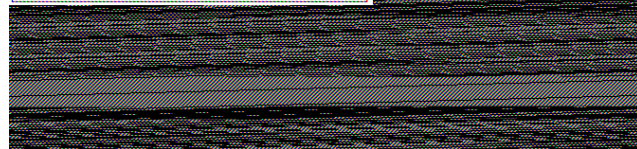
Extraction of Hydrogen

- Hydrogen exists in **combination with other elements**.
- Hence, for using it as a source of energy, it has to be **extracted from naturally occurring compounds** like water (which is a combination of two hydrogen atoms and one oxygen atom).

- **Green hydrogen** refers to hydrogen that is produced **using renewable energy sources**, such as wind, solar, or hydropower, through a process called electrolysis.
 - ♦ Electrolysis involves splitting water (H₂O) into hydrogen (H₂) and oxygen (O₂) using an electric current.
 - ♦ When this electricity comes from renewable sources, the hydrogen produced is considered “green” because the overall process has a **minimal environmental impact**.
- **Grey Hydrogen:** It involves extracting hydrogen from natural gas through a process called **steam methane reforming (SMR)**.
 - ♦ This process releases **carbon dioxide (CO₂)** as a byproduct, contributing to greenhouse gas emissions.
- **Blue Hydrogen:** It involves **capturing and storing the CO₂ emissions** generated during the production of hydrogen from **natural gas**.

Section 144 of CrPC:

- It gave the police and the District Magistrate the powers in order to prevent unlawful gathering of people and also to direct any person to abstain from a certain activity.



Significance of Green Hydrogen

- **Zero Emissions:** Unlike conventional hydrogen production methods that rely on fossil fuels, green hydrogen production emits no greenhouse gases or pollutants, making it a zero-emission energy carrier.
- **Energy Storage:** Green hydrogen can serve as a means of storing excess renewable energy generated during periods of low demand for later use, helping to balance the grid and enhance energy security.
- **Versatile Applications:** Hydrogen can be used as a fuel in various sectors including transportation, industry, and heating.
- **Economic Opportunities:** The transition to green hydrogen presents significant economic opportunities, including job creation, investment in new infrastructure, and the growth of related industries such as electrolyzer manufacturing and hydrogen fuel cell technology.

- **Climate Mitigation:** By replacing fossil fuels with green hydrogen, countries can reduce their carbon emissions and contribute to global efforts to mitigate climate change.

Challenges

- **Risks associated with the transportation:** Hydrogen in gaseous form is highly inflammable and difficult to transport, thereby making safety a primary concern.
- **Higher Cost:** Green hydrogen production is currently more expensive than conventional methods, primarily due to the high cost of renewable energy sources and electrolysis technology.
- **Lack of fuel station infrastructure:** India will need to compete with around 500 operational hydrogen stations in the world today which are mostly in Europe, followed by Japan and South Korea.

Way Ahead

- Increasing renewable energy use across all economic spheres is central to India's Energy Transition.
- Hydrogen offers the possibility to decarbonize applications, end uses, and sectors that have been traditionally difficult to tackle with other clean energy solutions.
- Hydrogen is expected to be used widely in the transportation sector in the coming years, and as a large and growing market for both vehicles and energy.
- India stands to gain significantly from the large-scale adoption of green hydrogen as vehicular fuel.

Source: TH

HYDROPONIC FARMING

Context

- In the wake of evolving consumer preferences, Hydroponic Farming has emerged as, at the forefront of an agricultural transformation.

Hydroponic Farming

- The Hydroponic System is a system of **growing crops without soil**, often called soilless farming. In this system, the plant roots grow in a liquid nutrient solution or inside the moist inert materials like **Rockwool and Vermiculite**.
- The liquid nutrient solution is a mixture of essential plant nutrients in the water.

- The plant roots are suspended either in the static liquid solution or in a continuously flowing nutrient mixture.

Suitable Regions for Hydroponic Farming

- **Areas with Limited Water Supply:** Hydroponics drastically reduces water usage, making it ideal for drought-prone areas.
- **Rocky Regions:** In places where the terrain is unsuitable for soil-based agriculture, hydroponics offers a practical alternative.
- **Low Soil Fertility Areas:** Hydroponics bypasses the need for fertile soil, allowing cultivation in regions with poor soil quality.
- **Demand-Driven Areas:** Regions with a high demand for fresh products are perfect for hydroponic farms, catering to health-conscious consumers in urban and semi-urban locales.

The Edge with Hydroponic Farming

- **Higher Yields:** The efficiency and controlled environment of hydroponic systems result in substantially higher crop yields.
- **Resource Efficiency:** The recycling of water and nutrients significantly cuts down on input costs and environmental impact.
- **Labour and Maintenance Savings:** The absence of weeding and traditional cultivation reduces labor requirements and costs.
- **Pest and Disease Reduction:** By eliminating soil, hydroponics reduces the risk of soil-borne diseases and pests.

Source: BL

NEWS IN SHORT

POST OFFICES IN ANTARCTICA

Context

- Recently, the Chief Postmaster General Maharashtra Circle inaugurated the **Bharati Branch Post Office at Bharati Station of Antarctica** accompanied by the introduction of a **new PIN code, MH-1718**.

Brief History of Post Offices in Antarctica

- In **1984**, shortly after the inaugural expedition to Antarctica, **India established its first-ever post office at Dakshin Gangotri** — the pioneering scientific base.

- The eventual submersion of Dakshin Gangotri under ice during the **late 1980s**, leading to its **decommissioning**.

- On **January 26, 1990**, a new post office branch emerged at **India's Maitri research station in Antarctica**.

Maitri and Bharati Post Offices

- These are **research bases of India in Antarctica** spanning a distance of 3,000 kms.
- They stand as a testament to the **nation's enduring presence in the polar landscape**, both falling under the **purview of the Goa Postal Division**.
- In practical terms, letters intended for Antarctica find their way to the **National Centre for Polar and Ocean Research (NCPOR) in Goa**, the pivotal hub for India's polar endeavours.

India and Antarctica

- India's engagement with Antarctica, the southernmost continent and site of the South Pole, traces back to 1981.
- It marked the initiation of the **Indian Antarctic Programme**, a multi-disciplinary, multi-institutional programme under the control of the **NCPOR, Ministry of Earth Sciences**.
 - ♦ It gained global acceptance with **India's signing of the Antarctic Treaty** and subsequent construction of the **Dakshin Gangotri** (in 1983), **Maitri** (in 1989), **Bharati** (in 2012) were commissioned.
 - ♦ Currently, India has two operational research stations in Antarctica: Maitri and Bharati.

The Indian Antarctic Bill 2022

- It provides a **regulatory framework and legal mechanisms** for India's Antarctic activities.
- It aims at having India's own national measures for protecting the Antarctic environment as also the dependent and associated ecosystem.
- It proposes to set up the **Indian Antarctic Authority (IAA)** under the Ministry of Earth Sciences as the apex decision-making authority.

Source: IE

PASHMINA MARCH

Context

- Recently, the Ladakh administration imposed '**Section 144 in Leh**', banning public rallies ahead of proposed '**Pashmina March**' by climate activist Sonam Wangchuk.

About the Pashmina March

Section 144 of CrPC:

- It gave the police and the District Magistrate the powers in order to prevent unlawful gathering of people and also to direct any person to abstain from a certain activity.

- Sonam Wangchuk, an education reformist and climate activist, planned the Pashmina March to **draw attention to the threats posed by large Indian industrialists and China** to the grazing lands of Ladakh.
- Wangchuk likened his march to Mahatma Gandhi's historic Dandi March.
- It was organised to protest the alleged Chinese incursions into the grazing areas of Ladakh and to flag the 'ground realities' in the **ecologically fragile region** of the **Changthang Plateau of Ladakh**.

Changthang Region of Ladakh

- It is a part of the **high-altitude Tibetan Plateau**, extends from western and northern Tibet into southeastern Ladakh, India.
- This vast highland, home to giant lakes and unique wildlife, is nestled at an altitude of 14,846 ft above sea level.
- The region is inhabited by the **Changpa people**, pastoralist nomads who navigate their existence around their **prized assets: goats, yaks, and sheep**.
- Changthang** is a hub of a lucrative fibre trade, with the indigenous Changra goat used for producing one of the **world's most sought-after natural wool — GI Ladakh pashmina or cashmere**.

Source: TH

BASEL III ENDGAME

Context

- The US Federal Reserve will make changes to the proposal for the Basel III Endgame.

What is the BASEL III Endgame?

- The Basel Committee on Banking Supervision is a panel convened by the **Bank for International Settlements (BIS)**.
- It aims to ensure regulators globally apply similar **minimum capital standards** so that banks can survive loan losses during tough times.
- The committee's Basel III standard was agreed after the 2007/2009 global financial crisis. It includes numerous capital, leverage and liquidity requirements.
- Regulators across the world have worked for years to implement many of those standards, and the so-called Endgame, agreed in 2017.

Source: BL

GERMANY LEGALISED RECREATIONAL CANNABIS

Context

- The German government has **legalised recreational consumption of cannabis (or marijuana)**.

About

- Cannabis refers to the **dried leaves, flowers, stems, and seeds** from the **Cannabis sativa or Cannabis indica** plant.
- The plant contains the **mind-altering chemical delta-9 tetrahydrocannabinol (THC)** and other similar compounds.
- The Mexican term '**marijuana**' is frequently used in referring to cannabis leaves.
- Compounds which are structurally similar to THC are referred to as **cannabinoids**.
- Marijuana is grown in the **United States, Canada, Mexico, South America, Caribbean, and Asia**.

Source: TH

COORDINATED LUNAR TIME

In News

- The White House directed NASA to establish a unified standard of time for the moon and other celestial bodies

About Coordinated Lunar Time (LTC)

- It would provide a time-keeping benchmark for lunar spacecraft and satellites that require extreme precision for their missions.
- It is aimed at making space missions more efficient by providing enhanced assistance.
- The new time zone needs to be developed by the end of 2026.

Need

- A unified time standard would be essential for coordinating operations, ensuring the reliability of transactions and managing the logistics of lunar commerce.
 - ♦ **Under its Artemis program**, NASA is aiming to send astronaut missions to the moon in the coming years and establish a scientific lunar base that could help set the stage for future missions to Mars.
 - ♦ Without a **unified lunar time standard** it would be challenging to ensure that data transfers between spacecraft are secure and that communications between Earth, lunar satellites, bases and astronauts are synchronised.

Source:HT

PLANKTON CRASH

In News

- The panel formed by the National Green Tribunal (NGT) to probe the cause of the sea turning red in Puduicherry in October and November 2023 has attributed the phenomenon to **plankton crash**.

About Plankton Crash

- As per a study by **Annamalai University**, the majority of a particular unicellular species of phytoplankton — **Noctiluca scintillans** — in the sea were found ruptured, leading to the **release of red pigment into the sea**.
 - ♦ The environmental parameters such as sea surface temperature (31°C), salinity(41psu), pH(6.5), and dissolved oxygen (5.8ppm) were assessed and related to the phytoplankton proliferation.
 - ♦ The parameters were found to be conducive to the development of this species
- **Recommendations** : Strict vigilance on quality of sewage carried in the canal which confluences at Kuruchikuppam and to take long term measures on untreated sewage presently being let into the sea.

Source:TH

