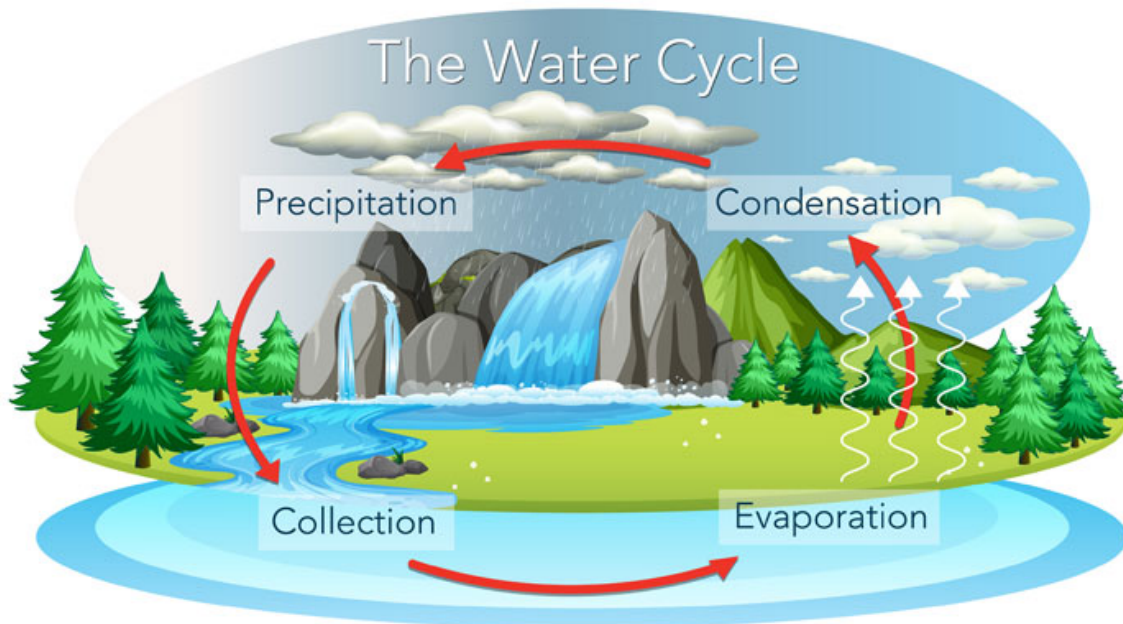


1. Ground Water Conservation



Topic: Environment and Ecology

In News: The projected increase in groundwater use for irrigation can cancel the benefits of increased rainfall from warming climate.

More on the Topic:

- Rapid depletion of groundwater in north India has become a norm during the last few decades. **Between 2002 and 2022, about 95% of India's groundwater depletion occurred in north India.**
- **Groundwater use and summer monsoon rainfall variability** are the two main drivers of groundwater storage.
- **Climate change can throw new challenges for the sustainability of groundwater** as a result of increased groundwater pumping to meet irrigation demands for crops.
- Also, **a warming climate will increase the frequency of hydroclimate extremes — floods and droughts;** already such hydroclimate extremes have manifested across the world, India included, and such events will become more frequent with further increase as the world gets increasingly warmer.
- A less discussed aspect is **the role of increased evapotranspiration due to warming climate,** which will limit water availability for groundwater recovery.



- But the role of evapotranspiration in negatively impacting groundwater recovery will be less as **increased groundwater use for irrigation will be the main driver of groundwater usage.**

Ground Water Usage Trend in India:

- According to a Report by the **Ministry of Jal Shakti (Dynamic Ground Water Resource Assessment Report 2022)**, the total annual groundwater recharge is 437.60 Billion Cubic Metres (BCM).
- The quantity of groundwater extracted stood at 239.16 BCM.
- The extraction has been the lowest since 2004, when the extraction was 231 BCM.
- The major user for groundwater is for irrigation (208.49 BCM), followed by domestic (27.05 BCM) and industrial use (3.64 BCM).
- According to a **Report by the CAG (2021)**, groundwater extraction in India increased from 58% to 63%, between 2004-17, exceeding the groundwater recharge rate.
- The **Central Groundwater Board of India** estimates that about **17% of groundwater blocks are overexploited** (rate of extraction exceeds the rate of recharge of aquifer) while 5% and 14% blocks are at critical and semi-critical stages, respectively.
- The situation is particularly alarming in three major regions: **North-western, Western, and Southern peninsular.**
- According to **India water portal**, India uses 25% of all groundwater extracted globally, ahead of USA and China. ~70% of the water supply in Indian agriculture today is groundwater.

Reasons why groundwater usage in India is high:

- **Population Pressure:** India is the second most populous country in the world, and the demand for water is high due to the large population. This puts significant pressure on water resources, including groundwater.
- **Agriculture Dependence:** Irrigation for agriculture heavily relies on groundwater, especially in areas where surface water sources are scarce or unreliable. Combined with faulty crop cycles due to farm subsidy and subsidy on electricity has resulted in over-use of groundwater, especially in the Northwest India.
- **Urbanization and Industrialization:** Rapid urbanization and industrial growth have increased the demand for water in cities and industrial areas. These sectors often depend on groundwater for various purposes.
- **Lack of Proper Water Management:** Inefficient water management practices, including over-extraction and inadequate recharge of groundwater, contribute to its depletion. In some cases, the lack of regulations and monitoring exacerbates the overuse of groundwater resources.

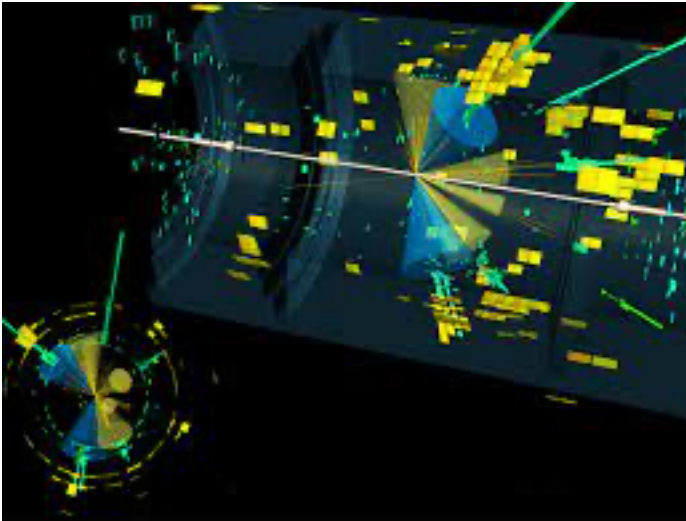
Way Ahead:

- Addressing the issue of high groundwater usage in India requires a multi-faceted approach, including improved water infrastructure, sustainable agriculture practices, conservation efforts, and effective water management policies.
- Encouraging alternative water sources, rainwater harvesting, and promoting water-efficient technologies can also help reduce the dependence on groundwater.

- For planning and management of groundwater, there is a need to focus on the **Integrated Water Resource Management** framework.
- Water-sensitive urban design and planning should be adopted.
- Policies in the agriculture sector should be reviewed. The cropping pattern should be according to the local agro-ecology.

Source: Indian Express

1. Higgs boson decay



Topic: Science and Technology

In News: Physicists working with the Large Hadron Collider (LHC) particle-smasher at CERN, in Europe, reported that they had detected a Higgs boson decaying into a Z boson particle and a photon.

More on the Topic:

- This is a very rare decay process that tells us important things about the Higgs boson as well as about our universe.
- The Higgs boson is a **type of boson, a force-carrying subatomic particle.**
- It carries the force that a particle experiences when it moves through an energy field, called the **Higgs field, that is believed to be present throughout the universe.**
- For example, when an electron interacts with the Higgs field, the effects it experiences are said to be due to its interaction with Higgs bosons.

About Higgs boson:

- An electron is a **subatomic particle that has mass.**
- **The stronger a particle's interaction with the Higgs boson, the more mass it has.**
- This is why **electrons have a certain mass, protons have more of it, and neutrons have just a little bit more than protons, and so on.**



- A Higgs boson can also interact with another Higgs boson: this is how we know that its mass is greater than that of protons or neutrons.
- Since all the matter in the universe is made of these particles, working out how strongly each type couples to Higgs bosons, together with understanding the properties of Higgs bosons themselves, can tell us a lot about the universe itself.
- The creation of a Higgs boson at the Large Hadron Collider (LHC) involves interactions with virtual particles, resulting in the production of a Z boson and a photon.
- Photons, the particles of light, have no mass because they don't interact with Higgs bosons.

Standard Model of Particle Physics:

- The Standard Model is a theory in physics that describes **how the smallest particles in the universe behave and interact with each other.**
- According to the Standard Model, there are several types of particles. **There are particles called quarks, which are the building blocks of protons and neutrons, and there are particles called leptons, which include electrons. These particles have different properties like mass and electric charge.**
- The theory explains how these particles interact with each other through different forces.
- The Standard Model predicts **the probabilities of different decay paths. The recent measurement confirms the decay of a Higgs boson into a Z boson and a photon, which was previously observed but now with increased statistical precision.**

Source: TH

1. 'Indian Opinion' Newspaper

Topic: Modern India

Indian Opinion

PUBLISHED WEEKLY IN ENGLISH AND GUJARATI

No. 21 —Vol. X.V. FRIDAY, MAY 26th, 1916. Registered at the G.P.O. as a Newspaper
Press No. 1188

DEBATE ON INDENTURED LABOUR

IN the Imperial Legislative Council of India, on the 20th March, Pandit Mahan Malaviya moved the following resolution:—'That this Council recommend to the Governor-General in Council that early steps be taken for the abolition of the system of Indian indentured labour.'

In doing so the hon. Pandit said that this system of labour had been in existence for nearly 50 years. Consequent on the abolition of slavery in 1833 the Colonials suffered heavy loss. Hence they resorted to the labour market of India, their main aim being to get enough labour to do as much work as possible under conditions as good as possible to the capitalists. The actual abuse that these conditions gave rise to led to

penalties they would have to undergo trade trips to them. Mr. Malaviya referred to a cook who, owing to some default or another, was imprisoned in the aggregate for 400 days.

Talking to the men who were entrusted with this recruitment, Mr. Malaviya said that they were merely very low class men who would not deem it wrong to practise fraud and be as unscrupulous as the occasion demanded. They mostly came in the guise of helpers to pilgrim caravans or station platform and then by deception drew these unfortunate men and women to the labour depots. Again, these depots could not be freely entered by the public in search of their lost men and women, and even when these latter were brought



In News: An exhibition was launched on June 4 at the Phoenix Settlement to mark the 120th anniversary of the 'Indian Opinion' newspaper started by Mahatma Gandhi during his time as a young lawyer in South Africa.

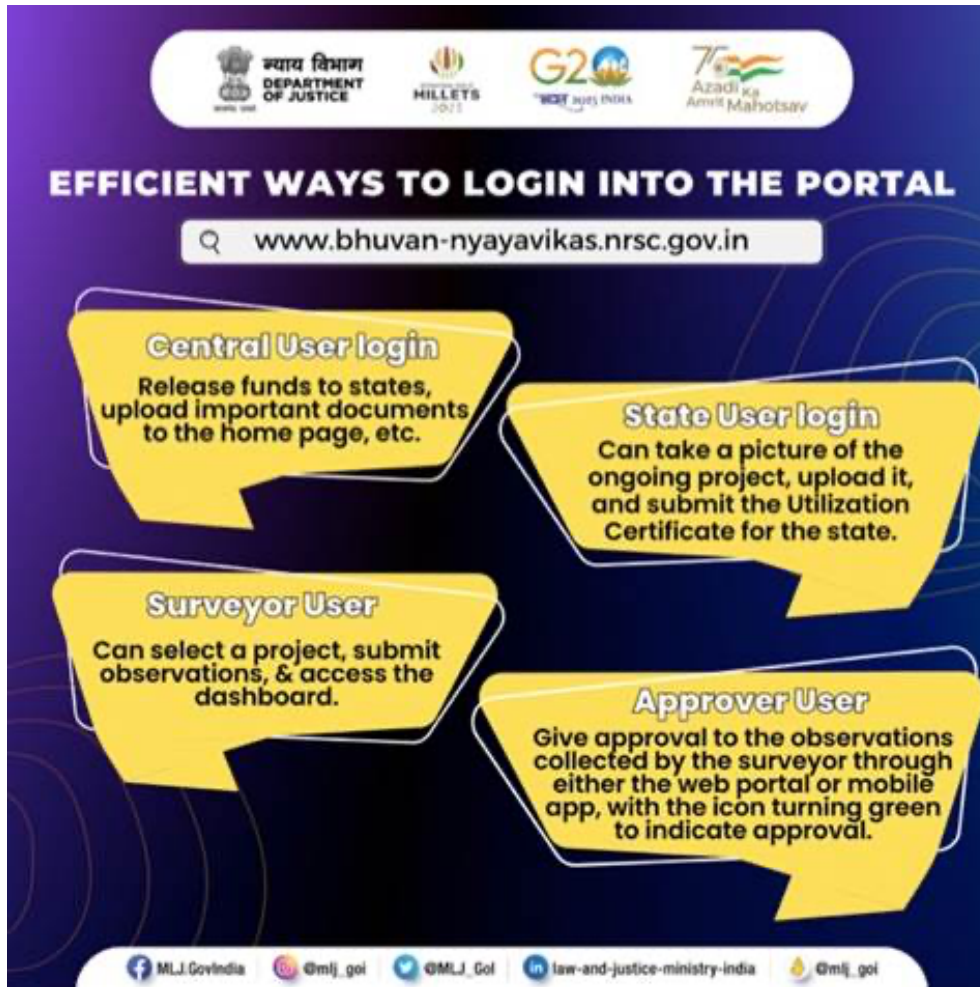
More on the Topic:

- Gandhi had started the publication as a mass communication mechanism for **the Natal Indian Congress**, which he had helped establish to fight the oppressive laws of the government at the time.
- After Gandhi's return to India, **the 'Indian Opinion' continued to be published by his son Manilal and his wife Sushila until its final edition in 1962.**
- With a firm focus on human and civil rights issues, the newspaper served as a vehicle for a large number of Indians who had first come to South Africa as indentured labourers for the sugar cane farms to **voice their dissatisfaction with the racial intolerance that they were subjected to.**
- The exhibition launched at Phoenix Settlement, where Gandhi's, press was housed also marks the 130th anniversary of the incident when Gandhi, on his way to Pretoria from Durban to fight a case for a client, was unceremoniously thrown off a train at Pietermaritzburg station in 1893 because he was travelling in a coach reserved for whites only.
- The incident sparked his path to Satyagraha and led to the fight against oppression in both South Africa and India.

Source: Hindu

2. Nyaya Vikas Portal

Topic:
e-governance



The infographic features a dark blue background with white and yellow text. At the top, there are logos for the Department of Justice, Millets 2023, G20 India 2023, and Azadi Ka Amrit Mahotsav. Below these is the title 'EFFICIENT WAYS TO LOGIN INTO THE PORTAL' and the URL 'www.bhuvan-nyayavikas.nrsc.gov.in'. Four yellow callout boxes describe user roles: Central User login (fund release), State User login (project photo upload), Surveyor User (project selection), and Approver User (approval of observations). The bottom of the infographic includes social media handles for MLJ.Govindia, @mlj_goi, @MLJ_Gol, law-and-justice-ministry-india, and @mlj_goi.

In News: Nyaya Vikas Portal has been created for monitoring the implementation of Centrally Sponsored Schemes.

More on the Topic:

- The Department of Justice has been implementing the Centrally Sponsored Scheme (CSS) - Nyaya Vikas for Development of Infrastructure Facilities for Districts and Subordinate Judiciary since 1993-94.



- Under the Scheme, central assistance is provided to the State Government / UT Administrations for construction of court halls and residential units for Judicial Officers / Judges of District and Subordinate Courts.
- The funds sharing pattern under the Scheme for Center and State is 60:40 in respect of States other than North Eastern and Himalayan States.
- The funds sharing pattern is 90:10 in respect of North Eastern and Himalayan States; and 100% in respect of Union Territories. This portal has been created for monitoring the implementation of this Scheme.

Source: Indian Express

5.Jhelum River

Topic: Environment and Ecology



In News: Waste dumping is polluting the Jhelum in Kashmir with micro plastics.

More on the Topic:

- Once disposed of, plastic waste is exposed to several physical, chemical and biological elements of the environment, such as degradation, physical abrasion, weathering, fire and chemical oxidation.
- It breaks down into huge amounts of microplastics (measuring less than 5 millimetres) and nanoplastics (less than 0.1 micrometres or μm).
- Plastic in the microplastic size range ($< 5 \text{ mm}$) is emerging as an environmental pollutant, which is bio-accumulative. Due to their minute size, microplastics are ingested by the riverine fauna (organisms in rivers) and marine species once it reaches the marine ecosystems.
- Until recently, microplastics have not received adequate attention in plastic pollution monitoring by scientific communities and policymakers.



Jhelum River:

- The Jhelum River flows from the Indian union territory of Jammu and Kashmir into Pakistani Punjab, passing through the Pakistani-administered territory of Azad Kashmir.
- It is the westernmost of the Punjab region's five rivers, and it flows through the Kashmir Valley. It is a Chenab River tributary with a total length of about 725 kilometres.

Source: Business Standard

6. India Rankings of HEIs

Topic: Reports and Indices



In News: India Rankings of Higher Educational Institutions (HEIs) in country is being released by Minister of State for Education.

More on the Topic:

- Ranking is based on National Institutional Ranking Framework (NIRF).
- The parameters on which institutes are ranked are teaching learning and resources, research and professional practice, graduation outcome, outreach and inclusivity and perception.



- IIT Madras has topped in overall NIRF Rankings, followed by IISc Bangalore in 2nd position and IIT Delhi stood third.
- New additions in the 2023 ranking include,
- Introduced a new subject namely Agriculture & Allied Sectors
- Integrated “Innovation” ranking previously executed by Atal Ranking of Institutions on Innovation Achievements (ARIIA) into India Rankings.
- Expansion of scope of “Architecture” to “Architecture and Planning”.

Source: Business Standard

7. Natural Refrigerant Carbon dioxide

Topic: Science and Technology



In News: A first of its kind 100KW capacity AC plant in the country based on natural refrigerant carbon dioxide has been launched by the Indian Navy in collaboration with IISc (Bengaluru).

More on the Topic:

- This is a significant step towards reducing use of conventional HCFCs with high Global Warming Potential y employing a natural refrigerant with GWP of 1 and is in line with Kigali Agreement of 2016 ratified by India.
- The other initiatives carried out towards a ‘Clean and Green Navy’ include the commissioning of solar power with cumulative capacity of 15.87 MW.
- CO2 has several unique thermo-physical properties such as Very good heat transfer coefficient; Relatively insensitive to pressure losses; and Very low viscosity.
- In practical applications, CO2 systems deliver very high performance, the main reasons being better heat exchange, very low pumping power when CO2 is used as secondary fluid, and in cold climate the possibility of operating with a very low condensing pressure in the winter.

Source: Business Standard
