Blue Hydrogen

Context: Coal Ministry organizes Seminar on "Blue Hydrogen-Energy Security & Hydrogen Economy"

- Secretary of Ministry of Coal delivered a keynote address on "Blue Hydrogen-Energy Security and Hydrogen Economy" at an event organized by the Ministry.
- The session focused on discussing technologies for coal to hydrogen conversion, cost competitiveness, global experiences, and the way forward strategy.
- The Ministry of Coal had formed a committee to identify actionable points for the coal sector to support the Green Hydrogen Mission, and its recommendations should be deliberated and an action plan finalized.
- Shri Meena, Secretary, suggested the formation of an Advisory Committee in the Ministry with experts to regularly discuss and promote gasification.

What is Blue Hydrogen?

- Blue hydrogen is produced from natural gas or coal through processes like steam methane reforming or coal gasification.
- The production process generates hydrogen gas and carbon dioxide (CO_2).
- CO_2 emissions from blue hydrogen production are captured and stored or utilized using carbon capture and storage (CCS) technology.
- Blue hydrogen is considered a transitional solution towards a low-carbon economy.
- It can potentially reduce greenhouse gas emissions compared to grey or brown hydrogen production.

Other Colour Coded forms of Hydrogen

COLOUR	DESCRIPTION: FEEDSTOCK
	Grey: natural gas reforming without CCUS
	Brown: brown coal (lignite) as feedstock
	Blue: natural gas reforming with CCUS
	Green: electrolysis powered through renewable electricity
	Pink: electrolysis powered through nuclear energy
	Turquoise: methane pyrolysis
	Yellow: electrolysis powered through electricity from solar
	Orange: electrolysis powered through electricity from wind

Hydrogen Economy

- Hydrogen economy refers to wide-scale use of hydrogen as an energy carrier.
- Produced from fossil fuels (with capture), renewables, and other sources.
- Applied in transportation, industry, and power generation.
- Offers high energy density, zero emissions (from renewables), and versatility.
- Aims to reduce fossil fuel dependence and mitigate emissions.
- Challenges include costs, infrastructure, and logistics.
- Global investments driving hydrogen technology and infrastructure growth.

National Green Hydrogen Mission

- India aims to achieve energy independence by 2047 and net-zero emissions by 2070.
- Increasing renewable energy use is crucial for India's energy transition.
- Green hydrogen is seen as a promising solution for this transition.
- It can be used for long-duration energy storage, replacing fossil fuels, clean transportation, decentralized power generation, aviation, and marine transport.
- The National Green Hydrogen Mission was approved to make India a leading producer and supplier of green hydrogen globally.
- Objectives include reducing dependence on imported fossil fuels, developing indigenous manufacturing capabilities, attracting investments, and creating employment opportunities.
- By 2030, the mission aims to develop a green hydrogen production capacity of 5 MMT per year and add 125 GW of renewable energy capacity.
- It targets over Rs. 8 lakh crore in investments, the creation of over 6 lakh jobs, reducing fossil fuel imports by over Rs. 1 lakh crore, and abating nearly 50 MMT of greenhouse gas emissions annually.

Discretionary Powers of Governor

Context: Tamil Nadu Chief Minister M.K. Stalin on Friday indicated that the State government might move the court against Governor R.N. Ravi withholding assent to Bills.

Discretionary Powers

The Governor of state, unlike the President of India, is conferred with power to act at his own discretion. There are two categories of discretion for the governor. One is Constitutional Discretion and the other is Situational Discretion.

Constitutional Discretion

- Reservation of a bill for the President's consideration. (Article 200)
- Recommendation for implementing President's Rule in the state. (Article 356)
- While performing his duties as the administrator of a neighbouring union territory (in case of additional charge). (when appointed under Article 153)
- Determining the amount payable to an autonomous Tribal District Council as royalty from mineral exploration licences by the governments of Assam, Meghalaya, Tripura, and Mizoram. (Schedule 6)
- Seeking information from the chief minister about state administrative and legislative matters.

Situational Discretion

- Appointment of a chief minister when no party has a clear majority in the state legislative assembly or when the current chief minister dies unexpectedly and there is no obvious successor.
- Dismissal of the council of ministers when it is unable to demonstrate the confidence of the state legislative assembly.
- Dismissal of state legislative assembly when the council of ministers lose their majority.
- Furthermore, the governor is charged with specific duties that must be carried out in accordance with the President's directives. In this regard, the governor, while required to consult the council of ministers led by the chief minister, acts at his discretion. These are:
    - Maharashtra – Formation of separate development boards for Vidarbha and Marathwada.
    - Gujarat – Formation of separate development boards for Saurashtra and Kutch.

- Nagaland–In terms of law and order in the state, as long as the internal conflict in the Naga Hills-Tuensang Area persists.
- Assam–With regards to tribal area administration.
- Manipur–In relation to the administration of the state's hill areas.
- Sikkim–For peace and the social and economic advancement of all sections of the population.
- Arunachal Pradesh–In terms of the state slaw and order.
- Karnataka - Creation of a separate development board for the Hyderabad-Karnataka region.

➢ If any question comes up if a certain action is in discretion of the Governor or not, then the decision of the Governor is final and can't be questioned.

Discretionary Powers of President

➢ **President has no discretionary powers mentioned in the Constitution, and shall act on the aid and advice of the Council of Ministers**
➢ **Situational Discretion**
- Appointment of Prime Minister during a hung Parliament
- Veto powers against a bill
- Dissolution of Lok Sabha when the ruling party loses majority
- Seeking information from the Prime Minister

El Nino and Indian Monsoon

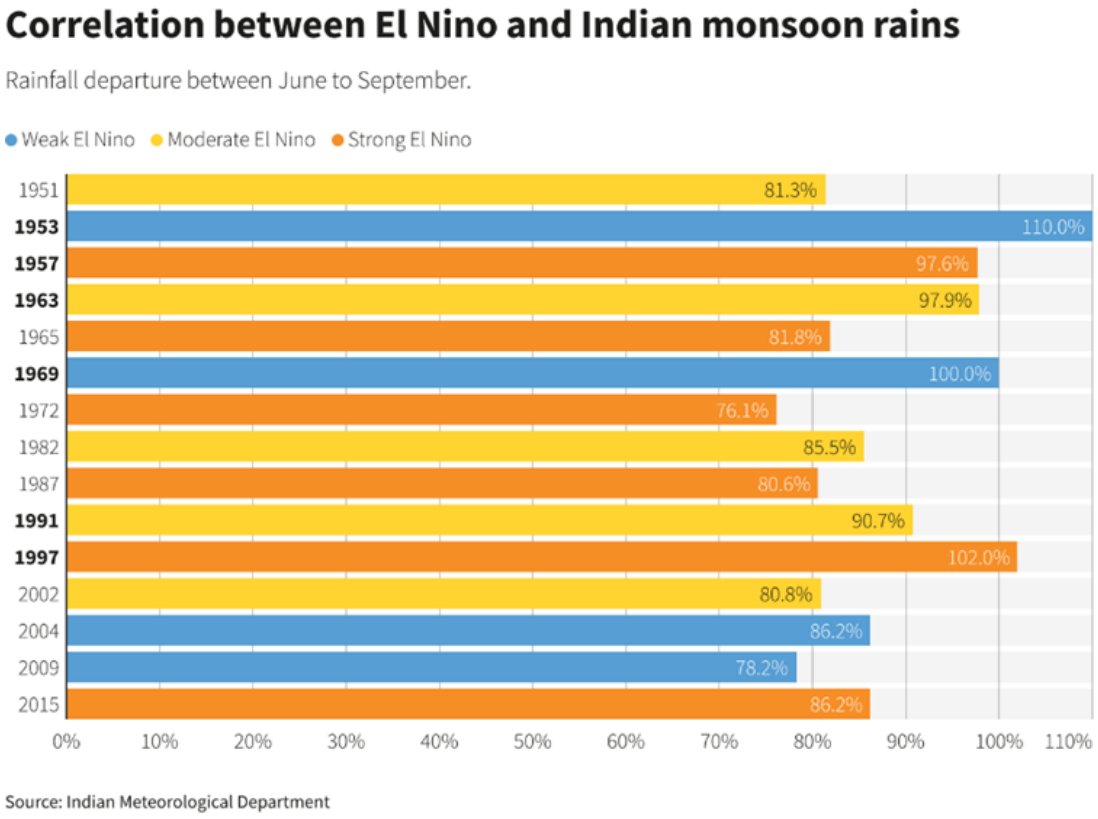
Context: As the monsoon hit the Kerala coast, the US National Oceanic and Atmospheric Administration (NOAA) declared that the equatorial Pacific Ocean was firmly in the El Nino phase.

➢ The US National Oceanic and Atmospheric Administration (NOAA) has declared the equatorial Pacific Ocean to be in the El Nino phase.
➢ El Nino refers to abnormal warming of sea surface waters in the equatorial Pacific Ocean, impacting weather events globally.
➢ El Nino suppresses rainfall during the monsoon season in India.
➢ El Nino can cause heavy rainfall and droughts in various locations worldwide.
➢ The current El Nino event is the fifth since 2000.
➢ El Nino and La Nina are alternating phases in the El Nino Southern Oscillation (ENSO) system.
➢ The sudden gain in strength of the El Nino event has exceeded expectations.
➢ Accelerated rates of warming, following three years of La Nina, are unusual.
➢ **El Nino is associated with drought years in India, with 13 out of 18 drought years in the last century being linked to El Nino.**
➢ During El Nino, trade winds weaken, and warmer sea surface temperatures prevail along the equatorial Pacific Ocean.
➢ El Nino years between 1951 and 2021 saw nine summer monsoon seasons in India with deficient rainfall.

What is El Nino?

➢ El Nino refers to abnormal warming of sea surface waters in the equatorial Pacific Ocean.
➢ It influences weather patterns globally.
➢ It can increase the risk of heavy rainfall and droughts in various locations worldwide.
➢ El Nino events occur every two to seven years as part of the El Nino Southern Oscillation (ENSO) system.

- It alternates with the cold phase known as La Nina.
- El Nino events can have significant impacts on agriculture, water resources, and ecosystems.
- El Nino can disrupt marine ecosystems, affecting fisheries and marine life.
- It can also impact global climate patterns, leading to changes in temperature and precipitation distribution.
- **Formation of El Nino**
  - El Nino forms due to changes in equatorial Pacific Ocean conditions.
  - Weakening trade winds disrupt the usual oceanic circulation pattern.
  - Warm surface waters pool near South America.
  - This leads to elevated sea surface temperatures in the central and eastern Pacific.
  - El Nino events peak in late fall or winter and can last for months to over a year.
  - Monitoring indicators help predict and track El Nino development.
  - El Nino influences global weather patterns, affecting rainfall, temperature, and atmospheric circulation.



Impact on Indian Monsoon

- El Nino leads to warmer ocean temperatures in the Pacific.
- It causes changes in atmospheric patterns.
- The Indian monsoon weakens during El Nino years.
- There is a significant correlation between El Nino and monsoon rainfall.
- India has experienced normal or above-normal rainfall in some El Nino years.
- However, recent El Nino years have seen drought conditions and below-average rainfall in India.

NEWS IN BETWEEN THE LINES

Tactical Nuclear Weapon

Context: Recently, Russia's President Vladimir Putin has announced plans to deploy tactical nuclear weapons in Belarus after the completion of special storage facilities on July 7-8.

What is a Tactical Nuclear Weapon?

Tactical nuclear weapons, also known as non-strategic nuclear weapons, are a category of nuclear weapons designed for use in specific military situations on a battlefield or in close proximity to the enemy's forces.

Size and Range:

These weapons are generally smaller in yield and have a shorter range compared to strategic nuclear weapons, which are designed for long-range delivery and are typically associated with intercontinental ballistic missiles (ICBMs) and strategic bombers.

Purpose:

The primary purpose of tactical nuclear weapons is to provide a variety of military options, including deterrence, escalation control and battlefield superiority.

Proxy war concerns:

President Putin views the conflict in Ukraine as an expansionist move by the West, with the United States and its allies allegedly supplying arms to Ukraine.

NATO's response:

NATO countries have expressed their support for Ukraine and vowed to assist in its defense against what they perceive as Russian aggression. The ongoing conflict in Ukraine is seen as a battle for the survival of the Ukrainian state by NATO.

International implications:

The decision to deploy nuclear weapons in Belarus has raised concerns globally. The United States and its NATO allies are closely monitoring the situation, as this move has potential consequences for regional stability and the balance of power in Europe.

Har Ghar Jal Program

Har Ghar Jal
Jal Jeevan Mission

Context: Recently, the World Health Organisation (WHO) report highlighted the significant impact of India's 'Har Ghar Jal' Program on public health, including the prevention of diarrheal disease deaths and estimated cost savings of up to $101 billion.

Har Ghar Jal Program:

The "Har Ghar Jal" (Water to Every Household) program is an initiative of the Government of India launched under the Ministry of Jal Shakti. The program aims to provide piped water supply to every rural household in India by 2024. The program was announced by the Prime Minister of India (Narendra Modi) on August 15, 2019.

Objective:

The key objectives of the Har Ghar Jal Program are to eliminate water scarcity, enhance access to clean drinking water, reduce water-borne diseases and improve the overall quality of life in rural communities. It is part of the larger government initiative called Jal Jeevan Mission.

Alignment with SDG 6.1:

The program aligns with the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation, and Hygiene (JMP) to monitor progress on Sustainable Development Goal (SDG) 6.1, which focuses on safely managed drinking water services.

Health Impact:

The report estimates that ensuring safely managed drinking water for all households in India could prevent nearly 400,000 deaths caused by diarrheal diseases and prevent approximately 14 million Disability Adjusted Life Years (DALYs) related to these diseases.

Cost Savings:

The achievement of providing safe drinking water would result in estimated cost savings of up to $101 billion.

The 'Sagar Samriddhi'

Context: Recently, the Union Minister Shri Sarbananda Sonowal has launched 'SAGAR SAMRIDDHI,' an online dredging monitoring system, to enhance transparency and efficiency.

What is 'Sagar Samriddhi'?

It is an online dredging monitoring system developed by the National Technology Centre for Ports, Waterways and Coasts (NTCPWC) under the Ministry of Ports, Shipping & Waterways.

Objective:

The objective of the Sagar Samriddhi program is to enhance productivity, contract management and effective reuse of dredged material, aligning with the waste to wealth concept.

Function:

The program will reduce dredging costs, increase transparency, and efficiency in the overall system.

The NTCPWC (National Technology Centre for Ports, Waterways & Coasts), established under the Sagarmala Programme, is responsible for research and development in the marine sector, offering solutions for port, coastal, and waterways-related challenges.

The Gulf of Oman

Context: Recently, the navies of India, France and the United Arab Emirates (UAE) conducted their first-ever trilateral maritime partnership exercise in the Gulf of Oman.

Gulf of Oman:

The Gulf of Oman is of great significance in terms of international trade and shipping routes as it is a key maritime corridor for the transportation of oil and natural gas from the Persian Gulf to the rest of the world. The Strait of Hormuz connects the Gulf of Oman to the Arabian Sea.

Location:

The Gulf of Oman is located in the northeastern part of the Arabian Sea.

Bordering Countries:

The countries that border the Gulf of Oman are Iran to the north and Pakistan to the east.

Major Ports:

Some major ports located along the Gulf of Oman include Chabahar Port in Iran, Port Sultan Qaboos in Oman and Gwadar Port in Pakistan.

The Territorial Disputes:

The territorial disputes or conflicts related to the Gulf of Oman primarily involve Iran and the United Arab Emirates (UAE) regarding sovereignty over certain islands, including Abu Musa, Greater Tunb, and Lesser Tunb.

Natural Resource:

The major natural resources found in the Gulf of Oman include oil, natural gas, and fish.

Environmental Significance:

The Gulf of Oman has environmental significance as it supports diverse marine ecosystems and is home to various marine species. However, it faces challenges such as pollution, overfishing, habitat destruction, and the impacts of climate change.

Mekedatu Dam Project

Context: Recently, the Cauvery Water Management Authority is scheduled to hold a meeting in New Delhi on June 16. However, it appears that the highly controversial Mekedatu dam project will not be a topic of discussion.

Mekedatu Dam Project:

Objective: The project aims to build a dam and reservoir on the Cauvery River to supply drinking water to Bengaluru and replenish groundwater. It also intends to generate 400 MW of power.

Approval: The Karnataka government approved the project in 2017.

Purpose: The project aims to address the water needs of Bengaluru, one of India's rapidly growing cities, and enhance power generation in the region.

Cauvery River:

Significance: It is the third largest river in southern India and the largest river in Tamil Nadu, known as 'Ponni' in Tamil.

Origin: The Cauvery River originates in Karnataka, specifically in Talakaveri located in the Brahmagiri range of the Western Ghats in Kodagu district.

Flow: It flows through Tamil Nadu and drains into the Bay of Bengal through Pondicherry.

Tributaries: Some of its tributaries include Harangi, Hemavati, Kabini, Bhavani, Lakshmana Tirtha, Noyyal, and Arkavati.

Tamil Nadu's Opposition to Mekedatu:

Tamil Nadu has consistently opposed the Mekedatu dam project and considers its planning a violation of the Cauvery Water Disputes Tribunal's decision of February 5, 2007, which was later affirmed by the Supreme Court on February 16, 2018.