

Current Affairs – April 2024 – Lecture 02

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MAINS MANIA

1. Why green hydrogen presents both major opportunities, significant challenges

• The Ministry of New and Renewable Energy (MNRE) recently unveiled a Rs-496-crore (2025-26) program to fund pilot projects that build safe supporting infrastructure, such refueling stations, or evaluate the viability of using green hydrogen as a car fuel.

Objecive of MNRE scheme

- I. Validation of technical feasibility and performance of green hydrogen as a transportation fuel
- II. Evaluation of the economic viability of green hydrogen-powered vehicles
- III. Demonstration of safe operation of hydrogen-powered vehicles and refuelling stations.



About Green, Blue and grey hydrogen



An October 2020 file photo of a hydrogen fuel pump in Torrance, California. Shell has now shut its hydrogen refuelling stations for cars in the state. The New York Times

THE COLOURS OF HYDROGEN

GREY hydrogen constitutes the bulk of India's production currently. It is extracted from hydrocarbons (fossil fuels and natural gas), and carbon dioxide is the byproduct of consumption.

BLUE hydrogen is also sourced from fossil fuels, but byproducts such as

carbon monoxide and carbon dioxide are captured and stored, so it is better than grey hydrogen.

GREEN HYDROGEN is an 'end-toend' green fuel. Electricity generated from renewable sources such as wind or solar is used to electrolyse water. Byproducts are water or water vapour.

- The importance of hydrogen-fueled automobiles, especially those with internal combustion engines (ICEs) and fuel cell electric vehicles (FCEVs)
- Zero Carbon Emissions: When operating, FCEVs and hydrogen-fueled internal combustion engines both emit zero carbon dioxide.
- Energy Efficiency: FCEVs still offer high energy efficiency when compared to traditional internal combustion engine vehicles, especially those powered by fossil fuels like diesel and petrol. However, research suggests that burning hydrogen in an ICE vehicle may be less energy-efficient than using it in a fuel cell.
- Clean Energy Production: A variety of renewable energy sources, including solar, wind, and hydroelectric power, can be used to manufacture hydrogen.
- Lightweight and Greater Payload Capacity: Because hydrogen and the fuel cell stack are less heavy than EV batteries, hydrogen fuel cell electric cars (FCEVs) often weigh less than battery electric vehicles (BEVs).
- Applications for Long-haul Freight: Studies show that long-haul FCEVs can transport loads of freight comparable to those of diesel trucks, however BEVs may be heavier than FCEVs.
- Diversification of Energy Sources: Vehicles powered by hydrogen are a practical substitute for batteryelectric vehicles, thereby offering a greater variety of energy sources for transportation.

Challenges

- Difficulties with Storage and Transportation: It is important to create specialized cylinders that can securely store high-pressure green hydrogen. Compressed natural gas (CNG) cylinders that are currently in use are not appropriate for storing hydrogen.
- Fuel Prices and Infrastructure: The higher fuel costs and the requirement for infrastructure development, such as hydrogen refueling stations, make it difficult for green hydrogen-powered vehicles to compete with battery electric vehicles (BEVs). The high expense of setting up and maintaining infrastructure for hydrogen refueling prevents hydrogen fuel cell electric vehicles (FCEVs) from being widely used.
- Safety Concerns: Because hydrogen burns easily, handling and storing the fuel at filling stations requires strict safety regulations and procedures.

Green hydrogen provides energy efficiency, zero emissions, and a variety of energy sources for mobility. Nevertheless, despite MNRE's support program, obstacles including storage, infrastructure costs, and safety concerns prevent wider use.



How is efficient and affordable urban mass transport key to the rapid economic development in India? (UPSC 2019)

Discuss in detail the photochemical smog emphasizing its formation, effects and mitigation. Explain the 1999 Gothenburg protocol. (UPSC 2022)

2. Implementing Universal Health Coverage

Many nations hope to adopt Universal Health Coverage (UHC) on the eve of World Health Day (7 April), following India's 2017 introduction of its National Health Policy. Nevertheless, there are obstacles to its implementation in India as well.

Context:

- The UN General Assembly unanimously adopted a resolution on December 12, 2012, pushing nations to move more quickly toward universal health coverage.
- In 2011, the Planning Commission received a report from a high-level expert committee informing them of the government's intention to raise public financing for health to 2.5 percent of GDP in the country's 12th Plan (2012–17).

What are the challenges in the Implementation of UHC in India?

- Federal Issue: In India, health is a state responsibility, although a national UHC policy is planned. Coordination between the federal government and state governments may become difficult as a result.
- The right to health is based on the Directive Principles of State Policy, but it may be difficult to ensure consistent and enforceable healthcare rights in the absence of an explicit constitutional provision.
- The population of migrants and urban slums: Because of problems including overcrowding, inadequate sanitation, and inadequate infrastructure, a considerable section of the population in urban slums struggles to get primary health care.

Suggestive Measures:

- Taking Care of the Medical Needs of Urban Migrants: Setting up mobile clinics or healthcare units that may travel to migrant groups in urban and peri-urban areas and offer basic medical care.
- Minimizing Out-of-Pocket Expense: Encouraging simple reimbursement for medical expenses by streamlining the reimbursement process through the digitization of healthcare payment systems and their integration with mobile banking platforms or government identity.
- Building Systems of Inclusive Health: To enable accessibility for a varied metropolitan population, bilingual and culturally relevant health information materials and services are being introduced.
- Establishing community health centers or clinics in urban and peri-urban regions manned by qualified community health workers capable of offering basic medical services and referrals is known as the implementation of community-based primary healthcare.

Q. Public health system has limitation in providing universal health coverage. Do you think that private sector can help in bridging the gap? What other viable alternatives do you suggest? (UPSC 2015)

3. The citizen's 'climate rights'

• In a recent ruling in M K Ranjitsinh & Ors. v. Union of India, the Supreme Court affirmed that individuals have a fundamental right to be free from the negative consequences of climate change while highlighting the need for nations like India to respect their international commitments for a healthy and sustainable development.

Background of M K Ranjitsinh & Ors. vs Union of India Case:

- The Great Indian Bustard (GIB), which is critically endangered, was at issue in this case.
- M K Ranjitsinh, a former government officer and conservationist, filed a writ petition in 2021 to save the endangered Greater Giant Butterfly and Lesser Florican.



The latest revision to the previous ruling rendered by the Supreme Court: Who applied for modification of an earlier case?

- The 2021 order was sought to be modified by the Ministries of Power, Environment, Forests and Climate Change, and New and Renewable Energy on the grounds that it would negatively affect India's power industry and that it would be impractical to subterranean electrical lines.
- One of the main justifications for requesting a revision of the 2021 decree is the Paris Climate Treaty of 2015.

What SC did say in this case?

- Subterranean powerlines: After taking into account variables like topography, population density, and infrastructure needs, the Supreme Court revised its April 2021 ruling directing the undergrounding of highand low-voltage power lines. It also instructed specialists to evaluate the viability of subterraneaning power lines in particular locations.
- The previous course was unworkable: The decision recognized that, in addition to not being practical to carry out, the prior directives "would not result in achieving its stated purpose, i.e., the conservation of the GIB."
- Appropriate link between FR and DPSP: The court underlined that the right to life and personal liberty as guaranteed by Article 21 must be taken into consideration when interpreting the Directive Principles of State Policy when addressing environmental concerns.

What are the implications of the judgment for environmental jurisprudence?

- Enhancing Environmental and Climate Justice: By acknowledging the complex effects of climate change on many communities, the ruling places a strong emphasis on enhancing environmental and climate justice.
- Extension of Article 14 and Right to Life: The ruling broadens the protection of equality before the law provided by Article 14 of the Constitution to include environmental issues.
- Impact on Government Policies and Public debate: It is anticipated that the ruling would impact government policies and public debate on environmental concerns, reshaping priorities and public perceptions of environmental protection.
- Creation of Legal precedent: The ruling creates a major legal precedence by recognizing the "right against adverse effects of climate change."

The Supreme Court's affirmation of people' "right to be free from adverse effects of climate change" fortifies environmental justice, broadens constitutional safeguards, shapes public policy, and establishes a significant legal precedent.

Does the right to clean environment entail legal regulation on burning crackers during Diwali? Discus in the light of Article 21 of Indian Constitution and judgements of the apex in this regard. (UPSC 2015) The most significant achievement of modern law in India is the constitutionalization of environmental problems by the Supreme Court." Discuss this statement with the help of relevant case laws. (UPSC 2022)

4. POEM-3: ISRO's 'Zero Orbital Debris' Milestone

According to the Indian Space Research Organization (ISRO), there is essentially no trash in Earth's orbit left over from the PSLV-C58/XPoSat mission.

About PSLV Orbital Experimental Module-3 (POEM-3)

- POEM-3 was launched on January 1, 2024, using the PSLV-C58 vehicle's discarded PS4 stage, which was used to launch XPoSat first.
- In order to support payloads, it is a three-axis, altitude-controlled platform with power production, telecommand, and telemetry capabilities.
- The goal of the XPoSat mission was to leave no debris in orbit, proving ISRO's dedication to ethical space operations.



- In order to reduce orbit decay time when the experiment is over, POEM-3 was guided to a 350 km circular orbit after being launched into an orbit at 650 km.
- POEM-3 spent 73 days in space before returning to Earth's atmosphere after 400 orbits.

Significance of this achievement

- Space debris is becoming a major concern because to the increase of satellites orbiting the planet.
- The majority of space debris in low earth orbit (LEO) is made up of rocket, spacecraft, and defunct satellite fragments as well as items that have undergone explosive degradation due to anti-satellite missile testing.
- There are times when this debris travels around at up to 27,000 km/h.
- They are a threat to multiple space assets because of their sheer bulk and momentum.

Threats posed by Space Debris

Space debris also leads to two major risks:

- It creates unusable regions of the orbit due to excessive debris, and
- Leads to the 'Kessler syndrome' creation of more debris due to cascading collisions resulting from one collision.

5. Green Elections

The use of non-biodegradable materials in elections has raised concerns from the Election Commission of India (ECI) about potential environmental implications.

Context:

• The adoption of sustainable methods in all areas of human endeavor has become imperative in light of the climate issue.

Green Elections:

• These are procedures designed to lessen the effect that elections have on the environment. They include actions like encouraging candidates to use sustainable campaign tactics, advocating the use of recycled materials, and promoting electronic voting.

Objectives/Aims of Green Elections:

- Parties and candidates can use eco-friendly substitutes including reusable materials, biodegradable banners, and recycled paper.
- During rallies, choosing energy-efficient vehicles, sound systems, and lighting can assist cut down on carbon emissions.
- Using digital tools (websites, social media, email) for campaigning lowers the amount of paper and energy used.

Need for a shift towards Green Elections:

- Because of a number of reasons, including the emissions from campaign planes during elections, traditional
 election processes have a major negative impact on the environment. These factors add significantly to the
 overall carbon footprint.
- The use of paper-based materials for voting, political literature, and administrative paperwork results in energy-intensive production processes and deforestation.
- Large-scale election rallies that use energy-intensive equipment such as lights, loudspeakers, and other devices increase emissions and energy use.
- Hoardings, PVC flex banners, and single-use goods used for campaigns all contribute to trash production and environmental damage.

Issues/Challenges in the Adoption of Green Elections:

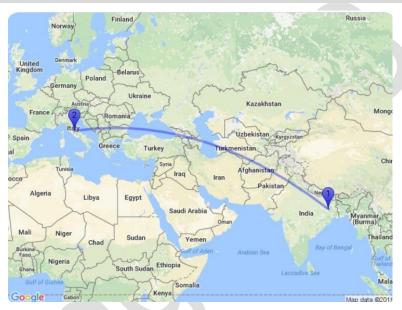
• It is imperative to guarantee equitable access to modern technology for all voters. On the other hand, this calls for significant work in terms of teaching voters about the new technologies and training election



officials. Developing the skills of election officials to operate and troubleshoot the new technology is one of the unique issues. Another is making sure that all voters, especially those in underprivileged or rural locations, can access and use the equipment. It is imperative to tackle inequalities in internet connectivity and digital literacy.

- Adopting cutting-edge technologies and environmentally acceptable materials frequently has large upfront expenditures. Finances being tight, governments may hesitate, particularly those with little budgets.
- Voting has historically been connected to being present in person at polling places. Achieving successful modernization requires transforming voter behavior and breaking through cultural stagnation. For many voters, traveling to the polls in person is an essential civic responsibility. It can be difficult to persuade them that digital alternatives are just as legitimate.
- Voter security is an issue when new methods are introduced, such as blockchain-based systems or internet voting. Election integrity and public trust could be compromised by any cybersecurity breach.

6. India - Italy Relations



• The Migration and Mobility Agreement between Italy and India was ratified by the Union Cabinet in December of last year.

Background:

India and Italy are two very old civilizations that have been connected for two millennia. Italian port cities
played a significant role in the spice trade as trading hubs. In the thirteenth century, the Venetian trader
Marco Polo visited India and documented his travels in writing. India and Italy established political
connections in 1947 upon their independence. From that time on, both countries have maintained a
regular exchange of official and political visits, including multiple visits by heads of state.

Relations between Italy and India:

- Both nations have regularly exchanged visits at the official and political levels. For example, in October 2021, the Indian Prime Minister made his first official trip to Italy in order to attend the G20 Summit. As the honored guest of Raisina Dialogue, the Italian prime minister made her first-ever state visit to India in March of 2023.
- India's fourth-largest EU trading partner is Italy. In 2022–2023, the two nations' bilateral commerce was valued at US\$ 14.25 billion, with India benefiting from a positive trade balance.
- The purpose of the India-Italy Military Cooperation Group (MCG) is to enhance defense cooperation. In order to foster collaboration in a variety of defense fields, including security and defense policy, defense industrial cooperation, and others, India and Italy signed a defense cooperation agreement in 2023.



- A Strategic Partnership was established between Italy and India in March 2023, coinciding with the Italian
 Prime Minister's visit to the country. A link was found between the expanded Mediterranean, where Italy is
 located in the middle of the Mediterranean Sea and serves as a natural bridge into the Indo-Pacific, and the
 Indo-Pacific, in which India plays a prominent role. Italy's decision to leave the Belt and Road Initiative is in
 line with shared objectives for increased global connectivity.
- Italy backed India's admission to the Australia Group and the Wassenaar Arrangement. Through an underwater cable system, the Blue-Raman project, which is centered around an Italian company, aims to transmit digital data for tighter ties between the Mediterranean and the Indian Ocean. Italy backed several of India's largest projects, such as the Global Biofuels Alliance (GBA), the India-Middle East-Europe Economic Corridor (IMEC), and the International Solar Alliance (ISA).

Issues/Challenges/Regarding the Relations Between Italy and India:

- Even while India and Italy have historical trade relations that date back to the Roman era, their present trade and investment volumes are rather small.
- A dispute over functional immunity and legal jurisdiction was raised by the Italian Mariners' case, and it wasn't resolved until 2020 when the Permanent Court of Arbitration rendered its decision.
- Due to allegations of bribery surrounding the Italian corporation Leonardo's defense firm in the Agusta Westland helicopter controversy, India cancelled the procurement agreement and barred Leonardo from the Indian defense market in 2015.
- The trilateral collaboration between Japan, Italy, and India was established in 2021, although it hasn't yet been operationalized.

Way Forward:

- To boost trade volume, find new investment opportunities, and encourage economic cooperation, strengthen trade ties.
- Italy and India stand to gain significantly from two-way commerce if the EU and India establish a trade agreement soon. Additionally, it would strengthen the recently rekindled EU-Indian partnership.
- India and Italy have a shared need to jointly create and support a new global agenda, so they can agree on multilateral concerns.
- Through food festivals and other gourmet events, honor and promote the culinary traditions of both nations. Italian pizza and pasta can be found on Indian tables, and Indian spices can give Italian cuisine a kick.

PRELIMS PROSPECTIVE

1. India has eliminated Kala-azar

• The National Centre for Vector Borne Diseases Control (NCVBDC) reports that India has effectively eliminated visceral leishmaniasis, also referred to as kala-azar.

About Kala-azar:

- The protozoan parasite Leishmania, which is spread by sandfly bites, is the cause of this illness. It mostly affects the liver, bone marrow, and spleen as it advances slowly. The name "kala-azar" refers to the discolored skin and indicates "black disease" in India, where Leishmania donovani is the source of the condition. Dermal lesions caused by the parasite's impact on skin cells are known as Post-Kala-azar Dermal Leishmaniasis (PKDL).
- India achieved its elimination target, originally scheduled for 2010 but extended until 2023, in spite of ongoing difficulties. In states like West Bengal, Uttar Pradesh, Jharkhand, and Bihar, kala-azar has long been a health concern. Just 520 instances of kala-azar were reported in India in 2023, which satisfied the World Health Organization's (WHO) eradication requirements.



• In order to prevent and manage diseases like Japanese encephalitis (JE), dengue, kala-azar, lymphatic filariasis, malaria, and chikungunya, the National Vector Borne Disease manage Programme (NVBDCP) was established in 2003–04.

2. OZONE

Scientists from India and other countries have collaborated to uncover compelling evidence of ozone on Callisto, Jupiter's moon.

Context:

• This discovery provided insight into the intricate chemical reactions taking place on frozen planets in our solar system.

About OZONE

- Ozone, a chemical compound with the formula O₃, is frequently referred to as trioxygen.
- In the Earth's atmosphere, ultraviolet (UV) radiation and electrical discharges combine to form ozone from dioxygen (O₂).
- The earth's atmosphere contains extremely small amounts of ozone.
- It is most concentrated in the stratosphere's ozone layer, which absorbs the majority of ultraviolet (UV) energy from the Sun.
- Because it keeps excessive UV radiation from reaching the surface, the ozone layer is essential to maintaining life as we know it on Earth. Living things could suffer serious harm from solar UV radiation in the absence of this shield.
- Ozone is a sign of a stable, oxygen-rich atmosphere, which is necessary for the emergence of complex organic compounds and possibly life on Jupiter's moon Callisto.
- The possible habitability of Callisto and the hunt for extraterrestrial life are significantly affected by the discovery of ozone on the moon.

3. RBI to launch Mobile App for Retail Direct scheme



• To make it easier for individual investors to participate in government securities, the RBI has chosen to launch a mobile app for its RBI individual Direct program.

The Retail Direct Scheme: What Is It?

- November 2021 saw the launch of the Retail Direct Scheme, which allowed individual investors to purchase government securities and keep gilt accounts with the RBI.
- Investors can purchase Treasury bills, federal and state government bonds, and more with this app.



- Investors can purchase securities through the Negotiated Dealing System-Order Matching system (NDS-OM) platform and during primary auctions.
- A Gilt Account is similar to a bank account, but instead of receiving payments or credits from cash, it receives payments in the form of government securities or treasury bills.

How does it operate?

- Small investors can purchase or sell government securities (G-Secs), sometimes known as bonds, directly through the program, bypassing middlemen like mutual funds.
- Nonetheless, income from G-Secs is subject to the same tax laws.
- A bid must be at least ₹10,000, and anything beyond that must be in multiples of ₹10,000.
- Payments can be made via UPI or Net banking.

Advantages of RDS

- Since the government is the borrower, there is no default risk because the funds are guaranteed by the government.
- Additionally, depending on current interest rate patterns, government assets may offer higher interest rates than bank fixed deposits.

How can individuals access G-Sec offerings?

- Investors can use the web portal created specifically for the plan to open a Retail Direct Gilt account directly with the RBI.
- Upon successful activation of the account via a password supplied to the user's mobile device, investors will have the ability to purchase securities through either the primary or secondary market.
- Q. Consider the following statements: 2018
- 1. The Reserve Bank of India manages and services Government of India Securities but not any State Government Securities.
- 2. Treasury bills are issued by the Government of India and there are no treasury bills issued by the State Governments.
- 3. Treasury bills offer are issued at a discount from the par value.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 3 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

4. DEMOGRAPHIC DIVIDEND

 The World Bank issued a warning, stating that the failure to create jobs at a rate to match the increase in the working-age population poses a risk to South Asian countries' ability to "squander its demographic dividend."

Context:

• The working-age population increased by an average of 19 million people annually between 2000 and 2023, and this resulted in an average of 10 million new jobs being created in the region.

About DEMOGRAPHIC DIVIDEND:

- "The economic growth potential that can result from shifts in a population's age structure, mainly when the share of the working-age population is larger than the non-working-age share of the population," is how the United Nations Population Fund defines demographic dividend.
- Because there are more people in India who are working age and have fewer dependents, there are more economic prospects as a result of the demographic dividend.



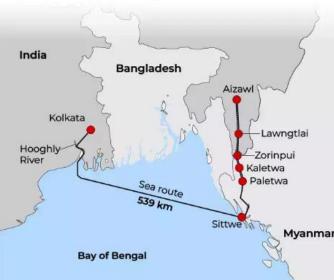
Aspects of the Demographic Dividend in India

- Large and Increasing Working-Age Population: Since 2018, India's working-age population (15–64 years old) has outpaced its dependant population.
- Uniqueness: Unlike any other nation in the world, India's demographic dividend opportunity covers five decades, from 2005–06 to 2055–06.
- increased Education Levels: India's workforce is becoming more skilled and productive as a result of increased educational attainment.
- Increasing Gender Equality: Women's engagement in the workforce and educational attainment have increased significantly in recent years, contributing to the notable progress made in this direction.

MAPPING MASTER

1. Sittwe Port in Myanmar





- India now has the authority to run Sittwe, a second overseas port in Myanmar, in addition to Chabahar.
- This construction is a component of the Kaladan Multimodal Transit Transport project, which intends to use the Sittwe port to offer alternative connections from India's eastern coast to the northeastern states.

About Sittwe Port

- Situated in Myanmar's Rakhine State, the Sittwe Port is an essential part of the Kaladan multimodal transit transport project.
- It was created in accordance with a framework agreement between India and Myanmar for the building and management of a Kaladan River multimodal transportation facility.
- It is a deep-water port that improves trade and connectivity between India and Myanmar by acting as a maritime gateway.

Significance

- The Kaladan multi-modal transit system project includes the Sittwe Port.
- The project intends to establish a maritime link between the seaports of Sittwe, Myanmar, and Kolkata, eastern India.
- Additionally, it connects Paletwa, Myanmar, to Zorinpui, Mizoram, via a road component, and Sittwe Port to Paletwa, Myanmar, via the Kaladan River canal.



- In addition to providing a different route for exporting commodities to the northeastern states, this link will drastically cut the price and travel time from Kolkata to Mizoram and other destinations.
- Additionally, it will lessen reliance on the chicken's neck, or Siliguri Corridor, which is crammed between Bangladesh and Bhutan.

In the Mekong-Ganga Cooperation, an initiative of six countries, which of the following is/are not a participant/participants? 2015

- 1. Bangladesh
- 2. Cambodia
- 3. China
- 4. Myanmar
- 5. Thailand

Select the correct answer using the codes given below:

- (a) 1 only
- (b) 2, 3 and 4
- (c) 1 and 3
- (d) 1, 2 and 5

2. Netaji Subhash Chandra Bose Island



• On Netaji Subhash Chandra Boss Island, the spotted deer (Chital) population is growing out of control, which is causing issues.

Context:

• The British brought the herbivore to the Andaman and Nicobar Islands for game hunting in the early 1900s, and because there were no significant predators to control its population, it multiplied unchecked for years. For the authorities of the Union Territory, it has turned into a "invasive" issue.

About Netaji Subhash Chandra Bose Island

- A member of the Andaman Islands, Netaji Subhash Chandra Bose Island was once known as Ross Island.
- Three kilometers to the east of Central Port Blair is where the island is located.
- It is a part of the Andaman and Nicobar Islands' South Andaman administrative district.



- Situated near vital maritime lanes and sandwiched between the Indian mainland, Myanmar, and Indonesia, the Andaman and Nicobar Islands enjoy a strategic location in the Indian Ocean.
- The islands were ruled by the British, the Dutch, and finally the Japanese troops as they advanced during World War II.
- By the end of 1943, the Japanese were forced to cede de jure authority of the islands to the Azad Hind government, and on December 29th, Subhash Chandra Bose landed in Port Blair.
- The PM renamed Ross Islands as Netaji Subhash Chandra Bose Dweep during his visit to the island in 2018 in recognition of Netaji Subhas Chandra Bose's memory and the historical significance of the Andaman & Nicobar Islands. Neil Island and Havelock Island were also renamed Shaheed Dweep and Swaraj Dweep.
- All the three islands are major tourist spots.

