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MINISTRY OF SCIENCE AND TECHNOLOGY



MK Yadav Sir

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KHELO INDIA INITIATIVE

(Syllabus: GS Paper 2 – Gov Initiatives)

Khelo India: Perfect present, bright future



Anurag Singh Thakur

is Union Minister of Youth Affairs and Sports and Information and Broadcasting, Government of India

We recently concluded the Khelo India Games with resounding success. While the magnitude of the mission has grown exponentially, the government has been adding new facets to the Khelo India campaign in terms of both technical and demographic diversity. Change is constant and if results are any yardstick, we are on the right track.

The Khelo India mission has been the cornerstone of Prime Minister Narendra Modi's vision of a nation oozing with energy. India is a young country: 65% of the population is below 35 years. Sports is arguably the ideal glue to bring everyone together.

Sports now provides a serious career option to our youth. We understand that every athlete has a career span. While achieving excellence is their primary goal, we as the government must reciprocate. Khelo India medal winners, who can potentially go on to win laurels for the country, deserve a tension-free existence. In a recent notification, the government has decided to provide jobs to those who meet the necessary criteria.

A few firsts

In this cycle of the Khelo India Games, we had a few firsts. Primarily aimed at spreading the good word on sports and boosting capacity-building in all the States to stage sporting events of importance, the Youth Games were held in the south for the first time. Tamil Nadu's multi-city approach was a success with fans having free and easy access to venues. Similarly, for the first time, the University Games were staged across seven north-eastern States, with Assam hosting 16 different sports. The Northeast has given India some of its top boxers and hockey and football players. It was in the fitness of things that Mizoram hosted men's football and Sikkim, boxing. The government is not only promoting Olympic disciplines, but also giving adequate attention to indigenous sports like Yogasana, Gatka, Mallakhamba, Silambam and Kalaripayattu. The participation in these sports has been overwhelming.

Identifying and nurturing talent is a challenging task and one that drives the Khelo India movement

It's been the government's endeavour to offer every State the opportunity to stage a major sports event. Enabling Ladakh to stage a portion of the Khelo India Winter Games for the first time in February is a case in point. It was heartening to see Ladakh excel in ice hockey and ice skating, alongside the Army and the Indo Tibetan Border Police teams. The confidence in hosting a national event of importance will only make the States and UTs.

The Khelo India mission has been a solid learning process. At the heart of this mission are the athletes, coaches, and other support staff. Athletes selected to represent India in international competitions must only focus on their goals and nothing else.

It is incumbent upon us to provide the right environment and ecosystem to make the athletes shine. Sports administration is all about setting transparent and stringent processes and executing them with some flexibility. It is important to produce a system which promotes ease of living and does not give anxiety to athletes. The government continues to yearn for that perfect system.

Sports always works on a cause-and-effect basis. The consistent international success of sportspersons in the Khelo India ecosystem is a testament to the government's success in sticking to the right causes. For example, the creation and upgradation of sports infrastructure was a priority. More than 300 sports infrastructure projects have been approved in 34 States/UT at a cost of more than ₹3,000 crore.

Identifying talent and nurturing them is a challenging task and one that drives the Khelo India movement. For the selection of genuine talent, the government has a two-tier structure consisting of a Scouting Committee and a Developmental Panel for training. At present, close to 2,800 athletes in 21 sports disciplines (including para sports) have been chosen as Khelo India athletes after being selected from various national championships, open selection trials, assessment camps, and from the Khelo India Games.

Glorious moments

The Khelo India mission has contributed significantly to India's glorious moments in international events including the Olympics, World Championships, Asian Games, and Commonwealth Games. Since 2018, both the participation of Khelo India athletes and their returns from global events have shown an upward trajectory. In 2022, 495 Khelo India athletes won 312 medals, with close to 63% of athletes returning with a medal. In 2018, 92 athletes won 82 medals.

Several sportspersons have taken up coaching as a career. Our system boasts of top coaches who keep producing results. In December 2022, many of them were promoted to high-performance coaches in the Sports Authority of India training centres and the National Centres of Excellence.

In keeping with the Olympic charter, we have given equal impetus to women. The ratio of men versus women athletes in the four Khelo India Games this season was almost 50:50. The Asmita Khelo India Women's League features 17 disciplines. It has been a great success. More than 63,000 women athletes have participated in more than 520 competitions in 21 sports disciplines. We aim to support the National Sports Federations and the State governments to conduct Khelo India Women's League tournaments for many age groups.

Development is always a work in progress. In about seven years, the government has been able to spread the Khelo India footprint. It's in the heart and soul of every Indian who wants to dream big in sports. And we have only begun.

Context: The recently concluded Khelo India Games achieved resounding success, with the government expanding the mission's scope exponentially and incorporating new facets to enhance technical and demographic diversity.

Khelo India Initiative

- **About**: It introduced by the Indian government in 2017, aimed at rejuvenating India's sporting culture by involving youngsters at the grassroots level.
- **Focus:** One of the key focuses of the Khelo India initiative was the development of better sporting infrastructure and academies throughout the nation, catering to various sports.
- **Establishment**: The initiative led to the establishment of annual national sports competitions including the Khelo India Youth Games (KIYG), Khelo India University Games (KIUG), and Khelo India Winter Games (KIWG), providing a platform for young athletes to showcase their talents.
- **Evolution**: The Khelo India initiative began with the Khelo India School Games in 2018, later evolving to include Khelo India University Games and Khelo India Winter Games.
- **Expansion of Sports and Participation:** Initially starting with 18 sports in 2018, the Khelo India Youth Games expanded to 26 sports by 2024, offering a diverse range of opportunities for young athletes to compete and excel.
- **Inclusivity and Age Categories**: Competitions within the Khelo India Youth Games are structured across Under-17 and Under-21 categories for both boys and girls, promoting inclusivity and participation at different age levels.
- **Khelo India Centres initiative**: It focuses on bolstering the sports infrastructure in India. It provides financial aid, support staff, and necessary equipment to existing sports training facilities.

INDIAN EXPRESS Explained

SABARMATI ASHRAM

Syllabus GS Paper 1 – History)

In Sabarmati Ashram redevelopment plan, stress on Gandhian ethos

LEENA MISRA
AHMEDABAD, MARCH 12

ON TUESDAY, the 94th anniversary of the Dandi March that began from the Sabarmati Ashram, Prime Minister Narendra Modi performed Ashram Bhoomi Vandana, a symbolic laying of the foundation stone, and unveiled the masterplan of the Rs 1,200-crore Gandhi Ashram Memorial and Precinct Development Project. Modi also inaugurated the redeveloped Kocharab ashram in Ahmedabad.

Masterplan

The masterplan, prepared by Ahmedabad-based Bimal Patel's HCP Design, Planning, and Management Pvt Ltd, aims to restore, conserve, and rebuild about half of the 63 structures in the original ashram that was spread over 120 acres by the Sabarmati river on Ahmedabad's outskirts.

Sabarmati Ashram as it exists today covers only 5 acres, and is managed by the Sabarmati Ashram Preservation and Memorial Trust (SAPMT). The new memorial will be spread over 55 acres, and the entire precincts will cover 322 acres.

According to the masterplan, 20 buildings will be conserved — including Hriday Kunj, where Gandhi and Kasturba lived, the Gandhi Memorial Museum designed by Charles Correa that opened in 1963, Vinoba-Mira Kutir, where Vinoba Bhave stayed, and the Junu Rasodu (Old Kitchen). Thirteen buildings, including two gaushalas, Sardar Vallabhbhai Patel's office, and Dus Ordi (Ten Rooms), will be restored, and three buildings are proposed to be rebuilt.

Importance of Gandhi Ashram

Gandhi set up two settlements in South Africa, where he lived from 1893 to 1914, and three in India, where he arrived in January 1915. The settlements were "places of continuous experiment and search". Neelkanth Chhaya, a former professor at CEPT University, wrote in the book *Gandhi's Places: An Architectural Documentation*.

Gandhi set up the first ashram in Ahmedabad in Kocharab in 1915. It was an "already built space, rented for use by the ashram and was therefore not according to Gandhi's own ideas of how such a place should be designed and built", Chhaya wrote. Thus, in 1917, he founded the Sabarmati Ashram. The Sabarmati Ashram is seen as the most important in Gandhi's life and work. It was a space that Gandhi designed himself, and built using local material. He spent the most time here.



PM Narendra Modi at the Sabarmati Ashram on Tuesday. *PTI*

Apart from the Dandi March, he also launched the Champaran Satyagraha (1917), the Ahmedabad mills strike and Kheda Satyagraha (1918), the Khadi movement (1918), the Rowlatt Act and Khilafat Movements (1919), and the Non-Cooperation movement (1920) while living here.

Redevelopment project

The redevelopment and restoration plan is based on a 1949 satellite image of the ashram, and a 200-page concept note prepared by the SAPMT based on the ashram's documented accounts, brochures, and "a study of the visitors' books of last ten years to understand what people want from this space", a source associated with the project said.

EXPLAINED HERITAGE

The ashram has been maintaining a visitors' book since 1963 — eminent visitors include Queen Elizabeth (1961), the Dalai Lama (1984–85), South Africa's former President Nelson Mandela (1995), and former US President Bill Clinton (2001).

According to the masterplan, the redeveloped memorial and precincts will have a new orientation centre, a scholars' residency, a parking area, a water harvesting pond, souvenir shops, two exhibition areas, a cafeteria, a workshop area, and a grand entrance plaza.

The existing buildings will tell the story of the ashram, host exhibitions and galleries on Gandhi's works in India and abroad, describe his movements and *yatras*, and have information about his daily routine, important events of his life, and his engagement with children and the youth. There will also be a feature on the "principal ashramites" from 1917 to 1951, and a gallery of women leaders. One of the buildings will house *charkhas* and khadi production centres.

At least 261 of the 263 residents of the ashram premises, called ashramwasis, have been evacuated and compensated for the project.

Ashram Road, one of Ahmedabad's oldest commercial arteries, will be closed from where the Gandhi Ashram begins in order to consolidate the areas that are now on the two sides of the road into one contiguous space. This is likely to happen in phases beginning March 12, and an alternative road will be opened to commuters.

Maintaining ethos, simplicity

When the project was announced in 2021, concerns were raised that it would turn the Ashram into a "Gandhi theme park". The Gujarat government had assured the Ashram trustees at the time that there would be no "sarkarikaran" (governmentalisation) of the Ashram.

The SAPMT's concept note, prepared in consultation with other Gandhian institutions, emphasised that simplicity, one of the values that Gandhi practised and cherished, should be maintained, and that no fees should be charged either from visitors, or from resident research scholars. The note also said that "no red carpet" should be laid out for VVIP visitors to the Ashram, a source said.

The Gujarat government has said that "utmost care will be taken to retain [the Ashram's] timeless essence while refashioning it with a new outlook, keeping in mind the sacrosanct goal of abiding by the Ashram's original architectural simplicity and essence." The rejuvenation project would be taken forward with "utmost sensitivity and respect to the fact that the Ashram's existence goes beyond the idea of mere physical space", it has said.

Context: Recently, commemorating the 94th anniversary of the Dandi March originating from the Sabarmati Ashram, Prime Minister Narendra Modi conducted the 'Ashram Bhoomi Vandana', symbolically laying the foundation stone.

Sabarmati Ashram

- **About**: It also known as Gandhi Ashram, is situated in the Sabarmati suburb of Ahmedabad, Gujarat, adjacent to Ashram Road, alongside the banks of the River Sabarmati, approximately 4 miles (6.4 km) from the town hall.
- **Twelve-Year Stay with Kasturba Gandhi and Followers**: Gandhi, along with his wife Kasturba Gandhi and followers like Vinoba Bhave, lived in Sabarmati and Wardha for a cumulative period of twelve years, fostering principles of truth and non-violence.
- **Significance of Dandi March**: Gandhi initiated the historic Dandi March, also known as Salt Satyagraha, from Sabarmati Ashram on 12 March 1930, a pivotal event in India's struggle for independence, leading to the establishment of the Ashram as a national monument.
- **Establishment of Gandhi's First Ashram in India**: Gandhi's inaugural Ashram in India was established in the Kochrab area of Ahmedabad on 25 May 1915, marking a significant milestone in his journey of activism and social reform.

Masterplan for the Sabarmati Ashram

- **About**: The proposed masterplan aims to restore, conserve, and rebuild approximately half of the 63 structures originally present in the Sabarmati Ashram, spanning 120 acres of land along the Sabarmati River.
- **Prepared by:** Ahmedabad-based HCP Design, Planning and Management Pvt Ltd (HCPDPM), under the guidance of Bimal Patel, the masterplan seeks to revitalize the historical significance of the ashram.
- **Focus on Historical Preservation:** Out of the 63 original structures, the plan prioritizes the restoration of 36 buildings, aiming to preserve the cultural and historical heritage associated with the ashram.

THE PRINT Mar 12

SIPRI REPORT ON ARMS IMPORT

(Syllabus: GS Paper 3 – Security)

India remains world's largest arms importer, France overtakes Russia in global sales, finds SIPRI

Context: India continues to be the world's top arms importer, according to a new report by the Stockholm International Peace Research Institute (SIPRI).

Stockholm International Peace Research Institute (SIPRI)

- **About:** It is an independent international institute dedicated to research into conflict, armaments, arms control and disarmament.
- **Established in:** 1966
- **Vision**: SIPRI envisions a world where sources of insecurity are recognized, conflicts are preempted or resolved, and peace is enduring.
- **Provision of Data and Analysis**: SIPRI provides data, analysis, and recommendations sourced from open channels, offering valuable insights into global security trends.
- **Target Audience**: SIPRI's research serves policymakers, researchers, media, and the general public, contributing to informed decision-making and public discourse.

Key Point of Report

- **India's Arms Imports**: Despite the "Make in India" initiative, aimed at promoting India as a global manufacturing hub, the country's arms imports increased by 4.7 percent between 2014–2018 and 2019–2023.
- **Leading Position**: India secures the top rank globally, importing 9.8 percent of arms, showcasing its substantial reliance on foreign military equipment.
- **Regional Comparison**: Following India, Saudi Arabia stands second with 8.4 percent arms import, indicating significant defense procurement in the region.
- **Qatar's Import Rate**: Qatar holds the third position, importing 7.8 percent of arms, reflecting its investment in defense capabilities.
- **Russia Remains India's Main Arms Supplier:** According to the SIPRI report, Russia retained its status as India's main arms supplier, accounting for 36 percent of its arms imports.
- **Shift in India's Arms Import Patterns**: The period from 2014 to 2018 marked the first five-year stretch in 50 years where deliveries from Russia or the former Soviet Union comprised less than half of India's arms imports.
- **French Arms Exports to India**: The increase in French arms exports was primarily driven by deliveries of combat aircraft to India, Qatar, and Egypt, including 36 Rafale fighter jets customized for the Indian Air Force.
- **Expansion of Indian-French Arms Deal**: India is in negotiations for the procurement of 26 Rafale Marine jets for the Navy's aircraft carrier INS Vikrant, with the contract likely to be signed soon after France submitted a bid in December 2023.

HINDUSTAN TIMES

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POBITORA WILDLIFE SANCTUARY

(Syllabus: GS Paper 3 – Env and Eco)

Assam set to redraw Pobitora boundaries

Utpal Parashar

letters@hindustantimes.com



Pobitora wildlife Santuary has the largest number of one-horned rhinos in the world. HT

GUWAHATI: The Assam government has established a committee to redraw the boundary of the Pobitora Wildlife Sanctuary, which has one of the highest concentrations of one-horned rhinos in the world, a day after Prime Minister Narendra Modi visiting the Kaziranga National Park and Tiger Reserve on March 9.

The state cabinet on Sunday decided to withdraw the notification on the sanctuary. The decision wasn't made public, but the state government mentioned it in an affidavit filed in the Supreme Court in connection with a petition filed by environmental activist Rohit Choudhury regarding non-declaration of eco-sensitive zones around the sanctuary in violation of an apex court order of December 2018. HT has seen the minutes of the cabinet meeting regarding the issue, which was submitted in the Supreme Court. The matter will come up for hearing on Wednesday.

As per the minutes of the cabinet meeting, the 1998 notification included government land in the wildlife sanctuary without settling rights of "deprived and marginalized sections of society" who were residing in three villages "even before Independence". "The cabinet held the view that in light of the facts and circumstances in the matter leading to the issue of final notification of PWS on March 17, 1998, the said notification declaring PWS should be withdrawn," the minutes of the meeting said.

"The cabinet at the same time also observed that it is important to declare Pobitora area as a wildlife sanctuary in view of the large number of rhino population," it added.

Context: The Assam government has established a committee to redraw the boundary of the Pobitora Wildlife Sanctuary.

Pobitora Wildlife Sanctuary

- **About:** It is a wildlife sanctuary on the southern bank of the Brahmaputra in Morigaon district in Assam, India
- **Location:** Situated in the Guwahati, it stands as a beacon of successful conservation efforts, particularly in protecting the habitat of the Rhino.
- **Rich Biodiversity**: Comprising the Rajamayong Reserve Forest and Pobitora Reserve Forest, it shelters diverse wildlife such as Leopard, Capped Langur, Porcupine, Pangolin, among others.
- **Global Significance:** Renowned for its high concentration of one-horned rhinos worldwide, it covers an area of 38.81 sq km and was officially declared a sanctuary by the Assam forest department in 1998.
- **Population Census**: Recent census data from 2022 indicates a thriving population of 107 rhinos, affirming its status as the world's highest density habitat for this species.
- **Conservation Contribution**: Pobitora plays a crucial role in conservation efforts, acting as a source population for initiatives like the Indian Rhinoceros Vision 2020 (IRV), with eight rhinos translocated from here to Manas National Park.

PIB Mar 12

BUREAU OF INDIAN STANDARDS

(Syllabus: GS Paper 3 – Economy)

Proposals worth over ₹340 Crore screened seeking testing facilities in government laboratories across sectors from Bureau of Indian Standards (BIS)

Context: Recently, the Government of India launched a scheme through the Bureau of Indian Standards (BIS) aimed at upgrading and fortifying the laboratory network across the country.

Bureau of Indian Standards (BIS)

- **About:** "It is the National Standards Body of India responsible for the harmonious development of standardization, marking, and quality certification activities for goods, along with related matters."
- **Establishment**: Under the BIS Act 2016
- **Headquarters**: New Delhi and its 05
- **Regional Offices**: Kolkata (Eastern), Chennai (Southern), Mumbai (Western), Chandigarh (Northern) and Delhi (Central).
- **Composition of BIS:** The BIS comprises 25 members from various sectors such as Central or State Governments, industry, scientific and research institutions, and consumer groups.
  - The Minister heading the administrative department of the BIS serves as its ex-officio President.
- **Functions of BIS**
  - **Representation on International Forum**: BIS represents India in global standardization bodies like ISO, IEC, and WSSN.
  - **Formulating and Promoting Standards**: BIS plays a vital role in formulating, recognizing, and promoting Indian Standards, aiding industries in enhancing product and service quality.
  - **Certifying Products**: BIS assesses products to ensure compliance with specified standards or regulatory requirements.
  - **Standards for Foreign Manufacturers**: BIS offers certification for foreign manufacturers, enabling them to mark their products with the BIS Standard Mark.
  - **Penalties for Violation**: BIS takes action against firms failing to meet Indian standards.
  - **Consumer Awareness**: BIS conducts programs to educate consumers about ISI-marked item standards and their misuse.

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NUCLEAR WASTE

(Syllabus: GS Paper 3 – Sci and Tech)



How is nuclear waste generated?

Why is the spent fuel from nuclear power plants dangerous? How can they be stored safely with minimum human contact? How are countries with major nuclear power programmes storing nuclear waste? Does India have nuclear waste reprocessing plants?

EXPLAINER

Vasudevan Mukunth

The story so far:

Recently, India loaded the core of its long-delayed Prototype Fast Breeder Reactor (PFBR) vessel, bringing the country to the cusp of stage II — powered by uranium and plutonium — of its three-stage nuclear programme. By stage III, India hopes to be able to use its vast reserves of thorium to produce nuclear power and gain some energy independence. But the large-scale use of nuclear power is accompanied by a difficult problem: waste management.

What is nuclear waste?

In a fission reactor, neutrons bombard the nuclei of atoms of certain elements. When one such nucleus absorbs a neutron, it destabilises and breaks up, yielding some energy and the nuclei of different elements. For example, when the uranium-235 (U-235) nucleus absorbs a neutron, it can fission to barium-144, krypton-89, and three neutrons. If the 'debris' (barium-144 and krypton-89) constitute elements that can't undergo fission, they become nuclear waste.

An important source of nuclear waste is the fuel itself. "The spent fuel contains all the radioactive fission products that are produced when each nucleus ... breaks apart to produce energy, as well as those radioactive elements, ... produced when uranium is converted into heavier elements following the absorption of neutrons and subsequent radioactive decays," M.V. Ramana, the Simons Chair in Disarmament, Global and Human Security at the School of Public Policy and Global Affairs, University of British Columbia, wrote in a 2006 paper.

Nuclear waste is highly radioactive and needs to be stored in facilities reinforced to prevent leakage and/or contamination of the local environment.

How do we handle nuclear waste?

Handling the spent fuel is the main challenge – it is hot and radioactive, and needs to be kept underwater for up to a few decades. Once it has cooled, it can be transferred to dry casks for longer-term storage. All countries with long-standing nuclear power programmes have accumulated a considerable inventory of spent fuel. For example, the U.S. had 69,632 tonnes (as of 2015), Canada 54,000 tonnes (2046), and Russia 26,362 tonnes (2046). Depending on radioactivity levels, the storage period can run up to many millennia, meaning "they have to be isolated from human contact for periods of time that are longer than anatomically modern *Homo sapiens* have been around on the planet," Dr. Ramana wrote.

Nuclear power plants also have liquid waste treatment facilities. "Small quantities of aqueous wastes containing short-lived radionuclides may be discharged into the environment," International Agency for Atomic Energy (IAEA) scientist V. Tsyplenkov wrote in a 1993 feature. Japan is currently discharging, after treatment, such water from the Fukushima nuclear power plant into the Pacific Ocean. Other such waste, depending on their hazard, can be evaporated or "chemically precipitated" to yield a sludge to be treated and stored, "absorbed on solid matrices" or incinerated.

Liquid high-level waste contains "almost all of the fission products produced in the fuel". It is vitrified to form a storable glass. "The vast majority of the radioactivity in the waste from [pressurised heavy-water reactors of stage I] ... can't be used to fuel the PFBR," Dr. Ramana said of India's situation in an email to *The Hindu*. "Only uranium and plutonium can be used as fuel. Because India reprocesses its spent fuel, these fission products will have to be stored, at least for a while, in the form of liquid waste, which poses accident hazards."

How is nuclear waste dealt with?

Once spent fuel has been cooled in the spent-fuel pool for at least a year, it can be moved to dry-cask storage. It is placed inside large steel cylinders and surrounded by an inert gas. The cylinders are sealed shut and placed inside larger steel or concrete chambers.

Some experts have also touted for geological disposal: the waste is sealed in "special containers", to quote Dr. Ramana's paper, and buried underground in granite or clay. The upside here is long-term storage away from human activity, although some studies have pointed to the risk of radioactive material becoming exposed to humans if the containers are disturbed, such as by nearby digging activity.

Reprocessing – the name for technologies that separate fissile from non-fissile material in spent fuel – is another way to deal with the spent fuel. Here, the material is chemically treated to separate fissile material left behind from the non-fissile material. Because spent fuel is so hazardous, reprocessing facilities need specialised protections and personnel of their own. Such facilities present the advantage of higher fuel efficiency but are also expensive.

Importantly, reprocessing also yields weapons-usable (different from weapons-grade) plutonium. The IAEA has specified eight kilograms of plutonium in which plutonium-239 accounts for more than 90% to be the threshold for "safeguards significance". It tightly regulates the setting up and operation of these facilities as a result.

What are the issues associated with nuclear waste?

In 2003, *Der Spiegel* reported on engineers' years-long effort to access the Asse II salt mine, where "thousands of drums filled with nuclear waste" had been kept for "over three decades". The effort – a decontamination project – was prompted by mounting public concerns that the waste may have contaminated water resources (including groundwater) in the area. The newspaper said it was likely to cost "somewhere between €5 billion and €10 billion" and around 30 years, to decontaminate the waste. Dr. Ramana also used the case of the Waste Isolation Pilot Plant (WIPP) in the U.S. to illustrate the issue of "unknown unknowns". The facility has been operational since March 1999 with a licence to store waste for a few millennia. "For long, WIPP had been held up as a model for how radioactive wastes should be dealt with," Dr. Ramana wrote. But in 2014, an accident at the site released small quantities of radioactive materials to the environment, revealing serious failures in its maintenance.

He expressed concerns in *The Hindu* about uncertainties with treating liquid waste: "How well have the vitrification plants at reprocessing plants functioned? How much liquid waste – high-level and intermediate level – is yet to be vitrified?"

"Almost all countries that have tried to site repositories have experienced one or more failures," he wrote. He also highlighted "normative problems with the idea of exporting nuclear waste, including the environmental injustice inherent in the exports of such hazardous materials, and the ethical argument that those enjoying the benefits of nuclear power should also incur the costs".

What does waste-handling cost nuclear power?

In the 1990 feature, Dr. Tsyplenkov considered a nuclear power plant of 1,000 MWe capacity "operating at a capacity factor of 70% for 30 years". They estimated "the waste management at the front end of the cycle leads to about 10% of the total waste management cost. Of this, about one-third is due to the management of depleted uranium as a waste. The management of wastes from power plant operation accounts for about 24% of the costs and 63% is due to power plant decommissioning. The remaining 30% of costs is associated with the back end of the fuel cycle."

In the final estimate, they added, waste management imposed a cost of $0.6-7.1 per MWh of nuclear energy.

How does India handle nuclear waste?

According to a 2015 report of the International Panel on Fissile Materials (IPFM), India has reprocessing plants in Trombay, Tarapur, and Kalpakkam. The Trombay facility reprocesses 50 tonnes of heavy metal per year (tHM/y) as spent fuel from two research reactors to produce plutonium for stage II reactors as well as nuclear weapons. Of the two in Tarapur, one is used to reprocess 100 tHM/y of fuel from some pressurised heavy water reactors (stage I) and the other, commissioned in 2011, has a capacity of 100 tHM/y. The third facility in Kalpakkam processes 100 tHM/y.

Also in 2015, Jitendra Singh, the Minister of State for the Prime Minister's Office (among other portfolios), said in the Rajya Sabha: "The wastes generated at the nuclear power stations during the operation are of low and intermediate activity level and are managed at the site itself."

He added they are treated and stored in on-site facilities, that "such facilities are located at all nuclear power stations", and that the surrounding area "is monitored for radioactivity".

The IPFM report also said the PFBR's delays suggested the Tarapur and Kalpakkam facilities "must have operated quite poorly, with a combined average capacity factor of around 6%".

Dr. Ramana also said in his email, "If and when the PFBR starts functioning and spent fuel from it is discharged, that will bring its own complications because it will have a different distribution of fission products and transuranic elements."

Context: Recently, India loaded the core of its long-delayed Prototype Fast Breeder Reactor (PFBR) vessel, bringing the country to the cusp of stage II powered by uranium and plutonium — of its three-stage nuclear programme.

Nuclear Waste

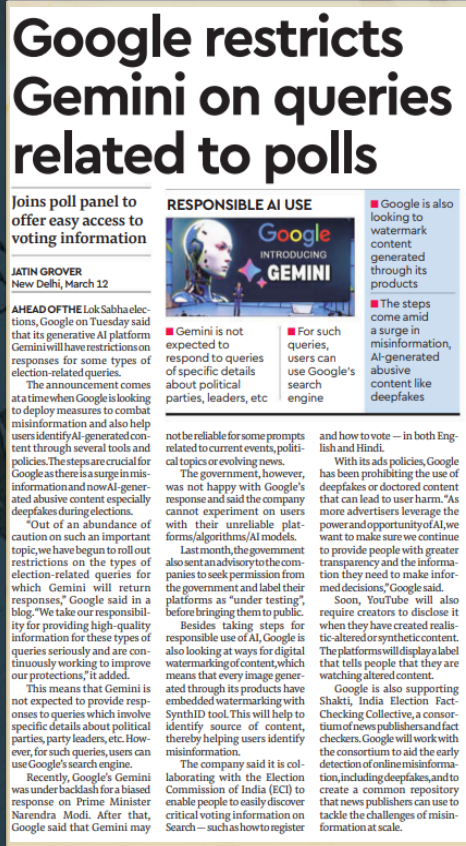
- **About:** It is a byproduct from nuclear reactors, fuel processing plants, hospitals and research facilities.
- **Fission Reaction**: In a fission reactor, atoms of certain elements undergo bombardment by neutrons, causing them to destabilize and break up, yielding energy and different nuclei.
- **Debris Formation**: Example: Uranium-235 nucleus absorbs a neutron, leading to fission producing barium-144, krypton-89, and neutrons. Debris elements that can't undergo further fission become nuclear waste.
- **Fuel as Source:** Spent fuel from reactors contains radioactive fission products and elements produced during uranium conversion, contributing to nuclear waste.
- **Radioactivity and Storage**: Nuclear waste is highly radioactive and requires secure storage facilities to prevent environmental contamination or leakage.
- **Managing Spent Fuel**: The primary challenge in handling nuclear waste lies in managing spent fuel.
    - Spent fuel is both hot and radioactive, necessitating underwater storage for several decades.

India's Approach to Nuclear Waste Management

- **Presence of Reprocessing Plants**: According to a 2015 report by the International Panel on Fissile Materials (IPFM), India operates reprocessing plants in Trombay, Tarapur, and Kalpakkam.
- **Trombay Facility Operations**: The Trombay facility reprocesses 50 tonnes of heavy metal per year (tHM/y) from spent fuel of two research reactors.
    - It aims to produce plutonium for stage II reactors and nuclear weapons.
- **Tarapur Reprocessing Plants:** Tarapur houses two reprocessing plants, one handling 100 tHM/y of fuel from certain pressurized heavy water reactors (stage I).
    - The second Tarapur facility, commissioned in 2011, has a similar capacity of 100 tHM/y.
- **Kalpakkam's Role:** The reprocessing facility in Kalpakkam processes 100 tHM/y of nuclear waste.

GEMINI

(Syllabus: GS Paper 3 – Sci and Tech)



Google restricts Gemini on queries related to polls

Joins poll panel to offer easy access to voting information

JATIN GROVER
New Delhi, March 12

AHEAD OF THE Lok Sabha elections, Google on Tuesday said that its generative AI platform Gemini will have restrictions on responses for some types of election-related queries.

The announcement comes at a time when Google is looking to deploy measures to combat misinformation and also help users identify AI-generated content through several tools and policies. The steps are crucial for Google as there is a surge in misinformation and now AI-generated abusive content especially deepfakes during elections.

"Out of an abundance of caution on such an important topic, we have begun to roll out restrictions on the types of election-related queries for which Gemini will return responses," Google said in a blog. "We take our responsibility for providing high-quality information for these types of queries seriously and are continuously working to improve our protections," it added.

This means that Gemini is not expected to provide responses to queries which involve specific details about political parties, party leaders, etc. However, for such queries, users can use Google's search engine.

Recently, Google's Gemini was under backlash for a biased response on Prime Minister Narendra Modi. After that, Google said that Gemini may not be reliable for some prompts related to current events, political topics or evolving news.

The government, however, was not happy with Google's response and said the company cannot experiment on users with their unreliable platforms/algorithms/AI models.

Last month, the government also sent an advisory to the companies to seek permission from the government and label their platforms as "under testing", before bringing them to public.

Besides taking steps for responsible use of AI, Google is also looking at ways for digital watermarking of content, which means that every image generated through its products have embedded watermarking with SynthID tool. This will help to identify source of content, thereby helping users identify misinformation.

The company said it is collaborating with the Election Commission of India (ECI) to enable people to easily discover critical voting information on Search — such as how to register and how to vote — in both English and Hindi.

With its ads policies, Google has been prohibiting the use of deepfakes or doctored content that can lead to user harm. "As more advertisers leverage the power and opportunity of AI, we want to make sure we continue to provide people with greater transparency and the information they need to make informed decisions," Google said.

Soon, YouTube will also require creators to disclose it when they have created realistic-altered or synthetic content. The platforms will display a label that tells people that they are watching altered content.

Google is also supporting Shakti, India Election Fact-Checking Collective, a consortium of news publishers and fact checkers. Google will work with the consortium to aid the early detection of online misinformation, including deepfakes, and to create a common repository that news publishers can use to tackle the challenges of misinformation at scale.

RESPONSIBLE AI USE

- Gemini is not expected to respond to queries of specific details about political parties, leaders, etc
- For such queries, users can use Google's search engine
- Google is also looking to watermark content generated through its products
- The steps come amid a surge in misinformation, AI-generated abusive content like deepfakes

Context: Ahead of the Lok Sabha elections, Google recently announced restrictions on responses for certain types of election-related queries on its generative AI platform Gemini, aiming to combat misinformation and assist users in identifying AI-generated content through various tools and policies.

Google Gemini

- **About**: Gemini is an **AI model** that cannot be accessed directly. Rather, it acts as a base that Google and, ultimately, other developers can use to build products on top of.
- **Built by:** Gemini was built from the ground up to be multimodal, which means it can operate across and combine different types of information, including text, audio, image, code, and video.
- **It can recognise images, speak in real-time**, and even solve physics with remarkable ingenuity.
- **Gemini 1.0 comprises 3 Models**: Ultra, Pro, and Nano.
    - **Gemini Ultra:** It is Google's most powerful LLM ever and is aimed at enterprise applications that will run it for "highly complex tasks.
    - **Gemini Pro**: It is the most general-purposed of the three and has already been plugged into Bard for prompts that require advanced reasoning, planning, and understanding.
    - **Gemini Nano:** It described as the most efficient model for on-device tasks, has been baked into the Pixel 8 Pro to process tasks like information summarisation and Smart Reply.
- **Tensor Processing Units**: Gemini 1.0 on its AI-optimised infrastructure using its in-house designed Tensor Processing Units (TPUs) v4 and v5e.
- **Concerns**: Job displacement in certain sectors and Amplification of misinformation or unintended consequences.

Google's Support for Shakti

- **About**: Google is bolstering its fact-checking efforts in India through support for **Shakti, the India Election Fact-Checking Collective.**
- **Shakti's Mission:** It comprises a consortium of news publishers and fact-checkers aimed at early detection of online misinformation, including deepfakes.
- **Creating a Shared Repository**: Shakti's objective includes establishing a shared repository for news publishers to collectively combat the challenges posed by large-scale disinformation.
- **Google's Tools to Combat Misinformation:** Google has already implemented tools and policies to assist users in identifying AI-generated content.

PIB Mar 12

NCPCR'S FOUNDATION DAY
(Syllabus: GS Paper 2 – Polity)

National Commission for Protection of Child Rights celebrates its 19th Foundation Day

Context: The National Commission for Protection of Child Rights (NCPCR) celebrated its 19th Foundation Day In New Delhi.

National Commission for Protection of Child Rights

- **About:** The Commission envisages a rights-based perspective, which flows into national policies and programmes, including defined responses at the state, district and block levels, taking into account the specifics and strengths of each region.
- **Statutory body**: set up in March 2007 under the Commissions for Protection of Child Rights (CPCR) Act, 2005.
- **Ministry:** It is under the administrative control of the Ministry of Women & Child Development.
- **Composition**: a chairperson and six members of which at least two should be women.
- **Appointment**: All of them are appointed by the Central Government for three years.
- **Tenure**: The maximum age to serve in commission is 65 years for Chairman and 60 years for members.
- **Commission's mandate**: to ensure that all laws, policies, programmes, and administrative mechanisms are in consonance with the child rights perspective as enshrined in the Constitution of India and also the UN Convention on the Rights of the Child.
- **Definition of Child:** The Child is defined as a person in the 0 to 18 years age group.
- **Power**: It inquires into complaints relating to a child's right to free and compulsory education under the Right to Education Act, 2009.
- **Function:**
  - **Examine and review:** The safeguards provided by or under any law for the time being in force for the protection of child rights and recommend measures for their effective implementation.
  - **Report:** Present to be central government, annually and at such other intervals, as the commission may deem fit, reports upon working of those safeguards.
  - **Children right:** Examine all factors that inhibit the enjoyment of rights of children affected by terrorism, communal violence, riots, natural disaster, domestic violence, HIV/AIDS, trafficking, maltreatment, torture and exploitation, pornography and prostitution and recommend appropriate remedial measures.
  - **Children special care**: Look into the matters relating to the children in need of special care and protection including children in distress, marginalized and disadvantaged children, children in conflict with law, juveniles' children without family and children of prisoners and recommend appropriate remedial measures.
  - **Research**: Undertake and promote research in the field of child rights.

HINDUSTAN TIMES
Page 14

DIGITAL COMPETITION LAW

(Syllabus: GS Paper 2 – Polity)

Panel proposes law to curb anti-competitive practices

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THE GOVT HAS SOUGHT PUBLIC COMMENTS ON ITS PROPOSAL TILL APRIL 15

NEW DELHI: The Committee on Digital Competition Law, constituted by the Union ministry of corporate affairs, has proposed a legislation to curb anti-competitive business practices used by tech giants such as Amazon, Google and Facebook. After the panel submitted its comprehensive report and a draft legislation on Tuesday night, the ministry sought public comments on the same until April 15.

In the draft bill, the committee proposed that for certain "core digital services" such as search engines, web browsers and social networking sites, the Competition Commission of India (CCI) should designate companies as "Systematically Significant Digital Enterprise (SSDE)" depending on either quantitative or qualitative factors such as turnover, size, user base, and market power.

The designated SSDEs will be prohibited from engaging in practices such as self-preferencing, anti-steering, and restricting third party applications, among others, for the identified services and if they do, they can attract a penalty of up to 10% of their global turnover.

The panel recommendations come amidst greater scrutiny of business practices of tech giants in India and abroad. Few days ago, Google and a clutch of Indian app developers had a public spat over what the latter called were anticompetitive practices used by Google on its Google Play Store.

The DCL panel was born out of a recommendation by the Parliamentary Committee on Finance led by Bharatiya Janata Party (BJP) lawmaker Jayant Sinha that recommended that competitive behaviour of internet based/digital companies needs to be assessed before the markets are monopolised by a handful of players. This is called ex-ante regulation where the law defines what conduct is illegal versus the regulator adjudicating whether certain acts are illegal after they have been committed (ex-post regulation).

Following the recommendations of the parliamentary panel, the ministry of corporate affairs constituted the CDL committee in February last year, headed by corporate affairs secretary Dr Manoj Govil, which was tasked with examining the need for an ex-ante regulatory mechanism for digital markets through a separate legislation, and to submit a draft Digital Competition Bill within three months.

In the report, the CDL panel mentioned the Digital India Act, "a legislation which is purported to be the successor to the Information Technology Act, 2000". "The Committee observed that since the draft of the proposed legislation is currently unavailable, the exact contours of its applicability cannot be delineated yet," the report said.

In his two presentations on the principles of the DIA in March and May 2023, minister of state for electronics and information technology Rajeev Chandrasekhar had said that an open internet should have "fair trade practices" that prevent "concentration of market power and gatekeeping", amongst other things, but gave no details of how that would be done through the DIA.

Context: The Committee on Digital Competition Law, formed by the Ministry of Corporate Affairs last February, released its report recently, recommending legislation to regulate the market power of Big Tech firms like Google and Meta.

Digital Competition Law

- **Formation:** Constituted to study the necessity of digital competition law and propose competition norms.
- **Headed by**: The Secretary of the Ministry of Corporate Affairs (MCA).
- **Composition**: Comprises 16 members including union secretaries, legal experts, and industry stakeholders.
- **Support:** The Competition Commission of India (CCI) will provide secretarial, research, and logistic assistance to the panel.
- **Aim**: To foster competition, innovation, and safeguard consumer interests in India's burgeoning digital economy, projected to reach $1 trillion by 2025-26.
- **Functions**: Review the adequacy of the Competition Act, 2002, and its rules in addressing challenges posed by the digital economy.

The Competition Act 2002

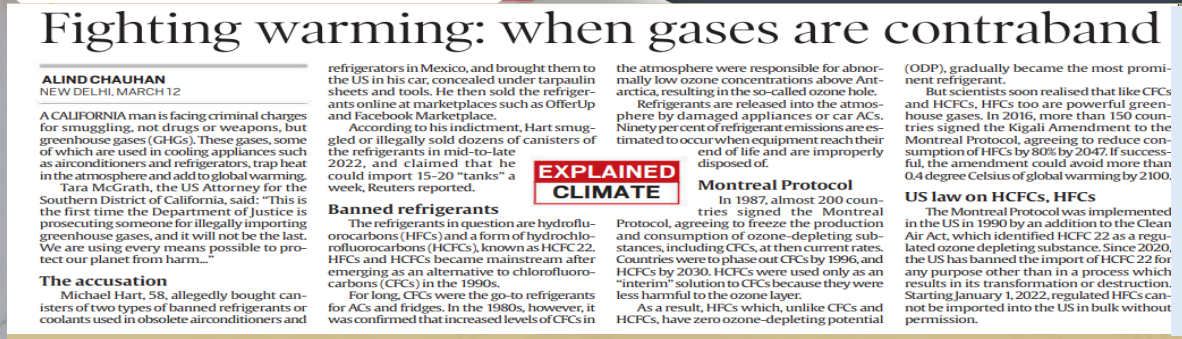
- **About:** It establishes regulations to ensure fair competition within business sectors, fostering innovation and efficiency.
- **Prohibition of Government Interference**: The act prohibits undue government intervention in business operations, safeguarding against arbitrary interference that could stifle competition.
- **Replacing Outdated Legislation:** It replaced the Monopolies & Restrictive Trade Practices Act of 1969, modernizing regulatory frameworks to suit contemporary market dynamics.

INDIAN EXPRESS

Explained

REFRIGERANTS & ENV. REGULATION

(Syllabus: GS Paper 3 – Env and Eco)



Fighting warming: when gases are contraband

ALIND CHAUHAN
NEW DELHI, MARCH 12

A CALIFORNIA man is facing criminal charges for smuggling, not drugs or weapons, but greenhouse gases (GHGs). These gases, some of which are used in cooling appliances such as airconditioners and refrigerators, trap heat in the atmosphere and add to global warming.

Tara McGrath, the US Attorney for the Southern District of California, said: "This is the first time the Department of Justice is prosecuting someone for illegally importing greenhouse gases, and it will not be the last. We are using every means possible to protect our planet from harm..."

The accusation

Michael Hart, 58, allegedly bought canisters of two types of banned refrigerants or coolants used in obsolete airconditioners and refrigerators in Mexico, and brought them to the US in his car, concealed under tarpaulin sheets and tools. He then sold the refrigerants online at marketplaces such as OfferUp and Facebook Marketplace.

According to his indictment, Hart smuggled or illegally sold dozens of canisters of the refrigerants in mid-to-late 2022, and claimed that he could import 15-20 "tanks" a week, Reuters reported.

EXPLAINED CLIMATE

Banned refrigerants

The refrigerants in question are hydrofluorocarbons (HFCs) and a form of hydrochlorofluorocarbons (HCFCs), known as HCFC 22. HFCs and HCFCs became mainstream after emerging as an alternative to chlorofluorocarbons (CFCs) in the 1990s.

For long, CFCs were the go-to refrigerants for ACs and fridges. In the 1980s, however, it was confirmed that increased levels of CFCs in the atmosphere were responsible for abnormally low ozone concentrations above Antarctica, resulting in the so-called ozone hole.

Refrigerants are released into the atmosphere by damaged appliances or car ACs. Ninety per cent of refrigerant emissions are estimated to occur when equipment reach their end of life and are improperly disposed of.

Montreal Protocol

In 1987, almost 200 countries signed the Montreal Protocol, agreeing to freeze the production and consumption of ozone-depleting substances, including CFCs, at then current rates. Countries were to phase out CFCs by 1996, and HCFCs by 2030. HCFCs were used only as an "interim" solution to CFCs because they were less harmful to the ozone layer.

As a result, HFCs which, unlike CFCs and HCFCs, have zero ozone-depleting potential (ODP), gradually became the most prominent refrigerant.

But scientists soon realised that like CFCs and HCFCs, HFCs too are powerful greenhouse gases. In 2016, more than 150 countries signed the Kigali Amendment to the Montreal Protocol, agreeing to reduce consumption of HFCs by 80% by 2047. If successful, the amendment could avoid more than 0.4 degree Celsius of global warming by 2100.

US law on HCFCs, HFCs

The Montreal Protocol was implemented in the US in 1990 by an addition to the Clean Air Act, which identified HCFC 22 as a regulated ozone depleting substance. Since 2020, the US has banned the import of HCFC 22 for any purpose other than in a process which results in its transformation or destruction. Starting January 1, 2022, regulated HFCs cannot be imported into the US in bulk without permission.

Context: A California man is facing criminal charges in a San Diego court for smuggling, not illegal drugs or weapons, but greenhouse gases (GHGs).

- A person purportedly bought canisters of banned refrigerants in Mexico.

Refrigerants: A working fluid used in the refrigeration cycle of air conditioning systems and heat pumps

Banned Refrigerants

- **Introduction of HFCs and HCFCs**: HFCs and a variant of HCFCs, known as HCFC 22, replaced CFCs in the 1990s as the primary refrigerants.
- **Environmental Impact of CFCs**: CFCs, once widely used, were found to deplete ozone, leading to concerns about the ozone layer's integrity.
- **Ozone Depletion:** Research in 1985 linked CFC emissions to the depletion of ozone, notably observed as an "ozone hole" above Antarctica.
- **Emission Sources**: Refrigerant emissions primarily occur through damaged appliances or improper disposal, with an estimated 90% released during end-of-life equipment disposal.

Montreal Protocol

- **About**: It is gradually eliminating the production and consumption of ozone depleting substances to limit their damage to the earth's ozone layer.
  - In 1987, nearly 200 countries ratified the Montreal Protocol, committing to halt the production and consumption of ozone-depleting substances such as CFCs at their current levels.
- **Phasing out CFCs and HCFCs:** Countries agreed to phase out CFCs by 1996 and HCFCs by 2030 under the Montreal Protocol.
  - HCFCs were considered an interim solution due to their lesser harm to the ozone layer compared to CFCs.
- **Rise of HFCs**: With the phase-out of CFCs and HCFCs, HFCs emerged as the primary refrigerant choice due to their zero ozone-depleting potential (ODP). However, it was later recognized that HFCs also contribute significantly to global warming as potent greenhouse gases.

Kigali Agreement:

- The Kigali Amendment to the Montreal Protocol is an international agreement to gradually reduce the consumption and production of hydrofluorocarbons (HFCs).
- It is a legally **binding agreement** designed to create rights and obligations in international law.
- As of October 3, 2023, 155 states, including the European Union & India have ratified the Kigali Amendment.

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