



1954 Hague Convention

For Prelims: United Nations Educational, Scientific and Cultural Organization (UNESCO), “Blue Shield” emblem, 1954 Hague Convention, Red Cross, Sustainable Development Goals (SDGs).

For Mains: Cultural Heritage Protection and Preservation.

Why in News?

Recently, the [United Nations Educational, Scientific and Cultural Organization \(UNESCO\)](#) has pitched for protective measures **to preserve Ukraine’s endangered cultural heritage in light of Russia’s invasion over Ukraine.**

- To avoid deliberate or accidental damages, the agency is marking cultural sites and monuments in Ukraine with the distinctive **“Blue Shield” emblem** of the **1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict.**

What is the Hague Convention 1954?

- **Background:** Through history, armed conflicts always **wrought havoc on the lives of people.** In addition to its humanitarian toll, conflicts also led to the **large-scale destruction of cultural heritage**, weakening the foundations of communities, lasting peace and prospects of reconciliation.
- **Origin:** Considering that the preservation of cultural heritage is of great importance for all peoples of the world and thus needs universal protection, the **Convention for the Protection of Cultural Property in the Event of Armed Conflict was adopted in 1954** under the auspices of UNESCO.
 - This convention is referred to as the **1954 Hague Convention.**
 - It is the **first and the most comprehensive multilateral treaty** dedicated exclusively to the protection of cultural heritage in times of peace as well as during an armed conflict.
- **Aim:** The convention aims **to protect cultural property, such as monuments of architecture, art or history, archaeological sites, works of art, manuscripts, books and other objects of artistic, historical or archaeological interest, as well as scientific collections** of any kind regardless of their origin or ownership.
- **India is party to Hague Convention 1954.**

What is the Blue Shield Emblem?

- **Need:** Article 6 of the **1954 Hague Convention** states that **cultural property may bear a distinctive emblem** so as to facilitate its recognition.
- **Origin:** In pursuance of this, the Blue Shield, formerly the **International Committee of the Blue Shield** was founded in 1996.
- **About:** It is a **non-governmental, non-profit, international organisation** committed to the protection of heritage across the world.
 - The Blue Shield network, often referred to as the **cultural equivalent of the [Red Cross.](#)**

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- **Function:** The Blue Shield is a network of committees of dedicated individuals across the world that is committed to protect the world's cultural heritage from threats such as armed conflict and natural disasters.
 - This includes museums, monuments, archaeological sites, archives, libraries and audio-visual material, and significant natural areas, as well as intangible heritage.
- **Associated Issue:** Some States have refrained from marking their cultural **property**, arguing that it would make that property more vulnerable to attack by an enemy determined to destroy its symbols of national identity.
 - Unfortunately, this proved to be the case during the war in the former Yugoslavia where cultural property marked with the Blue Shield was intentionally targeted.

What is UNESCO?

- **About:**
 - It is a specialized agency of the [United Nations \(UN\)](#). It seeks to build peace through international cooperation in Education, the Sciences and Culture.
 - It was **founded in 1945** and is **located in Paris, France**.
 - It has **193 Members and 11 Associate Members**. India joined UNESCO in 1946.
 - In 2019, the USA and Israel formally quit UNESCO.
- **Major Initiatives of UNESCO:**
 - [Man and Biosphere Programme](#)
 - [World Heritage Programme](#)
 - [Global Geopark Network](#)
 - [Network of Creative Cities](#)
 - [Atlas of World Languages in Danger](#)
- **Reports:**
 - UNESCO Science Report
 - Global Education Monitoring Report
 - [State of the Education Report for India](#)

PYQ

Q. Recently, which one of the following was included in the UNESCO's World Heritage list? (2009)

- (a) Dilwara Temple
- (b) Kalka-Shimla Railway
- (c) Bhitarkanika Mangrove Area
- (d) Visakhapatnam to Araku valley railway line

Ans: (b)

[Source: IE](#)

Chemical Weapons Convention and Biological Weapons Convention

For Prelims: Chemical Weapons Convention and Biological Weapons Convention

For Mains: Impacts of Chemical and Biological Weapons, Initiatives related to Chemical and Biological Weapons

Why in News?

Recently, the US said that **Russia could be planning a chemical or biological weapon attack in Ukraine.**

- Earlier, Russian claimed that the **US had chemical and biological weapons labs** in Ukraine, which was denied by the US.

What are Chemical Weapons?

- **About:**
 - A Chemical Weapon is a **chemical used to cause intentional death or harm** through its toxic properties.
 - Munitions, devices and other equipment specifically designed to weaponize toxic chemicals also fall under the definition of chemical weapons.
- **Related Initiatives:**
 - **India's:**
 - The **Chemical Weapons Convention Act, 2000** was passed to implement the Chemical Weapons Convention (CWC).
 - It provided for the establishment of a National Authority for Chemical Weapons Convention or NACWC. This institution, formed in 2005, is the chief liaison between the government of India and the **Organization for the Prohibition of Chemical Weapons (OPCW).**
 - **Global:**
 - **Basel, Rotterdam and Stockholm Conventions (Hazardous Chemicals and**

Wastes):

- The Basel, Rotterdam and Stockholm conventions are **multilateral environmental agreements**, which share the common objective of protecting human health and the environment from hazardous chemicals and wastes.
- The **Australia Group (AG)** is an informal forum of countries which, through the **harmonisation of export controls**, seeks to ensure that exports do not contribute to the development of chemical or biological weapons.

PYQ

Consider the following pairs: (2020)

International agreement/set-up	Subject
1. Alma-Ata Declaration :	Healthcare of the people
2. Hague Convention :	Biological and chemical weapons
3. Talanoa Dialogue :	Global climate change
4. Under2 Coalition :	Child rights

Which of the pairs given above is/are correctly matched?

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

Ans: (c)

What is the Chemical Weapons Convention?

▪ About:

- It is a **multilateral treaty banning chemical weapons** and requiring their destruction within the stipulated time.
- Negotiations for the **CWC began in 1980** at the [United Nations Conference on Disarmament](#).
- The convention was drafted in **September 1992** and opened for signature in January 1993. It became effective from April 1997.
- It makes it **mandatory to destroy old and abandoned chemical weapons**.
- Members **should also declare the riot-control agents** (sometimes referred to as 'tear gas') in possession of them.
 - [Organisation for the Prohibition of Chemical Weapons](#) is an international organization established by the CWC in 1997 to implement and enforce the terms of the CWC.

▪ Members:

- It has **192 state parties** and 165 signatories.
- India is a signatory of the convention.

▪ Convention Prohibits:

- The **development, production, acquisition, stockpiling**, or retention of chemical weapons.
- **Transferring** of chemical weapons.
- **Using** chemical weapons.
- Assisting other States to indulge in activities that are prohibited by the CWC.
- **Using riot-control devices** as 'warfare methods'.

What is a Biological Weapon?

▪ **About:**

- Biological weapons **use microbiological agents** (such as bacteria, viruses or fungi) or toxins to intentionally cause death or harm to humans, animals, or plants.

▪ **Related Initiatives:**

- The **1925 Geneva Protocol** banned the use of biological weapons in war.
 - India ratified the Geneva Convention in 1950.
- Subsequently, the **Biological and Toxin Weapons Convention (BTWC)**, which **entered into force in 1975 prohibited the development, production, stockpiling, acquisition** and retention of biological weapons.
 - India ratified this in 1974.

PYQ

Recently, the USA decided to support India's membership in multi-lateral export control regimes called the "Australia Group" and the "Wassenaar Arrangement". What is the difference between them? (2011)

1. The Australia Group is an informal arrangement which aims to allow exporting countries to minimize the risk of assisting chemical and biological weapons proliferation, whereas the Wassenaar Arrangement is a formal group under the OECD holding identical objectives.
2. The Australia Group comprises predominantly of Asian, African and North American countries whereas the member countries of Wassenaar Arrangement are predominantly from the European Union and American Continents.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: (d)

What is the Biological Weapons Convention?

▪ **About:**

- It is a **key element in the international community's efforts to address Weapons of Mass Destruction (WMD)** proliferation and it has established a strong norm against biological weapons.
 - WMD is a **weapon with the capacity to inflict death and destruction** on such a massive scale and so indiscriminately that its very presence in the hands of a hostile power can be considered a grievous threat.
- Formally known as **"The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction"**, the Convention was negotiated by the Conference of the Committee on Disarmament in Geneva, Switzerland.
- It opened for signature on **10th April 1972** and entered into force on **26th March 1975**.

▪ **Members:**

- 183 States Parties and 4 Signatory States.
- India is a signatory of the convention.

▪ **Convention Prohibits:**

- It effectively prohibits the **development, production, acquisition, transfer, stockpiling and use of biological and toxin weapons**.
- It was the **first multilateral disarmament treaty** banning an entire category of **Weapons of Mass Destruction (WMD)**.

PYQ

With reference to 'Organization for the Prohibition of Chemical Weapons (OPCW)', consider the following statements: (2016)

1. It is an organization of the European Union in working relation with NATO and WHO.
2. It monitors the chemical industry to prevent new weapons from emerging.
3. It provides assistance and protection to States (Parties) against chemical weapons threats. Which of the statements given above is/are correct?

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

Ans: (b)

[Source: TH](#)

Representation of Women in Judiciary

For Prelims: Chief Justice of India, United Nations General Assembly, Sustainable Development Goals, United Nations, Supreme Court Collegium

For Mains: Reasons for Low Women Representatives, Significance of High Women Representation and way ahead, Issues Related to Women, Gender.

Why in News?

Recently, the [Chief Justice of India](#) raised concerns about the **lack of women among High Court judges**.

- He made this remark while addressing an event on the occasion of the **International Day of Women Judges (10th March)**.

What is the International Day of Women Judges?

- **About:**
 - [United Nations General Assembly Resolution 75/274](#) designated **10th March** the International Day of Women Judges **in 2021**.
 - India was **among the nations that sponsored the resolution**, which was moved by Qatar.
- **Significance:**
 - The day **aims to recognise the efforts and contributions** being made by women judges.
 - The day also **empowers young women and girls** who aspire to become judges and leaders in the community.
 - Combating gender disparity in the judicial services will also **help achieve the [Sustainable](#)**

[Development Goals of the United Nations.](#)

- **SDG Goal 5:** Achieve gender equality and empower all women and girls.

What is the State of Women in Judiciary?

- In high courts, the percentage of **women judges** is a mere **11.5%**, while in the **Supreme Court** there are **four sitting women judges out of 33 in office**.
- The situation of **women lawyers in the country** is not any better. Out of 1.7 million advocates registered, **only 15% are women**.

What are the Reasons for Low Women Representatives?

- **Patriarchy in Society:**
 - The **primary reason for underrepresentation** of women in judiciary is deeply ingrained patriarchy in society.
 - Women often have to face **hostile atmospheres within courtrooms**. **Harassment, lack of respect from members of the bar and bench**, the silencing of their opinions, are some of the other traumatic experiences often recounted by many women lawyers.
- **Opaque Collegium System Functioning:** More women tend to enter the lower judiciary at the entry level because of the method of recruitment through an entrance examination.
 - However, the higher judiciary has a collegium system, which has tended to be more opaque and, therefore, more likely to reflect bias.
 - Recently, the [Supreme Court Collegium](#) recommended **192 candidates for the High Courts**, out of these, 37, that is 19%, were women. But Unfortunately, so far **only 17 of the 37 women recommended were appointed**.
- **No Women Reservation:** Many states have a reservation policy for women in the lower judiciary, which is missing in the **High Courts and Supreme Court**.
 - States such as **Assam, Andhra Pradesh, Telangana, Odisha and Rajasthan** have **benefited from such reservation** as they now have 40-50% women judicial officers.
 - However, the [Bill for giving 33% reservation to women in Parliament](#) and state legislatures has not been passed till date, despite all major political parties publicly supporting it.
- **Familial Responsibilities:** Factors of age and family responsibilities also **affect the elevation of women judges from the subordinate judicial services** to the higher courts.
- **Not Enough Women in Litigation:** Since lawyers elevated from the bar to the bench form a significant proportion of judges in the high courts and Supreme Court, it is worth noting that the number of women advocates is still low, reducing the pool from which women judges can be selected.
- **Judicial Infrastructure:** Judicial infrastructure, or the lack of it, is **another barrier to women in the profession**.
 - Small courtrooms which are crowded and cramped, absence of restrooms, and childcare facilities are all barriers.
- **No Serious Attempt:**
 - No serious attempt has been made **during the past 70 years to give adequate representation to women** either in the high courts or in the Supreme Court.
 - In India, women constitute about **50% of the total population and a large number of women** are available in the Bar and in the judicial services for elevation but, in spite of that, the **number of women judges is small**.

What is the Significance of High Women Representation?

- **Motivates More Women to Seek Justice:** Higher numbers, and greater visibility, of women judges can **increase the willingness of women to seek justice** and enforce their rights through the courts.
 - Though not true in all cases, having a judge who is the same gender as litigant, **can play a**

role in setting the litigant's mind at ease.

- For instance, think of a [transgender](#) woman as a judge listening to the case of other trans women. That would inspire confidence in the litigant, as well.
- **Different Point of Views:** It is **definitely valuable to have representation of various marginalities** in the judiciary because of their different lived experiences.
 - **Diversity on the bench would definitely bring in alternative** and inclusive perspectives to statutory interpretations.
- **Increase Judicial Reasoning:** Increased judicial diversity **enriches and strengthens the ability of judicial reasoning** to encompass and respond to varied social contexts and experiences.
 - This can **improve justice sector responses** to the needs of women and marginalized groups.

Way Forward

- There is a need to bring **about institutional, social and behavioral change** among India's populace by sensitising and giving emphasis on inclusivity.
- The need of the hour is to **correct the patriarchal mindset in recommending and approving the names** of those who are to be elevated as high court judges and come out with more representation to worthy women lawyers and district judges for elevation.
 - **Unless women are empowered**, justice cannot be done to them.
- It is high time that all those who matter in the appointment of judges to the high court and the Supreme Court, **realize the need of giving adequate representation to women** in the judiciary.
 - In fact, the **superior judiciary should also have horizontal reservation** for women such as subordinate judiciary without diluting merit.

[Source: TH](#)

MSME Innovative Scheme

For Prelims: MSME Innovative Scheme, Definition of MSMEs.

For Mains: Government Policies and Interventions, Industrial Policy, MSME sector

Why in News?

Recently, the **Ministry of [MSME \(Medium, Small and Micro Enterprises\)](#)** has launched the MSME Innovative Scheme (Incubation, Design and IPR) along with the MSME IDEA HACKATHON 2022.

What are the Key Points?

- **About:**
 - It is the **combination of existing sub-schemes around incubation, design, and [Intellectual Property Rights \(IPR\)](#)** for MSMEs.
 - The **government also announced equity support of up to Rs 1 crore for commercialisation of ideas, designs and patents** across all three sub-schemes and also to help MSMEs further scale up to raise subsequent funding.
 - For this, a separate corpus will be **created and managed by SIDBI (Small**

Industries Development Bank of India) as the fund manager.

- SIDBI set up on 2nd April 1990 under an Act of Indian Parliament, acts as the Principal Financial Institution for Promotion, Financing and Development of the MSME sector as well as for co-ordination of functions of institutions engaged in similar activities.
- The new scheme will ensure support through guidance, financial support, technical support, and more to MSMEs to scale up.
- The new scheme would act as a hub for innovation activities facilitating and guiding the development of ideas into viable business propositions that can benefit society directly and can be marketed successfully.
- **Components:**
 - **Incubation:** The primary objective of the scheme is **to promote and support untapped creativity and to promote adoption of latest technologies in MSMEs** that seek the validation of their ideas at the proof-of-concept level.
 - As part of the incubation scheme, the government announced the launch of an **MSME Idea Hackathon** to invite ideas from MSMEs, innovators and students through host institutes.
 - **Financial assistance up to Rs. 15 lakh per idea and up to Rs. 1.00 crore for relevant plants and machines** will be provided.
 - **Design:** The objective of this component is to bring the Indian manufacturing sector and Design expertise/ Design fraternity on to a common platform.
 - It aims to provide expert advice and cost-effective solutions on real time design problems for new product development, its continuous improvement and value addition in existing/new products.
 - **IPR (Intellectual Property Rights):** The objective of the scheme is to improve the **IP culture in India with a view to enhance the awareness of Intellectual Property Rights (IPRs)** amongst the MSMEs and to encourage creative intellectual endeavor in the Indian economy.
 - It also aims to take suitable measures for the protection of ideas, technological innovation and knowledge-driven business strategies developed by the MSMEs for their commercialization and effective utilization of IPR tools through IP Facilitation Centre.
 - Financial assistance upto Rs. 5 lakh for Foreign Patent, Rs. 1.00 lakh Domestic Patent, Rs. 2.00 lakh for GI (Geographical Indication) Registration, Rs. 15,000/- for Design Registration, Rs.10,000/- for Trademark in the form of reimbursement.

Revised Classification applicable w.e.f 1st July 2020

Composite Criteria: Investment in Plant & Machinery/equipment and Annual Turnover

Classification	Micro	Small	Medium
Manufacturing Enterprises and Enterprises rendering Services	Investment in Plant and Machinery or Equipment: Not more than Rs.1 crore and Annual Turnover ; not more than Rs. 5 crore	Investment in Plant and Machinery or Equipment: Not more than Rs.10 crore and Annual Turnover ; not more than Rs. 50 crore	Investment in Plant and Machinery or Equipment: Not more than Rs.50 crore and Annual Turnover ; not more than Rs. 250 crore

What are the other Schemes Related to MSME?

- The **Ministry of Micro, Small & Medium Enterprises (M/o MSME)** envisions a vibrant MSME sector by promoting growth and development of the MSME Sector, including Khadi, Village and Coir Industries.
- The **Micro Small and Medium Enterprises Development (MSMED) Act** was notified in 2006 to address policy issues affecting MSMEs as well as the coverage and investment ceiling of the sector.
- **Prime Minister's Employment Generation programme (PMEGP):** It is a credit linked subsidy scheme, for setting up of new micro-enterprises and to generate employment opportunities in rural as well as urban areas of the country.
- **Scheme of Fund for Regeneration of Traditional Industries (SFURTI):** It aims to properly organize the artisans and the traditional industries into clusters and thus provide financial

assistance to make them competitive in today's market scenario.

- **A Scheme for Promoting Innovation, Rural Industry & Entrepreneurship (ASPIRE)**: The scheme promotes innovation & rural entrepreneurship through rural Livelihood Business Incubator (LBI), Technology Business Incubator (TBI) and Fund of Funds for start-up creation in the agro-based industry.
- **Interest Subvention Scheme for Incremental Credit to MSMEs**: It was introduced by the **Reserve Bank of India** wherein relief is provided upto 2% of interest to all the legal MSMEs on their outstanding fresh/incremental term loan/working capital during the period of its validity.
- **Credit Guarantee Scheme for Micro and Small Enterprises**: Launched to facilitate easy flow of credit, guarantee cover is provided for collateral free credit extended to MSMEs.
- **Micro and Small Enterprises Cluster Development Programme (MSE-CDP)**: It aims to enhance the productivity and competitiveness as well as capacity building of MSEs.
- **CHAMPIONS portal**: It aims to assist Indian MSMEs march into the big league as National and Global CHAMPIONS by solving their grievances and encouraging, supporting, helping and hand holding them.
- **MSME Samadhan**: It enables them to directly register their cases about delayed payments by Central Ministries/Departments/CPSEs/State Governments.
- **Udyam Registrations Portal**: This new portal assists the government in aggregating the data on the number of MSMEs in the country.
- **MSME SAMBANDH**: It is a Public Procurement Portal. It was launched to monitor the implementation of the Public Procurement from MSEs by Central Public Sector Enterprises.

Sourcer: PIB

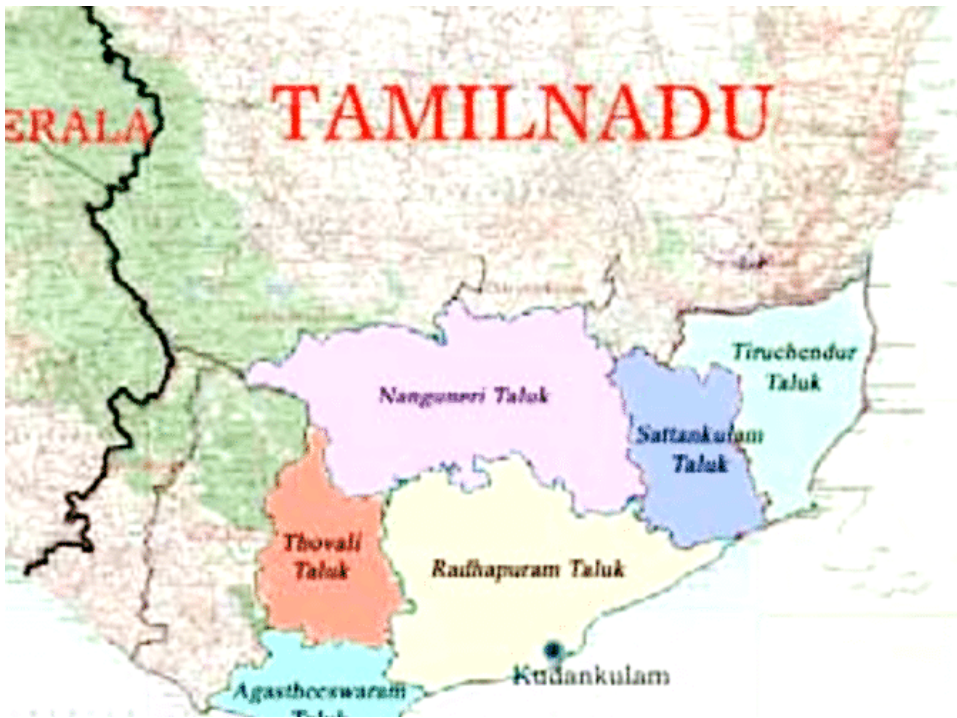
Nuclear Waste Facility at the Kudankulam

For Prelims: Away From Reactor (AFR) facility, Kudankulam Nuclear Power Project (KKNPP) , nuclear waste, radioactive pollution (spread of radioactivity), effects of radioactive pollution on Health.

For Mains: Nuclear Disaster, Effects of radioactive pollution on Health.

Why in News?

- Recently, the **Kudankulam Village Panchayat** has passed a resolution against the construction of the '**Away From Reactor (AFR) facility** at the **Kudankulam Nuclear Power Project (KKNPP)** site for storing **nuclear waste**.
- Earlier, the state government (Tamil Nadu) had **also opposed such construction**.
- The village panchayat is of the view that the AFR site would lead to **radioactive pollution (spread of radioactivity)** and **spoil the groundwater**, which is used for drinking water and irrigation.



What is an AFR site?

- The scheme for the storage of spent fuel in a nuclear power plant is **two-fold**:
 - One facility is located within the **reactor building/service building**, generally known as the **spent fuel storage pool/bay**.
 - Another is located away from the reactor, called the **Away From Reactor (AFR) Spent Fuel Storage Facility**, **but within the plant's premises**.
- The spent fuel storage pool inside the reactor building has a **limited capacity** and is **used for immediate storage of the spent fuel** removed from the **reactor during refueling**.
- The fuel remains in the pool initially for a few years for it to be **cooled sufficiently before it is shifted to the facility**.
- The AFR Spent Fuel Storage Facility is functionally similar to the 'Spent Fuel Pool' inside the reactor building, **except in terms of capacity**.

What are the Arguments of the Union Government?

- The proposed AFR facility at KKNPP reactors 1 and 2 is for storage of **spent fuel only and not for storage of nuclear waste, as perceived by a few**.
- The design ensures that there **would not be any adverse impact of the facility** on the personnel, the public and the environment.
- The radiation dose on account of AFR to the **public would be negligible**, even [when] compared to the **exposure from natural radiation** background sources like soil, sun etc.
- This has been established at the **Tarapur and Rawatbhata sites, where AFRs** have been in operation for many years.

What is Radioactivity?

- Radioactivity is the phenomenon of **spontaneous emission of particles** or waves from the **unstable nuclei of some elements**.
- There are three types of radioactive emissions: **Alpha, Beta and Gamma**.
 - **Alpha particles are positively charged He (Helium) atoms**, **beta particles are negatively charged electrons** and **gamma rays are neutral electromagnetic radiations**.
- Radioactive elements are naturally found in the earth's crust.
 - **Uranium, thorium and actinium** are **three NORM (Naturally Occurring Radioactive Materials)** series that contaminate water resources.

- A small amount of radiation is found in nature **but the extended amount of radiation is harmful to human health.**
- Radioactivity is measured in **Becquerel (SI unit) or in Curie.**
- The unit **Sievert measures the quantity of radiation** absorbed by human tissues.

PYQ

To meet its rapidly growing energy demand, some opine that India should pursue research and development on thorium as the future fuel of nuclear energy. In this on text, what advantage, does thorium hold over uranium? (2012)

1. Thorium is far more abundant in nature than uranium.
2. On the basis of per unit mass of mined mineral, thorium can generate more energy compared to natural uranium.
3. Thorium produces less harmful waste compared to uranium.

Which of the statements given above is/are correct?

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

Ans: (d)

What are Sources of Radioactivity?

▪ Natural:

- **Radiotoxic Elements in Aquatic System:** Radium, a descendant of the NORM series, is **one of the radiotoxic elements** found in aquatic systems and can be penetrated into groundwater via:
 - **aquifer rock dissolution**
 - **decaying of ^{238}U and ^{232}Th ,**
 - **desorption processes.**
 - Radium is a radionuclide formed by the decay of uranium (U) and thorium (Th) in the environment.
- **Magma:** Sometimes, magma also releases radioactive gases into the environment.
- **Soil Sediments:** Percolation of NORM from the soil sediments to the aquifer causes groundwater contamination.
- **Atmospheric Deposition of Cosmogenic Radionuclides:**
 - Atmospheric deposition (both dry and wet) of cosmogenic radionuclides add radioactive nuclei in the surface water.
 - Cosmogenic radionuclides are **radioactive isotopes** which are produced by natural processes and distributed within the Earth system.

▪ Anthropogenic:

- **Nuclear Reactors and Warheads:**
 - Nuclear reactors and nuclear warhead experiments are the key sources of human-induced radionuclides discharge.
 - Nuclear reactors produce **radioisotopes (Cobalt-60, Iridium-192, etc)** that hand out as sources of gamma radiation in radiotherapy and numerous industrial appliances.
 - Nuclear power plants placed at the coastal regions **add to the radiological contaminants in the marine water by releasing atomic wastes.**
 - Water is also used as coolants in these powerhouses, which also get contaminated.
- **Dumping of Radioactive Waste:**

- The application of radioactive elements in **nuclear weapons, X-rays, MRI and other medical equipment** causes their exposure to human beings. Dumping of these radioactive wastes in surface water bodies causes water pollution.
- **Mining:**
 - Mining activities of radioactive elements like uranium and thorium also pollute surface and groundwater.
- **Nuclear Accidents:**
 - Radioactive pollution due to nuclear submarine accidents and sinking have been reported.
 - The **Rocky Flats plant in Colorado, Fukushima and the Chernobyl nuclear disaster** are some examples of such nuclear accidents.

What are the effects of radioactive pollution on Health?

- **Radiation Syndrome:**
 - Human tissues absorb radiation through polluted water and foodstuff, which can cause serious health risks.
 - High doses of radiation can cause acute radiation syndrome or dermal radiation injury.
- **Disorders in Human Physiology:**
 - Exposure to radiation causes various disorders in human physiology, including cancer, leukemia, genetic mutations, cataracts, etc.
- **Mutation and Structural Alteration:**
 - Genetic effects ionizing radiation induces mutations in germ cells (male sperm cells and female egg cells), resulting in structural alteration in germ cell DNA that is passed onto offspring.
 - **Hereditary disorders** can lead to premature death and severe mental illness.

PYQ

Which among the following has the world's largest reserves of Uranium? (2009)

- (a) Australia
- (b) Canada
- (c) Russian Federation
- (d) USA

Ans: (a)

[Source: TH](#)

New Lunar Crater

For Prelims: Project Pluto, Lunar Crater, Earth craters, Mitra Crater on Moon.

For Mains: Space Junk, Space Technology.

Why in News?

Recently, a **leftover piece of a spacecraft flying (of Chang'e 5-T1 - a lunar mission of China)** through space reportedly hit the surface of the moon **creating a new crater that may be around 65 feet wide.**

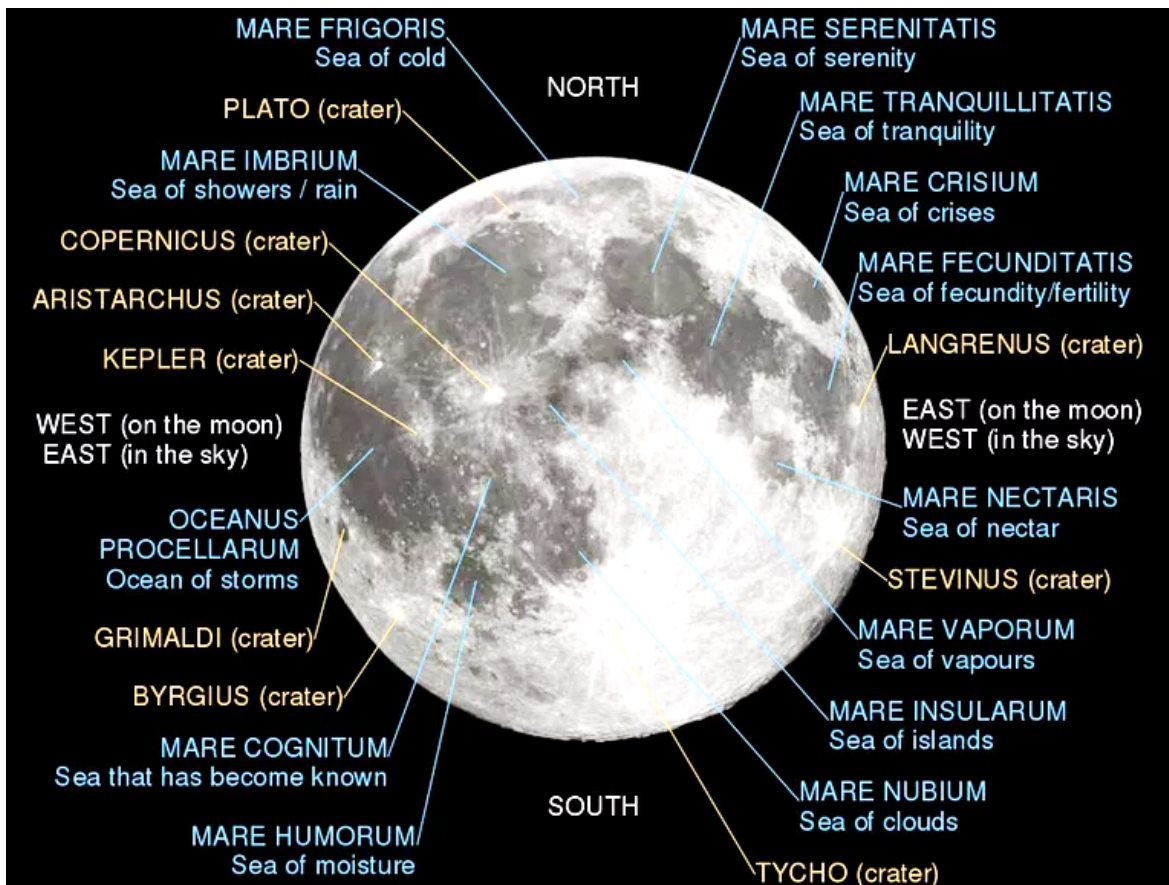
- This is the **first recorded unintentional case of space junk** hitting the moon.
- The speed, trajectory, and time of impact were calculated using earth-based telescope observations called **Project Pluto.**
- **Project Pluto** is a blog that tracks near-earth objects, which was created by American astronomer Bill Gray. He is also the creator of a popular astronomy software called Guide.

What is Space Junk?

- **About:** Space debris, also called space junk, artificial material that is orbiting Earth but is no longer functional.
 - This material can be as large as a discarded rocket stage or as small as a microscopic chip of paint.
- **Location:** Much of the debris is in low Earth orbit, within 2,000 km of Earth's surface, though some debris can be found in geostationary orbit 35,786 km above the Equator.
- **Issue (Kessler Syndrome) :** The free floating space debris is a potential hazard for operational satellites and colliding with them can leave the satellites dysfunctional.
 - This is referred to as **Kessler Syndrome**, named after NASA scientist Donald Kessler in 1978.
 - It says if there is too much space junk in orbit, it could result in a **chain reaction where more and more objects will collide and create new space junk in the process**, to the point where Earth's orbit becomes unusable - a Domino Effect.
 - With countries launching more and more satellites, each one of them being a strategic or commercial asset, avoiding collisions could become a challenge in the future.
- **Solution: Clearspace-1 (of European Space Agency)**, which is scheduled to launch in 2025, will be the first space mission to eliminate debris from orbit.

What are Lunar Craters?

- Lunar Craters are bowl-shaped landforms **created by Volcanism and Cratering, about 4.5 billion years ago, shortly after Earth was formed.**
- There are hundreds of thousands of moon craters ranging from less than a mile across to giant basins.
- The **largest crater on the Moon is called South Pole-Aitken Basin.**
- Further, throughout its existence, the Moon has been bombarded by comets and asteroid chunks, and those created the many impact craters we see today.
- Moon's lack of water, atmosphere, and tectonic plates, there is little erosion, and craters are found that exceed two billion years in age.
- **[Mitra Crater on Moon](#)** is named after Indian radio physicist Sisir Kumar Mitra.



What is the Difference between Craters on the Moon and Earth?

- Both the earth and the moon have been hit by multiple objects like asteroids throughout their existence, but craters on the moon are of a more permanent nature than those on earth.
- This is because of processes like erosion, tectonics, and volcanism.
- According to NASA, these three processes keep the surface of the earth crater-free and remove traces of collisions that have happened in the past.
- Currently, the earth has less than 200 known craters while the moon has thousands.
- An absence of atmosphere means there is no wind system and no weather on the moon, and hence no cause for erosion of existing craters.
- The absence of tectonics prevents the moon's surface from forming new rocks or causing a shift in the existing surface patterns, unlike that on earth.
- Lastly, the absence of volcanism (in recent history) makes it impossible for craters to be covered.

PYQ

Selene-1, the lunar orbiter mission belongs to which one of the following? (2008)

- (a) China
- (b) European Union
- (c) Japan
- (d) USA

Ans: (c)

[Source: TH](#)

Amazon Rainforest Nearing Tipping Point

For Prelims: Types of Forest Ecosystem.

For Mains: Environment Pollution and Degradation, Conservation.

Why in News?

A study published recently says that **a significant part of the [Amazon rainforest](#) has been heading towards a tipping point since the early 2000s. It may be losing its ability to bounce back from extreme events** such as drought or fire, threatening **to become a dry savanna-like ecosystem.**

- In this study, **researchers analyzed 30 years of satellite data** to understand the resilience of the rainforest and how it has changed over the years.
- The latest findings are **consistent with the accumulating evidence that the twin pressures of climate change and human exploitation of tropical forests are endangering the world's largest rainforest**, which is home to one out of every 10 species known to science.

What is the Savannah-Like Ecosystem?

- The Savannah ecosystem is **a tropical grassland with warm temperatures year-round and with its highest seasonal rainfall in the summer.**
- The savanna is **characterized by grasses and small or dispersed trees that do not form a closed canopy**, allowing sunlight to reach the ground.
- The **largest areas of savanna are found** in Africa, South America, Australia, India, the Myanmar (Burma)-Thailand region in Asia, and Madagascar.

What are the Findings of the Study?


- **Loss of Resilience:**
 - There are **signs of a loss of resilience in more than 75% of the forest**, with trees taking longer to recover from the effects of droughts largely driven by climate change as well as human impacts such as deforestation and fires.
 - A vicious cycle of damage **could trigger "dieback"**.
 - Dieback: A condition in which a tree or shrub begins to die from the tip of its leaves or roots backwards, owing to disease or an unfavourable environment.
- **Implications:**
 - While it's not clear when that critical point might be reached, the implications for **climate change**, biodiversity and the local community would be "devastating".
 - A previous study predicted that a tipping point would occur when the rainforest witnesses roughly 20-25% of deforestation.
- **Causes:**
 - **Deforestation is on the rise:**
 - It totalled 430 square kilometers in January 2022, five times higher than the same month last year.
 - Around a fifth of the rainforest has already been lost, compared to pre-industrial levels.
 - This loss will **affect the amount of rainfall**. Trees take up water through the roots, releasing it into the atmosphere, influencing precipitation over South America.
 - **Climate Inducing it into Carbon Source:**

- Increasing temperatures due to human-induced climate change and deforestation are pushing the rainforest **to transform into a [carbon source](#): Places that release more CO₂ than they absorb.**
- The researchers warn that the forests could release vast amounts of CO₂ if they partially transform into dry habitats.
- **Anthropogenic Activities are the on the rise:**
 - Human land-use activities — direct removal of trees, construction of roads, and fires — could be another contributor. It has been on the rise since 2010.

What are the Suggestions?

- **Reducing deforestation** will protect the forest's threatened parts and boost Amazon rainforest resilience.
- **Limiting global [greenhouse gas emissions](#)** is also necessary to safeguard the Amazon.

What are the Key Points Related to Amazon Rainforests?

- These are **large tropical rainforests occupying the drainage basin of the Amazon River** and its tributaries in northern South America and covering an area of 6,000,000 square km. 
- Tropical forests are **closed-canopy forests growing within 28 degrees north** or south of the equator.
- They are **very wet places, receiving more than 200 cm rainfall** per year, either seasonally or throughout the year.
- Temperatures are uniformly high - between 20°C and 35°C.
- Such forests are found in Asia, Australia, Africa, South America, Central America, Mexico and on many of the Pacific Islands.
- Comprising **about 40% of Brazil's total area**, it is bounded by the Guiana Highlands to the north, the Andes Mountains to the west, the Brazilian central plateau to the south, and the Atlantic Ocean to the east.

PYQ

Which one of the following pairs is correctly matched? (2013)

Geographical Feature	Region
(a) Abyssinian Plateau	Arabia
(b) Atlas Mountains	North-Western Africa
(c) Guiana Highlands	South-Western Africa
(d) Okavango Basin	Patagonia

Ans: (b)

Source: DTE

Current Account Deficit

For Prelims: Current Account Deficit, Balance of Payments, Forex Reserve.

For Mains: Factors on which Current Account Deficit depends and measures to deal with it.

Why in News?

Recently, an American financial services company Morgan Stanley has predicted that the **Current Account Deficit** will widen to a 10-year high of 3% of GDP in FY23.

What are the Key Points?

- In the wake of continued **geopolitical tensions**, **the surge in oil prices** is likely to be sustained, which would lead to deterioration in the current account deficit from a higher oil import bill.
- The **Balance of Payments (BoP)** to be in deficit of approximately 0.5-1% of **GDP (Gross Domestic Product)** because capital flows are likely to be lower than the current account deficit.
- The extent of vulnerability to funding risks **will be cushioned by the large forex reserves**, which stand at USD 681 billion.
- The company expects the April 2022 policy to mark the process of **policy normalization** with a reverse repo rate hike. However, if the RBI were to delay its normalization process, the risk of disruptive policy rate hikes would rise.
- There is **less room for fiscal policy stimulus to support growth** given high deficit and debt levels – it is seen that there is a possibility **of a modest fuel tax cut and reliance on the national rural employment program** as an automatic stabilizer.

PYQ

Consider the following actions which the Government can take: (2011)

1. Devaluing the domestic currency.
2. Reduction in the export subsidy.
3. Adopting suitable policies which attract greater FDI and more funds from FII's.

Which of the above action/actions can help in reducing the current account deficit?

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

Ans: (d)

What is the Current Account Deficit?

- A current account deficit occurs **when the total value of goods and services a country imports exceeds** the total value of goods and services it exports.
 - The balance of exports and imports of goods is referred to as the trade balance. Trade Balance is a part of 'Current Account Balance'.
- According to an earlier report of 2021, **High Oil Imports, High Gold Imports are the** major driving force, widening the CAD.

PYQ

With reference to Balance of Payments, which of the following constitutes/constitute the Current Account? (2014)

1. Balance of trade
2. Foreign assets
3. Balance of invisibles
4. Special Drawing Rights

Select the correct answer using the code given below:

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

Ans: (c)

What is Balance of Payments?

▪ About:

- BoP of a country can be defined as **a systematic statement of all economic transactions of a country with the rest of the world** during a specific period, usually one year.

▪ Purposes of Calculation of BoP:

- Reveals the financial and economic status of a country.
- Can be used as an indicator to determine whether the country's currency value is **appreciating or depreciating**.
- Helps the Government to decide on fiscal and trade policies.
- Provides important information to analyze and understand the economic dealings of a country with other countries.

▪ Components of BoP:

- For preparing BoP accounts, economic transactions between a country and the rest of the world are grouped under - Current account, Capital account and Errors and Omissions. It also shows changes in Foreign Exchange Reserves.
- **Current Account:** It shows export and import of visibles (also called merchandise or goods - represent trade balance) and invisibles (also called non-merchandise).
 - Invisibles include services, transfers and income.
- **Capital Account:** It shows a capital expenditure and income for a country.
 - It gives a summary of the net flow of both private and public investment into an economy.
 - **External Commercial Borrowing (ECB), Foreign Direct Investment, Foreign Portfolio Investment**, etc form a part of capital account.
- **Errors and Omissions:** Sometimes the balance of payments does not balance. This imbalance is shown in the BoP as errors and omissions. It reflects the country's inability to record all international transactions accurately.
- **Changes in Foreign Exchange Reserves:** Movements in the reserves comprises changes in the foreign currency assets held by the **Reserve Bank of India (RBI) and also in Special Drawing Rights (SDR)** balances.
- Overall the BoP account **can be a surplus or a deficit**. If there is a deficit then it can be bridged by taking money from the Foreign Exchange (Forex) Account.
 - If the reserves in the forex account are falling short then this scenario is **referred to as BoP crisis**.

PYQ

Which of the following constitute a Capital Account? (2013)

1. Foreign Loans
2. Foreign Direct Investment
3. Private Remittances
4. Portfolio Investment

Select the correct answer using the codes given below:

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

Ans: (b)

[Source: TH](#)

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