



## W Boson

**For Prelims:** Standard Model of Particle Physics, W Boson, Z boson, Higgs boson.

**For Mains:** Scientific Innovations & Discoveries

### Why in News?

Recently, researchers from Collider Detector at Fermilab (CDF) Collaboration, in the US, announced that they **have made a precise measurement of the mass of the W boson**.

- It has been stated that this **precisely determined value did not match with the estimates** from the standard model of particle physics.

### What is W Boson?

- The W boson was **first seen in 1983 at CERN**, located on the Franco-Swiss border.
  - In contrast to the **photon, which is massless**, the **W bosons are quite massive**, so the weak force they mediate is very short ranged.
  - **European Organisation for Nuclear Research (CERN)** is the world's largest nuclear and particle physics laboratory and best known as operator of the Large Hadron Collider, which found the elusive Higgs boson in 2012.
- Unlike the photon, which **is electrically neutral**, the **W-plus and W-minus are both massive and charged**.
- By exchanging such W bosons, a neutron can change into a proton, for example:
  - **This is what happens in beta decay**, a radioactive interaction that takes place in the sun.
- Thus, the **W boson facilitates the interactions that make the sun burn** and produce energy.

### What is the Standard Model of Elementary Particle Physics?

- The standard model of elementary particles is a theoretical construct in physics that describes particles of matter and their interaction.
- It describes the **elementary particles of the world as being connected by mathematical symmetry**, just as two objects are connected by bilateral (left-right) symmetry.
- These are **mathematical groups** generated by continuous transformations from, say, one particle to another.
- According to this model there are a **finite number of fundamental particles** which are represented by the characteristic "eigen" states of these groups.
- The particles predicted by the model, such as the **Z boson, have been seen in experiments**.
  - The last to be discovered, in 2012, was the [Higgs boson](#) which gives mass to the heavy particles.

### Why is the Standard Model believed to be Incomplete?

- Because it **gives a unified picture of only three of the four fundamental forces** of nature —



Select the correct answer using the codes given below:

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

Ans: (a)

- Basic equations of the Unified Theory described the electro-weak force and its associated force-carrying particles, namely the photon, and the W and Z bosons. All of these particles emerged without a mass. Protons are with negligible mass, but W and Z have mass nearly 100 times that of a proton.
- Theorists Robert Brout, Francois Englert and Peter Higgs made a proposal known as Brout-Englert-Higgs mechanism that gives a mass to the W and Z when they interact with an invisible field, now called the "Higgs field", which pervades the universe.
- The Higgs boson is the visible manifestation of the Higgs field.
- Just after the Big Bang, the Higgs field was zero, but as the universe cooled and the temperature fell below a critical value, the field grew spontaneously so that any particle interacting with it acquired a mass.
- The more a particle interacts with this field, the heavier it is. Particles, like the photon that do not interact with it are left with negligible mass.
- Like all fundamental fields, the Higgs field has an associated particle – the Higgs boson. Hence, statement 1 is correct and there is no relation of the Higgs boson particle with statements 2 and 3. Therefore, option (a) is the correct answer.

Source: TH

## Open-RAN Architecture

**For Prelims:** Open-RAN Architecture, 5G.

**For Mains:** Advantages of Open-RAN Architecture.

### Why in News?

The Ministry of Communications has signed a Memorandum of Understanding (MoU) with M/s VVDN Technologies Private Limited to facilitate registered startups, innovators and MSMEs working in the field of [Open RAN \(Radio Access Network\)](#) to get their product tested at the existing lab of M/s VVDN.

- Such testing certification shall **accelerate the research innovation in domestic design and manufacturing**. It is aimed that India shall be emerging as a design leader in **5G/O-RAN**. This test certification eco system will make India as design testing and certification hub of Asia.

### What is O-RAN?

- **About:**
  - Open-RAN is not a technology, **but rather an ongoing shift in mobile network**

**architecture** that allows networks to be built **using subcomponents from a variety of vendors.**

- O-RAN has **an open, multi-vendor architecture** for deploying mobile networks, as opposed to the single-vendor proprietary architecture.
- O-RAN **uses software to make hardware manufactured by different companies** work together.
- The key concept of Open RAN is **“opening” the protocols and interfaces between the various subcomponents (radios, hardware and software) in the RAN.**
  - **Radio Access Network (RAN):**
    - It is the part of a telecommunications system that connects individual devices to other parts of a network through radio connections.
    - A RAN resides between user equipment, such as a mobile phone, a computer or any remotely controlled machine, and provides the connection with its core network.
  - As a technical matter this is what the industry refers to as a disaggregated RAN.
- **Elements of RAN:**
  - The Radio Unit (RU) is where the radio frequency signals are transmitted, received, amplified and digitized. The RU is located near, or integrated into, the antenna.
  - The Distributed Unit (DU) is where the real-time, baseband processing functions reside. The DU can be centralized or located near the cell site.
  - The Centralized Unit (CU) is where the less time-sensitive packet processing functions typically reside.
- **Functioning of Open RAN:**
  - It is the interface between the RU, DU and the CU that are the main focus of Open RAN.
  - By opening and standardizing these interfaces (among others in the network), and incentivizing implementation of the same, networks can be deployed with a more modular design without being dependent upon a single vendor.
  - Making these changes can also allow the DU and CU to be run as virtualized software functions on vendor-neutral hardware.
- **Traditional RAN:**
  - In a traditional RAN system, the radio, hardware and software are proprietary.
    - This means that nearly all of the equipment comes from one supplier and that operators are unable to, for example, deploy a network using radios from one vendor with hardware and software from another vendor.
  - **Problems:**
    - Mixing and matching cell sites from different providers typically leads to a performance reduction.
    - The result is that most network operators, while supporting multiple RAN vendors, will deploy networks using a single vendor in a geographic region which can create vendor lock-in with high barriers to entry for new innovators.

## What are the Advantages of O-RAN?

- **Innovation and Options:**
  - An open environment expands the ecosystem, and with more vendors providing the building blocks, there is more innovation and more options for the Operators. They can also add new services.
- **New Opportunities:**
  - It will open new opportunities for Indian entities to enter into the network equipment market.
- **Cost Saving:**
  - The benefits of this approach also include increased network agility and flexibility, and cost savings.
  - It's expected to make **5G** more flexible and cost efficient.

**Source: PIB**

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## UNCCD Conference of Parties (COP15)

**For Prelims:** UNCCD, COP15, land degradation, climate change, Drought, Delhi Declaration of 2019, desertification, IWMP, Soil Health Card Scheme

**For Mains:** Desertification and its impact, Environmental Pollution & Degradation

### Why in News?

Recently, the Union Minister for Environment, Forest and Climate Change addressed the **fifteenth session of the [Conference of the Parties \(COP15\)](#) of the [United Nations Convention to Combat Desertification \(UNCCD\)](#) in Cote d'Ivoire (Western Africa).**

### What are the Highlights of the COP15?

- **About:**
  - COP 15 is a **key moment in the fight against desertification, land degradation and drought.**
  - It will **build on the findings of the second edition** of the **Global Land Outlook** and offer a concrete response to the interconnected challenges of [land degradation](#), [climate change](#) and biodiversity loss.
    - The Global Land Outlook (GLO), the **UNCCD flagship publication, underscores land system challenges**, showcases transformative policies and practices, and points to cost-effective pathways to scale up sustainable land and water management.
- **Top Agenda:**
  - [Drought](#), **land restoration, and related enablers** such as land rights, gender equality and youth empowerment are among the top items on the Conference agenda.
- **Theme:** 'Land. Life. Legacy: From scarcity to prosperity'

### What is Desertification?

- **About:**
  - Land degradation is defined as the **reduction or loss of the biological or economic productivity of drylands.**
  - Land degradation in arid, semiarid and dry subhumid areas resulting from various factors, including climatic variations and human activities.
- **Causes:**
  - **Loss of Soil Cover:**
    - **Loss of soil cover, mainly due to rainfall** and surface runoff, is one of the biggest reasons for desertification.
    - Cutting forests adversely affect the soil and cause degradation. As urbanization increases, the demand for resources is also increasing.
  - **Vegetation Degradation:**
    - Vegetation degradation is defined as, "**the temporary or permanent reduction in the density, structure, species composition or productivity of vegetation cover**".
  - **Water Erosion:**
    - It results in **Badland Topography** which itself is an initial stage of desertification.
      - Badlands are a type of dry terrain where softer sedimentary rocks and clay-rich soils have been extensively eroded.
  - **Wind Erosion:**
    - **Sand encroachment by wind reduces fertility of the soil** making the land susceptible

to desertification.

- It was found to be responsible for 5.46% of the desertification in India.
- **Climate Change:**
  - It may exacerbate desertification through alteration of spatial and temporal patterns in temperature, rainfall, solar radiation and winds.

## What are the Related Efforts Taken?

### ▪ Global Efforts:

- **United Nations Convention to Combat Desertification (UNCCD):** It was established in 1994, the sole legally binding international agreement linking environment and development to sustainable land management.
  - The [Delhi Declaration of 2019](#), signed by 14th CoP of the UNCCD, called for better access and stewardship over land, and emphasised gender-sensitive transformative projects.
- **The Bonn Challenge:** To bring 150 million hectares of the world's deforested and degraded land into restoration by 2020, and 350 million hectares by 2030.
- **Great Green Wall:** Initiative by Global Environment Facility (GEF), where eleven countries in Sahel-Saharan Africa have focused efforts to fight against land degradation and revive native plant life to the landscape.

### ▪ India's Efforts to Check Land Degradation:

- **India is focusing on sustainable land and resource management** for livelihood generation at community level for making the local lands healthier and productive for providing a better homeland and a better future for its inhabitants.
- The **National Action Programme for combating desertification** was prepared in 2001 to take appropriate action in addressing the problems of desertification.
- Following the **global call for the submission of nominations for World Restoration Flagships**, India endorsed **six restoration flagships** that target the restoration of 12.5 million hectares of degraded land.
- Some of the **major programmes which address issues related** to land degradation and desertification, being implemented currently are as follows:
  - [Integrated Watershed Management Programme \(IWMP\)](#) (Pradhan Mantri Krishi Sinchayee Yojana)
  - National Afforestation Programme (NAP)
  - National Mission for Green India (GIM)
  - The [Mahatma Gandhi National Rural Employment Guarantee Scheme \(MGNREGS\)](#),
  - Soil Conservation in the Catchment of River Valley Project
  - National Watershed Development Project for Rainfed Areas (NWDPPRA)
  - Fodder and Feed Development Scheme-component of Grassland Development including Grass Reserves.
  - Command Area Development and Water Management (CADWM) programme,
  - [Soil Health Card Scheme](#), etc.

## UPSC Civil Services Examination, Previous Year Questions

### Q. What is/are the importance/importances of the ' United Nations Convention to Combat Desertification' ? (2016)

1. It aims to promote effective action through innovative national programmes and supportive international partnerships.
2. It has a special/particular focus on South Asia and North Africa regions, and its Secretariat facilitates the allocation of major portion of financial resources to these regions.
3. It is committed to bottom-up approach, encouraging the participation of local people in combating the desertification.

Select the correct answer using the code given below:

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

**Ans: (c)**

- The United Nations Convention to Combat Desertification aims to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa. Hence, 2 is not correct.
- It seeks to take effective action at all levels, supported by international cooperation and partnership arrangements in the framework of an integrated approach which is consistent with Agenda 21, with a view to contributing to the achievement of sustainable development in affected areas. Hence, 1 is correct.
- Parties should ensure that decisions on the design and implementation of programmes to combat desertification and/or mitigate the effects of drought are taken with the participation of the populations and local communities and that an enabling environment is created at higher levels to facilitate action at national and local levels. Hence, 3 is correct. Therefore, option (c) is the correct answer.

**Source: PIB**

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## Regulating Digital News Intermediaries

**For Prelims:** Article 19

**For Mains:** Need to Regulate Digital News Intermediaries

### Why in News?

Recently, Canada introduced a Bill that **seeks to make Internet platforms** such as Google and Facebook pay news publishers for use of their content.

### What is the underlying Idea?

- The bill seeks to **regulate digital news intermediaries** “to enhance fairness in the Canadian digital news marketplace and contribute to its sustainability.”
- The legislation is **expected to produce four outcomes.**
  - A framework that supports fair business relationships between digital platforms and news outlets.
  - Sustainability in the news ecosystem.
  - Maintenance of press independence.
  - Diversity within the news landscape.

## What is the Nature of Publisher-Platform Relationships?

- **Use of Tools and Strategies:**
  - Their relationship has till recently been largely about how **publishers can use tools and strategies to better use the reach** provided by these platforms.
  - **Google and Facebook provide much of the traffic** for a lot of traditional news publishers.
- **Making Money:**
  - All over the world the platforms are **able to make much of the money from this arrangement** while publishers struggle.
  - The publishers also **have to contend with frequent changes to the platform algorithm**, which comes with the real threat of them losing a large amount of readers all of a sudden.

## What is the importance of Such Law for India?

- **About:**
  - The Canadian order on the issue is likely **to boost the chances of India's news publishers getting a fair revenue-sharing system** in the country.
  - India in December 2021 said that it **had no plans to make tech giants, such as Facebook and Google, pay local publishers** for news content.
  - However, following a **complaint by Digital News Publishers' Association (DNPA)** the [Competition Commission of India](#) ordered investigations into Google earlier in 2022.
    - In the process of the order, the watchdog did take note of the legislations in Australia and France.
- **Need to Regulate:**
  - India, once the **world's largest unconnected country**, will soon be one of the world's biggest internet-enabled nations, with over 800 million online.
  - Technology will **likely be a big part of our economy**, accounting for almost a fifth of our overall output.
  - Unregulated social and digital media could **pose a threat to India's rise as a trustworthy and responsible nation**, as also Indian democracy, the world's largest.
  - These challenges can be **addressed by regulating social media efficiently** and modernizing our laws and institutions.

## What is the Status in Other Countries?

- Google and Facebook **face legal battles over compensation for using news content worldwide**.
  - They also face antitrust lawsuits from regulators and publishers.
- With news publishers in Australia, the UK, the [European Union](#), and France having enacted or planning to enact laws to enforce a fair revenue-sharing model, the tech giants seem to be fighting desperately to hang on to their alleged monopolistic system to rake in huge revenues.

[Source: TH](#)

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## Indian Pharma Sector

**For Prelims:** Indian pharmaceutical industry, Active Pharmaceutical Ingredients.

**For Mains:** India's Pharma Sector - associated challenges and steps that can be taken to boost the sector, Making India the world's pharmacy in terms of value.



## Why in News?

Recently, the Ministry of Chemical & fertilizers released guidelines on pharmaceutical innovation and entrepreneurship for academic institutions to Catalyze [Indian Pharma Sector](#).

- The Department of Pharmaceuticals has established NIPERs (National Institutes of Pharmaceutical Education and Research) as institutes of national importance for providing quality education and conducting high-end research.
- The Department is also soon coming up with a 'Policy to catalyze Research & Development and Innovation in the Pharma- MedTech Sector in India'.

## What Do the Policy Guidelines Seek?

- These policy guidelines **aim to transform academic research into innovative and commercially applicable technologies**.
- It seeks to **build a strong ecosystem for entrepreneurial activities** and contribute to a [Self-Reliant India Mission](#).
- The policy guidelines will **encourage faculty, staff and students to pursue entrepreneurship**.
- The **availability of resources needs** to be ensured for pre-incubation and providing common facilities for prospective inventors and entrepreneurs.
  - Budgetary provisions should be available in terms of allocation of a fixed percentage (such as not less than 1%) of institute's annual budget for funding, promoting and supporting innovation and startup-related activities.
  - In return for the services and facilities provided, an institute may take a fixed percentage of (2 - 9.5%) equity in the startup/spin-off company, based on employee contribution, support provided and use of the institute's Intellectual Property.
- The entrepreneurial initiatives shall be evaluated on a regular basis using well-defined impact assessment parameters such as [IP \(Intellectual Property\)](#) filed, products developed and commercialized and number of employments generated, and startups created.
- To encourage students, **relaxation in attendance should be provided** to enable them to dedicate time for entrepreneurial activities, and they should be allowed to sit for the examination, even if their attendance is less than 75 %, adding institutes should provide relaxation to the PhD students in terms of a semester/year break or more, if needed, to devote time on startup ventures.

## What is the Status of the Indian Pharma Sector?

- India is the **largest provider of generic drugs globally**. It supplies over 50% of global demand for various vaccines, 40% of generic demand in the US and 25% of all medicine in the UK.
- The **Indian pharmaceutical market is estimated at USD 40 billion** and pharma companies export another USD 20 billion.
  - However, this is a miniscule portion of the USD 1.27-trillion global pharmaceutical market.
- Globally, **India ranks 3rd in terms of pharmaceutical production by volume and 14th by value**.
- India has more than 30% share in the global generic market but less than 1% share in the new molecular entity space.
  - **New Molecular Entity:** A novel compound that has not previously been approved for use in humans.
- According to the [Economic Survey 2021](#), the domestic market is expected to grow three times in the next decade.

## What are the Issues with the Indian Pharma Sector?

- **Lack of Capabilities in Innovation Space:** India is rich in its manpower and talent but still lags in innovation infrastructure. The government needs to invest in research initiatives and talent to

grow India's innovation.

- The government should support the clinical trials and subjectivity in certain regulatory decision-making.
- **Effect of External Markets:** Reports comments that India is heavily dependent on other countries for [Active Pharmaceutical Ingredients \(API\)](#) and other intermediates. 80% of the APIs are imported from China.
  - So India is, therefore, at the mercy of supply disruptions and unpredictable price fluctuations. Implementation of infrastructure improvement in the field of internal facilities is necessary to stabilize supply.
- **Quality compliance inquiry:** India has undergone the highest number of Food and Drug Administration (FDA) inspections since 2009; therefore, continuous investment for upgrading quality standards will distract the capital away from other areas of development and growth is reduced.
- **Lack of Stable Pricing and Policy Environment:** The challenge created by unexpected and frequent domestic pricing policy changes in India. It has created a vague environment for investments and innovations.

## What is the Need for Innovation in the Pharma Sector?

- Changing perspective and increasing the use of technology were the need of the hour. But now it is essential that innovation is at the core of business, and there is a dire need to embrace it if India wants to continue to be of relevance in the global pharmaceutical space.
- India playing at scale in the innovation space will not just help the country but will create a source of sustainable revenues, bringing new solutions to unmet healthcare needs.
  - In India, this would lead to reduction in disease burden (development of drugs for India-specific concerns like [tuberculosis](#) and [leprosy](#) does not get global attention), creation of new high-skilled jobs, and probably around USD 10 billion of additional exports from 2030.
  - Countries like China have already leapfrogged ahead, skipping the generic medicine based development.

## What are Government Initiatives?

- [Strengthening of Pharmaceutical Industry Scheme:](#)
  - A total financial outlay of Rs. 500 crore (USD 665.5 million) for the period FY 21-22 to FY 25-26 were announced under the Scheme.
- **First Global Innovation Summit of the pharmaceuticals sector:**
  - In November 2021, Indian PM inaugurated the first Global Innovation Summit of the pharmaceutical sector, where national and international speakers deliberated on a range of subjects including regulatory environment, funding for innovation, industry-academia collaboration and innovation infrastructure.
- **Production Linked Incentive (PLI) Scheme:**
  - The PLI scheme aims to promote domestic manufacturing of critical Key Starting Materials (KSMs)/Drug Intermediates and Active Pharmaceutical Ingredients (APIs) in the country.
- [Promotion of Bulk Drug Parks Scheme:](#)
  - The government aims to develop 3 mega Bulk Drug parks in India in partnership with States to reduce manufacturing cost of bulk drugs in the country and dependency on other countries for bulk drugs.

## Way Forward

- Medicine spending in India is projected to grow 9-12% over the next five years, leading India to become one of the top 10 countries in terms of medicine spending.
- Going forward, better growth in domestic sales would also depend on the ability of companies to align their product portfolio towards chronic therapies for diseases such as cardiovascular, anti-diabetes, anti-depressants and anti-cancers, which are on the rise.
- The Indian Government has taken many steps to reduce costs and bring down healthcare expenses. **Speedy introduction of generic drugs into the market has remained in focus and is expected to benefit the Indian pharmaceutical companies.**

- In addition, the thrust on rural health programmes, lifesaving drugs and preventive vaccines also augurs well for the pharmaceutical companies.

[Source: PIB](#)

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## Andaman and Nicobar Islands to Get Gas Plant

**For Prelims:** Island Coastal Zone Regulation 2019, Andaman and Nicobar Islands.

**For Mains:** Coastal Zone Regulation.

### Why in News?

The Ministry of Environment, Forest and Climate Change has approved an **exemption to the laws governing the regulation of coastal zones** and has paved the way for **gas-powered plants to be set up at [Andaman and Nicobar islands](#)**.

### What are the Key Points?

- The Island Coastal Zone Regulation (ICRZ), 2019, limits infrastructure development on vulnerable coastal stretches.
- The National Coastal Zone Management Authority (NCZMA) has recommended that gas-based power plants be permitted within the Island Coastal Regulation Zone area only on islands with geographical areas greater than 100 sq. km.
- A dual-fuel power plant that runs on both diesel and LNG is expected to be commissioned.
- There has been an increased interest in the development of the Andaman region following a policy push by the NITI Aayog. A proposed project plans to develop the Greater Andaman region or the southernmost stretch of the island group.
  - Proposals include a 22-sq.km airport complex, a TransShipment Port (TSP) at South Bay at an estimated cost of Rs 12,000 crore, a parallel-to-the-coast mass rapid transport system and a free trade zone and warehousing complex on the southwestern coast.

### What is ICRZ 2019?

- The Central Government **declared certain coastal stretches as Coastal Regulation Zone and restrictions were imposed on the setting up and expansion** of industries, operations and processes in the said zone.
- The Central Government has received **representations from Andaman and Nicobar Administration regarding re-categorisation of Great Nicobar Island from Group -I to Group -II islands** under the provisions of the Island Coastal Regulation Zone (ICRZ) notification.
  - Group-I: Islands with geographical areas >1000 sq.km such as South Andaman, Middle Andaman, North Andaman and Great Nicobar.
  - Group-II: Islands with geographical areas >100 sq.km but < 1000 sq.km such as Baratang, Little Andaman, Havelock and Car Nicobar.
  - The land area from High Tide Line to 200 meters on the landward side along the sea front for Group-I Islands and 100 meters on the landward side along the sea front for Group-II Islands.

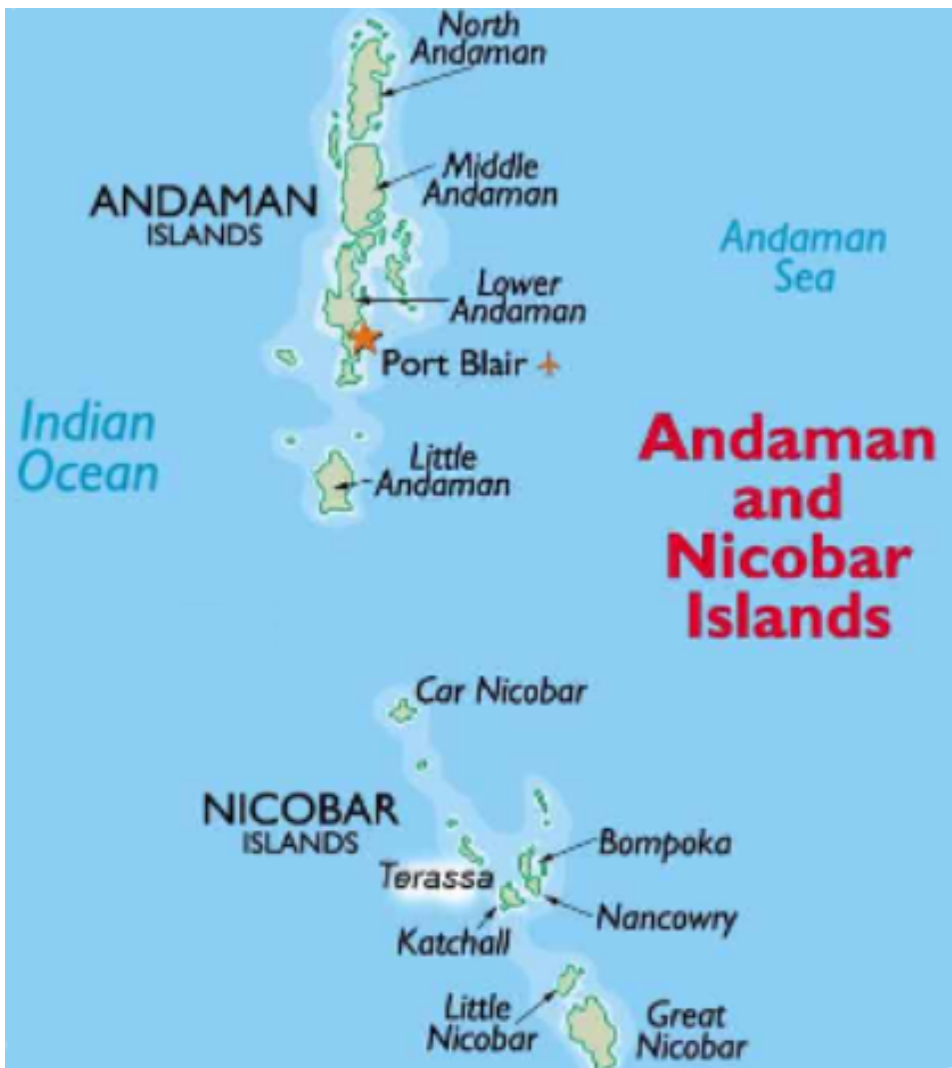
### What is Coastal Regulation Zone?

- The coastal areas of seas, bays, creeks, rivers, and backwaters which get influenced by tides up to 500 m from the high tide line (HTL) and the land between the low tide line (LTL) and the high tide line **have been declared as coastal regulation zone (CRZ) in 1991.**
  - HTL means the **line on the land up to which the highest water line reaches** during the spring tide.
  - Low Tide Line means the **line on the land up to which the lowest water line reaches** during the spring tide.
- The coastal regulation zones have been declared by the Ministry of Environment, Forest and Climate change under the Environment Protection Act 1986.
- While the CRZ Rules are made by the Union environment ministry, implementation is to be ensured by state governments through their Coastal Zone Management Authorities.

## Andaman & Nicobar Islands

- The Andaman & Nicobar Islands is a union territory of India. This territory is known as A & N Islands, or ANI.
- It is located in the Indian Ocean, in the southern reaches of the Bay of Bengal, nearer to Indonesia and Thailand. This comprises of two island groups - the Andaman Islands and the Nicobar Islands - which separates the Andaman Sea to the east from the Indian Ocean.
- These two groups are separated by the 10° N parallel, the Andamans lying to the north of this latitude, and the Nicobars to the south. The capital of this territory is the Andamanese town of Port Blair.
- Hindi and English are the official languages of the islands. Bengali is the dominant and most spoken language, with 26% of the population speaking Bengali.
- [Particularly vulnerable Tribal Groups \(PTGs\)](#) who have been identified in the Andaman & Nicobar Islands. They are:-
  - Great Andamanese of Strait Island
  - Onges of Little Andaman
  - Jarawas of South and Middle Andaman
  - Sentinelese of Sentinel Islands
  - Shompens of Great Nicobar





### UPSC Civil Services Examination, Previous Year Questions (PYQs)

**Q. Which one of the following regions of India has a combination of mangrove forest, evergreen forest and deciduous forest? (2015)**

- (a) North Coastal Andhra Pradesh
- (b) South-West Bengal
- (c) Southern Saurashtra
- (d) Andaman and Nicobar Islands

**Ans: (d)**

**Q. Which one of the following pairs of islands is separated from each other by the 'Ten Degree Channel'? (2014)**

- (a) Andaman and Nicobar
- (b) Nicobar and Sumatra
- (c) Maldives and Lakshadweep
- (d) Sumatra and Java

**Ans: (a)**

**Q. Which of the following have coral reefs? (2014)**

1. Andaman and Nicobar Islands
2. Gulf of Kachchh
3. Gulf of Mannar
4. Sunderbans

**Select the correct answer using the code given below:**

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

**Ans: (a)**

**Q. In which one of the following places is the Shompen tribe found? (2009)**

- (a) Nilgiri Hills
- (b) Nicobar Islands
- (c) Spiti Valley
- (d) Lakshadweep Islands

**Ans: (b)**

**Source: TH**

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## **National Mission for Clean Ganga**

**For Prelims:** Namami Gange Programme, District Ganga Committees, National Mission for Clean Ganga.

**For Mains:** Significance of Namami Gange Programme in the Rejuvenation of River Ganga, Conservation.

### **Why in News?**

The [National Mission for Clean Ganga \(NMCG\)](#) has organised the 6<sup>th</sup> Edition of the monthly 'Webinar with Universities' series on 'Igniting Young Minds, Rejuvenating Rivers'.

- The theme for the webinar was **'Waste Water Management.'**

### **What is NMCG?**

- **About:**
  - The National Mission for Clean Ganga (NMCG) is implemented by the **National Council for Rejuvenation, Protection and Management of River Ganga** also known as the **National Ganga Council**.
  - This mission was established on 12<sup>th</sup> August 2011 under the **Societies Registration Act, 1860** as a registered society.

### ▪ Objectives:

- The mission incorporates **rehabilitating and boosting the existing STPs (Sewage Treatment Plants) and instant short-term steps** to curb pollution at exit points on the riverfront in order to check the inflow of sewage.
- To maintain the continuity of the water flow without changing the natural season variations.
- To restore and maintain the surface flow and groundwater.
- To regenerate and maintain the natural vegetation of the area.
- To conserve and regenerate the aquatic biodiversity as well as the riparian biodiversity of the river Ganga basin.
- To allow participation of the public in the process of protection, rejuvenation and management of the river.

## What are the Initiatives Related to Ganga?

- **Namami Gange Programme:** It is an Integrated Conservation Mission, approved as a 'Flagship Programme' by the Union Government in June 2014 to accomplish the twin objectives of effective abatement of pollution and conservation and rejuvenation of National River Ganga.
- **Ganga Action Plan:** It was the first River Action Plan that was taken up by the Ministry of Environment, Forest and Climate Change in 1985, to improve the water quality by the interception, diversion, and treatment of domestic sewage.
  - The National River Conservation Plan is an extension to the Ganga Action Plan. It aims at cleaning the Ganga river under Ganga Action Plan phase-2.
- **National River Ganga Basin Authority (NRGBA):** It was formed by the Government of India in the year 2009 under Section-3 of the Environment Protection Act, 1986.
  - Ganga was declared as the 'National River' of India in 2008.
- **Clean Ganga Fund:** In 2014, it was formed for cleaning up of the Ganga, setting up of waste treatment plants, and conservation of biotic diversity of the river.
- **Bhuvan-Ganga Web App:** It ensures involvement of the public in monitoring of pollution entering into the river Ganga.
- **Ban on Waste Disposal:** In 2017, the [National Green Tribunal](#) banned the disposal of any waste in the Ganga.

## What is the Ganga River System?

- The headwaters of the Ganga called the 'Bhagirathi' are fed by the Gangotri Glacier and joined by the Alaknanda at Devprayag in Uttarakhand.
- At Haridwar, Ganga emerges from the mountains to the plains.
- The Ganga is joined by many tributaries from the Himalayas, a few of them being major rivers such as the Yamuna, the Ghaghara, the Gandak and the Kosi.

# THE GANGA RIVER MAP



## Way Forward

- Monetization of sludge and treated water is **one of the focus areas of Namami Gange Programme under the banner of 'Arth Ganga'**, which means linking people with Ganga through a 'Bridge of Economics'.
- Awareness generation and community-led efforts are the key in Ganga Clean. In addition to the cultural and spiritual significance of River Ganga, the focus should be on the economic benefits of the river as well.
- The **social and behavioral change in the young generation that is a requisite for a programme** like Namami Gange and that could be brought about by proper communication.
- A targeted **dissemination of information must be done** to bring about the desired change. There is a need **to create a "generation with cleanliness conscious"** and everything else will automatically fall into place.

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. Consider the following pairs: (2013)

National Park	River flowing through the Park
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1. Corbett National Park : Ganga
2. Kaziranga National Park : Manas
3. Silent Valley National Park : Kaveri

Which of the above pairs is/are correctly matched?

(a) 1 and 2



- (b) 3 only
- (c) 1 and 3
- (d) None

**Ans: (d)**

- Jim Corbett National Park: River Ramganga, a tributary of river Ganga is the primary source of water for the park. Tributaries of Ramganga are Khoh, Kolhu and Mandal rivers. **Hence, pair 1 is not correctly matched.**
- Kaziranga National Park: It is a park hosting around two-third of total world's one-horned rhinoceros and is circumscribed by the Brahmaputra River. The Brahmaputra forms the northern and eastern boundaries of it, whereas the Mora Diphlu forms the southern boundary. Other notable rivers within the park are the Diphlu and Mora Dhansiri. **Hence, pair 2 is not correctly matched.**
- Silent Valley National Park: Located in Kerala, the park's entire stretch drains from north to south by River Kuntipuzha. It is part of the Nilgiri Biosphere Reserve. **Hence, pair 3 is not correctly matched.**
- **Therefore, option (d) is the correct answer.**

[Source: PIB](#)

## AIM-PRIME Playbook

### Why in News?

Recently, the **AIM-PRIME** (Program for Researchers in Innovation, Market Readiness, and Entrepreneurship) **Playbook** was launched by [NITI Aayog](#).

- The playbook was aimed at promoting early-stage science-based, deep technology ideas to market through **training and guidance over a period of 12 months** using a blended learning curriculum.

### What is Atal Innovation Mission (AIM)?

- **About:**
  - AIM is the Government of India's flagship initiative **to promote a culture of innovation and entrepreneurship** in the country.
- **Objective:**
  - To develop **new programmes and policies** for fostering innovation in different sectors of the economy, provide platform and collaboration opportunities for different stakeholders, create awareness and create an umbrella structure to oversee the innovation ecosystem of the country.
- **Major Initiatives:**
  - **Atal Tinkering Labs:** These are creating problem-solving mindsets across schools in India.
  - **Atal Incubation Centers:** Fostering world class startups and adding a new dimension to the incubator model.
  - **Atal New India Challenges:** Fostering product innovations and aligning them to the needs of various sectors/ministries.
  - **Mentor India Campaign:** A national mentor network in collaboration with the public

sector, corporates, and institutions, to support all the initiatives of the mission.

- **Atal Community Innovation Center:** To stimulate community-centric innovation and ideas in the unserved/underserved regions of the country including Tier 2 and Tier 3 cities.
- **Atal Research and Innovation for Small Enterprises (ARISE):** To stimulate innovation and research in the MSME industry.



## What is AIM-PRIME?

- **Objective:**
  - Promoting science-based, **deep technology ideas** to market through training and guidance over a period of 12 months.
    - Deep technology is based on tangible engineering innovation or scientific advances and discoveries. Deep Tech is often set apart by its profound enabling power, the differentiation it can create, and its potential to catalyse change.
- **Focus Area:**
  - Science-based, knowledge-intensive, deep technology entrepreneurship.
- **Launching & Implementing Agency:**
  - AIM has collaborated with [Bill & Melinda Gates Foundation \(BMGF\)](#) to launch this nationwide programme which will be implemented by Venture Centre - a non-profit technology business incubator hosted by [Council Of Scientific And Industrial Research](#)-National Chemical Laboratory (CSIR-NCL).
- **Beneficiaries:**
  - Technology developers (early-stage deep tech start-ups, and scientists/engineers/clinicians) with **strong science-based deep tech business ideas.**
  - Chief Executive Officers and Senior incubation managers of [AIM Funded Atal Incubation](#)

[Centers](#) that are supporting deep tech entrepreneurs.

▪ **Significance:**

- Candidates selected for the programme will get access to **in-depth learning** via a comprehensive lecture series, live team projects, exercises, and project-specific mentoring.
- They will also have **access to a deep tech start-up playbook**, curated video library, and plenty of peer-to-peer learning opportunities.

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

### Q. Atal Innovation Mission is set up under the (2019)

- (a) Department of Science and Technology
- (b) Ministry of Labour and Employment
- (c) NITI Aayog
- (d) Ministry of Skill Development and Entrepreneurship

**Ans: C**

**Source: PIB**

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