



## Artificial Intelligence Mission

**For Prelims:** [Artificial Intelligence](#), [Global Partnership for AI Summit](#), [AI Mission](#), [Machine Learning \(ML\)](#), [INDIAai](#).

**For Mains:** Boosting AI innovation and startups, Artificial Intelligence Technology.

**Source:** [IE](#)

### Why in News?

India is gearing up for a significant [Artificial Intelligence \(AI\)](#) push with the recent announcement of the AI Mission by the Prime Minister at the [Global Partnership for AI Summit](#).

- The AI Mission is expected to boost India's innovation ecosystem and position it as a global leader in artificial intelligence by building computational capacity and providing compute-as-a-service to startups.

### Note:

- Computing capacity, or compute, is a general term that refers to the resources required for a program to be successful. This includes **processing power, memory, networking, and storage**.

### What are the Key Highlights of the AI Mission?

- **Mission Objectives:**
  - The primary objectives of the AI Mission include establishing robust **computing powers for AI within India**.
  - The mission seeks to **enhance services for startups and entrepreneurs** while fostering AI applications in critical sectors such as **agriculture, healthcare, and education**.
- **Compute Capacity Goals:**
  - The ambitious plan involves building a substantial compute capacity, ranging between **10,000 to 30,000 Graphic Processing Units (GPUs)**.
    - A GPU is a chip or electronic circuit that can **render graphics** for display on an electronic device. GPUs are designed to accelerate **computer graphics and image processing**.
  - Additionally, an extra 1,000-2,000 GPUs are slated through the PSU [Centre for Development of Advanced Computing \(C-DAC\)](#).
  - The government emphasizes a collaborative approach with the **private sector for capacity building** within the **National Supercomputing Mission**.

### Note:

- **C-DAC's Rudra and [Param systems](#)** are slated for expansion with the addition of 1,000-2,000 GPUs.
  - Rudra is an **indigenous server platform** built by the C-DAC which has two expansion slots for graphic cards.
  - Param Utkarsh is a high-performance computing system setup at C-DAC that offers **AI over [machine learning](#) and [deep learning](#)** frameworks, computing and storage as a cloud service.
- **Incentive Structures:**
  - The government is exploring varied incentive models, including capital expenditure subsidies, operational expense-based incentives, and a "usage" fee.
- **Digital Public Infrastructure (DPI) for Startups:**
  - The government plans to create a **[Digital Public Infrastructure \(DPI\)](#)** using the GPU assembly, allowing startups to access computational capacity at a reduced cost.
- **Focus on Datasets:**
  - The introduction of the **[India Datasets platform](#)** is highlighted, offering non-personal and **anonymized datasets** to startups and researchers.
  - The government contemplates issuing a directive to major tech companies, including Facebook, Google, and Amazon, to share anonymized personal data with the India Datasets platform.

## What is Artificial Intelligence (AI)?

- AI is the ability of a computer, or a robot controlled by a computer to do tasks that are usually done by humans because they require **human intelligence and judgement**.
  - Although no AI can perform the wide variety of tasks an ordinary human can do, **some AI can match humans in specific tasks**.
- The ideal characteristic of AI is its ability to rationalize and take actions that have the best chance of achieving a specific goal. A subset of AI is **Machine Learning (ML)**.
  - **Deep Learning (DL)** techniques enable this automatic learning through the absorption of huge amounts of unstructured data such as text, images, or video.

## What are India's Other Initiatives Related to Artificial Intelligence?

- [INDIAai.](#)
- [Global Partnership on Artificial Intelligence \(GPAI\).](#)
- [US India Artificial Intelligence Initiative.](#)
- [Responsible Artificial Intelligence \(AI\) for Youth.](#)
- [Artificial Intelligence Research, Analytics and Knowledge Assimilation Platform.](#)

## UPSC Civil Services Examination Previous Year Question (PYQ)

### Prelims

Q. With the present state of development, Artificial Intelligence can effectively do which of the following? (2020)

1. Bring down electricity consumption in industrial units
2. Create meaningful short stories and songs
3. Disease diagnosis
4. Text-to-Speech Conversion
5. Wireless transmission of electrical energy

Select the correct answer using the code given below:

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

**Ans: (b)**

### **Mains**

**Q.** What are the main socio-economic implications arising out of the development of IT industries in major cities of India? **(2022)**

**Q.** “The emergence of the Fourth Industrial Revolution (Digital Revolution) has initiated e-Governance as an integral part of government”. Discuss. **(2020)**

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## **Kakrapar Atomic Power Project**

**For Prelims:** [Kakrapar Atomic Power Project](#), Regulated Fission Reaction, Atomic Energy Regulatory Board (AERB).

**For Mains:** Kakrapar Atomic Power Project, Ways to Enhance India’s Nuclear Power Capacity.

**Source:** [TH](#)

### **Why in News?**

Recently, the fourth unit of [Kakrapar Atomic Power Station \(KAPS\)](#), Gujarat has achieved its **first Criticality** — the beginning of the regulated fission reaction — paving the way for its eventual transition to generating power for commercial use.

### **What is Criticality?**

- Criticality is the **first step towards power production**. A nuclear reactor is said to be critical when the nuclear fuel inside a reactor sustains a fission chain reaction.
- Each fission reaction releases a sufficient number of neutrons **to sustain a series of reactions**. Heat is produced in the event, which is used to generate steam that spins a turbine to create electricity.
  - **Fission is a process** in which the nucleus of an atom splits into two or more smaller nuclei, and some byproducts.
  - When the nucleus splits, the **kinetic energy of the fission fragments (primary nuclei) is transferred** to other atoms in the fuel as heat energy, which is eventually used to produce steam to drive the turbines.

### **What is the Significance of Achieving First Criticality?**

- **Milestone for Power Generation:**
  - This stage demonstrates that the **reactor can produce a controlled and continuous chain reaction**, essential for sustained power generation. It's a precursor to full operation and power generation for commercial use.

- **Technology Advancements:**
  - The Kakrapar reactors, particularly Units 3 and 4, boast advanced safety features inspired by lessons from past nuclear incidents like the [Fukushima Daiichi disaster](#).
  - These include steel-lined containment systems and passive decay heat removal systems, enhancing safety and reliability.
- **Energy Sustainability and Climate Goals:**
  - Nuclear energy, as a **low-carbon source**, aligns with India's climate goals to increase its renewable energy share.
  - India aims to generate 50% of its electricity from non-fossil fuel sources by 2030, as pledged at international forums like the [United Nations Convention of Parties \(COP26\)](#).

## What are the Key Points about the Kakrapar Reactor?

- Existing KAPS reactors Unit-1 and Unit-2 have a capacity of 220 MW each. But the new 700MW projects, Unit-3 and Unit-4, are **among the safest reactors** in the world.
- The **Unit-3 and 4 reactors have steel-lined inner containment systems** that prevent any radioactive material from escaping in case of an accident.
- They also have passive decay heat removal systems, which **safely cool down the reactor even when it is shut down**.

## How has India's Nuclear Journey Been?

- **Early Development:**
  - India's nuclear program started in the 1940s and gained momentum with the establishment of the **Atomic Energy Commission (AEC) in 1948**.
  - Homi Bhabha, known as the **father of India's nuclear program**, played a pivotal role in its early stages.
- **Peaceful Nuclear Explosions:**
  - India conducted its **first peaceful nuclear explosion as operation Smiling Buddha** 1974, in Pokhran, marking its entry into nuclear technology.
  - In May 1998 Pokhran-II was conducted as a series of five nuclear tests including one thermonuclear test aimed **at demonstrating nuclear weapon capability**
- **Civil Nuclear Cooperation:**
  - Despite being outside the [Nuclear Non-Proliferation Treaty \(NPT\)](#), India negotiated civil nuclear agreements with various countries, including the [Indo-US Civil Nuclear Agreement in 2008](#), allowing for technology cooperation and nuclear fuel supply.
- **Indigenous Nuclear Capabilities:**
  - India developed indigenous nuclear technology, including [Pressurised Heavy Water Reactors \(PHWRs\)](#) and [Fast Breeder Reactors \(FBRs\)](#), showcasing self-reliance and scientific prowess.
    - India's nuclear power generation capacity grew steadily, with the Nuclear Power Corporation of India Limited (NPCIL) leading the construction and operation of nuclear reactors across the country.
- **Safety and Regulations:**
  - India focused on stringent safety standards and regulatory measures overseen **by the Atomic Energy Regulatory Board (AERB)** to ensure the safe operation of nuclear facilities.
    - Nuclear energy played a role in diversifying India's energy mix, contributing to energy security and reducing dependence on fossil fuels.
- **Current Status and Future Plans:**
  - Currently, India has **23 nuclear power reactors** in operation under NPCIL (Nuclear Power Corporation of India), with a total capacity of **7,480 MW**.
  - NPCIL is constructing nine more reactors, including KAPS Unit-4, with a total capacity of 7,500 MW.
  - As of 2023, India has a **total generation capacity of 417 GW**, out of which **43 percent is from renewable sources**. However, nuclear energy still has a small role in India's total energy generation, despite its rapid growth.
    - In 2022-23, nuclear energy formed around 2.8 percent of India's total energy

- production, according to government data.
- India has set ambitious targets to significantly increase its nuclear energy production, **aiming to triple its capacity by 2031.**
  - However, challenges such as **public concerns over safety, land acquisition, and regulatory hurdles remain.**

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

### Prelims

**Q. The function of heavy water in a nuclear reactor is to (2011)**

- (a) Slow down the speed of neutrons
- (b) Increase the speed of neutrons
- (c) Cool down the reactor
- b Stop the nuclear reaction

**Ans: (a)**

### Mains

**Q. With growing energy needs should India keep on expanding its nuclear energy programme? Discuss the facts and fears associated with nuclear energy. (2018)**

## Outcome of SHG Bank Linkage Project

**For Prelims:** [RBI](#), [NABARD](#), [Self-Help Group \(SHG\)](#), [Bank Sakhis](#), [Core Banking Solution \(CBS\) database](#), [DAY-NRLM](#), [Revolving Fund and Community Investment Fund](#), [Start-up Village Entrepreneurship Programme \(SVEP\)](#)

**For Mains:** Significance of SHG Bank Linkage Project, Deendayal Antyodaya Yojana-National Rural Livelihood Mission (DAY-NRLM), Government Policies & Interventions .

**Source:** [PIB](#)

### Why in News?

Recently, the Union Minister of State for Rural Development, in a written reply in Rajya Sabha has given information about **Self Help Group (SHG) Bank linkage (BL)**.

- In **2019**, the **International Initiative for Impact Evaluation** assessed **DAY-NRLM**, finding a **19% income boost** and a **28% increase in household savings** compared to the baseline.
  - The study spanned nine states: **Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Uttar Pradesh, and West Bengal.**

### What is Self Help Group (SHG) Bank linkage (BL) Project?

- **About:**

- The **SHG BL Project** was launched by **NABARD** in **1992** and has blossomed into the **world's largest microfinance project**.
- Under this **programme**, banks were allowed to open **savings accounts** for **SHGs**.
- **Components:**
  - Training and sensitization of **Bank Branch Managers**
  - Training and positioning of **Bank Sakhis** at **Rural Bank Branches**
  - Initiate **Community Based Repayment Mechanism (CBRM)** at **Rural Bank Branches**
  - **Credit Linkage of SHGs**
- **Key Factors for SHG-BL's Success:**
  - Annual issuance of a Master Circular by **RBI** and **NABARD**.
    - Specification of minimum loan amounts for each **Self-Help Group (SHG)** with provisions being modified as needed to meet the scheme's requirements.
  - Regular training of staff and community cadres under **State Rural Livelihoods Missions (SRLMs)** to enhance their capacity.
  - Financial education for **Self Help Group (SHG) members** through trained **Financial Literacy Community Resource Persons (FLCRPs)** at the village level.
  - **Bank Sakhis**, trained members from **SHGs** who act as intermediaries, aiding SHG members in transactions and application processes.
  - A web portal was created to overcome **information asymmetry** in **SHG-Bank Linkage**, incorporating data directly from Banks' **Core Banking Solution (CBS) database**.
- **Status of Bank Loans:**
  - The Bank loans to the tune of Rs. 7.68 lakh Crore have been accessed by SHGs since FY 2013-14.

## What is Deendayal Antyodaya Yojana-National Rural Livelihood Mission (DAY-NRLM)?

- **About:**
  - It is a **Centrally Sponsored Programme**, launched by the **Ministry of Rural Development** in **2011**.
  - It aims to **eliminate rural poverty** through the promotion of multiple livelihoods and improved access to financial services for the **rural poor households** across the country.
- **Functioning:**
  - It involves working with community institutions through community professionals in the spirit of **self-help which is a unique proposition of DAY-NRLM**.
  - It impacts livelihoods by
    - Mobilizing rural households into SHGs.
    - Organizing one-woman member from each **rural poor household** into SHGs
    - Providing training and **capacity building to SHG members**
    - Providing access to financial resources from their own institutions and banks.
- **Sub Programs:**
  - **Mahila Kisan Sashaktikaran Pariyojana (MKSP):** It aims to promote agro-ecological practices that increase women farmers' income and reduce their input costs and risks.
  - **Start-Up Village Entrepreneurship Programme (SVEP):** It aims to support entrepreneurs in rural areas to set up local enterprises.
  - **Aajeevika Grameen Express Yojana (AGEY):** It was launched in August 2017, to provide safe, affordable and community monitored rural transport services to connect remote rural villages.
  - **Deendayal Upadhyaya Grameen Kaushalya Yojana (DDUGKY):** It aims at building placement-linked skills of the rural youth and placing them in relatively higher wage employment sectors of the economy.
  - **Rural Self Employment Institutes (RSETIs):** DAY-NRLM, in partnership with 31 Banks and State Governments, is supporting Rural Self Employment Institutes (RSETIs) for skilling rural youth to take up gainful self-employment.

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

### Prelims

**Q.** How does the National Rural Livelihood Mission seek to improve livelihood options of rural poor? **(2012)**

1. By setting up a large number of new manufacturing industries and agribusiness centres in rural areas
2. By strengthening 'self-help groups' and providing skill development
3. By supplying seeds, fertilizers, diesel pump-sets and micro-irrigation equipment free of cost to farmers

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

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

**Ans: (b)**

### Mains

**Q.** "The emergence of Self-Help Groups (SHGs) in contemporary times points to the slow but steady withdrawal of the State from developmental activities". Examine the role of the SHGs in developmental activities and the measures taken by the Government of India to promote the SHGs. **(2017)**

**Q.** The Self-Help Group (SHG) Bank Linkage Programme (SBLP), which is India's own innovation, has proved to be one of the most effective poverty alleviation and women empowerment programmes. Elucidate. **(2015)**

## Bihar's Punaura Dham project

**Source: IE**

### Why in News?

The Bihar state government recently approved a project to develop **Punaura Dham, a temple complex in Sitamarhi district**, as a major tourist attraction.

- Punaura Dham is believed to be the birthplace of Goddess **Sita**, wife of Lord Rama and a revered figure in **Hinduism**.
- The initiative aims to promote the culture and heritage of **Mithila**, the region where Sita was born and raised.

### Note:

- According to the **Valmiki Ramayana**, Sita emerged from a furrow when King Janaka, the ruler of Mithila, was ploughing the land.

- He adopted her as his daughter and named her Sita, which means “furrow” in Sanskrit. He also gave her the name Janaki, meaning “daughter of Janaka”.

## What are the Key Cultural Aspects of Mithila?

### ▪ Historical Significance:

- Mithila has a rich and ancient history, dating back to the **Vedic period (1500-500 BCE)** when it was one of the **16 Mahajanapadas of India**.
- Mithila, also known as **Tirhut or Tirabhukti**, is a historically and culturally significant region encompassing Darbhanga, Madhubani, Sitamarhi, Supaul, Saharsa, Madhepura, and adjacent areas of Bihar and Nepal.
  - It is bounded by the **Himalayas in the north**, the **Ganges in the south**, the **Gandaki River in the west**, and the **Mahananda River in the east**.
  - It is also known as Mahla and mentioned in revenue records of the United Provinces of Bihar, Bengal, and Orissa.
- It was ruled by the **Videha Janak dynasty**.

### ▪ Language and Literature:

- The main language of **Mithila is Maithili** which belongs to the Indo-Aryan family.
  - Maithili has a rich literary tradition, the **poet Vidyapati(1352-1448 AD)**, wrote famous songs of love and devotion in this language.
  - Maithili literature also includes epics, dramas, folktales, and biographies of saints and heroes.

### ▪ Cultural Heritage:

- Mithila is famous for its unique style of painting, known as **Madhubani or Mithila painting**, which is done using bright earthy natural colours and geometric patterns.
  - The paintings depict scenes from Hindu mythology, especially the Ramayana, as well as flora, fauna, and social events.

### ▪ GI Tag:

- **Mithila Makhana or Makhana (botanical name: Euryale ferox Salisb.)** is a special variety of aquatic fox nut cultivated in Mithila region of Bihar and Nepal. It is also recognised with the **GI (geographical indication) tag**.