

**The Hindu Important News Articles & Editorial For UPSC CSE**

**Saturday, 01 March, 2025**

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—It's about quality—

- ➔ The country's real Gross Domestic Product (GDP) grew by 6.2% in the third quarter (October-December) of the 2024-25 Fiscal year.

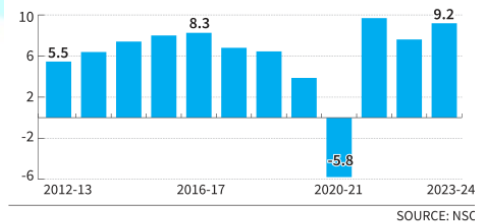
### Analysis of the news:

- ➔ **Comparison with Previous Periods:** This marks an increase from 5.6% in the previous quarter but is lower than the 9.5%.
- ➔ **Growth Target for Full Year:** To achieve the annual GDP target of 6.5%, the economy needs to grow by 7.6% in the fourth quarter.
- ➔ **Key Growth Drivers:** The economic rebound was driven by improved GST collections, higher public spending, increased electricity generation, and recovering exports.
- ➔ **Government and Private Consumption:** Government spending surged by 8.3%, while private consumption grew by 6.9%, contributing significantly to overall growth.
- ➔ **Export Growth:** Exports rose by 10.4%, a sharp improvement from the 3% growth in the same period last year.
- ➔ **Imports Decline:** Imports fell by 1.1%, partly due to the depreciation of the rupee.
- ➔ **Investment Slowdown:** The Gross Fixed Capital Formation (investment rate) grew by 5.7%, down from 9.3% in the previous year's third quarter.

## GDP grows 6.2% on rising government, consumer spending

### Slow rebound

The chart shows the annual growth rate of GDP at constant market prices (in %). Real GDP has grown by 9.2% in 2023-24, highest in the previous 12 years, except for 2021-22



**Ashokamithran T.**  
MUMBAI

India's real Gross Domestic Product (GDP) grew 6.2% in the October to December 2024 period, the third quarter of the fiscal year, picking up pace from the 5.6% growth recorded in the previous quarter, according to data released by the National Statistics Office (NSO) on Friday.

However, this was considerably slower than the 9.5% growth over the same period in 2023. Third quarter growth trailed the Reserve Bank of India's estimates by 0.2 percentage points.

"Rebound in growth momentum in Q3 was largely anticipated, as indicated by several high-frequency macroeconomic indicators, including improved GST collections, public spending, electricity generation, and a recovery in export performance," said Rajani Sinha, Chief Economist at Care Edge ratings. "On demand side, recovery in consumption growth, government expenditure and export growth look encouraging."

The growth was mostly led by a significant uptick of 8.3% in government spending and 6.9% growth in private final consump-

tion expenditure in the third quarter, compared to just 2.3% and 5.7%, respectively, in the same period last year. Exports too rose 10.4% in the the third quarter of 2024-25, significantly higher than 3% growth the previous year.

Imports slid 1.1%, entering negative territory. Experts say this can partly be attributed to the depreciation of the rupee.

The increase in government and private consumption offset the slowdown in investment rate, measured by the growth of Gross Fixed Capital Formation, which fell to 5.7% in Q3, from 9.3% in the year ago period.

### Ambitious projection

The economy grew at 6.5% and 5.6% in the first two quarters of the current fiscal. Achieving a GDP estimate of 6.5% for the full year would require a 7.6% growth rate in the fourth quarter, said Chief Economic Adviser V. Anantha Nageswaran in a media briefing. Although this looks ambitious, he said it could be doable if three factors fall in place: a spike in exports, higher capex pickup, and huge private consumption spending prompted by the Maha Kumbh.

- ➔ A glacier avalanche struck a BRO project site in Uttarakhand's Chamoli district, trapping 22 workers under ice.
- ➔ Indian Army and ITBP, are conducting rescue operations despite adverse weather conditions.

# 22 missing after avalanche hits BRO project site

Of 55 civilians at the site in Uttarakhand, 10 have been rescued, says Army; 23 believed to be safe

Continuous snowfall hinders efforts to rescue workers trapped under a 'mountain of ice'

IMD has issued an advisory on possibility of further avalanches in mountainous districts

Ishita Mishra  
NEW DELHI

In a life-or-death race against time, teams from the Indian Army and the Indo-Tibetan Border Police are working to save 22 workers who are feared to be trapped beneath the ice after a devastating glacier avalanche hit a Border Roads Organisation (BRO) project site at Mana village in Uttarakhand's Chamoli district at around 5 a.m. on Friday.

According to the Uttarakhand government, there were 57 civilian workers present at the affected site where BRO construction work has been ongoing for the past two years.

Chamoli district's Disaster Response Officer Nandkishore Joshi said that the

workers had been sleeping inside a couple of containers when the avalanche hit their sheds. The victims include the construction workers as well as earth mover drivers and other machine operators.

"There has been continuous snowfall in the area for the past 48 hours," he said, adding that while many of the workers managed to run out of the sheds, many others are trapped under the mountain of ice that has covered the site.

Army Brigade Commander Mandeep Dhillon said that a dedicated rescue team – comprising seven officers, 17 Junior Commissioned Officers (JCO), and 150 other personnel of the IBEX Brigade, which is trained for rescue operations in the Himalayas – has been deployed in Mana village since 8 a.m. They



**Heroic task:** Army personnel engaged in rescue work following an avalanche that struck a camp near Mana village in Chamoli district of Uttarakhand, on Friday. PTI

are equipped with a specialised medical team and engineering equipment.

"Ten people have been rescued so far, who are under treatment by Army doctors. The operation re-

mains ongoing, with all resources focused on saving lives," Brigadier Dhillon said. He added that 22 other workers were reported to be safe. Later, the State government said that they

had managed to trace the whereabouts of one more worker and clarified that two other workers had been on leave.

Injured workers have been admitted to the army

hospital in Mana, according to a statement from the State Disaster Response Force. The doctors have stitched up a couple of the rescued workers who suffered grievous injuries on their heads and other parts of the body.

### Adverse weather

The rescue operations were forced to stop multiple times during the day due to the extreme weather conditions, with continuous snow and rainfall in the upper reaches of the Himalayas, including at Mana. The India Meteorological Department has issued an advisory on the snowfall and the possibility of further avalanches in mountainous districts, along with the precautionary measures to be taken.

The State government

also issued two helpline numbers that can be contacted by the kin of the trapped workers seeking information about the rescue, as the communication channels at the site remained non-functional due to the bad weather.

"Sad news was received about many workers being buried under an avalanche during the construction work being carried out by the BRO near Mana village in Chamoli district. Relief and rescue operations are being carried out by ITBP, BRO and other rescue teams," Uttarakhand Chief Minister Pushkar Singh Dhami said.

Describing it as a tragic incident, Defence Minister Rajnath Singh said that he has spoken to the Chief Minister and taken stock of the situation.

## Causes of Glacier Avalanches:

- ➔ **Glacier avalanches occur due to a combination of natural and environmental factors. These include:**
  - **Heavy Snowfall and Ice Accumulation:** Excessive snowfall increases the weight of glaciers, making them unstable.
  - **Temperature Fluctuations:** Rapid warming weakens ice structures, leading to cracks and eventual collapse.
  - **Seismic Activity:** Earthquakes and tremors can trigger ice breakages, causing large avalanches.
  - **Glacial Meltwater:** Water from melting glaciers reduces friction, making ice more prone to sliding.
  - **Climate Change:** Rising global temperatures accelerate glacial melting and increase avalanche risks.

- **Steep Slopes and Gravity:** Glaciers on steep terrains are naturally prone to collapse under their weight.





Aditya-L1, India's first space-based solar mission, has achieved a breakthrough as its Solar Ultraviolet Imaging Telescope (SUIT) captured the first-ever image of a solar flare 'kernel' in the lower solar atmosphere, specifically in the photosphere and chromosphere.

- ➔ The photosphere is the visible surface of the sun, while the chromosphere is a layer above the photosphere.

### Solar Corona: The Sun's Outermost Layer

- ➔ The solar corona is the Sun's outermost layer of atmosphere, made of ionized gas. It's visible during a total solar eclipse or with a special telescope called a coronagraph.

### Characteristics of the Solar Corona

- ➔ **Extremely Hot:** Temperatures range from 1 to 10 million Kelvin, much hotter than the Sun's surface.
- ➔ **Plasma Composition:** Made of highly ionized gas.
- ➔ **Dynamic Structure:** Constantly changing due to the Sun's magnetic fields.
- ➔ **Emits High-Energy Radiation:** Produces significant ultraviolet and X-ray radiation.

### Importance of the Solar Corona

- ➔ Helps in understanding solar processes and predicting heliospheric events.
- ➔ Responsible for the solar wind, formed by the outward expansion of corona plasma.

### Solar Flare

- ➔ A solar flare is a sudden and intense burst of solar energy from the Solar atmosphere.

## ISRO's Aditya-L1 mission captures first-ever image of a solar flare 'kernel'

**The Hindu Bureau**  
BENGALURU

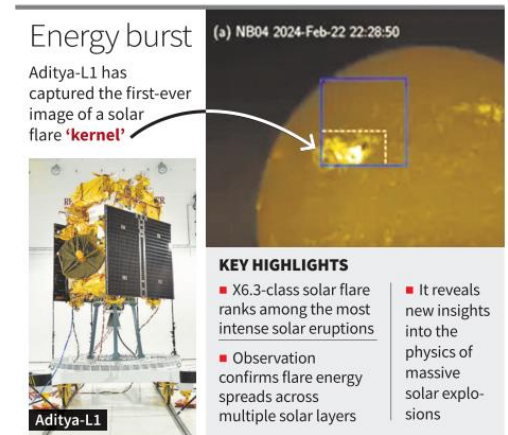
India's first dedicated space-based solar mission, Aditya-L1, has made a ground-breaking observation as one of its scientific payloads has captured the first-ever image of a solar flare 'kernel'.

The Solar Ultraviolet Imaging Telescope (SUIT) payload has captured the image in the lower solar atmosphere – the photosphere and chromosphere.

ISRO said that this observation and associated scientific results mark a major step towards understanding the Sun's explosive activity and its impact on Earth.

According to ISRO, "On February 22, the SUIT payload onboard Aditya-L1 observed an X6.3-class solar flare, which is one of the most intense categories of solar eruptions. The unique feature of this observation was that SUIT detected brightening in the Near Ultra Violet wavelength range (200-400 nm) – a range never observed before in such detail".

These observations confirm that the energy released from the flare spread through different layers of the Sun's at-



### Observations confirm that energy from the flare spread through different layers of Sun's atmosphere

mosphere. This provides new insights into the complex physics responsible for these massive solar eruptions, the space agency added.

One of the most exciting revelations in this observation is that the localised brightening captured in the lower solar atmosphere corresponds directly with an increase in the temperature of plasma in

the solar corona at the top of the solar atmosphere.

According to ISRO "This confirms the linkage between flare energy deposition and associated temperature evolution. This finding also validates long-standing theories while offering new data that will help to reshape our understanding of physics of solar flare".

The Aditya-L1 mission was launched on September 2, 2023. On January 6, 2024, the spacecraft was successfully placed in a large halo orbit around first Earth-Sun Lagrange Point, known as Lagrange Point L1.

- This phenomenon is caused by Sun's magnetic field.
- The magnetic field of the Sun is very dynamic in nature. Sometime they suddenly snap and release intense burst of energy – like a powerful, short flash.
- These flares emit radiation across the electromagnetic spectrum, including X-rays and ultraviolet light, and can impact space weather, disrupting satellite communications, GPS, and power grids on Earth.
- Solar flares often originate from sunspots and are classified into categories (A, B, C, M, and X) based on their intensity.

### **Solar Ultraviolet Imaging Telescope (SUIT)**

- SUIT is one of the seven payloads on Aditya-L1, designed to capture full-disk images of the Sun in the 2000–4000 Å wavelength range, which has never been obtained before.

### **Key Features & Importance**

- Records images in a wavelength crucial for maintaining Ozone and Oxygen in Earth's atmosphere.
- Measures UV radiation, which can be hazardous for skin cancer.
- Addresses fundamental questions about the higher-temperature solar atmosphere and the origin of near-ultraviolet radiation.
- Aids in studying high-energy solar flares and solar radiation from Hard X-ray to Infrared.
- Supports in-situ measurements of solar wind particles and the Sun's magnetic field at L1 point.

### **Study the Solar Flares by Aditya-L1**

- Recently, the SUIT (Solar Ultraviolet Imaging Telescope) payload on Aditya-L1 observed an X6.3-class solar flare, one of the most intense solar eruptions.

### **Unique NUV Brightening Observation**

- SUIT captured brightening in the near-ultraviolet (NUV) wavelength range (200-400 nm), a region never observed in such detail before.
- This confirms that the flare's energy spreads through different layers of the Sun's atmosphere.

### **Confirmation of Energy-Temperature Linkage**

- The localized brightening in the lower solar atmosphere was found to correspond with an increase in plasma temperature in the solar corona, validating long-standing theories.

- This observation provides new insights into the physics of solar flares, helping to refine our understanding of these massive solar explosions.

**UPSC Mains Practice Question**

**Ques :**How does the Aditya-L1 mission contribute to the understanding of solar activity and its impact on spaceweather? Explain its significance for India's space research. (250 Words /15 marks)





The Meghalaya High Court has recently initiated suo motu public interest litigation to monitor the conservation of wetlands in the state.

# The necessity of mainstreaming wetland conservation

**T**he suo motu public interest litigation by the Meghalaya High Court very recently, to monitor the conservation of wetlands in the State brings the focus back on this important ecosystem. Since 1971, February 2 is observed every year as 'World Wetland Day' to mark the adoption of the Ramsar Convention, an international treaty for the conservation of wetlands, which was signed in the Iranian city of Ramsar. The theme this year was 'Protecting Wetlands for Our Common Future'. It is a theme that has appropriately positioned wetlands in the sustainable development perspective, as espoused in the Brundtland report, 'Our Common Future', and published by the UN World Commission on Environment and Development in 1987.

### Many pressures

Wetlands, one of the most biologically productive ecosystems, provide multiple benefits. Globally, wetlands cover an area of 12.1 million km<sup>2</sup>, or around 6% of the earth surface, providing 40.6% of global ecosystem services. However, they are under severe stress, both qualitatively and quantitatively, due to various development activities including population growth, urbanisation, industrialisation, and increasing demand for land to cater to various human needs and climate change.

Since 1900, as much as 50% of the area under wetlands has been diverted to accommodate various other uses, as one of the studies indicated. Wetland surface area, both coastal and inland, declined by about 35% between 1970 and 2015. Globally, the rate of loss estimated with the Wetland Extend Trends (WET) index is (-)0.78% a year, which is more than three times higher than the loss rate of natural vegetation as estimated by the Food and Agriculture Organization of the United Nations. Around 81% of inland wetland species population and 36% of coastal and marine species have declined since 1970. The extinction risk of wetland species, both plants and animals, is increasing, globally.

The conservation and the management of wetlands have emerged as a major challenge as they are linked to other development issues and can serve in devising nature-based solutions for water management and the mitigation of climate change impacts, besides providing blue-green infrastructures in urban areas. Recognising the importance of wetlands in the larger development context, the Ramsar Convention COP14 that was held in Wuhuan, China and Geneva, Switzerland from November 5-13, 2022,



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The conservation and the management of wetlands have emerged as a challenge as these are linked to other development issues

laid stress on preparation of the fifth Ramsar Strategic Plan and recognised that the conservation and management of wetlands cannot be a stand-alone initiative. It needs to be contextualised and appropriately linked to other international environment development initiatives.

Accordingly, the COP14 argued that implementation of the Ramsar Strategic Plan would be an important contribution towards the achievement of the Sustainable Development Goals, meeting the Global Biodiversity targets, the United Nations Framework Convention of Climate Change. It would also align with the UN Decade on Ecosystem Restoration, and any relevant work of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the Intergovernmental Panel on Climate Change (IPCC) and other global programmes relating to wetlands. The global changes resulting from the COVID-19 pandemic and greater knowledge about the impacts of biodiversity loss and climate change since COP13, or the 13th Meeting of the Conference of the Parties to the Ramsar Convention on Wetlands (2018), reinforce the urgency to arrest the loss of wetlands.

### The situation in India

India is a signatory to the Ramsar Convention. As of 2023, the Ministry of Environment, Forest and Climate Change has designated 75 Ramsar sites (wetlands of international importance) in the country. These are distributed from the coasts to Himalayan territory, and are diverse in nature. Even some of the river stretches such as that of the Upper Ganga river are designated as Ramsar sites.

However, identification of Ramsar site does not necessarily contribute to its conservation. Moreover, the area under Ramsar sites together cover 1.33 million hectares or around 8% of 15.98 million ha wetlands, presently known and mapped as reported in the National Wetland Decadal Change Atlas, 2017-18 prepared by Space Applications Centre (SAC), Government of India. Based on the location, wetlands are classified as inland and man-made. By 2017-18, India had 66.6% of wetlands as natural wetland (43.9% as inland wetland and 22.7% as coastal wetland).

The area under wetlands is not a static figure. The general trends indicate a reduction in natural wetlands and an increase in man-made wetlands across the country. The SAC study showed that natural wetlands along the coast are declining even in a short span of 2006-07 to 2017-18.

According to an estimate by the Wetlands International South-Asia (WISA), nearly 30% of the natural wetlands in India have been lost in the last four decades due to urbanisation, infrastructure building, agricultural expansion and pollution. The loss is more in urban areas, especially around major urban centres. It is reported that from 1970 to 2014, Mumbai lost 71% of its wetlands.

Another study has shown that wetlands in east Kolkata have shrunk by 36% in 30 years from 1991 to 2021. A recent WWF study has indicated that Chennai has lost 85% of its wetlands. There have been several studies indicating the loss of ecosystem services due to the degradation of wetlands around the world. One such study, of Cali city in Colombia, has brought out that the estimated loss of total ecosystem services due to loss of urban wetlands is \$76,827 a hectare in a year. In the peri-urban area the loss is estimated at \$30,354 a ha a year.

### The bigger dimension

At present, most wetland management initiatives in India address the ecological and environmental aspects of the wetland ecosystem. The studies are also limited to some of the major wetlands. At the global level, apart from wetland biodiversity, there is stress on wetland distribution and a characterisation of wetland and human impacts to evaluate and prioritise wetlands for conservation.

Given the varied ecosystem services and values that they offer to society, wetlands form an integral part of ecological, economic and social security. It is important to recognise this larger dimension and investigate the physical, social and economic factors, including alterations, in land use within the catchment area, the drivers which have led to modifications in wetland surroundings, and the ex-situ pressure contributing to wetland degradation and the governance structure.

Wetlands act as a source as well as sink of carbon. Therefore, their role in climate change mitigation has to be carefully evaluated and monitored, something which is hardly attempted now. More effective and comprehensive management strategies are required in response to escalating stress from various climatic and anthropogenic factors. The present approach is insufficient to address all these issues. Wetland management warrants an innovative ecosystem-based approach and it should be mainstreamed within the development plan, as advocated during the Ramsar COP14.



- This brings focus to the growing importance of wetland ecosystems, especially on World Wetland Day (February 2), marking the Ramsar Convention's adoption.
- The theme for this year, "Protecting Wetlands for Our Common Future," highlights wetlands' crucial role in sustainable development as per the Brundtland report.

### Wetland Importance and Global Concerns

- **Wetlands as Key Ecosystems:** Wetlands cover 6% of Earth's surface and provide 40.6% of global ecosystem services. They are critical for biodiversity, water management, and carbon storage.
- **Global Wetland Decline:** Since 1900, 50% of wetland areas have been diverted, and between 1970 and 2015, wetland surface area shrank by 35%. The annual loss of wetlands is over three times higher than natural vegetation loss.
- **Increasing Threats to Wetland Species:** 81% of inland wetland species and 36% of coastal species have declined since 1970. The extinction risk for wetland species is rising globally, urging immediate action.

### Challenges and Strategic Approaches for Conservation

- **Need for Comprehensive Wetland Management:** Conservation requires more than isolated efforts. Wetlands' conservation needs integration with broader environmental and developmental strategies, as emphasized in Ramsar's COP14.
- **India's Wetland Crisis:** India, with 75 Ramsar sites, has lost around 30% of its natural wetlands over the last 40 years due to urbanization and pollution. Key cities like Mumbai, Kolkata, and Chennai have seen dramatic wetland losses, severely impacting ecosystem services.
- **Role of Wetlands in Climate Change:** Wetlands act as carbon sinks and play a vital role in mitigating climate change. Their degradation exacerbates climate impacts, necessitating effective management strategies to address climate and human-induced pressures.

### Conclusion and Governance for Wetland Conservation

- **Wetlands' Socio-Economic and Ecological Value:** Beyond ecological functions, wetlands are crucial for social and economic security, providing water, livelihood, and natural resources to local communities. Their preservation must align with broader national and international development goals.

## Daily News Analysis

- ➔ **Innovative Management for Wetland Sustainability:** Conservation requires ecosystem-based, innovative strategies to restore wetlands and balance ecological health with human needs, focusing on governance reforms and stronger implementation of the Ramsar Convention.
- ➔ **Need for Strategic Global Collaboration:** Addressing wetland loss is integral to achieving global environmental targets like SDGs and the Paris Agreement. Strengthening governance, stakeholder engagement, and resource allocation will be key for effective global wetland conservation.

### UPSC Mains Practice Question

**Ques :**What are the key challenges in the conservation of wetlands in India? Discuss the need for integrated management approaches in ensuring the sustainability of wetland ecosystems.



The World Bank has recently published a report titled "Becoming a High-Income Economy in a Generation".

# India must hasten reforms to speed up growth: World Bank

**The Hindu Bureau**

BENGALURU

India would need to grow by 7.8% on an average over the next 22 years to achieve the country's aspirations of reaching high-income status by 2047, said the World Bank in a report released on Friday.

Achieving this target is possible, however, getting there will require reforms and their implementation to be as ambitious as the target itself, the bank said in the report titled: *India-Country Economic Memorandum: 'Becoming a High-Income Economy in a Generation.'*

Recognising India's fast pace of growth averaging 6.3% between 2000 and 2024, the bank observed India's past achievements provide the foundation for its future ambitions.

## Global integration

"Lessons from countries like Chile, Korea and Poland show how they have successfully made the tran-



Past achievements provide the foundation for India's future ambitions, says the bank.

sition from middle- to high-income countries by deepening integration into the global economy," said Auguste Tano Kouame, World Bank Country Director adding, "India can chart its own path by stepping up pace of reforms and building on past achievements."

The Bank said, the scenario that will enable India to reach high-income status in a generation, would require a) achieving faster and inclusive growth across States; b) increasing total investments from the current 33.5% GDP to 40% (both in real terms) by

2035; c) increasing overall labour force participation from 56.4% to above 65% and d) accelerating overall productivity growth.

"India can take advantage of its demographic dividend by investing in human capital, creating enabling conditions for more and better jobs and raising female labour force participation rates from 35.6% to 50% by 2047," said Emilia Skrok and Rangee Ghosh, co-authors of the report.

In the past three fiscal years, India has accelerated its average growth rate to 7.2%. To attain an average growth rate of 7.8% (in real terms) over the next two decades, the Country Economic Memorandum recommends four areas for policy action viz. increasing investment, fostering an environment to create more and better jobs, promoting structural transformation, trade participation, technology adoption and enabling States to grow faster and together.



- As per the World Bank's latest report, Becoming a High-Income Economy in a Generation, India has made remarkable economic progress over the past two decades, achieving an average growth rate of 6.3% between 2000 and 2024.
- However, to transition into a high-income economy by 2047, India must sustain an annual GDP growth rate of 7.8%, the report says.
- The report outlines key policy areas where India must accelerate reforms, including investment, labor force participation, structural transformation, and regional economic development.
- It draws lessons from successful transitions of nations like Chile, South Korea, and Poland, emphasizing the need for deeper integration into the global economy.

### India's Growth Potential and Challenges

- India's economic success has been built on rapid industrialization, a booming services sector, and strong macroeconomic stability.
- The country's GDP per capita has nearly tripled since 2000, and its share in the global economy has doubled to 3.4% in 2023.
- Despite these achievements, the report warns that maintaining a business-as-usual approach will not be enough to achieve high-income status.
- India's Gross National Income (GNI) per capita must increase nearly eightfold, requiring structural reforms at an unprecedented scale.

### The report outlines four critical areas for policy action:

#### Boosting Investment

- Increase private and public investment from 33.5% of GDP to 40% by 2035.
- Encourage higher foreign direct investment (FDI) inflows.
- Develop robust financial markets to support long-term infrastructure financing.

#### Enhancing Labor Force Participation

- Improve overall labor force participation from 56.4% to 65% by 2047.
- Raise female labor force participation from 35.6% to 50%.
- Invest in human capital development through skill enhancement programs.

#### Structural Transformation and Technology Adoption

- Reduce agricultural employment from 45% to align with global peers like Vietnam and China.
- Promote digitalization and integration into global value chains.
- Strengthen research and development initiatives in high-growth sectors.

#### Enabling Regional Growth

- Focus on infrastructure, healthcare, and education in underdeveloped states.
- Encourage developed states to deepen business reforms and global trade participation.

#### Economic Growth and Emission Concerns

- As India pursues higher growth, balancing economic expansion with environmental sustainability is critical.

- The country must adopt clean energy technologies, promote electric mobility, and invest in sustainable urbanization to ensure that growth does not come at the cost of environmental degradation.
- The World Bank suggests that India's economic strategy must align with global climate commitments, emphasizing green investments in key sectors such as renewable energy, electric vehicles, and sustainable agriculture.

### India's Current Growth Trajectory

- India has already shown strong momentum, with its GDP growth averaging 7.2% in the past three years.
- However, sustaining this growth over the next two decades will require significant policy coordination.
- The report highlights that while India's economic policies have driven progress, global uncertainties such as geopolitical tensions, trade disruptions, and climate risks could impact future growth.
- Ensuring resilience through diversified trade and self-sufficiency in critical industries will be vital.

### Path Forward – Policy Recommendations

- To meet the ambitious 2047 target, the World Bank emphasizes:
  - **Encouraging Entrepreneurship and Innovation:** Supporting small and medium enterprises (SMEs) to foster job creation and new technologies.
  - **Financial Sector Reforms:** Expanding access to credit for startups and industries.
  - **Urbanization and Infrastructure:** Strengthening smart city projects and efficient public transport networks.
  - **Trade and Investment Liberalization:** Negotiating new trade agreements and reducing barriers to business.

By implementing these reforms, India can sustain high growth, create employment opportunities, and improve the standard of living for its citizens.

### Conclusion

- India's aspiration to become a high-income economy by 2047 is ambitious but achievable with the right policy framework.
- Accelerated reforms in investment, labor, technology, and infrastructure will be crucial in realizing this goal.
- As the world's fastest-growing major economy, India's journey to high-income status will serve as a model for emerging markets worldwide.

**UPSC Mains Practice Question**

**Ques :**What are the key reforms and policy measures India needs to implement to achieve high-income status by 2047. **(150 Words /10 marks)**





# The steps that will shape India's AI ambition

In the heart of Bengaluru, software developers find themselves racing against time to outbid Chinese rivals for major Artificial Intelligence (AI)-driven projects with international clients. Despite being part of a skilled workforce, deals often slip away due to capabilities Indian firms struggle to match. This is not just a single developer's dilemma. It is a glimpse into India's crossroads.

Faced with a three-way race to catch up with Silicon Valley while being chased by China and South East Asia, India is being subject to rigorous competition. But, if it wants to prevail at the forefront of the AI race, India must recognise that the challenge lies not in whether businesses prefer a local or foreign AI platform but in whether market regulations will inadvertently stifle India's momentum.

### The issues in India

Export competitiveness hinges on the nationwide deployment of productivity-enhancing technologies. Indian services and consultancies must incorporate AI technologies to maintain their lead position in the global market. But concerns remain over the massive loss of routine jobs, discriminatory algorithmic decision-making, and the negative risks of human impersonation. In particular, "deepfakes" undermine trust by spreading misinformation, and destabilise political processes eroding credibility rapidly.

AI adoption issues such as misinformation and intermediary liability are at the forefront of the AI discussion in India, as digital platforms have become primary conduits for information dissemination. The general opinion among startups in India is that intermediaries – usually foreign tech giants – often set the rules of engagement, making it challenging for local startups to compete.

Tension has increased since, with recent Indian app developers filing a complaint against Google before the Competition Commission of India. But, putting regulatory and administrative pressure on those companies will not necessarily resolve the core problem of monopolistic



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If it wants to lead in the AI race, India must recognise that the challenge lies in whether market regulations will stifle its momentum

business practices. Regulating AI will interfere with technological adaptation, which will have undesirable consequences on India's relative competitiveness.

India has already localised a significant portion of the AI value chain, and additional AI-related compliance costs may hamper India's ability to outpace commercial rivals such as China and the United States, which have decided to leave AI unregulated.

### Navigating the global AI race

India's position as the world's IT powerhouse gives it a unique advantage in the AI era. Attempts to govern and regulate AI occur as industrialised nations compete globally for industrial leadership. The European Union (EU) opted for strict regulation to address risks and societal impacts. In contrast, the U.S. maintains a more hands-off stance, prioritising innovation. India finds itself in a delicate balancing act between these two paths. But the sooner misconceptions about quickly outdated market rules addressing a limited set of hypothetical risks are set aside, the better India can focus on outpacing commercial rivals such as China and the U.S.

There are very good reasons why the EU has chosen to legislate through binding laws, mainly due to its unique structural deficiencies. The EU lacks a supranational constitution that safeguards human rights and protects citizens against AI-based surveillance or policing by its member-states. Therefore, unlike India, the EU must enact binding rules to pre-empt AI laws by national governments that will otherwise fragment its single market.

Additionally, the costs of regulatory failure are too high if India's exporting capabilities are at stake, particularly given Chinese dominance in hardware and cloud technologies. India has previously taken inspiration from EU or U.S. laws. However, it must follow its own paths and pursue its national interests based on its services-driven industrial profile.

Introducing regulatory attempts that can

impede AI development in India may allow businesses to repatriate from India and relocate IT development and software research and development to other countries with more AI-friendly rules. In other words, Indian IT services and consultancies held back by AI regulations run the risk of losing their hold of the global market.

Instead, the Indian government can use its diplomatic influence to ensure that open-source models remain open, accessible, and commercially viable, paired with international strategic partnerships for energy security, computing resources, and international standardisation.

### A case for regulatory clarity

Building on the expected strong adoption of AI, public officials have a responsibility to listen to political and social concerns. While India is not explicitly pursuing ex-ante product regulation on AI akin to that in Europe (or previously planned in California), various agencies have launched conflicting policies, resulting in a minor power struggle that resulted in a fragmented policy landscape.

Lessons learnt from the EU and the U.S. point to the need to strengthen and future-proof existing laws rather than produce new ones. Current transitional guidelines have shown a feasible pathway to avoiding overlapping liability or regulatory blindspots by re-interpreting existing legislation. India has a comprehensive framework for antitrust, corporate liability, free speech, and public order that covers AI development and use cases. India may not need AI-specific rules legislation such as the IT Act.

India must choose its own path according to its national interests. The challenge lies not in whether businesses prefer a local or foreign AI platform but in encouraging rapid adoption and supporting open-source and other alternatives accessible for fine-tuning and transferring learning in its IT industry.

*The views expressed are personal*

**GS Paper 03 Science and Technology**

**PYQ: UPSC CSE(M) GS-2 2020** The emergence of the Fourth Industrial Revolution (Digital Revolution) has initiated e-Governance as an integral part of government”.

Discuss.(250 Words /15 marks)

**UPSC Mains Practice Question** “e-Governance is not just about technology but also about process reengineering and institutional transformation.” Analyze. (250 Words /15 marks)

**Context :**

- In Bengaluru, Indian developers face tough competition from China for AI projects. To lead the AI race, India must focus on supportive regulations and enhancing technological capabilities.

**What are the key issues related to Artificial Intelligence (AI) in India?**

- **Job Displacement and Skill Gap:** Increased AI adoption threatens to automate routine jobs, leading to large-scale unemployment and requiring a workforce with advanced digital skills. Example: The NASSCOM report (2023) highlighted that 69% of Indian tech workers need to upskill in AI and machine learning to remain employable as automation rises.
- **Algorithmic Bias and Ethical Concerns:** AI systems can reflect and amplify societal biases, leading to discriminatory outcomes in hiring, lending, and public services. Example: In 2023, the Union Public Service Commission (UPSC) faced criticism when its AI-based screening system allegedly disadvantaged candidates from marginalized backgrounds during preliminary evaluations.
- **Misinformation and Deepfake Threats:** AI-generated misinformation and deepfakes undermine public trust, pose security risks, and impact democratic processes. Example: During the 2024 Lok Sabha elections, deepfake videos impersonating political leaders circulated widely on social media, raising concerns about election manipulation.
- **Regulatory Uncertainty and Compliance Costs:** The lack of a unified AI policy and fragmented regulations create legal ambiguity, increasing compliance burdens for Indian startups. Example: In 2023, Indian app developers filed a complaint with the Competition Commission of India (CCI) against Google for restrictive AI-related practices on the Play Store, citing unfair competition.

- ➔ **Global Competitiveness and Innovation Lag:** Over-regulation and high compliance costs could hinder AI innovation, making India less competitive against global leaders like the U.S. and China. **Example:** India's AI startup investments lag behind China and the U.S., with China attracting four times more AI funding in 2023, according to a Stanford AI Index report.

### Where does India stand in the global Artificial Intelligence (AI) race?

- ➔ **Emerging AI Hub with Growing Investments:** India is positioning itself as an emerging AI hub with increasing investments in AI research and development, but it still lags behind global leaders like the U.S. and China. **Example:** According to the Stanford AI Index Report 2023, India ranked fifth globally in AI research output but attracted significantly less AI funding compared to China and the U.S.
- ➔ **Government Initiatives to Boost AI Innovation:** India has launched several initiatives to promote AI adoption, such as the "National Program on AI" and the establishment of AI research centers to enhance innovation and application. **Example:** In 2023, the Ministry of Electronics and Information Technology (MeitY) introduced the "IndiaAI" mission to promote AI-based solutions in healthcare, agriculture, and education.
- ➔ **Challenges in Global Competitiveness:** Despite having a large talent pool, India faces challenges in scaling AI innovation due to fragmented regulations, limited high-performance computing resources, and competition from advanced economies. **Example:** While India produced over 20,000 AI and machine learning professionals in 2023, its AI exports remain limited compared to China's dominance in AI-driven hardware and cloud solutions.

### What is the current regulatory framework for Artificial Intelligence (AI)?

- ➔ **Existing Laws Governing AI Use:** India does not have a dedicated AI law but regulates AI through existing legal frameworks like the Information Technology (IT) Act, 2000, which governs data protection, cybersecurity, and intermediary liability.
- ➔ **Sector-Specific Guidelines:** Various government bodies have issued guidelines for AI applications in specific sectors. For example: RBI Guidelines for AI in financial services (e.g., credit scoring) and Telecom Regulatory Authority of India (TRAI) recommendations on AI in data privacy and telecommunications.
- ➔ **National Strategy on AI:** The government launched the National Strategy for Artificial Intelligence (NITI Aayog, 2018) to guide AI research, ethical standards, and public-sector AI deployment. **Example:** Under the IndiaAI Mission (2023), the government aims to promote responsible AI use while fostering innovation across industries.



## Daily News Analysis

- ➔ **Competition and Data Protection Framework:** The Competition Commission of India (CCI) monitors anti-competitive practices by tech firms using AI algorithms. The Digital Personal Data Protection Act, 2023 regulates how AI systems process personal data. Example: In 2023, the CCI investigated Google for alleged AI-related anti-competitive practices on the Play Store.
- ➔ **AI Ethics and Responsible Use:** Guidelines on the ethical use of AI emphasize transparency, fairness, and accountability without imposing ex-ante (preemptive) regulation. Example: In 2023, the Ministry of Electronics and IT (MeitY) released advisory notes on preventing algorithmic bias and ensuring explainability in AI decisions.

### Way forward:

- ➔ **Comprehensive AI Policy Framework:** Establish a unified and adaptive AI policy focusing on ethical guidelines, data privacy, and accountability to balance innovation with public interest.
- ➔ **Investment in AI Infrastructure and Skill Development:** Enhance funding for AI research, expand high-performance computing resources, and implement large-scale reskilling programs to bridge the skill gap and improve global competitiveness.