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Daily News Analysis

# The Hindu Important News Articles & Editorial For UPSC CSE

## Wednesday, 08 Jan, 2024

## Edition: International

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The National Statistics Office (NSO) projects India's real GDP growth for 2024-25 at 6.4%, a four-year low, compared to 8.2% in 2023-24.

- The economy, which grew 6% in the first half of 2024-25, is expected to rebound with a 6.8% growth in the second half.

# GDP growth projected to fall to four-year low at 6.4%

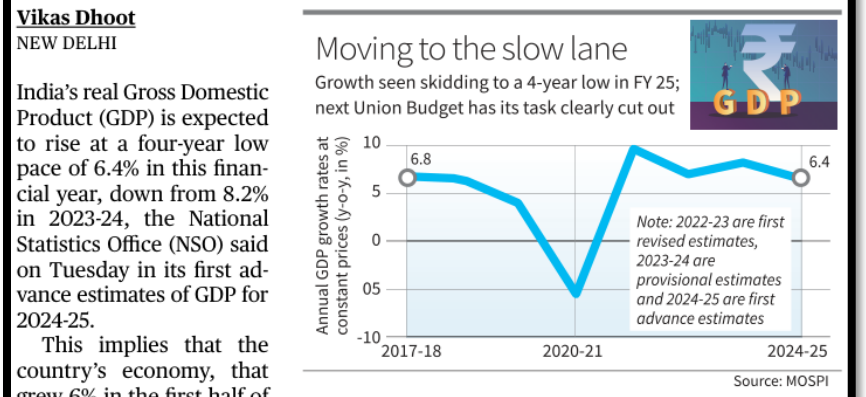
**Vikas Dhoot**
NEW DELHI

India's real Gross Domestic Product (GDP) is expected to rise at a four-year low pace of 6.4% in this financial year, down from 8.2% in 2023-24, the National Statistics Office (NSO) said on Tuesday in its first advance estimates of GDP for 2024-25.

This implies that the country's economy, that grew 6% in the first half of this financial year, is expected to rebound with a 6.8% surge in the second half.

The real Gross Value Added (GVA) in the Indian economy is reckoned to rise 6.4% as well, relative to a 7.2% uptick in 2023-24. Just two of eight broad economic sectors are seen to be clocking a higher growth than last year – Agriculture that is expected to rise 3.8% from 1.4% last year, and Public Administration, Defence and Other Services, seen growing 9.1% from a 7.8% increase recorded in 2023-24.

Manufacturing GVA growth is expected to nearly halve from 9.9% in 2023-24 to 5.3% this year, while GVA in Mining and Quarrying is estimated to rise just 2.9% from 7.1% a year ago.




**Investment growth**

A broader worry is the NSO's projection that gross fixed capital formation (GFCF), an indicator of fresh investments in the economy, is expected to grow at a pace of just 6.4% compared with a 9% rise in 2023-24.

"Real GDP or GDP at Constant Prices is estimated to attain a level of ₹184.88 lakh crore in the financial year 2024-25, against the Provisional Estimate of GDP for the year 2023-24 of ₹173.82 lakh crore," the NSO said.

The NSO's first advance estimates of GDP growth for the year, used for framing the Union Budget for the next fiscal to be presented on February 1, suggest reviving the economy's engines back to the 7%-plus growth recorded in the preceding three years will be the key challenge for Budget 2025-26 to address.

India's GDP growth had slipped to a seven-quarter low of 5.4% in the July to September 2024 quarter. Following this, the Reserve Bank of India had pared its growth projection for the full year to 6.6% from 7.2% estimated earlier. Subsequently, the Finance Ministry also reframed its growth expectation for 2024-25 from 'a range of 6.5% to 7%' to 'around 6.5%'.

### Sectoral Growth Trends

- **Agriculture:** Growth is expected to rise significantly to 3.8% from 1.4% in 2023-24.
- **Public Administration, Defence, and Other Services:** These sectors are projected to grow by 9.1%, up from 7.8% last year.
- **Manufacturing:** Growth is estimated to slow down sharply from 9.9% in 2023-24 to 5.3% in 2024-25.
- **Mining and Quarrying:** Growth is expected to dip to 2.9% from 7.1% in the previous year.

**Investment Growth Concerns**

- Gross Fixed Capital Formation (GFCF), an indicator of fresh investments, is projected to grow at 6.4%, down from 9% in 2023-24.

**Economic Challenges and Budget Implications**

- Reviving the economy's growth to the 7%-plus levels seen in preceding years is identified as a key challenge for the Union Budget 2025-26.
- The Reserve Bank of India has revised its growth projection for the full year to 6.6%, down from the earlier estimate of 7.2%.
- The Finance Ministry now expects growth for 2024-25 to be 'around 6.5%', revising its earlier range of 6.5% to 7%.

**Reasons and Way Forward:**

- **Reasons for Decline in India's GDP GrowthGlobal Economic Slowdown:** The global economic slowdown has impacted India's exports and foreign investments, contributing to the decline in growth.
- **Weak Domestic Demand:** Consumer spending and private investment have been sluggish, affecting domestic demand and economic growth.
- **Manufacturing Slowdown:** The manufacturing sector, a key driver of economic growth, has experienced a slowdown due to various factors, including weak global demand and domestic challenges.

**Way Forward**

- **Boosting Investment:** Encouraging private investment through policy reforms and infrastructure development is crucial for reviving economic growth.

- **Reforming Labor Markets:** Implementing labor market reforms to enhance flexibility and productivity can boost employment and economic activity.
- **Improving Ease of Doing Business:** Streamlining business regulations and reducing bureaucratic hurdles can encourage entrepreneurship and attract foreign investment.
- **Focus on Exports:** Diversifying exports and promoting export-oriented sectors can boost economic growth and create jobs.
- **Addressing Rural Distress:** Addressing the challenges faced by the agricultural sector and improving rural incomes can boost domestic demand and economic growth.

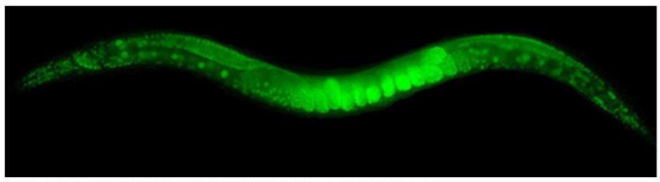
**USPC Mains PYQ : 2020**

**Ques :** Define potential GDP and explain its determinants. What are the factors that have been inhibiting India from realizing its potential GDP?(**150 Words /10 marks)**

## Page 07 : GS 3 : Science and Technology

The article explores the groundbreaking discoveries made using Caenorhabditis elegans, a model organism.

- It has helped in understanding genetic regulation, cell death, RNA interference, and gene expression.



An adult *C. elegans* worm glows after a GFP coding sequence was inserted into it. DAN DICKINSON, GOLDSTEIN LAB, UNC CHAPEL HILL (CC BY-SA 3.0)

# How curiosity-driven research into a worm won four Nobels

Advances in health often arise from solving fundamental biological problems. One difficulty is identifying the right place where the answer can be found. *Caenorhabditis elegans* provides such a setting: a versatile model whose results often reveal general principles with parallels in humans

Rohini Karandikar
Sandhya P. Koushika

Victor Ambros and Gary Ruvkun won the 2024 Nobel Prize in Physiology or Medicine for discovering microRNAs and their role in controlling gene expression. This pioneering discovery was made using the roundworm *Caenorhabditis elegans*. This 1-mm long, slender, and transparent nematode has been the star of many pathbreaking discoveries in biology, four of which have won Nobel Prizes.

How did *C. elegans*, a tiny invertebrate, become such a crucial tool for biological research? What insights did this worm yield? What is the value of such research for society when one can argue that our focus should be on studying human biology?

Advances necessary for human health and welfare often arise from solving fundamental biological problems. One major difficulty isn't just finding the right question to ask but also finding the right place to ask it where it can be solved. *C. elegans* provides exactly such a setting: a relatively simple yet versatile model for biological investigations whose results often reveal general principles that remain valid or have parallels in other organisms, including humans.

The worm's story also highlights how breakthroughs can arise from research driven by curiosity.

### Humble beginnings

In 1963, biologist Sydney Brenner wrote to his peer Max Perutz his thoughts on research in the fields of development and neurobiology. He believed that as the nature of problems in these areas wasn't clearly defined, there was a gap in identifying the right experimental approach that would lead to "defining [the] unitary steps of any given process."

Brenner suggested the use of genetic analysis in defining these steps in both animal development and the nervous system. He chose the nematode *C. elegans* for its simplicity and because it has several organ systems akin to those found in humans, allowing a chance to identify principles in development.

In 1963, Brenner requested another scientist, Ellsworth Dougherty, for a culture of *C. elegans* and sought his guidance on its growth conditions. This culture of sharing resources and unpublished information continues to this day.

### Cell death

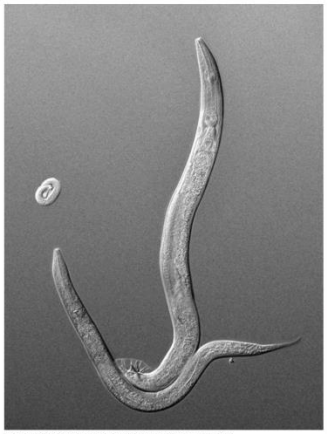
Brenner shared the 2002 Nobel Prize for medicine with H. Robert Horvitz and John Sulston "for their discoveries concerning genetic regulation of organ development and programmed cell death." In his award ceremony, Brenner said, "Without a doubt, the fourth winner of the Nobel Prize this year is *Caenorhabditis elegans*: it deserves all of the honour, but, of course, it will not be able to share the monetary award."

Brenner established *C. elegans* as a genetic model and demonstrated that genes in the worm could be mutated, resulting in observable changes in development and behaviour.

In 1976, Sulston elucidated the cell lineage of *C. elegans*, which is the developmental history of all cells of this nematode. He tracked cell divisions from the fertilised single cell to the final 959 cells in the adult organism. This was possible because of the worm's transparency but nonetheless was a daunting task.

Sulston showed that precisely 131 of the 1,090 cells born died during development and that cell death was genetically controlled. He described the steps involved in programmed cell death, where healthy cells killed themselves.

Horvitz identified the genes essential for cell death and the genes that prevented it. He found that the process of cell death arose from interactions among key genes and followed a specific molecular pathway.



An image of *Caenorhabditis elegans* worms. MEGHA RAI/SPECIAL ARRANGEMENT

His team's work in *C. elegans* showed that many genes involved in cell death also have counterparts in humans. Thus, research in *C. elegans* was particularly important in advancing understanding of the role of programmed cell death in human development, e.g., of fingers, the nervous system, and in some cancers.

### Ageing and genome sequencing

Work in *C. elegans* also revealed insights into the pathways that regulate ageing. The early work of Michael Klass, Tom Johnson, and Cynthia Kenyon in the 1980s and 1990s identified some of the genes leading to longer lifespans than seen in normal worms. Further work in this direction led to the appreciation of the role of insulin signalling pathways in ageing. This has led to *C. elegans* being used as a key model for discovering the molecular mechanisms of ageing and as a test bed for drugs that might influence this process.

The genomic information of any organism is invaluable in linking the observable characteristics to a particular gene. Sequencing the *C. elegans* genome started in 1990 and was an exemplar for the larger Human Genome Project. The whole genome sequence of *C. elegans* was carried out by a consortium working together across continents. It was led by Robert Waterston at the Genome Sequencing Center at Washington University, U.S., and Richard Durbin at the Sanger Centre in the U.K.

The technology and the software tools developed to sequence the *C. elegans* genome led the way in achieving the scale and efficiency critical to sequencing larger genomes.

It was debated if human whole-genome sequencing data should be publicly available, as private sequencing efforts wished to patent some of the genes. The open sharing of *C. elegans* data and community feedback provided a model for the public human genome sequencing effort.

### Gene silencing

A geneticist's dream is to control gene expression, which is the ability to turn genes "on" or "off" in a controlled manner. Andrew Fire and Craig Mello discovered using *C. elegans* that providing double-stranded RNA could lead to destruction of a much larger amount of the corresponding cellular RNA, suggesting double-stranded RNA was a catalyst for RNA interference. For their work, Fire and Mello jointly received the 2006 Nobel Prize for medicine.

The discovery of RNA interference led to technologies for a highly specific approach to gene-silencing that work in all known organisms. They also have applications in therapeutics for cancer and some inherited gene disorders.

### Glowing worms

A dream of biologists is to track biological processes and gene products in living cells. The green fluorescent protein (GFP) revolutionised our ability to do this. How this came about is another success story of curiosity-driven research.

Osamu Shimomura was trying to understand why jellyfish are fluorescent. In the 1960s, he identified bioluminescent proteins like GFP from the jellyfish *Aequorea victoria*. In 1994, Chalfie was able to introduce GFP into live *C. elegans*. The transparency of the organism meant he could see green glowing cells when the organism was illuminated by blue light.

GFP was soon widely used in many organisms and has transformed biological research. Together with Roger Tsien's success in making fluorescent proteins of multiple colours, scientists today can follow multiple processes and proteins simultaneously in a variety of organisms.

Shimomura, Chalfie, and Tsien received the 2008 Nobel Prize in chemistry for developing GFP.

### The microRNA prize

The discovery of microRNAs (miRNA)

**miRNAs are molecules that turn off gene expression. This fundamental advance, which won Victor Ambros and Gary Ruvkun a Nobel Prize in 2024, is another example of an unexpected finding arising from curiosity**

challenged the central dogma, which said RNAs were mere conduits of information that flowed from DNA to proteins.

miRNAs are a class of molecules that turn off gene expression at the right time and place. This fundamental advance, which won Victor Ambros and Gary Ruvkun a Nobel Prize in 2024, is another example of an unexpected finding arising from curiosity. The duo discovered in *C. elegans* that miRNAs could bind corresponding cellular RNAs to reduce protein expression.

It is established that gene regulation by miRNAs is an essential process during development and for organisms to have normal physiological processes. There is increasing recognition of the value of miRNAs in diagnostics and therapeutics as well.

### A prize for neuronal circuits

*C. elegans* has just 302 neurones, yet exhibits complex behaviour. Thus it offers a promising model to study a nervous system simple enough to analyse while still yielding valuable lessons about general principles.

Naturally, a useful step is to build a layout of all its neurones. Brenner began such a reconstruction of the *C. elegans* nervous system in the 1970s. It was a formidable challenge, never attempted before. John White, Brenner's PhD student, set up a computer system for neuron reconstructions from electron micrographs. He stayed on after his PhD to reconstruct the *C. elegans* connectome, a map of all neuronal connections.

This was well before sophisticated tools were available and was the first such effort for any organism. The connectome immediately opened the door to questions about how neural circuits function. For example, in the 1980s, Chalfie used laser-based neurone-killing experiments to determine the circuit for the escape response to touch.

### Holding promise

We can ask questions about the relationship between the genetics of neural circuits and behaviour. The answers, when we can find them in specific contexts, are difficult to obtain, extremely complex, and yet vital for our understanding.

Cornelia Bargmann won the 2013 Breakthrough Prize in Life Sciences for her research on the olfactory system of *C. elegans*. The sense of smell is very important for many organisms. *C. elegans* has a large number of olfactory receptors and uses complex machinery to sense smells and respond, adapt, and learn.

Bargmann took on this complex problem and unearthed remarkable insights in all these aspects through elegant experiments. She identified smell neurones in *C. elegans*. Her lab also showed that despite there being a fixed template for sensing attractive and repulsive cues, individual genetic variation and an ability to integrate environmental cues allowed the olfactory circuit to be very flexible as well.

Many of these findings also hold true in organisms like mice, with promise for understanding the human brain.

*(Rohini Karandikar is a science communicator, educator, and facilitator. Sandhya P. Koushika is a cellular neurobiologist who works with* C. elegans *at the Tata Institute of Fundamental Research, Mumbai. rohinikarandikar84@gmail.com, sandhyakoushika@gmail.com)*

**Caenorhabditis Elegans:**

- Caenorhabditis elegans is a 1-mm long, transparent nematode commonly used in scientific research.
- It inhabits soil and feeds on microbes, making it easily cultivated in laboratories.
- The adult worm has 959 cells and 302 neurons, providing a simple model for studying development and neuroscience.
- It is widely used in genetic and developmental biology due to its straightforward anatomy and short lifespan.
- The complete genome of C. elegans has been sequenced, providing valuable insights into genetic functions.
- Its transparency allows scientists to directly observe cellular processes and track molecular activities.

**Researches that led to Nobel Prize:**

- **Genetic Regulation & Programmed Cell Death (2002)**
  - Sydney Brenner, H. Robert Horvitz, and John Sulston discovered how genes regulate organ development and programmed cell death.
  - Their work revealed the genetic mechanisms that control cell death during development.
  - This research is crucial for understanding diseases like cancer, where cell death regulation is disrupted.
- **RNA Interference (2006)**
  - Andrew Fire and Craig Mello discovered how double-stranded RNA silences specific genes through RNA interference.
  - This mechanism prevents certain genes from producing proteins.
  - Their work created powerful tools for genetic research and opened doors for therapies targeting gene expression in diseases such as cancer and genetic disorders.
- **Green Fluorescent Protein (2008)**
  - Osamu Shimomura, Martin Chalfie, and Roger Tsien developed the Green Fluorescent Protein (GFP) to track proteins in living organisms.
  - GFP enabled scientists to visualize cellular processes in real time.
  - Their discovery revolutionized biological research, providing a key tool to study molecular interactions within living cells.
- **MicroRNAs (2024)**
  - Victor Ambros and Gary Ruvkun discovered microRNAs (miRNAs) that regulate gene expression by silencing specific genes.

- miRNAs control various biological processes, including development and disease regulation.
- Their findings advanced our understanding of genetic regulation and opened new possibilities for diagnostic tools and therapeutic approaches in genetic diseases.

**UPSC Mains Practice Question**

**Ques : Discuss the significance of Caenorhabditis elegans in advancing our understanding of genetic regulation and programmed cell death. How have its discoveries impacted medical research? (150 Words /10 marks)**

## Page 07 : Prelims Fact

A recent study suggests the world may have already surpassed 1.5°C of warming.

- The study highlights accelerated climate impacts, including weakening ocean circulations, forest struggles, and intensified natural disasters.

### Global Temperature and Climate Threshold

- The world may have already reached 1.5°C of warming above pre-industrial levels, a critical threshold for irreversible climate impacts.
- This is based on an analysis of 2,000 years of atmospheric gases trapped in Antarctic ice cores, suggesting 1.49°C of warming in 2023.
- Traditionally, scientists measured temperatures against a baseline from 1850-1900, where warming was around 1.3°C.

### Impact on Ocean Circulations and Ecosystems

- The Atlantic Meridional Overturning Circulation (AMOC), crucial for European climate, has weakened by 15% since 1950 and may be nearing a critical slowdown.
- The ongoing fourth mass coral bleaching event raises concerns that the world's reefs may have passed an irreversible point.

### Wildfires and Droughts

- Global warming is exacerbating wildfires, with climate change contributing to 13% of deaths from toxic wildfire smoke in the 2010s.
- The Amazon faced its worst drought in 2024, with drought and heat stresses threatening the rainforest's survival, potentially transitioning it into degraded forests.

### Forests and Carbon Sequestration

- A 2024 study found that forests globally are absorbing less $CO_2$, indicating their diminished role in mitigating climate change.

### Volcanic Eruptions

Lava erupting over the Mount Etna volcano in Sicily in July 2024. AFP

**The latest science on climate change**

**Agence France Presse**

After another record-breaking year for global temperatures in 2024, pressure is rising on policymakers to step up efforts to curb climate change. The last global scientific consensus on the phenomenon was released in 2021, but scientists say evidence shows the effects of global warming are unfolding faster than expected.

Here is some of the latest climate research.

The world may already have hit 1.5 degrees C of warming above the average pre-industrial temperature — a critical but also arbitrary threshold beyond which it is at risk of irreversible and extreme climate change, scientists say.

A group of researchers made the suggestion in a study released in November based on an analysis of 2,000 years of atmospheric gases trapped in Antarctic ice cores.

Scientists have typically measured today's temperatures against a baseline temperature average for 1850-1900. By that measure, the world is now nearly 1.3 C warmer.

But the new data suggests a longer pre-industrial baseline, based on temperature data spanning the year 13 to 1700, which put warming at 1.49 C in 2023, the study published in Nature Geoscience said.

The Atlantic Meridional Overturning Circulation (AMOC), which transports warm water from the tropics to the North Atlantic, has helped to keep European winters milder for centuries. Research in 2018 showed AMOC has weakened by about 15% since 1950, while research published in 2024 in the journal Science Advances suggested it could be closer to a critical slowdown than previously thought.

**Globally, forests appear to be struggling. A July 2024 study found that forests overall failed in the year before to absorb as much carbon dioxide from the atmosphere as in the past**

In addition, with the world in the throes of a fourth and the largest mass coral bleaching event, scientists fear the world's reefs have passed a point of no return.

Ocean warming is causing storms to intensify faster, with some leapfrogging strength categories in just hours.

Likewise, global warming is drying waterways and sapping moisture from forests, creating conditions for bigger and hotter wildfires. Research published in October in *Nature Climate Change* calculated that about 13% of deaths associated with toxic wildfire smoke during the 2010s could be attributed to the climate effect on wildfires.

The Amazon in 2024 was in the grip of its worst, most widespread drought since records began in 1950. River levels sank to all-time lows while fires ravaged the rainforest. That added concern to findings last year that 10-47% of the Amazon will face combined stresses of heat and drought by 2050.

That could push the Amazon past a tipping point, with the jungle no longer able to produce enough moisture to quench its own trees, at which point the ecosystem could transition to degraded forests or sandy savannas.

Globally, forests appear to be struggling. A July 2024 study found that forests overall failed to absorb the year before as much carbon dioxide from the atmosphere as in the past.

Scientists fear climate change could even boost volcanic eruptions. In Iceland, volcanoes appear to be responding to rapid glacier retreat. As ice melts, less pressure is exerted on the earth's crust and mantle.

- Climate change could also trigger more volcanic eruptions, as rapid glacier retreat in Iceland reduces pressure on the earth's crust.

## Page 15 : Prelims Fact

Biden designates two new national monuments in California, Chuckwalla and Sattitla, securing environmental protections for sacred lands and leaving a lasting conservation legacy.

**Places in news:**

- **Chuckwalla National Monument**
  - Located near Joshua Tree National Park in southern California, the Chuckwalla National Monument spans 624,000 acres.
  - It will be protected from drilling, mining, solar farms, and other industrial activities.
  - The area holds cultural and spiritual significance for Native American tribes that have inhabited the land for millennia.
  - The designation safeguards the land's unique beauty, canyons, and wildlife for future generations.
- **Sattitla National Monument**
  - The Sattitla National Monument, covering 224,000 acres, is located in northern California, bordering Oregon.
  - Like Chuckwalla, it will be shielded from industrial activities, ensuring its preservation.
  - The area is known for its diverse landscapes and ecological importance.
  - The designation reflects efforts to conserve important natural and cultural resources for long-term environmental sustainability.

U.S. President Joe Biden. FILE PHOTO

# Eyeing green legacy, Biden declares new national monuments

**Agence France-Presse**
LOS ANGELES

Joe Biden is set on Tuesday to designate two new U.S. national monuments – sprawling parks – in California as he looks to secure his environmental legacy in the waning days of his presidency.

Just weeks before Donald Trump is due to move into the White House, the 82-year-old will proclaim the 6,24,000-acre Chuckwalla National Monument, near Joshua Tree National Park in southern California.

The move will protect the area from drilling, mining, solar energy farms and other industrial activity, and comes after lobbying from Native American tribes who have used the land for millennia.

Mr. Biden will also create the 2,24,000-acre Sattitla National Monument in the state's far north, at the border with Oregon, offering that area the same environmental safeguards.

"The stunning canyons and winding paths of the Chuckwalla National Monument represent a true unmatched beauty," said Interior Secretary Deb Haaland, the first Native American to serve as a cabinet secretary. "It was my honour to visit this area to explore and meet with federal, state, tribal and local leaders to hear about the need to protect and conserve this sacred area. "President Biden's action today will protect important spiritual and cultural values tied to the land and wildlife. I am so grateful that future generations will have the opportunity to experience what makes this area so unique."

# In News : Year End Review 2024: Ministry of Tribal Affair

The Ministry of Tribal Affairs implements various initiatives to enhance the socio-economic, educational, and cultural development of tribal communities.

- This article explains these key programs and achievements.

**Key Initiatives and Achievements of the Ministry of Tribal Affairs**

**Increased Budget Allocation:**

- The Ministry of Tribal Affairs has seen a significant increase in its budget, particularly for the Development Action Plan for Scheduled Tribes (DAPST).
- This enhanced funding supports a variety of initiatives aimed at improving the socio-economic status of tribal communities.

**Key Programs Launched:**

- **Dharti Aaba Janjatiya Gram Utkarsh Abhiyan:** Aimed at addressing gaps in social infrastructure, health, education, and livelihood in tribal villages.
- **Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN):** Focuses on improving the quality of life for Particularly Vulnerable Tribal Groups (PVTGs) through targeted support.
- **Pradhan Mantri Adi Adarsh Gram Yojana (PMAAGY):** Aims to provide essential infrastructure to villages with significant tribal populations.
- **Pradhan Mantri Janjatiya Vikas Mission (PMJVM):** Promotes tribal entrepreneurship by supporting businesses focused on locally produced goods.

**Other Initiatives:**

- **Eklavya Model Residential Schools (EMRS):** The government has expanded the number of EMRS, which offer quality education to tribal students. Key achievements include:
  - Inauguration of 40 new EMRS by the Prime Minister.
  - Recruitment of teachers and support staff for these schools.
  - Organization of cultural and literary festivals for students.
- **Scholarships for Tribal Students:** Various scholarship schemes are available to support tribal students across different educational levels, including:
  - Pre-matric and post-matric scholarships.
  - Overseas scholarships for higher education.

- **Aadi Mahotsav:** An annual tribal festival that celebrates and showcases the rich cultural heritage of tribal communities across India.
- **Support to Tribal Research Institutes:** Financial assistance is provided to Tribal Research Institutes for research activities aimed at preserving and promoting tribal languages and cultures.
- **Forest Rights Act:** Significant amounts of forest land have been distributed to tribal communities under the Forest Rights Act, 2006.
- **Janjatiya Gaurav Divas**: November 15th is celebrated as Janjatiya Gaurav Divas to honor tribal freedom fighters and recognize their contributions to India's independence.
- **Focus on Healthcare:** The government has launched the Sickle Cell Anemia Elimination Mission to address the health challenges faced by tribal populations.

**Additional Initiatives:**

- Training programs in semiconductor technology for tribal students.
- Support to voluntary organizations working for tribal welfare.
- Healthcare improvements aimed at enhancing the well-being of tribal communities.

**USPC Mains Practice Question**

**Ques :** Examine the role of the Ministry of Tribal Affairs in improving the quality of life for tribal communities in India through its key initiatives and programs**. (250 Words /15 marks)**

# More flexibility, but also greater challenges

**Milind Kumar Sharma**

Teaches at the Department of Production and Industrial Engineering, MBM University, Jodhpur. Views are personal

The latest guidelines of the University Grants Commission (UGC) herald a transformative shift in higher education in India. Among other reforms, the UGC has introduced an accelerated degree programme and an extended degree programme for undergraduate students, which will allow them to complete their degrees either earlier or later than the standard duration.

**Advantages and challenges**

This new paradigm aims to create a globally competitive educational framework that allows students greater autonomy and flexibility in charting out their academic trajectory. In a rigid education system such as India's, this is particularly revolutionary.

While an accelerated degree programme will be advantageous for students who are keen to join the workforce quickly or who wish to gain early professional experience or save money on tuition fees, the extended degree programme will allow students the leeway to explore a broader range of subjects, undertake internships, engage in research projects, travel and learn new skills, and balance academic pursuits with personal and professional commitments. As the National Education Policy (NEP), 2020, advocates for a multidisciplinary approach to learning, this approach could produce graduates who are not only proficient in their chosen fields, but are also equipped with more soft skills, creative skills, and ideas for innovation.

In addition, by aligning the structure of undergraduate education with international standards, the reforms aim to create greater mobility for Indian students, both within India and abroad. The flexible credit system introduced under these reforms will allow students to progress at their own pace. They can tailor their academic experiences to their specific needs, interests, and future career goals. This autonomy is important for the students.

However, there are challenges. The accelerated format raises questions about the depth and rigour of the education provided to students. If students are taught the same curriculum within a shorter period of time, they may have a superficial understanding of key concepts; this could compromise educational outcomes. In contrast, students who opt for the extended degree programme may lack academic urgency. Some may take longer than necessary to complete their studies, which would diminish the value of the degree.

**Adapting to the new structure**

It is especially difficult for technical education to adapt to the new structure. Engineering programmes demand a deep understanding of both theory and practice. While the push for interdisciplinary education is beneficial for students, engineering programmes are traditionally structured to provide students with a specialised education that prepares them for specific career paths.

Accelerated engineering degrees could risk oversimplifying technical learning. Engineering degrees require an in-depth study of subjects such as mathematics, physics, chemistry, and advanced engineering principles. Compressing this content could reduce the time available for practical projects, lab work, tutorial sessions, and project work and internships, which are crucial for developing technical competencies required in the field. Engineering students are often required to solve real-world problems, and any pressure to finish their studies quickly may hinder their ability to master problem-solving techniques that are integral to their profession.

Conversely, while the extended degree option in engineering could provide students with more opportunities for specialisation, research, and practical experience, it may also be more of a financial burden for students and could discourage those who already face economic constraints.

**Practical issues**

The transition to accelerated and extended degree formats requires substantial restructuring of curricula, teaching methods, and approval from competent bodies of universities and administrative systems. This could be daunting for universities that already face resource constraints. Further, the shift towards greater digitalisation in education, which is likely to accompany these reforms, could deepen the digital divide.

The introduction of accelerated and extended degrees necessitates robust systems for tracking student progress, evaluation, managing credit transfers, and ensuring the appropriate recognition of academic achievements. Institutions will need to develop sophisticated administrative frameworks to manage these complexities.

The equity implications of these reforms are also concerning. Students from underprivileged backgrounds may struggle to navigate the new system without adequate guidance and support and may even drop out if they are not able to catch up with the rest.

The adaptation of faculty to these new pedagogical models is another potential obstacle. Teachers will need to undergo professional development to adjust to the demands of flexible, interdisciplinary curricula. The success of these reforms hinges not only on the students' ability to navigate the new systems but also on the capacity of educators to support them effectively.

If these challenges are addressed with strategic planning, adequate investment, timely recruitment of faculty and staff, and a commitment to inclusivity, these reforms could lay the foundation for a more dynamic higher education system, which is better aligned to market needs, and would help India realise the dream of Viksit Bharat by 2047.

The accelerated and extended degree programmes herald a transformative shift in Indian education but also raise many questions

**GS Paper 02 : Social Justice – Education**

**UPSC Mains Practice Question:** Discuss the potential advantages and challenges of the University Grants Commission's (UGC) accelerated and extended degree programmes in transforming India's higher education system. **(150 Words /10 marks)**

## Context :

- The University Grants Commission (UGC) introduced two transformative reforms: accelerated and extended degree programmes.This summary seeks to explore their advantages, challenges, and implications for India's higher education system.

### Introduction to New Degree Programmes

- The University Grants Commission (UGC) has introduced two transformative reforms in Indian higher education: accelerated and extended degree programmes for undergraduate students.
- These programmes provide students with the flexibility to complete their degrees faster or over an extended duration, deviating from the traditional rigid framework.

### Advantages of the New Programmes

- **Enhanced Autonomy and Flexibility:**
  - Students can customise their academic journey based on individual needs, aligning with the multidisciplinary approach of the National Education Policy (NEP) 2020.
  - The reforms aim to produce graduates proficient in their fields while equipped with soft and creative skills, fostering innovation.
- **Career and Skill Benefits:**
  - The accelerated programme allows students to enter the workforce earlier, gain professional experience, and save on tuition fees.
  - The extended programme enables exploration of diverse subjects, internships, research, skill development, and personal pursuits alongside academics.
- **Global Alignment and Mobility:**
  - These programmes align with international education standards, enhancing mobility for Indian students domestically and globally.

- The introduction of a flexible credit system allows students to progress at their own pace, tailoring education to career goals.

**Challenges of the New Structure**

- **Depth and Rigour Concerns:**
  - Accelerated programmes may lead to superficial learning due to compressed teaching schedules, compromising educational quality.
  - Extended programmes might reduce academic urgency, with some students taking unnecessarily long to complete their degrees.
- **Impact on Technical Education:**
  - Engineering programmes, requiring in-depth theoretical and practical learning, may face challenges in maintaining rigour under accelerated formats.
  - Reduced time could hinder hands-on experiences such as lab work, internships, and problem-solving exercises critical for technical competence.
  - Extended programmes could increase financial burdens on students, deterring those with limited economic resources.

**Practical Challenges in Implementation**

- **Institutional and Administrative Overhaul:**
  - Substantial restructuring of curricula, teaching methods, and administrative systems is required, posing difficulties for resource-constrained universities.
  - Effective systems for tracking student progress, credit transfers, and evaluation need to be developed.
- **Equity Concerns:**
  - Students from underprivileged backgrounds may struggle without adequate guidance and support, potentially increasing dropout rates.
- **Digital Divide:**
  - Increased reliance on digital education could exacerbate inequities among students lacking access to digital infrastructure.
- **Faculty Training:**
  - Teachers must adapt to new pedagogical models through professional development to support flexible, interdisciplinary learning.

**Way Forward**

- To overcome these challenges, strategic planning, adequate investment, and timely recruitment of faculty and staff are essential.
- Inclusivity and robust administrative frameworks are critical to ensuring equity and accessibility for all students.
- If implemented effectively, these reforms could create a dynamic higher education system aligned with market needs, contributing to India's vision of Viksit Bharat by 2047.

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