

10th Oct, 2024

## 1. Mental health in India's material world GS 2 (Social Issues)

- **Why in News:** Recent tragedies involving young professionals, including a 26-year-old woman executive and a 38-year-old software engineer, have spotlighted a **growing mental health crisis in India**, exacerbated by immense work pressures and societal expectations. These incidents highlight the disconnect between perceived success and actual mental well-being, prompting urgent discussions on the state of mental health in a rapidly developing nation.
- **The Rising Mental Health Crisis**
  - **Surge in Disorders:** India is witnessing an alarming rise in mental health disorders, with over 197 million people affected by conditions such as depression, anxiety, and substance abuse, as reported by The Lancet Psychiatry Commission.
  - **Impact of Economic Growth:** While economic expansion has generated opportunities, it has also intensified societal pressures, driving individuals towards relentless productivity and material wealth at the expense of mental well-being.
  - **Existential Questions Ignored:** Traditional inquiries about identity and purpose have been overshadowed by consumerism, resulting in a society where the pursuit of material success leads to a profound sense of purposelessness and emotional distress.
- **The Role of Consumerism**
  - **Disconnect from Community:** The focus on consumerism fosters a culture where luxury and material possessions define status, leading to feelings of inadequacy and social comparison, particularly in urban areas.
  - **Temporary Comfort vs. True Well-being:** Material wealth may provide temporary relief, but it fails to address deeper emotional needs, causing individuals to feel isolated despite their achievements.
  - **Cycle of Dissatisfaction:** The relentless pursuit of affluence traps individuals in a cycle of dissatisfaction, where personal success is measured by consumption rather than meaningful relationships or self-awareness.
- **Solutions and Community Focus**
  - **Shift to Collective Well-being:** Addressing the mental health crisis requires a shift from individual success to collective well-being, emphasizing the importance of strong social connections and supportive communities.
  - **Lessons from Other Countries:** Initiatives like community gardens in Brazil exemplify how fostering social bonds can combat urban isolation, suggesting similar approaches could benefit Indian communities.
  - **Rethinking Freedom:** Prioritizing community and connection over material consumption can cultivate a healthier society, where well-being is assessed by relationships and shared experiences rather than purchasing power.

The theme of World Mental Health Day (October 10) this year is about prioritising mental health in the workplace. The critical link between mental health and work is examined in three articles on the Editorial and Opinion pages – two in the print edition and one in the online edition

### Mental health in India's material world

In July this year, the case of a 26-year-old woman executive working for a multinational consulting firm, ending her life due to immense work pressures, moved the spotlight to an important issue that concerns millions of working Indians. In September, a 38-year-old software engineer with 15 years of experience in a Chennai-based firm, ended his life. He was on medication for depression caused by work stress. Despite their "successful" careers, the loss of these lives underscores a growing mental health crisis in India, where success is often equated with relentless productivity and material wealth. These cases reveal the struggles many face such as battling depression, anxiety, and lack of purpose as they just up a facade of success and contentment.

India is currently witnessing a surge in mental health disorders. According to the Lancet Psychiatry Commission, over 197 million people suffer from conditions such as depression, anxiety and substance abuse. Economic growth has created new opportunities, but it has also intensified societal pressures and personal expectations. As India's developmental aspirations rise, mental well-being is often overlooked, fueling a crisis driven by materialism and a growing disconnect from community and self-awareness.

At the core of this crisis are existential questions that have plagued humans throughout the ages of Socrates and Aristotle such as: Who am I? What is the purpose of my life? How should I live? Socrates said, "The unexamined life is not worth living", highlighting the need for self-reflection. Aristotle linked the good life to the deeper meaning and purpose in life that can be found through community, joy, and flourishing.

**Bleeding stress and anxiety**  
India is grappling with a mental health epidemic, with millions suffering from disorders such as depression and anxiety. The relentless pressures of urban living, financial instability, and fierce competition are significant contributors. Even those who achieve material success often find that wealth and status do not deliver true well-being. Instead, many feel isolated and disconnected from their communities, experiencing a profound sense of purposelessness. While material wealth provides temporary comfort, it fails to meet deeper emotional and psychological needs. The growing focus on consumption, particularly in urban areas, has fostered a culture where luxury and



**Sumitranandan Pant**  
Assistant Professor and Assistant Dean, Department of Journalism and Mass Communication, School of Liberal Studies, IIT, Mumbai



**Kishore Kumar**  
Assistant Professor of Philosophy at the School of Liberal Studies, IIT, Mumbai

consumerism goods define status. This leads to feelings of inadequacy, stress and social comparison. As Kishore Pant noted, much of human behaviour is driven by the fear of impermanence and insignificance. People chase material wealth for social validation, hoping it will bring lasting happiness, but this pursuit neglects self-awareness. The endless quest for affluence disconnects individuals from the essential elements of a meaningful life – self-awareness, purpose, and meaningful relationships – trapping them in a cycle of dissatisfaction. Current policies and societal norms do little to help; rather, they reinforce the belief that wealth and consumption equate to happiness. This mindset shapes societal norms, encouraging consumption-driven choices that further erode the mental health crisis.

**Collective action, community as solutions**  
To address this crisis, we must shift focus from individual success to collective well-being. Studies show that strong social connections, supportive communities, and meaningful work are critical to mental health. However, work-life balance and legal protections are increasingly under threat.

The socio-political climate in India, where young individuals desperately strive for a consumerist "good life", has led to proposals such as extended work hours. For instance, the Karnataka Shops and Commercial Establishments (Amendment) Bill 2024 permits employers to work more than 12 hours a day, up to 125 hours in three months. Amid rapid industrialisation and personal achievement, it is essential to remind ourselves of the deeper meaning and purpose in life that can be found through community, joy, and flourishing.

Examples from other countries offer lessons. In Brazil, community gardens have helped residents reconnect by sharing responsibilities and fostering a sense of belonging. Similar initiatives in India could counteract the isolation fostered by urban living and consumerism, bringing people together to create stronger social bonds.

India is facing a mental health epidemic, with financial instability and fierce competition as significant contributors. Even those who achieve material success often find that wealth and status do not deliver true well-being. Instead, many feel isolated and disconnected from their communities, experiencing a profound sense of purposelessness. While material wealth provides temporary comfort, it fails to meet deeper emotional and psychological needs. The growing focus on consumption, particularly in urban areas, has fostered a culture where luxury and

people share resources and experiences, reducing the pressure to compare for individual success. This strengthens social support networks and reintroduces the value of interdependence, where well-being is measured by relationships and contributions to the group rather than personal wealth. Unlike the isolation and competition promoted by consumer culture, community living fosters empathy, mutualism, and human connection, providing fulfilment through shared experiences. These environments offer a sense of belonging, purpose, and security, all of which are critical for reducing stress and mental health issues.

**Consumer choice and liberty**  
A significant contributor to India's mental health crisis is the reduction of freedom to consumer choice. In India's middle-class expansion, many equate their ability to buy goods with personal freedom and success. However, this perspective prioritises material wealth over deeper values such as equality and fraternity. The result is a society where happiness is measured by buying power, leading to an endless cycle of consumption that does little to improve long-term mental health.

By reducing freedom to consumer choice, individuals feel growing inadequacy, unable to meet rising standards of success. In contrast, prioritising community, equality, and equity provides a healthier foundation for both personal well-being and societal progress. Addressing India's mental health crisis requires redefining what it means to live a good life. We must challenge the materialistic notion of success and reflect on mental, emotional, and social well-being. The solution lies in adopting alternative pathways that prioritise community and collective action over individual wealth accumulation.

Programmes that promote mutualism, social-emotional learning, community living, and mental health awareness are essential for creating a culture that values mental well-being. Additionally, social policies that reduce inequality and provide mental health support are crucial to address the crisis.

A truly good life is not about how much we can buy or achieve, but about how we relate to ourselves, our communities, and our environment. By prioritising community, equity, and mental well-being, we can build a healthier, more connected society where people feel supported and valued. Only by addressing the root causes of the mental health crisis can we pave the way for a more meaningful and fulfilling future for all.

## 2. Monetary Policy Committee Meeting 2024

### GS 3 (Economy)

#### • Why in News:

- The Reserve Bank of India (RBI) announced its fourth bi-monthly monetary policy for FY25 on October 9, 2024.
- The RBI's Monetary Policy Committee (MPC) decided to keep the repo rate unchanged at 6.5%, marking the **tenth consecutive time the rate** has remained steady. Five out of six MPC members voted in favour of maintaining the current rate.

## RBI holds rate at 6.5%, shifts stance to 'neutral'

Central Bank thus opens the door for a rate cut in the near future: Monetary Policy Committee notes that currently the macroeconomic parameters of inflation and growth are well balanced

Lalendu Mishra  
MUMBAI

The Reserve Bank of India (RBI) on Wednesday maintained its benchmark interest rate at 6.5% for the 10th successive monetary policy review since April 2023, but opened the door for a rate cut in the near future by shifting its policy stance to "neutral".

The status quo on interest rates was approved by a majority of five out of six members of the Monetary Policy Committee (MPC) which met for three days starting October 7, with three new external members on board.

The change of the policy stance from "withdrawal of accommodation" to "neutral" was, however, unanimously agreed upon by the committee, along with a resolve to unambiguously focus on a durable alignment of inflation with the target, while also supporting growth.

"The MPC noted that currently the macroeconomic parameters of inflation and growth are well balanced. Going forward, the moderation in headline inflation is expected to reverse in September and likely to remain elevated in the near-term due to adverse base effects, among other factors," RBI Governor Shaktikanta Das said.

"It is with a lot of effort that the inflation horse has been brought to the stable, that is closer to the target within the tolerance band compared to its heightened levels two years ago," Mr. Das said. Retail inflation was under the central bank's median target of 4% in July and August.

"We have to be very careful about opening the gate as the horse may simply bolt again. We must keep the horse under tight leash, so that we do not lose control. Going forward, we need to closely monitor the evolving conditions for further confirmation of the disinflationary impulses," he said.



Shaktikanta Das

The RBI did not alter its 7.2% GDP growth projection and the 4.5% average inflation estimate for 2024-25, with risks evenly balanced. However, it did lower its second quarter inflation projection to 4.4% from 4.4%, even as it expects that pace to pick up 4.8% in the October to December quarter.

Asked about the inflation analogy moving to horses from an elephant cited in earlier policy statements, Mr. Das said: "It is not a shift. Earlier I used elephant, this time I am using horse. The reason is that it is a war against inflation and in a war, elephants and horses are used historically."

Stating that domestic growth has sustained its momentum, with private consumption and investment growing in tandem, he said resilient growth had given the RBI the space to focus on inflation so as to ensure its durable descent to the 4% target. "In these circumstances, the MPC decided to remain watchful of the evolving inflation outlook in the coming months," the Governor said.

"Unexpected weather events and worsening of geopolitical conflicts constitute major upside risks to inflation," he said.

#### • Monetary Policy Committee (MPC)

##### ○ The Committee

- Under Section 45ZB of the amended RBI Act, 1934, the central government is empowered to constitute a six-member Monetary Policy Committee (MPC).
- MPC will determine the policy interest rate required to achieve the inflation target. The first such MPC was constituted in September 2016.

##### ○ Members of MPC

- As per the amended RBI act, the MPC shall consist of
  - the RBI Governor as its ex officio chairperson,
  - the Deputy Governor in charge of monetary policy,
  - an officer of the Bank to be nominated by the Central Board, and
  - three persons to be appointed by the central government.

##### ○ Functions of MPC

- **Setting Policy Interest Rates:** The primary function of the MPC is to determine the policy interest rates, specifically the repo rate.
- **Inflation Targeting:** The current inflation target set by the government is a Consumer Price Index (CPI) inflation target of 4% with a tolerance band of +/- 2%.
- **Economic Analysis and Forecasting:** The MPC conducts thorough analysis and forecasting of various economic indicators, including inflation, GDP growth, employment, fiscal conditions, and global economic developments.
- **Decision-Making:** The MPC meets at least four times a year to review the monetary policy stance.

#### • Current domestic and global situation against which the MPC meeting was held

- Domestic growth has continued its strong momentum, and the global economy has shown resilience since the last meeting.
- However, risks remain due to geopolitical conflicts, financial market instability, and high public debt.
- On the bright side, world trade is showing signs of recovery.

#### • Key highlights of the MPC meeting

##### ○ Key Policy rates remain unchanged

- **Repo Rate** - The repo rate now stands at 6.50 per cent.
  - Repo rate is the rate at which the Reserve Bank of India lends money to commercial banks in the event of any shortfall of funds.
- **The standing deposit facility (SDF)** - This rate stands at 6.25%.
  - The SDF is a liquidity window through which the RBI will give banks an option to park excess liquidity with it.
  - It is different from the reverse repo facility in that it does not require banks to provide collateral while parking funds.



- The idea of an SDF was first mooted in the **Urjit Patel Monetary Policy Committee report** in 2014.
- It later received the government's nod following an amendment to the RBI Act in 2018, vide the Finance Bill.
- **The marginal standing facility (MSF) rate** – It stands at 6.75%.
  - MSF is a window for banks to borrow from the central bank in an emergency situation when inter-bank liquidity dries up completely.
- **The Bank Rate** - It is now 6.75%.
  - Bank rate is the rate charged by the central bank for lending funds to commercial banks.
  - There is a slight difference between Bank Rate and Repo Rate. In Repo Rate, RBI lends money to the banks against securities for the short term only.
- **Policy stance changed**
  - The RBI has changed its policy stance changed to '**Neutral**' from '**Withdrawal of Accommodation**'.
    - **Withdrawal of accommodation** - It means reducing the money supply in the system to control inflation. It rules out the option of cutting rates
    - **Neutral stance** - This means that the central bank is open to either increasing or decreasing interest rates, depending on data related to inflation and economic growth.
- **GDP projection**
  - India's real GDP grew by 6.7 per cent in Q1.
  - For FY25, the RBI kept its gross domestic product (GDP) projection unchanged at 7.2 per cent.
- **Inflation projection**
  - The MPC projected inflation at **4.5 per cent for FY25**, the same as previously forecast.
  - The RBI reported that headline inflation dropped significantly to 3.6% in July and 3.7% in August from 5.1% in June.
  - However, the RBI warned that September inflation could rise due to adverse base effects and higher food prices, though food inflation is expected to ease by Q4 FY25 with better kharif and rabi harvests.
  - **Core inflation is likely to remain contained**, influencing the RBI's shift to a 'Neutral' policy stance.
  - Despite efforts to control inflation, risks such as unfavorable weather, geopolitical tensions, and rising food and metal prices could push inflation higher in the coming months.
- **Reserve Bank Climate Risk Information System (RB-CRIS)**
  - The RBI proposed to create a climate risk data repository, the RB-CRIS, to address gaps in climate-related data.
  - It will have two parts: a publicly accessible web-based directory of data sources like meteorological and geospatial information, and a data portal with **standardized datasets available only to regulated entities in phases**.
- **Enhancement of transaction and wallet limits for UPI**
  - **UPI Lite Wallet Limit Increased**
    - The RBI has increased the UPI Lite wallet limit from Rs 2,000 to Rs 5,000 and per-transaction limit for the same from Rs 500 to Rs 1,000.
    - UPI Lite operates without using real-time core banking systems, while ensuring risk mitigation.
    - UPI Lite is a simplified version of UPI that lets users make small transactions without a UPI PIN.
  - **UPI123 Pay Transaction Limit Enhanced**
    - The per-transaction limit for UPI123 Pay has been increased to ₹10,000 from ₹5,000. This feature is now available in 12 languages, broadening accessibility.
    - UPI 123PAY is a payment system mainly for non-smart phone/feature phone user by which they can make payment using UPI without Internet in a safe and secure manner.

- **Beneficiary Account Name Look-up Facility**
  - The RBI proposed a new 'beneficiary account name look-up facility' for RTGS and NEFT transactions.
  - This feature allows remitters to verify the beneficiary's name by entering the account number and branch IFSC code, reducing the chances of incorrect transfers and fraud.
- **Foreclosure Charges on MSE Loans Removed**
  - To promote transparency and customer-centric lending, the RBI has banned foreclosure charges and pre-payment penalties on loans to micro and small enterprises (MSEs).
    - Foreclosure refers to the complete repayment of the outstanding loan amount before the end of the loan tenure.
      - E.g., If one takes a home loan for 10 years but decides to repay the entire loan in 5 years, the lender might charge a fee for doing so.
    - Pre-payment is when a borrower pays off a part of the loan early (in addition to regular monthly payments).
      - E.g., If you pay an extra ₹1 lakh towards your home loan principal, in addition to your regular EMI, the lender may impose a penalty for reducing the loan balance early
    - Additionally, banks and NBFCs are prohibited from levying such charges on floating rate term loans to individuals for non-business purposes.

### 3. Tharu Tribe GS 1 (Art and Culture)

- **Why in News:** The Pradhan Mantri Awas Yojana (PMAY) homes bring smiles to women of the Tharu tribe in the Kheri district near the Indo-Nepal border.
- **About Tharu Tribe:**
  - The Tharu tribe is one of the indigenous groups living in the **Terai plain** on the **Indo-Nepal border**.
  - They live in both **India and Nepal**.
  - In the Indian terai, they live mostly in **Uttarakhand, Uttar Pradesh and Bihar**.
  - In 1967, this tribe was documented as a **Scheduled Tribe** by the Government of India.
  - **Language:** They have their own language called **Tharu** or Tharuhati, a language of the **Indo-Aryan subgroup** of the Indo-Iranian group of the **Indo-European family**.
  - **Economy:** Most Tharu practice **agriculture**, raise cattle, hunt, fish, and **collect forest products**.
  - Most of their food involves rice, lentils, and vegetables.
  - They **build their homes from bamboo and mud**.
  - **Society:**
    - Despite their **patrilineal social system**, **women have property rights** greatly exceeding those recognized in Hindu society.
    - Tharu **marriages are patrilocal within the tribe**.
    - A common feature of the Tharu community is the **joint family system of living in long houses**.
    - Tharus live in **compact villages**, usually in the middle of a forest clearing. Each village is **governed by a council and a headman**.

#### 4. MQ-9B Drones GS 2 (Security)

- **Why in News:** The **Cabinet Committee on Security (CCS)** has approved significant defense deals aimed at enhancing India's military capabilities, particularly in the naval domain. This includes the indigenous construction of nuclear-powered attack submarines and the acquisition of **31 MQ-9B remotely piloted aircraft (RPAs)** from the **United States**.
- **About MQ-9B Drone**
  - The MQ-9B is a **high-altitude, long-endurance (HALE)** remotely piloted aircraft system developed by General Atomics.
  - It is designed for a range of missions, including **intelligence, surveillance, and reconnaissance (ISR) operations**.
  - The MQ-9B can operate in various environments and is equipped with advanced sensors, including **synthetic aperture radar and electro-optical/infrared (EO/IR) cameras**, allowing it to conduct detailed surveillance and reconnaissance tasks.
  - Additionally, the drone can perform precision strikes on strategic targets, making it a versatile asset for military operations.
  - The Indian Armed Forces will receive a mix of **16 Sky Guardian** and **15 Sea Guardian** variants, which will be assembled in India.
  - The acquisition is part of a broader effort to enhance India's operational capabilities in both land and maritime domains, particularly in light of recent geopolitical tensions.
  - The use of MQ-9B drones is expected to provide India with improved situational awareness and the ability to conduct effective operations across diverse scenarios.

### CCS clears deals for 31 MQ-9B drones and submarines

Dinakar Peri  
NEW DELHI

The Cabinet Committee on Security on Wednesday approved two high-profile deals for the purchase of 31 MQ-9B High Altitude Long Endurance (HALE) Unmanned Aerial Vehicles (UAV) from General Atomics of the U.S. and indigenous construction of two nuclear attack submarines (SSNs).

The MQ-9B HALE UAVs are for the three services, as confirmed by two official sources.

Approval from CCS is the final step and the MQ-9B deal now awaits formal conclusion. As part of the deal, General Atomics is scheduled to establish a Global Maintenance, Repair and Overhaul (MRO) facility in India which would count towards offset obligations.

As reported by *The Hindu* earlier in end-July, the Defence Acquisition Council (DAC) chaired by Mr. Singh had approved amendments to the MQ-9B deal related to indigenous content and related aspects.

The deal for 31 MQ-9B UAVs, 15 Sea Guardians for the Indian Navy and 16 Sky Guardians, eight each for the Indian Army and Air



Approval from CCS is the final step and the MQ-9B deal now awaits formal conclusion.

Force, is estimated to cost \$3.99 billion.

India has already indigenously manufactured nuclear-powered ballistic missile submarines (SSBN) and the SSN project will be a follow-on to that.

India's second SSBN, *INS Arighaat*, was commissioned into service at Visakhapatnam in end-August joining *INS Arihant*, which was commissioned into service in 2016.

The SSNs are a critical requirement for the Navy as they give unlimited endurance to perform a variety of tasks, their endurance only limited by that of the crew.

India has in the past leased two SSNs from Russia and a third SSN which has been contracted is expected to join service in another two or three years after some delay.

#### 5. National Maritime Heritage Complex (NMHC) GS 2 (Governance)

- **Why in News:** The Union Cabinet recently approved the development of the National Maritime Heritage Complex (NMHC) in Lothal, Gujarat.
- **About National Maritime Heritage Complex (NMHC):**
  - Under the **Sagarmala programme**, the **Ministry of Ports, Shipping, and Waterways** is developing the NMHC, a world-class facility at **Lothal, Gujarat**.
  - NMHC is set to become an international tourist destination, **showcasing India's maritime heritage** from ancient to modern times through an **edutainment approach** utilizing the latest technology.
  - The project will be **completed in phases**:
    - **Phase 1A** will have an **NMHC museum** with **6 galleries**, which also includes an **Indian Navy & Coast Guard gallery** envisaged to be one of the largest in the country with external naval artifacts, a **replica model of Lothal township** surrounded by an open aquatic gallery, and a jetty walkway.
    - **Phase 1B** will have NMHC museum with **8 more galleries**, **Light house museum** which is **planned to be the world's tallest**, Bagicha complex (with a car parking facility for about 1500 cars, a food hall, a medical centre, etc.).
    - **Phase 2** will have **Coastal States Pavilions** (to be developed by respective coastal states and union territories), Hospitality Zone (with maritime theme eco resorts and museotels), Recreation of real-time Lothal City, **Maritime Institute** and hostel and **4 theme-based**



**parks** (Maritime & Naval Theme Park, Climate Change Theme Park, Monuments Park, and Adventure & Amusement Park).

- **Phases 1A and 1B** of the project are to be developed in **Engineering, Procurement and Construction (EPC) mode** and **Phase 2** of the project will be **developed through land subleasing/ PPP** to establish NMHC as a world-class heritage museum.
- A **separate society** will be set up for the **development of future phases**, to be governed by a **Governing Council headed by the Minister of Ports, Shipping and Waterways** under the Societies Registration Act, 186
- This society will manage the implementation and operation of the NMHC.

## 6. Nobel Prize in Chemistry for Decoding Protein Design and Structures

### Recent events of importance

#### • Why in News:

- The 2024 Nobel Prize for chemistry will be shared by (American scientist) **David Baker** “for computational protein design” along with (Briton scientist) **Demis Hassabis** and (American scientist) **John Jumper** “for protein structure prediction.”
- Last year the Nobel Prize for Chemistry was jointly awarded to Moungi G. Bawendi, Louis E. Brus and Alexei I. Ekimov for the discovery and synthesis of quantum dots.

#### • Why is Work on Protein Important?

##### ○ The role played by proteins:

- Proteins are **vital for life** and participate in nearly all biological processes. **For example:** Haemoglobin transports oxygen and Insulin aids in glucose absorption.
- Hence, any disruption in protein production can impact human health.

##### ○ Significance of protein structure:

- Made of long chains of 20 different amino acids, **their unique sequences determine their structure and function.**
- Understanding a protein's shape is key to knowing how it works.

- **Challenges in determining protein structure:** Historically, determining protein structures has been slow, often taking months or years using x-ray crystallography.

#### • What the 2024 Chemistry Nobel was Awarded For?

##### ○ For creating innovative tool - AlphaFold:

- AlphaFold is an **AI tool** created by Hassabis and Jumper that accurately predicts protein structures in a fraction of the time.
- It utilises known amino acid sequences to make fast and reliable predictions.

##### ○ For designing new proteins:

- Baker created **Rosetta software** to predict protein structures.
- He used Rosetta to reverse-engineer protein design, allowing the creation of new proteins by entering desired structures.
- David Baker developed **synthetic proteins** that do not exist in nature.
- As his methods are more efficient, it allowed for **quicker development of proteins for specific tasks**, like breaking down plastics.

## Trio wins Chemistry Nobel for work on protein design and prediction of structures

Vasudevan Mukunth  
CHENNAI

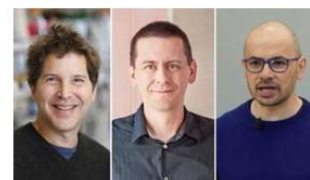
The 2024 Nobel Prize for Chemistry was shared by David Baker “for computational protein design” along with Demis Hassabis and John Jumper “for protein structure prediction,” the Royal Swedish Academy of Sciences announced on Wednesday.

Heiner Linke, chair of the Nobel Committee for Chemistry, said the award honoured research that connected the sequence of amino acids that make up a protein and the protein's structure.

Mr. Baker led a team that in 2003 designed a new protein using bespoke software methods. They and others have since refined these methods to be able to point the way to ‘designer’ proteins intended for specific applications.

Johan Aqvist, a former chair of the chemistry Nobel Committee, called the variety of proteins developed by Mr. Baker et al. to be “absolutely mind-blowing” and that “it seems that you can almost construct any type of protein with this technology”.

Mr. Hassabis and Mr. Jumper received the other half of the prize for their hand in developing an artificial intelligence model called AlphaFold 2 that could predict the structures of millions of proteins. Human scientists had done that for only around 1.7 lakh proteins



**Glory moment:** (From left) David Baker, John Jumper and Demis Hassabis, the recipients of Nobel Prize for Chemistry, 2024. AP



With skillful use of artificial intelligence, Demis Hassabis and John Jumper made it possible to predict the complex structure of essentially any known protein in nature

**HEINER LINKE**  
chair of the Nobel Committee

until then, although the structures and patterns therein were used to train AlphaFold.

“Four years ago in 2020, Demis Hassabis and John Jumper managed to crack the code. With skillful use of artificial intelligence, they made it possible to predict the complex structure of essentially any known protein in nature,” Mr. Linke said.

##### Unusual pattern

The Nobel Prize for Mr. Hassabis and Mr. Jumper comes relatively quickly after the corresponding

work, around four to six years. There is usually a gap of a few decades between the work and the prize because the former does not immediately prove to be of “greatest benefit to humankind” – a criterion for winning.

For example, John Goodenough shared the 2019 chemistry prize for his work on lithium-ion batteries in 1970s. John Nash, Jr. won part of the Nobel Memorial Prize in Economic Sciences in 1994 for work he had done in the 1950s.

The chemistry prize this year also continues a relatively new tradition in this category of the prize going to non-chemists – although 1981 chemistry laureate Roald Hoffmann has interpreted this to be a mark of chemistry’s “far and influential reach”, especially in biochemistry and molecular biology.

Mr. Baker works at the University of Washington in Seattle and Mr. Hassabis and Mr. Jumper work at Google DeepMind in London.

- **What Makes the 2024 Chemistry Nobel Significant?**
  - **Simplifies understanding of proteins:** Enhanced visualisation of protein structures helps understand biological functions and disease mechanisms, including antibiotic resistance and microbial degradation of plastics.
  - **Key to understanding critical areas:** The ability to design proteins with novel functions opens doors to: **nanomaterials, targeted pharmaceuticals, rapid vaccine development and environmental solutions.**
  - **Curing diseases:** These innovations have far-reaching implications for developing new treatments and addressing protein-related diseases.
  - **Recognition to AI:** The Nobel Prize emphasises the transformative role of AI in biological research.
- **Interesting facts about the 2024 Chemistry Nobel:**
  - **Winners:** Baker works at the University of Washington in Seattle and Hassabis and Jumper work at Google DeepMind in London.
  - **Comes relatively quicker:**
    - The Nobel Prize for Hassabis and Jumper comes relatively quickly after the corresponding work (of around 4 to 6 years).
    - **There is usually a gap of a few decades** between the work and the prize because the former doesn't immediately prove to be of greatest benefit to humankind, which is a criterion for winning.
    - **For example,** John Goodenough shared the 2019 chemistry prize for his work on lithium-ion batteries in the late 1970s.
  - **Given to non-chemists:**
    - The Chemistry Nobel this year also continues a relatively new tradition in this category of the prize going to non-chemists.
    - In 1981, chemistry laureate Roald Hoffmann interpreted this to be a mark of **chemistry's far and influential reach**, especially in biochemistry and molecular biology.

## 7. Universal supply of fortified rice till December 2028 GS 2 (Governance)

- **Why in News:**
  - The Union cabinet, chaired by PM Modi, approved the continuation of the universal supply of fortified rice under all Union government schemes, including the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY), from July 2024 until December 2028.
  - The rice fortification initiative will continue as a central sector initiative with 100% funding by the Centre as part of PMGKAY (Food Subsidy), thus providing a unified institutional mechanism for implementation.
- **Rice fortification**
  - **About/definition**
    - The Food Safety and Standards Authority of India (FSSAI) defines fortification as the deliberate addition of essential micronutrients to food to improve nutritional quality and provide public health benefits, with minimal health risks.
  - **Need for fortification of rice**
    - **Malnutrition in India**
      - India faces high levels of malnutrition, especially among women and children.
      - According to the National Family Health Survey (NFHS-5), anaemia affects a significant portion of the population, **with every second woman being anaemic and every third child stunted.**

### Rice with added nutrients, Centre to continue supply until 2028

HARISHARAN SHARMA  
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THE UNION Cabinet on Wednesday extended the universal supply of fortified rice to all central government schemes providing free food grains under the National Food Security Act, 2013, in its present form, until December 2028.

In a briefing on the Cabinet decision, Union Information and Broadcasting Minister Anurag Kashyap said that the aim of the move is to address anaemia and micronutrient deficiency.

The Cabinet Committee on Economic Affairs (CCEA), in April 2022, had decided to implement the rice fortification initiative through the country's public distribution system.

By March 2024, all three planned phases have now been successfully completed, with the coverage of universal coverage achieved by March 2024, an official statement following the Cabinet announcement said.

**What is rice fortification, and why is it needed?**

The Food Safety and Standards Authority of India (FSSAI) defines fortification as the deliberate addition of essential micronutrients to food to improve nutritional quality and provide public health benefits, with minimal health risks.

India has a high level of malnutrition among women and children.

According to the National Family Health Survey (NFHS-5) conducted between 2019 and 2022, anaemia remains a widespread issue in India, affecting children, women, and men across various age groups and income levels. Besides micronutrient deficiencies, iron and vitamin deficiencies, such as Vitamin B12 and folic acid, also persist, impacting the overall health and productivity of the population.

The aforementioned government statement said.

Fortification of food is considered to be one of the most suitable methods to combat malnutrition. Rice is one of India's staple foods, which is consumed by about two-thirds of the population. Per capita rice consumption in India is 4.6 kg per month. Fortifying rice with micronutrients is a simple way to supplement the diet of the poor.

**What is the process by which rice is fortified?**

Various technologies, such as coating, dusting, and extrusion, are available to add micronutrients to regular rice. The most common technology involves the production of fortified rice through a process known as 'rice extrusion'.

In this process, rice is mixed with a premix of micronutrients, and water is added to this mixture, which is then passed through a twin-screw extruder with heating zones. Ronds similar in shape and size to rice are produced, which, as per Ministry of Consumer Affairs, Food and Public Distribution guidelines, must "resemble the normal milled rice as closely as possible".

The kernels are dried, cooked, and packed. IRRI has a shelf life of about 12 months.

The kernels are blended with regular rice to produce fortified rice, as per the Ministry's guidelines. Up to 1% must be blended with regular rice.

According to FSSAI norms, 1 kg of fortified rice will contain the following: iron (26 mg-42.5 mg), folic acid (75-125 mcg), and vitamin B12 (10.75-12.5 mcg).

Rice may also be fortified with zinc (10 mg-15 mg), vitamin A (500-750 mcg/kg), vitamin B1 (1.1 mg-1.5 mg), vitamin B2 (1.25 mg-1.75 mg), vitamin B3 (12.5 mg-20 mg), and vitamin B6 (1.5 mg-2.5 mg) per kg.

**How is fortified rice cooked and eaten?**

It is no different from the way any rice is cooked and eaten. The rice needs to be drained and washed in the normal way before cooking.

After cooking, fortified rice retains the same physical properties and consistency as regular rice, making it suitable for use in all recipes.

Fortified rice is packed in jute bags with the logo 'e-P' and the label 'Fortified with Iron, Folic Acid and Vitamin B12'.

**How has the fortification initiative fared so far?**

While independent reports in 2015, Prime Minister Narendra Modi announced that rice distributed under various central government schemes like the Public Distribution System (PDS) and Mid-Day Meal Scheme in schools, would be fortified by 2024. In April 2022, the Centre decided to phase-wise plan to implement the rice fortification initiative.

PMKAY had already been implemented when the Centre's plan was cleared. It saw two programmes — Integrated Child Development Services and PM POSHAN — converge by March 2022.

PMKAY 2 extended the supply of fortified rice to PDS and other welfare schemes in 112 Aspirational Districts in 27 states and 251 high-mountain blocks from March 2023.

PMKAY 3 saw all remaining districts in the country get covered under the initiative by March 2024.

The total rice fortification is around 1.2 billion annual total food subsidy bill. Since the 2015-16 fiscal year through March 31, 2024, approximately 400 lakh metric tonnes (LMT) of fortified rice have been distributed through the PDS, the government said in a statement issued in July this year.

As per officials, there are 100 fortified rice manufacturers in the country with a capacity of 11.1 LMT per annum. 100 produced by these manufacturers are sent to India's 21,000+ co-operatives for blending, fortified blends in these mills have a monthly capacity to produce 223,387 MT of fortified rice.

According to Vaidhyan, the Centre has invested Rs 1,000 crore in developing the fortified rice supply chain in India.



- Deficiencies in iron, Vitamin B12, and folic acid are widespread, affecting health and productivity.
- **Fortification of Rice as a Solution**
  - **Rice, a staple food for two-thirds of India's population**, is considered an ideal candidate for fortification to address malnutrition.
  - Per capita rice consumption in India is 6.8 kg per month, and fortifying it with micronutrients can help supplement the diet of the poor.
- **Fortification Process**
  - Fortification technologies include coating, dusting, and extrusion, with extrusion being the most suitable for India.
  - In extrusion, dry rice flour is mixed with micronutrients and water, the passed through an extruder to create fortified rice kernels (FRKs), which resemble regular rice.
  - These kernels are blended with regular rice in a 10g FRK to 1 kg rice ratio to produce fortified rice.
- **Nutrient Content in Fortified Rice**
  - According to FSSAI standards, 1 kg of fortified rice contains:
    - Iron: 28 mg-42.5 mg
    - Folic acid: 75-125 micrograms
    - Vitamin B12: 0.75-1.25 micrograms
  - It may also be fortified with other micronutrients like zinc, vitamin A, and various B vitamins.
- **Cooking and Consumption of Fortified Rice**
  - Fortified rice is cooked and eaten just like regular rice, and it retains its micronutrient levels after cooking.
  - Packaging is marked with a logo ('+F') and labeled as "Fortified with Iron, Folic Acid, and Vitamin B12."
- **Progress of the Rice Fortification Initiative**
  - In 2015, PM Modi announced that rice distributed under government schemes, such as the Public Distribution System (PDS) and Mid-Day Meal Scheme, would be fortified by 2024.
  - The Centre implemented the initiative in phases
    - **Phase 1:** Integrated Child Development Services and PM POSHAN by March 2022.
    - **Phase 2:** PDS and welfare schemes in 112 Aspirational Districts by March 2023.
    - **Phase 3:** Full nationwide coverage by March 2024.
  - **Cost and Scale of the Initiative**
    - The annual cost of **rice fortification is about ₹2,700 crore, less than 2% of India's food subsidy bill.**
    - From 2019 to March 2024, 406 lakh metric tonnes of fortified rice have been distributed through the PDS.
    - There are 925 fortified rice manufacturers with a capacity of 111 lakh metric tonnes per annum, and rice mills have a capacity of 223 lakh metric tonnes for blending.
    - The government has invested ₹11,000 crore in developing the fortified rice supply chain.
- **Pradhan Mantri Garib Kalyan Anna Yojana (PM-GKAY)**
  - **About**
    - PM-GKAY is a food security welfare scheme announced by the Central Government in March 2020, during the **Covid-19 pandemic**.
    - It is a part of Pradhan Mantri Garib Kalyan Package (PMGKP) to help the poor fight the battle against Covid-19.
  - **Objective:**
    - To feed the poorest citizens of India by providing grain through the Public Distribution System, to all the **priority households** (ration card holders and those identified by the Antyodaya Anna Yojana scheme).
    - Launched in 2000, Antyodaya Anna Yojana is a Centrally Sponsored Scheme to provide highly subsidised food to millions of the poorest families.
  - **Entitlement**



- The eligible ration cardholders under NFSA 2013 were entitled to 5 kg free wheat/rice per person per month.
- This was in addition to the 5 kg food grains already provided to the beneficiaries under the National Food Security Act, 2013.
- **Implementing Agency:**
  - Department of Food and Public Distribution, Ministry of Consumer Affairs, Food and Public Distribution.
- **Merger of PM-GKAY and NFSA**
  - In December 2022, the **Government amalgamated PMGKAY with NFSA.**
  - After the merger, the entire quantity of 5 kg and 35 kg under the NFSA was made available free of cost.
    - With this, India has a Central food security legislation which gives the poor a 'right' to receive 5 kg foodgrains free of cost.
    - Earlier, beneficiaries paid a small price of Rs 3 per kg for rice and Rs 2 per kg for wheat.
- **Extension of PM-GKAY**
  - The scheme was extended for five years, starting January 1, 2024.
  - It was previously extended until December 31, 2023
- **National Food Security Act (NFSA)**
  - The NFSA, 2013 was notified to provide for food and nutritional security, by ensuring access to adequate quantity of quality food at affordable prices to people to live a life with dignity.
  - It provides a **legal right** to persons belonging to "eligible households" to receive food grains at subsidised price/central issue prices under the Targeted Public Distribution System (TPDS).
  - State governments are tasked with identifying Antyodaya Anna Yojana (AAY - poorest of the poor) and priority households (PHH) beneficiaries within the TPDS-covered population.
  - Every person in the PHH category receives 5 kg of food grains per month at - **rice at Rs 3/kg, wheat at Rs 2/kg and coarse grain at Re 1/kg.**
    - Each Antyodaya Anna Yojana (AAY) **household gets Rs 35 kg of food grains per month.**
  - The Act covers up to 75% of the rural population and up to 50% of the urban population for receiving subsidised food grains (overall **67%** of the total population).

**MCQ Current Affairs**  
**10<sup>th</sup> Oct, 2024**

1. **Where is the National Maritime Heritage Complex (NMHC) being developed?**
  - a) Mumbai, Maharashtra
  - b) Visakhapatnam, Andhra Pradesh
  - c) Kochi, Kerala
  - d) Lothal, Gujarat
  
2. **In which one of the following groups of states is the Tharu tribe mostly found?**
  - a) Punjab, Haryana, Rajasthan
  - b) Assam, Meghalaya, Manipur
  - c) Uttarakhand, Uttar Pradesh, Bihar
  - d) Maharashtra, Gujarat, Madhya Pradesh
  
3. **Consider the following statements regarding Rice Fortification:**
  - A. It is a process of adding Fortified Rice Kernels which is nearly identical to traditional rice in aroma and taste.
  - B. It helps in addressing the micronutrient deficiency.

Which of the statements given above is/are correct?

  - a) A only
  - b) B only
  - c) A and B
  - d) Neither of two
  
4. **IBSAMAR Exercise, recently in news, is conducted between:**
  - a) India, Brazil and South Africa
  - b) India, Brazil South Korea
  - c) India, Brunei and South Africa
  - d) Israel, Brazil and South Africa
  
5. **INS Nirdeshak, recently in news, is a:**
  - a) Submarine
  - b) Aircraft carrier
  - c) Guided Missile Destroyer
  - d) Survey Vessel



**Answers Current Affairs**  
**10<sup>th</sup> Oct, 2024**

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1. d
2. c
3. c
4. a
5. d

