



The Nobel Prize in Physics 2024

For Prelims: [Nobel Prize](#), [Artificial neural networks](#), [Machine learning](#), [Artificial Intelligence](#), [ChatGPT](#), [Artificial neurons](#), [Nobel Prize in Physics 2023](#), [Deep learning](#), Recurrent Neural Networks

For Mains: Advancements in AI and machine learning, IT & Computers, Artificial Neural Network.

[Source: TH](#)

Why in News?

The **2024 Nobel Prize in Physics** has been awarded by the **Royal Swedish Academy of Sciences** to **John J. Hopfield** and **Geoffrey E. Hinton**, two pioneers whose groundbreaking work laid the foundation for **modern artificial neural networks (ANNs) and machine learning (ML)**.

- Their work has had profound implications for various fields, from physics to biology, finance, medicine and chat [Artificial Intelligence \(AI\)](#) apps, including [OpenAI's ChatGPT \(Generative Pre-trained Transformer\)](#).



What is the Contribution of John Hopfield?

- **Hopfield Network:** John Hopfield, is best known for creating the **Hopfield network**, a type of **recurrent neural network (RNN)** that has been foundational in ANN and AI.
 - Developed in the 1980s, the Hopfield network is designed to store simple **binary patterns (0s and 1s)** across a network of artificial nodes (artificial neurons).
 - A key feature of the network is **associative memory**, which allows it to **retrieve complete information from incomplete or distorted inputs** (similar to how the human brain recalls memories when triggered by familiar sensations, like a scent).
 - The Hopfield network, based on **Hebbian learning** (a concept in neuropsychology where

repeated interactions between neurons strengthen their connections).

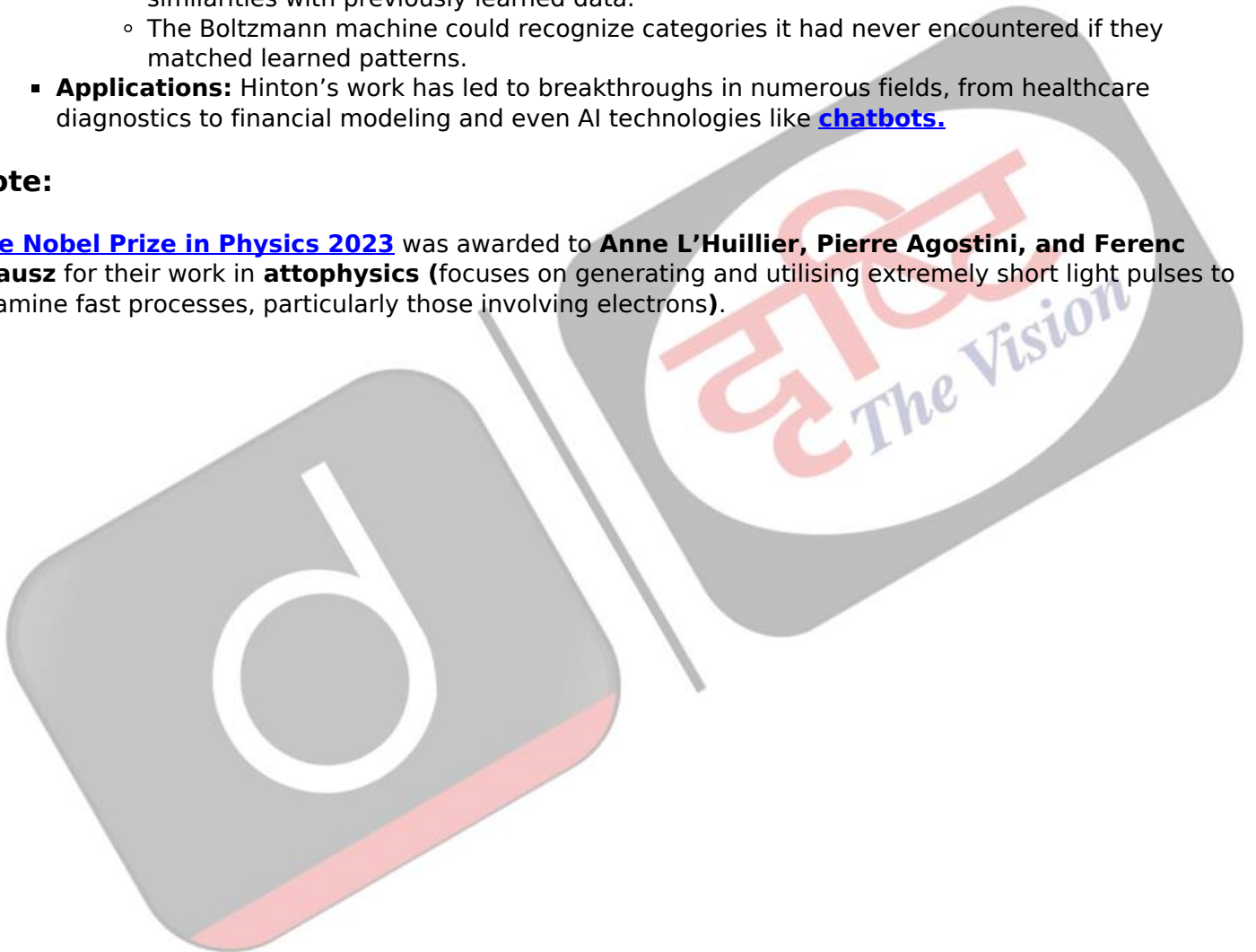
- By drawing parallels to atomic behavior, Hopfield used statistical physics to make the network perform **pattern recognition and noise reduction** by minimising energy states, a breakthrough in advancing neural networks and AI by mimicking biological brain functions.
- **Impact:** Hopfield's model system has been used to solve **computational tasks, complete patterns, and improve image processing.**

What is the Contribution of Geoffrey Hinton?

- **Restricted Boltzmann Machines (RBMs):** Building on Hopfield's work, in the 2000s, Hinton developed a learning algorithm for **Restricted Boltzmann Machines (RBMs)**, which enabled deep learning by stacking multiple layers of neurons.
 - The RBMs could learn from **examples rather than explicit instructions.** This was revolutionary because it allowed the machine to recognize new patterns based on similarities with previously learned data.
 - The Boltzmann machine could recognize categories it had never encountered if they matched learned patterns.
- **Applications:** Hinton's work has led to breakthroughs in numerous fields, from healthcare diagnostics to financial modeling and even AI technologies like [chatbots](#).

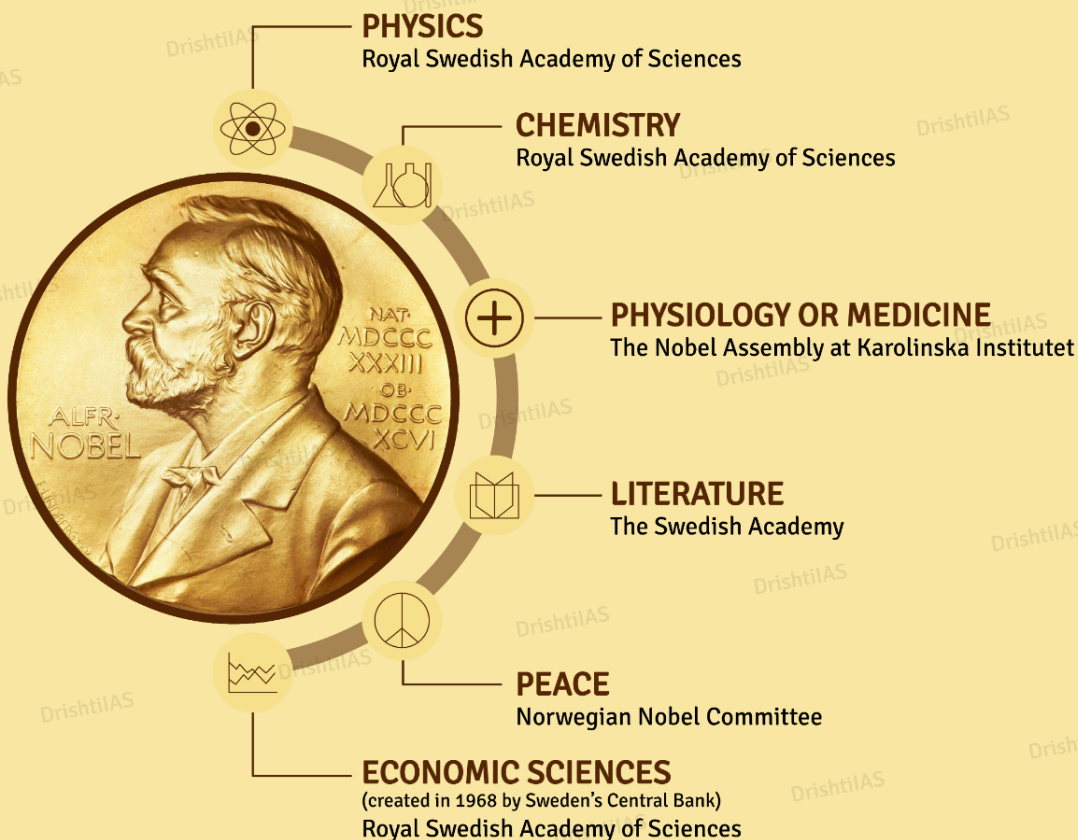
Note:

[The Nobel Prize in Physics 2023](#) was awarded to **Anne L'Huillier, Pierre Agostini, and Ferenc Krausz** for their work in **attophysics** (focuses on generating and utilising extremely short light pulses to examine fast processes, particularly those involving electrons).



Nobel Prize

- ✦ Established by the will of Alfred Nobel (inventor of Dynamite)
- ✦ Awarded to those who have conferred the greatest benefit to humankind, during the preceding year
- ✦ First awards were handed out in 1901



- ✦ The Prize Ceremony is held in Stockholm, Sweden, in December every year
 - ▲ The Peace Prize is not awarded at Stockholm ceremony but presented annually in Oslo, Norway, on the same day
- ✦ Each Nobel laureate receives a gold medal, a diploma, and a monetary award
- ✦ Nobel Prize cannot be given posthumously (after death). Also, up to 3 people can share a Nobel Prize award between them

✦ **First Indian Nobel Laureate: Rabindranath Tagore for Literature, 1913**

▲ **First Indian Woman Nobel Laureate: Mother Teresa for Peace, 1979**

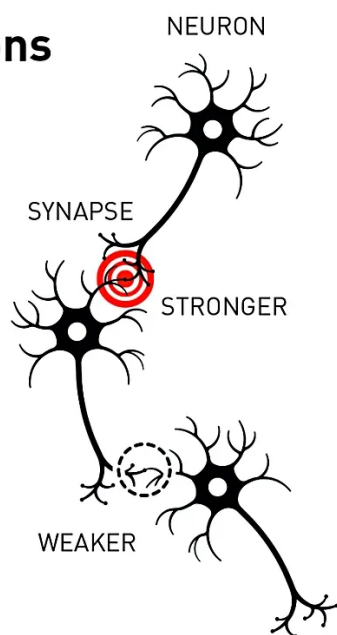


What are Artificial Neural Networks (ANNs)?

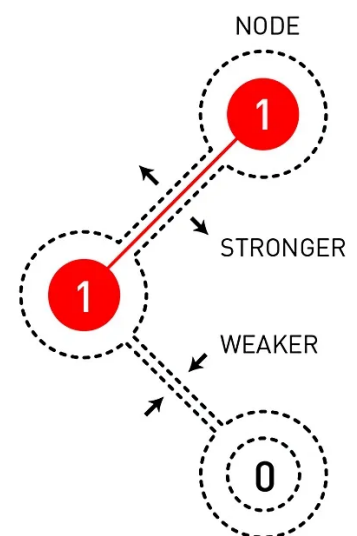
- **About:** ANNs are inspired by the structure of the brain, where **biological neurons** are interconnected to perform complex tasks. In ANNs, **artificial neurons (nodes)** process information collectively, allowing data to flow through the system, similar to brain **synapses**.
- **Common Architectures of ANNs:**
 - **Recurrent Neural Networks (RNNs):** It is trained on **sequential or time series data** to create a **machine learning (ML) model** that can make sequential predictions or conclusions based on sequential inputs.
 - **Convolutional Neural Networks (CNNs):** Designed for **grid-like data** (e.g., images), CNNs use three-dimensional data for image classification and object recognition tasks.
 - **Feedforward Neural Networks:** The simplest architecture, where information flows in one direction from input to output with fully connected layers.
 - It is simpler than recurrent and convolutional neural networks.
 - **Autoencoders:** Used for unsupervised learning, they take input data, compress it to keep only the most important parts, and then rebuild the original data from this compressed version.
 - **Generative Adversarial Networks (GANs):** They are a powerful type of neural network used for unsupervised learning. They consist of **two networks:** a **generator**, which creates fake data, and a **discriminator**, which distinguishes between real and fake data.
 - Through this adversarial training (a machine learning technique that helps models become more robust), GANs produce realistic, high-quality samples.
 - They are versatile AI tools widely used in image synthesis, style transfer, and text-to-image synthesis, revolutionising generative modelling.

Natural and artificial neurons

The brain's neural network is built from living cells, neurons, with advanced internal machinery. They can send signals to each other through the synapses. When we learn things, the connections between some neurons gets stronger, while others get weaker.



Artificial neural networks are built from nodes that are coded with a value. The nodes are connected to each other and, when the network is trained, the connections between nodes that are active at the same time get stronger, otherwise they get weaker.



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What is Machine Learning?

- **About:** It is a branch of **Artificial intelligence (AI)** that uses data and algorithms to enable **computers to learn from experience** and improve their accuracy over time.
- **Operating Mechanism:**
 - **Decision Process:** Algorithms predict or classify data based on input, which can be labelled or unlabeled.
 - **Error Function:** This function evaluates the model's predictions against known examples to assess accuracy.

- **Model Optimization Process:** The model iteratively adjusts its weights to improve its predictions until it reaches an acceptable level of accuracy.
- **Machine Learning vs. Deep Learning vs. Neural Networks:**
 - **Hierarchy:** AI encompasses ML; ML encompasses [deep learning](#); deep learning relies on neural networks.
 - **Deep Learning:** A subset of machine learning that uses **neural networks with many layers (deep neural networks)** and can process unstructured data without needing labelled datasets.
 - **Neural Networks:** A specific type of machine learning model structured in layers (input, hidden, output) that mimic how the human brain works.
 - **Complexity:** As transition from AI to neural networks, the complexity and the specificity of tasks increase, with deep learning and neural networks being specialised tools within the broader AI framework.



Artificial Intelligence(AI)

AI is the simulation of human intelligence in machines programmed to think and learn like humans, capable of problem-solving, reasoning, and adapting to new information.

AI Timeline - Major Milestones

- 1950s** Turing Test Proposed; First AI Programs Developed
- 1956** Dartmouth Conference Coins "Artificial Intelligence"
- 1960s** Eliza Chatbot Created; Early Neural Networks Emerge
- 1996** Deep Blue - a Chess-Playing Program
- 2012** Deep Learning Breakthrough in Image Recognition
- 2014** Generative Adversarial Networks (GANs) Introduced
- 2020** GPT-3 Demonstrates Advanced Language Generation
- 2022** Chatgpt Launches, Bringing Conversational AI to Masses
- 2023** Generative AI Boom; Major Tech Companies Release AI Models



Applications of AI

- ➔ **Healthcare:** Personalised medicine
- ➔ **Finance:** Algorithmic trading
- ➔ **Transportation:** Autonomous vehicles
- ➔ **Marketing & Customer Service:** Targeted advertising, chatbots
- ➔ **Education:** Adaptive learning systems, personalised tutoring
- ➔ **Agriculture:** Crop monitoring
- ➔ **Cybersecurity:** Threat detection
- ➔ **Energy:** Smart grid management, consumption forecasting

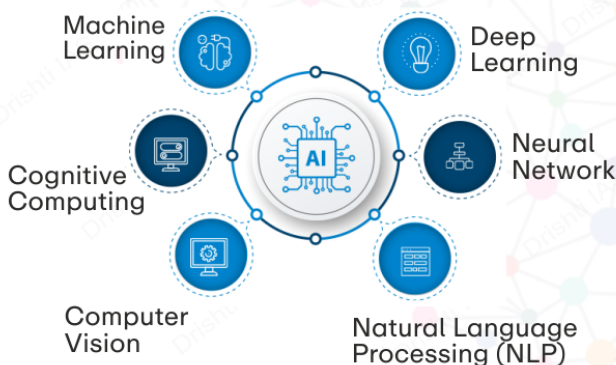
Concerns

- ➔ Deepfakes & misinformation
- ➔ Algorithmic bias
- ➔ Automation & job displacement
- ➔ Privacy issues
- ➔ Data ownership & liability issue
- ➔ Ethical decision-making complexes

Regulating AI

- ➔ **Global Partnership on AI (GPAI)** launched in 2020
- ➔ **Bletchley Declaration (2023):** Enhance Global Collaboration on AI
- ➔ **G20 New Delhi Leaders' Declaration (2023):** Harnessing AI responsibly for good and for all
- ➔ **Hiroshima AI Process (2023)** by G7

KEY COMPONENTS OF AI



India and AI

- ➔ **National Strategy For AI 2018**
- ➔ **AI For All:** Self-learning online program
- ➔ **GPAI Summit 2023** hosted by India
- ➔ **IndiaAI Mission 2024**
- ➔ **US India Artificial Intelligence (USIAI) Initiative:** AI cooperation in critical areas
- ➔ **AIRAWAT (AI Research, Analytics and Knowledge Assimilation Platform):** Supercomputer

Drishti Mains Question:

Analyze the impact of neural networks and machine learning on modern technology. Provide examples of their applications in various sectors.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

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

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

Select the correct answer using the code given below:

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

Ans: (b)

Mains:

Q. Impact of digital technology as a reliable source of input for rational decision making is an issue. Critically evaluate with suitable examples. (2021)

Ultra-Processed and Fast Foods Making India Diabetic

For Prelims: [Ultra-Processed Foods](#), [Diabetic Capital](#), [Oxidative Stress](#), [Insulin](#), Advanced Glycation End Products, [Food Processing](#), [Sweeteners](#), [Saturated Fat](#), [Food Safety and Standards Authority of India \(FSSAI\)](#), [High in Fat, Sugar, and Salt \(HFSS\) Foods](#), [Saksham Anganwadi](#), [Poshan 2.0](#).

For Mains: Impact of ultra-processed foods (UPFs) on public health, Measures to promote healthier dietary practices.

[Source: TH](#)

Why in News?

Recently, a study published in the *International Journal of Food Sciences and Nutrition* highlights the role of **advanced glycation end products (AGEs)** found in [ultra-processed](#) and [fast foods](#) in India's

increasing diabetes cases.

- The clinical trial was the first of its kind in India and was funded by the **Department of Biotechnology** under the **Ministry of Science and Technology**.

What are the Key Highlights of the Study?

- **Role of AGEs:** The high intake of **AGE-rich foods** is a major factor behind India's status as the "**diabetic capital**" of the world, with over **101 million people** affected.
 - AGEs are **harmful compounds** formed through **glycation**, a process where **sugars react with proteins or fats** during high-temperature cooking, like frying or roasting.
 - AGEs contribute to **oxidative stress**, which is an imbalance between **free radicals and antioxidants**, leading to inflammation and cell damage.
- **Susceptibility to Diabetes:** Ultra-processed foods (UPFs) cause **rapid blood sugar spikes and insulin resistance** over time.
 - Low in fibre and high in calories, they also contribute to **weight gain and obesity**, major diabetes risk factors.
- **Impact on Insulin Sensitivity:** **Low-AGE diets**, which primarily included foods cooked by boiling or steaming, showed **improved insulin sensitivity** and reduced inflammatory levels compared to those on high-AGE diets.
 - Reducing AGEs in the diet could be a **viable strategy** for mitigating diabetes risk, particularly for those at high risk of developing **type 2 diabetes**.

Note:

- **Prevalence of Diabetes in India:** The prevalence of diabetes in India was **11.4% in 2021**. This equates to approximately **101 million Indians** suffering from diabetes.
- The **rapid nutrition transition** in India, with increased consumption of **refined carbohydrates, fats, and animal products**, along with **sedentary lifestyles**, has further escalated the prevalence of obesity and diabetes.

Why are Ultra-Processed Foods Harmful to Health?

- **Saturated Fats, Salt, and Sugar:** Ultra-processed foods are typically loaded with **saturated fat, salt, and sugar**, which contribute to health problems such as **heart disease**, high blood pressure, and **diabetes**.
- **Negative Effects of Additives:** Ultra-processed foods often contain additives like **preservatives**, artificial colours, sweeteners, and emulsifiers.
 - These substances are suggested to have negative effects on health, potentially contributing to **inflammation, gut imbalance, and metabolic issues**.
- **Alters Nutrient Absorption:** The way food is processed can significantly affect how the body responds to it.
 - For example, when nuts are **eaten whole, less fat is absorbed** compared to when they are **processed** and oils are released, altering the nutrient profile and **caloric intake**.
- **Effects on Gut Health:** The **gut microbiome**, which is critical for **digestion and immunity**, may be disrupted by high levels of sugar, unhealthy fats, and additives commonly found in these foods.
- **Overall Lifestyle Impact:** People who consume a high amount of ultra-processed foods may also engage in other **unhealthy behaviours**, such as physical inactivity or irregular eating patterns.

What are Types of Food Processing?

- **About Food Processing:** It is the process of **transforming raw agricultural products** like grains, meats, vegetables, and fruits into more **valuable and convenient food products** with minimal waste.

- **Types of Food Processing:**
 - **Minimally Processed:** It includes **fruits, vegetables, milk, fish, pulses, eggs, nuts, and seeds** with no added ingredients and minimal alterations from their natural state.
 - **Processed Ingredients:** They are **added to other foods** rather than eaten by themselves, such as salt, sugar and oils.
 - **Processed Foods:** They are made by **combining minimally processed and processed ingredients** that can be made at home. E.g., **jam, pickles, cheese etc.**
 - **Ultra-Processed Foods:** They are **industrially manufactured** food products that typically contain ingredients not commonly found in a home kitchen.
 - These foods often include additives such as **preservatives, colorings, flavourings, emulsifiers, and sweeteners.**
 - They are usually **high in sugar, unhealthy fats, and salt**, while being low in fibre, vitamins, and minerals.
 - Foods marketed as **“instant” or “ready-to-eat,”** as well as **pre-packaged snacks and frozen meals** usually fall into this category.
 - Examples include **sugary beverages, packaged snacks, instant noodles,** and ready-to-eat meals.

Why is there an Increase in Consumption of Ultra-Processed Foods in India?

- **Urbanisation:** Fast-paced living in urban areas often necessitates **quick and convenient food options.**
 - Ultra-processed foods are readily available and **require minimal preparation**, making them appealing to busy individuals and families.
- **Cultural Shifts in Dietary Preferences:** There has been a cultural shift towards **Western-style diets**, characterised by a higher intake of fast food, **sugary snacks, and ready-to-eat meals.**
- **Rising Number of Working Women:** Ultra-processed foods are viewed as **time-saving alternatives** to traditional meal preparation, helping working individuals balance their professional and personal lives more easily.
- **Fresh Food Availability:** In urban areas, the availability of fresh foods may be limited.
 - Ultra-processed foods can fill this gap by providing a **readily available alternative** for those who may struggle to access healthier options.
- **Aggressive Marketing and Availability:** UPFs are **heavily advertised**, often with misleading health claims that appeal to consumers.
 - Celebrity endorsements and **targeted advertising**, especially towards children, further promote these products.
- **Status Symbol:** There is a growing perception that consuming processed and packaged foods signifies a **higher social status.**

What are the Government Initiatives to Promote Healthy Food Habits?

- [World Food Safety Day](#)
- [Eat Right India](#)
- [State Food Safety Index](#)
- [RUCO \(Repurpose Used Cooking Oil\)](#)
- [Food Safety Mitra](#)

What are Recommendations to Curb Consumption of UPF?

- **Low-AGE Diet:** It is recommended to adopt a **diet low in AGEs**, consisting of **fruits, vegetables, whole grains,** and low-fat dairy products.
 - Cut down bakery and sugary foods and include non-starchy vegetables in meals.
- **Cooking Methods:** Foods cooked using low-temperature methods, such as **boiling or steaming,** should replace those prepared through high-temperature methods like **frying or roasting.**
- **Clear Definition of HFSS Foods:** The [Food Safety and Standards Authority of India \(FSSAI\)](#) should define [High in Fat, Sugar, and Salt \(HFSS\) foods](#) to help identify harmful

products and guide regulations on their sale and consumption.

- **Nutrient-Based Taxation:** A **higher tax** on products with excessive fat, sugar, and salt would incentivise manufacturers to reformulate their offerings and make **healthier options more affordable**.
- **Revising PLI Scheme:** Revising the [Production Linked Incentive \(PLI\) scheme](#) to support nutrition-linked production can give healthier food products a competitive market advantage.
- **Restricting Promotions:** Marketing regulations should be **tightened** to limit the promotion of HFSS foods, particularly in **media targeting children**.
- **Strengthening Policies and Programs:** Existing initiatives like [Saksham Anganwadi](#) and [Poshan 2.0](#) need to be expanded to explicitly target the dual challenges of **inadequate nutrition and diet-related diseases**.

Drishti Mains Question:

Discuss the impact of ultra-processed foods (UPFs) on public health. What measures can be taken to discourage their consumption and promote healthier dietary practices?

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. Aspartame is an artificial sweetener sold in the market. It consists of amino acids and provides calories like other amino acids. Yet, it is used as a low-calorie sweetening agent in food items. What is the basis of this use? (2011)

- (a) Aspartame is as sweet as table sugar, but unlike table sugar, it is not readily oxidized in human body due to lack of requisite enzymes
- (b) When aspartame is used in food processing, the sweet taste remains, but it becomes resistant to oxidation
- (c) Aspartame is as sweet as sugar, but after ingestion into the body, it is converted into metabolites that yield no calories
- (d) Aspartame is several times sweeter than table sugar, hence food items made with small quantities of aspartame yield fewer calories on oxidation

Ans: (d)

Mains:

Q. What are the challenges and opportunities of the food processing sector in the country? How can the income of the farmers be substantially increased by encouraging food processing? (2020)

Medical Ethics and Consumer Rights in India

For Prelims: Principles of Medical Ethics, [NCDRC](#), [Central Consumer Protection Authority \(CCPA\)](#)

For Mains: Ethical implications of medical negligence, Determinants and Consequences of Ethics in Human Action

[Source: IE](#)

Why in News?

Recently, the [National Consumer Disputes Redressal Commission \(NCDRC\)](#) has fined **Johnson & Johnson** Rs 35 lakh for supplying **defective medical devices**, following a case filed by a consumer who suffered complications from a **faulty hip replacement**.

- This highlights the critical need for strict adherence to medical ethics and protocols.

Note:

- Hip replacement surgery (hip **arthroplasty**) aims to relieve pain, improve hip joint function, and help patients move better.
- Hip implants are used to **alleviate pain and stiffness** in the hip due to conditions like **arthritis or avascular necrosis**.
 - These implants are made from various materials, including **metal, ceramic, and plastic**, with the ball often made from cobalt-chromium alloy or ceramic and the stem typically from titanium or cobalt-chromium alloy.

How Ethics Guide Medical Practices?

- **About Medical Ethics:** Medical ethics deals with the **right choices of conduct in the field of human health**, addressing the distinction between what is considered right or wrong at a given time in a given culture.
 - It is concerned with the **obligations of doctors, hospitals, other health professionals, and society towards patients**.
 - Ethical principles are fundamental in medical practice and often take precedence over legal obligations in guiding healthcare professionals' actions.
- **Principles of Medical Ethics:**
 - **Respect for Autonomy:** Acknowledging the **patient's right to make informed choices** regarding their treatment by ensuring proper informed consent is obtained.
 - **Beneficence:** It involves **prioritising the patient's health and well-being** during the entire surgical procedure, **acting in their best interests**.
 - **Non-Maleficence:** A medical practitioner/medical equipment supplying company must **avoid harming patients** and ensure they **receive necessary medical care**, refraining from any **negligent acts** that could **deprive patients of essential healthcare**.
 - **Justice:** It involves **treating all patients impartially and equitably**, regardless of their religion, nationality, race, or social status.
- **Hippocratic Oath:** The Hippocratic Oath is a **fundamental tenet for newly graduated medical professionals**, recited during convocation ceremonies to bind them to a code of ethics.
 - It encompasses the principles set forth in the **Indian Medical Council (Professional Conduct, Etiquette, and Ethics) Regulations 2002**, committing them to **serve humanity, comply with medical laws, respect life, prioritise patient welfare, maintain confidentiality, express gratitude to teachers, and foster collegial respect**.
 - This oath acts as a **moral compass**, guiding physicians in upholding the esteemed traditions and **ethical standards of the medical profession**.

What is the National Consumer Disputes Redressal Commission (NCDRC)?

- **About:**
 - The National Consumer Disputes Redressal Commission (NCDRC) is a **quasi-judicial body** that was **set up in 1988** under the **Consumer Protection Act (CPA), 1986**.
 - NCDRC aims to ensure **inexpensive, prompt, and summary resolution of consumer disputes**.
 - The NCDRC is headed by a **sitting or a retired Judge** of the **Supreme Court** of India or a **sitting or retired Chief Justice of the High Court**.
- **Provisions of the CPA, 1986:**
 - **Jurisdiction: Section 21** of the CPA, 1986 provides the NCDRC authority to entertain **complaints valued over Rs 2 crore**.
 - Additionally, it possesses **appellate and revisional jurisdiction** over orders issued by **State Commissions and District Forums**.
 - **Appellate Authority:** If a consumer is dissatisfied with a decision made by a District Forum, they can appeal to the **State Commission**.
 - Subsequently, if the consumer is **still unsatisfied with the State Commission's ruling**, they can escalate the matter to the NCDRC.
 - According to **Section 23** of the Act, any individual aggrieved by a decision of the NCDRC may file an **appeal to the Supreme Court of India within 30 days**.
 - **Scope of Coverage:** The provisions of this Act encompass **both 'goods' and 'services.'**
- **Consumer Forums:**
 - The **Consumer Protection Act (CPA), 2019** provides that complaints can be filed into District, State, and National levels based on the **value of the claim**.
 - **District Consumer Disputes Redressal Commission (DCDR):** For claims up to Rs 50 lakh.
 - **State Consumer Disputes Redressal Commission (SCDR):** For claims between Rs 50 lakh and Rs 2 crore
 - **National Consumer Disputes Redressal Commission (NCDRC):** For claims above Rs 2 crore.

Central Consumer Protection Authority (CCPA):

- CCPA is the **regulatory body** established under **Section 10** of the **Consumer Protection Act (CPA), 2019**, it regulates matters related to **consumer rights violations** and unfair trade practices.
- It operates under the **Ministry of Consumer Affairs, Food and Public Distribution**.
- **Powers of CCPA:**
 - **Consumer Rights:** Protects and enforces the rights of consumers as a group.
 - **Unfair Trade Practices:** Prevents individuals from engaging in unfair trade practices.
 - **Advertisement Regulation: Section 21 of CPA, 2019** grants the CCPA the power to **issue directions and penalties** against **false or misleading advertisements**.

What are the Issues of Medical Ethics in India?

- **Informed Consent:** There is often inadequate or no informed consent obtained from patients, particularly in clinical trials involving vulnerable populations.
 - Example: Controversy surrounding the **Covid-19** vaccine trials conducted in various parts of the world.
- **Patient Privacy:** There is a significant lack of robust measures to safeguard patient data and ensure confidentiality.
 - Example: In 2023, a significant **data breach of the ESIC database** exposed the personal health information of millions of patients, including sensitive data such as Aadhaar numbers, medical histories, and contact details.
- **Conflicts of Interest:** Instances arise where medical professionals have **financial stakes in the treatments or procedures** they recommend.
 - In 2023, a prominent cardiologist in Delhi, was found to have financial ties to a stent manufacturing company, receiving substantial payments for consulting and holding equity

stakes.

- **Doctor-Patient Trust:** The **commercialization of healthcare and a lack of transparency** have led to an erosion of trust between doctors and patients.
 - Example: Doctors employed in government hospitals engaging in private practice and charging exorbitant fees from patients.
- **Regulatory Oversight:** Weak enforcement and compliance with ethical guidelines result in abuses within clinical trials and patient care.

What are the Initiatives for Consumer Protection?

- [Consumer Welfare Fund](#)
- [Central Consumer Protection Council](#)
- [Consumer Protection Rules, 2021](#)
- [Consumer Protection \(E-Commerce\) Rules, 2020](#)
- [National Consumer Day](#)

Way Forward

- **Cultivating Ethical Awareness in Healthcare:** Implement extensive training programs and workshops to educate healthcare professionals on ethical principles and their practical applications.
 - Encourage a **culture of open dialogue and transparency** within healthcare institutions to facilitate discussions on ethical dilemmas and share best practices.
- **Structured Communication Protocols:** Implementing structured communication protocols, such as the **SBAR (Situation-Background-Assessment-Recommendation)** technique, can improve clarity and reduce errors.
 - Ensuring informed consent involves a detailed explanation of the procedure, risks, benefits, and alternatives, along with verification of understanding.
- **Strengthening Redressal Mechanisms:** The government can **enhance consumer complaint resolution** by utilising existing infrastructures of [Alternative Dispute Resolution \(ADR\)](#) and [Online Dispute Resolution \(ODR\)](#) through a [Public-Private Partnership \(PPP\)](#) model.
- **Creating a National Consumer Lok Adalat Helpline:** A tech-enabled National Consumer Lok Adalat helpline can **facilitate communication between complainants, companies, and legal authorities**, ensuring faster resolutions.

Drishti Mains Question:

What is medical ethics? Discuss its significance, particularly in light of the deteriorating patient-physician relationship in India.

UPSC Civil Services Examination Previous Year Question

Prelims

Q.1 With reference to 'consumers' rights/privileges under the provisions of law in India, which of the following statements is/are correct ? (2012)

1. Consumers are empowered to take samples for food testing.
2. When a consumer files a complaint in any consumer forum, no fee is required to be paid.
3. In case of death of consumer, his/her legal heir can file a complaint in the consumer forum on his/her behalf.

Select the correct answer using the codes given below:

(a) 1 only

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

Ans: c

Crackdown on NGOs under FCRA, 2010

For Prelims: [NGOs](#), [Foreign Contribution Regulation Act, 2010 \(FCRA\)](#), [Oxfam India](#), [Civil Society organisations \(CSOs\)](#), [United Nations Human Rights Council](#).

For Mains: Regulation of NGOs under FCRA and their implications on the developmental activities in India.

[Source: IE](#)

Why in News?

Recently, the government has cracked down on **five major NGOs** under the [Foreign Contribution Regulation Act, 2010 \(FCRA\)](#) due to concerns over their **financial activities** and **objectives**.

- These NGOs include [Oxfam India](#), [Centre for Policy Research \(CPR\)](#), [EnviroNics Trust \(ET\)](#), [Legal Initiative for Forest and Environment \(LIFE\)](#), and [Care India Solution for Sustainable Development \(CISSD\)](#).
- In the recent past, the [International Commission of Jurists \(ICJ\)](#) criticised India's FCRA for being **repressive** and should be revised.

What are the Key Allegations Against NGOs?

Issue	Details
Stalling Development Projects	LIFE is accused of being an instrument for US-based NGO EarthJustice to oppose coal mines and thermal power projects in India.
Protest Funding	ET and Survival International allegedly opposed the construction of a thermal power plant in Jharkhand, collaborating with the European Climate Foundation (ECF) to mobilise protests against coal industries in India.
Fund Mismanagement	CPR received foreign funds for its Namati-Environmental Justice Programme , which was reportedly used for litigation instead of specified research or educational activities.
Conspiring with Foreign Agents	Oxfam India is accused of conspiring to halt mining activities in Australia by Indian companies, allegedly supporting Oxfam Australia and working against Indian interests abroad.
Use of Other NGOs for Illegal Activities	After losing its FCRA licence, Oxfam sought "puppet NGOs" with valid permissions to redirect funds for illegal activities, such as providing funds to Josh and Aman Biradari Trust .
Political Agenda	NGOs are accused of promoting specific religious communities or castes rather than serving the public interest as a whole.
Financial Support	Oxfam India allegedly financially supported ET in anti-coal

How FCRA Regulates NGOs Receiving Foreign Funding?

- **Monitoring FCRA:** The Union **Ministry of Home Affairs (MHA)** monitors the implementation of the FCRA.
 - Through the FCRA, the ministry regulates foreign donations to ensure that such funds do not adversely affect the country's **internal security**.
- **Registration Requirement:** Any association, group, or NGO intending to receive foreign donations **must register under the FCRA**. This registration allows NGOs to receive contributions for **social, educational, religious, economic, and cultural programs**.
- **Five-Year Validity of Registration:** Once an NGO registers under the FCRA, the registration is valid for **five years**. After this period, the NGO must apply for a renewal to continue receiving foreign contributions.
- **2010 Legislation and 2020 Amendments:** The original **FCRA Act, 1976** was repealed and replaced by new legislation in **2010** to **modernise the law** governing foreign contributions. In **2020**, additional amendments were introduced to **tighten the regulations** and improve oversight of foreign donations.
- **Purpose-bound Utilisation:** Foreign funds must be used only for the **purpose** for which they were **received**, as stipulated under the Act.
- **Transfer Restrictions:** Registered NGOs are **prohibited from transferring foreign funds** to other NGOs.
- **SBI Bank Account:** Registered entities must open a **dedicated bank account** in the State Bank of India, Delhi, for receiving foreign funds.
- **Annual Returns:** NGOs are required to **file annual returns**, ensuring transparency in the use of foreign contributions.
- **Prohibited Entities:** The FCRA prohibits candidates for **elections, journalists, media companies, judges, government servants, members of the legislature, political parties**, and organisations of a political nature from receiving foreign contributions.
- **Government's Right to Cancel:** The government can **cancel** an NGO's registration if found **violating FCRA provisions**.
 - Reasons for cancellation include false statements, inactivity for two years, violations of certificate terms, or acts against national interest.

DEVELOPMENTAL GROUPS IN INDIA

Self-Help Groups (SHGs)

- Self-governed peer-controlled information group of people with similar socio-economic backgrounds and interests
 - Members allowed: 5-20 | Registration not required
 - SHGs use savings amounts for giving loans to members
- NABARD's SHG-Bank Linkage Programme (1992)** - To connect SHGs with formal banking institutions
- ~88% of SHGs in India have all-women members
- Success Stories:**
 - Self-Employed Women's Association (SEWA) since 1972
 - Kudumbashree (1998) in Kerala

Cooperative Societies

- People-centred** enterprises, owned, controlled, and run by and for their members.
 - Capital raised through shared contributions from members.
- Regulating Acts:**
 - Multi-State Co-operative Societies Act, 2002
 - State Cooperative Societies Acts
- 97th Constitutional Amendment (2011):**
 - Right to form cooperatives - a fundamental right (Article 19(1)(c))
 - Article 43B (DPSP) - Promotion of Cooperatives
 - Part IX-B titled "The Co-operative Societies" (Articles 243-ZH to 243-ZT).
- Examples:** AMUL, IFFCO and PACS

Non-Governmental Organisations (NGOs)

- Pursue activities to relieve suffering, promote the interests of the poor, protect the environment, provide basic social services, or undertake community development
- Registered as:**
 - Societies:** Societies Registration Act, 1860
 - Trusts:** Indian Trusts Act, 1882
 - Companies:** Section 8 Companies Act, 2013
- Constitutional Provisions:**
 - Article 19(1)(c)**
 - Article 43**
 - Concurrent List** mentions Charities and charitable institutions
- FCRA mandates registration for all NGOs intending to receive foreign donations.**
- Prominent NGOs:**
 - NGO Pratham:** Pioneered the **ASER** report to assess the learning levels of children in rural India.
 - Akshaya Patra Foundation:** Provided nutritious mid-day meals to school children.
- NGO-DARPAN Platform - An interface between NGOs and Government Bodies.**



What Reforms are Needed to Better Regulate NGOs?

- Clarity in Definitions:** The government should **clearly define** terms like **public interest and national security** before restricting foreign funding to NGOs.
 - It could reduce the risk of the law being misused against **civil society organisations (CSOs)** genuinely involved in welfare works.
- Independent Oversight:** Establishing an **independent regulatory body** to oversee the foreign funding of NGOs will ensure **transparent procedures** in their functioning.
- Tiered Regulatory System:** A **tiered regulation** approach could be adopted for stricter reporting for NGOs involved in national security while easing rules for those in humanitarian or development work.
- Aligning with International Standards:** Revise the FCRA to align it with **international treaties** and human rights obligations, such as those outlined by the **United Nations Human Rights Council**.
 - It will allow for a fair balance between **national security concerns** and the need for civil society to access international funding.

Drishti Mains Question:

Discuss the allegations raised against NGOs under the FCRA and their implications for the developmental activities in India.

UPSC Civil Services Examination, Previous Year Question:

Mains

Q. Can Civil Society and Non-Governmental Organisations present an alternative model of public service delivery to benefit the common citizen? Discuss the challenges of this alternative model.

Chagos Archipelago and Diego Garcia Island

[Source: IE](#)

Why in News?

Recently, the [United Kingdom \(UK\)](#) agreed to cede **sovereignty** of the strategically important [Chagos Archipelago](#) to Mauritius.

- However, the UK will continue to exercise **sovereign rights** over [Diego Garcia island](#).

What are the Key Facts Regarding the Chagos Archipelago?

- **Geography of the Chagos Archipelago:** It consists of **58 islands** and is located approximately **500 km south** of the Maldives in the [Indian Ocean](#).
- **History of the Chagos Archipelago:** The **French** were the **first to colonize** Mauritius along with the **Chagos Islands** in **1715**.
 - In the late **18th century**, the French brought in [slave labour](#) from **Africa and India** to work in newly established [coconut plantations](#).
 - However, the **UK** took control of the region in **1814** after the fall of France's [Napoleon Bonaparte](#).
 - In **1965**, the UK constituted the [British Indian Ocean Territory \(BIOT\)](#), of which the Chagos Islands were a central part.
- **Mauritius' Claims Over Chagos:** Chagos was attached to **Mauritius**, another British colony in the Indian Ocean, for **administrative purposes**.
 - When **Mauritius gained independence** in 1968, **Chagos** remained with **Britain**, which gave **Mauritius a 3 million pound grant** for the "**detachment**."
- **Strategic Importance of Chagos and Diego Garcia:** In **1966**, Britain signed an agreement with the **United States** to use the BIOT for military purposes.
 - Subsequently, the **plantation** on Diego Garcia was **shut down** and it became unlawful for a person to enter or remain in Diego Garcia without a permit.
 - Diego Garcia, the largest in the archipelago, became a fully operational military base in **1986**.
 - It was a key location in the US overseas "**war on terror**" operations following **al-Qaeda's September 11 attacks** on the US in 2001.
- **International Pressure on the UK:** In 2019, the [International Court of Justice \(ICJ\)](#) issued an **advisory opinion** that asked the United Kingdom to **unconditionally withdraw** its colonial administration from the area within **six months**.
 - The ICJ ruled that the **1965 detachment** of Chagos from Mauritius before its independence was **illegal**.

What are the Key Details of the UK-Mauritius Agreement?

- **Sovereignty Over Chagos:** The deal grants Mauritius **full sovereignty** over the archipelago except **Diego Garcia** island.
- **Resettlement of Chagossians:** Mauritius can now **resettle people** on the Chagos Archipelago, except Diego Garcia, where **Britain evicted 2,000 islanders** for a US naval base.
- **Trust Fund:** The UK has also promised to create a **new trust fund** for the benefit of the people of Chagos.



Pradhan Mantri Awas Yojana-Gramin

[Source: ET](#)

Why in News?

Recently, the Indian government has taken significant steps to enhance its rural housing scheme under the [Pradhan Mantri Awas Yojana-Gramin \(PMAY-G\)](#) by initiating a survey of kutcha houses nationwide and launching the **Awas Sakhi mobile app**.

- This initiative aims to identify new beneficiaries for pucca (all-weather) homes, helping families with inadequate housing.

What is the Purpose of the Survey of Kutcha Houses?

- **Addressing Housing Inadequacy:** It aims to gather data on families living in kutcha dwellings, allowing the government to focus **resources on those most in need of assistance**.
- **Supporting the Awas Sakhi Mobile App:** The survey will complement the recently launched Awas Sakhi mobile app, which streamlines the application process for beneficiaries and provides them with easy access to information and resources related to housing.

What is the Pradhan Mantri Awas Yojana-Gramin (PMAY-G)?

- **About:** Launched in 2016, the PMAY-G aims to provide housing for the poorest segments of society.
 - The selection of beneficiaries involves a thorough **three-stage validation process**, including the [Socio-Economic Caste Census 2011](#), [Gram Sabha approvals](#), and [geo-tagging](#), ensuring that aid reaches the most deserving individuals.
- **Under PMAY-G Beneficiaries Receive:**
 - **Financial Assistance:** Rs 1.20 lakh in plain areas and Rs 1.30 lakh in hilly states, including northeastern states and union territories.
 - **Additional Support for Toilets:** Rs 12,000 for constructing toilets through convergence with schemes like [Swachh Bharat Mission - Gramin \(SBM-G\)](#) or [Mahatma Gandhi National Rural Employment Guarantee Scheme \(MGNREGS\)](#) or any other dedicated source of funding.
 - **Employment Support:** Mandatory provision of 90/95 person-days of unskilled wage employment for beneficiaries through [Mahatma Gandhi National Rural Employment Guarantee Act \(MGNREGA\)](#) for house construction.
 - **Basic Amenities:** Access to water, [Liquefied petroleum gas \(LPG\)](#), and electricity connections through convergence with relevant schemes.
- **Cost Sharing:** The Centre and states share expenses in the **60:40 ratio in the case of plain areas**, and **90:10 for Northeastern states**, two Himalayan states (Himachal Pradesh and Uttarakhand) and the Union Territory(UT) of J&K.
 - **The Centre bears 100% cost in the case of other UTs including Ladakh.**
- **Progress Under PMAY-G:** The Government has set an ambitious target to build **2.95 crore houses**. As of August 2024, **2.94 crore houses have been sanctioned**, and **2.64 crore houses have been completed**, significantly improving the living conditions of millions of rural families.
- **Recent Developments:** The Union Cabinet, in August 2024 approved financial assistance for the construction of **two crore additional houses** at the existing unit assistance.
 - The PMAY-G eligibility criteria have been relaxed, and those owning bikes or scooters can now make it to the beneficiary list. People earning up to **Rs 15,000 a month** will now also be eligible for a house (the earlier limit was Rs 10,000).
 - This initiative, set to **span from FY 2024-2029**, aims to address ongoing housing needs, benefiting nearly **10 crore individuals** and ensuring safe, hygienic, and socially inclusive housing for those currently without proper shelter or living in dilapidated conditions.

Details of the benefits given in the programme

1

Unit assistance of Rs. 1.20 lakh in plains and Rs.1.30 lakh in hilly States/UTs, North Eastern States, difficult areas, and worst Left-Wing Extremism (LWE) districts



2

Provision of assistance (Rs.12,000/-) for toilets through convergence with Swachh Bharat Mission – Gramin (SBM-G), MGNREGS, or any other dedicated source of funding

3

Provision of 90/95 person days of un-skilled labour wage under MGNREGA for construction of house, over and above the unit assistance. This amounts to about Rs 18,000/-

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

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

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

Select the correct answer using the codes given below:

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

Ans: (b)

Exp:

- **The National Rural Livelihood Mission (NRLM) is a poverty alleviation project implemented by the Ministry of Rural Development.** This scheme is focused on promoting self-employment and organization of rural poor. The basic idea behind this programme is to organize the poor into SHGs (Self Help Groups) and make them capable for self-employment.
- Pillars of NRLM:
 - Enhancing and expanding existing livelihood options of the poor,
 - Building skills for the job market outside,
 - Nurturing self-employed and entrepreneurs **Hence, 2 is correct.**
- The Mission neither focuses on setting up a large number of new manufacturing industries, nor agribusiness centres in rural areas. Its objective is not to supply seeds, fertilizers, diesel pump-sets and micro-irrigation equipment. **Hence, 1 and 3 are not correct. Therefore, option (b) is the correct answer.**

92nd Indian Air Force Day

[Source: ET](#)

Recently, the **92nd anniversary** of the [Indian Air Force \(IAF\)](#) was celebrated at [Marina Beach, Chennai](#), featuring an airshow.

- The theme is "**Bhartiya Vayu Sena: Saksham, Sashakt, Atmanirbhar**" (**Potent, Powerful, and Self-Reliant**).
 - It reflects the IAF's commitment to **self-reliance and modernisation**, aligning with India's vision for a robust defence capability.
- The **motto** of IAF is **Touch the sky with Glory (Nabhah Sparsam Diptam)** which has been taken from the eleventh chapter of the [Bhagavad Gita](#).
- The Indian Air Force was formed on **18th October 1932**, The first **operational flight** of the IAF took place on **1st April 1933**.
- Problems concerning the defense of India were reassessed in **1939 by the Chatfield Committee**. It proposed a scheme to raise **five flights** on a voluntary basis to assist in the **defence** of the [principal ports](#).

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Strengthening India-UAE Investment Relations

[Source: PIB](#)

India has reduced the local remedies exhaustion period for [United Arab Emirates \(UAE\)](#) investors from five years to three years under the **India-UAE Bilateral Investment Treaty (BIT)**.

- The BIT came into force on 31st August 2024, ensuring continuity of investment protection after the expiration of the earlier **Bilateral Investment Promotion and Protection Agreement**

(BIPPA).

- The BIT assures minimum treatment standards (fairly and equitably) and independent arbitration for dispute resolution.
- The local remedies exhaustion period is the time frame an investor must attempt to resolve a dispute through the host country's legal system **before seeking international arbitration.**
- In another development, the **Abu Dhabi Investment Authority (ADIA)** has opened an office in [GIFT City](#) to enhance its investment activities in India.
 - UAE continues to be the **largest Arab investor in India**, with investments amounting to around USD 3 billion in FY 2023-24.
 - The UAE was the **sixth-largest Foreign Direct Investment (FDI) source for FY 2023-24** and the seventh-largest overall since 2000.
 - Over 70% of all [Gulf Cooperation Council \(GCC\)](#) investments in India come from the UAE.
- Additionally, India and the UAE are advancing plans for a **USD 2 billion food corridor** to enhance UAE food security and support Indian farmers, with the [Comprehensive Economic Partnership Agreement \(CEPA\)](#) and BIT ensuring duty-free access and a stable investment climate for UAE businesses.

[Read more...](#)

FPIs Investment Exceeds USD 1 Trillion in Indian Securities

[Source: BS](#)

[Foreign Portfolio Investors \(FPIs\)](#) have accumulated about **USD 1.1 trillion** in [Indian securities](#), highlighting India's increasing attractiveness to global investors.

- This represents a **threefold increase** from the [Covid-19](#) low of USD 329 billion in March 2020. [India's market capitalisation](#) has also quadrupled, now around USD 5.6 trillion.
- Indian markets have **provided strong long-term returns**, with a 10-year annualised return of **8.5% for the Sensex** in US dollar terms, compared to 9.7% for the **Dow Jones index of the United States (US).**
- **Liberalised investment rules** and a supportive regulatory framework have driven this growth since India opened to **FPIs in 1992** (then known as [foreign institutional investors \(FIIs\)](#)), following the [1991 balance of payments crisis](#).
 - FPIs consist of **non-residents investing in Indian financial assets** like shares, government bonds, corporate bonds, convertible securities, and infrastructure securities.
 - FPIs include investment groups such as **FIIs, Qualified Foreign Investors (QFIs)**, and **subaccounts.**
- The primary sources of FPI inflows into India are the **US, Singapore, and Luxembourg.**

[Read more...](#)

World Cotton Day 2024

[Source: PIB](#)

On the occasion of [World Cotton Day](#) (**7th October 2024**) the **Ministry of Textiles** jointly hosted the

conference with [Cotton Corporation of India](#) and [CITI](#) focusing on the **theme of "Megatrends Shaping Cotton Textile Value Chain"**.

▪ **Aim:**

- To **promote the [cotton textile industry](#)** and its contribution to the economy.
- To **address challenges faced by the cotton value chain** and explore solutions.
- To highlight the importance of **sustainability and traceability in the cotton industry.**

▪ **Key Highlights of Cotton Day:**

- The government aims to achieve a **textile export target of USD 100 billion by 2030.**
- Adoption of practices like [high-density planting](#), closer spacing, and [drip fertigation](#) can increase cotton yield.
- Weed management is a significant challenge for cotton farmers, which can be addressed through new seed varieties.
- The event showcased [Kasturi cotton products](#), **recycled textiles, and handloom products.**

▪ **Few Facts About the Cotton Industry:**

- **India** is the **world's largest producer of cotton**, accounting for about **23% of the world's cotton production.**
- India is the **world's second-largest exporter of cotton**, after the United States. In 2023-2024.
- India's **major cotton importers** include **Bangladesh, China, and Vietnam.**

Read More: [Cotton Corporation of India \(CCI\)](#), [Confederation of Indian Textile Industries \(CITI\)](#).

PDF Reference URL: <https://www.drishtias.com/current-affairs-news-analysis-editorials/news-analysis/09-10-2024/print>

