



## Reforms for Combating Honour Killings

**For Prelims:** [Sex Ratio](#), [Bharatiya Nyaya Sanhita \(BNS\)](#), [Law Commission](#), [Supreme Court](#), [Fundamental Rights](#).

**For Mains:** Reforms needed to tackle honour killings, judicial stand and legal provisions.

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

### Why in News?

In an [honour killing](#) case in Madhya Pradesh, a **girl was shot dead** by her family for wanting to marry someone of her choice, against their wishes.

### What is Honour Killing?

- **About: Honour killing** is the murder of a **family member, typically a woman**, by relatives or community members in response to **perceived dishonor or shame brought** to the family.
  - These acts are often rooted in strict **cultural, social, and religious norms** regarding **family honor, morality, and social behavior**.
  - The concept of **honor** is often tied to women's behavior regarding issues like **marriage, relationships, sexuality, and modesty**.
- **Key Statistics:** As per the [National Crime Records Bureau data \(NCRB\)](#), the number of honour killings reported in India was **25 each in 2019 and 2020, and 33 in 2021**. But these figures could be **much higher** than mentioned.
- **Causes:**
  - **Caste System:** Fear of losing **caste status** drives violence, especially against **inter-caste or same gotra marriages**.
  - **Patriarchal Norms:** Women's right to choose a partner is often denied, with marriage seen as a **family honour transaction**.
  - **Caste Panchayats:** These informal bodies, controlled by **dominant caste males**, impose punishments, including killings, for **violating caste norms**. E.g., [Khap Panchayats](#).
  - **Gender Imbalance:** Skewed [sex ratios](#) lead to violence against women, especially when marriage choices defy traditional norms.
  - **Social Status:** Ascribed **social status is prioritized** over personal achievements, causing family honour to override personal choice.
- **Consequences:**
  - **Violation of Human Rights:** It is a blatant violation of the fundamental human [right to life](#). It perpetuates [gender inequality](#), reinforcing patriarchal norms.
  - **Social Impact:** Surviving families and communities suffer **deep psychological trauma** and long-term mental health issues.
  - **Governance Challenges:** Weak legal frameworks or societal acceptance result in **perpetrators evading justice**, undermining the rule of law.
  - **Cultural Backwardness:** It prevents women's education and employment, reinforcing **regressive traditions** and hindering progress.
  - **International Repercussions:** Honor-based violence draws **global human rights**

scrutiny, impacting diplomatic relations.

**Note: Honour killings** are considered "**murders**" since the law **does not handle them expressly**. As such, they are subject to the provisions of [Indian Penal Code, 1860](#).

- Entitled "**Prohibition of Unlawful Assembly (Interference with the Freedom of Matrimonial Alliances) Bill, 2011**" the bill dealt primarily with the "**unlawful assemblies**" called by **caste panchayats** to prevent a self-choice.
  - Despite initial support, the bill **failed to progress in Parliament** and was **not enacted into law**.
- The [Law Commission of India's 242nd Report \(2012\)](#) emphasised the need for **anti-honor killing laws** that would provide clear guidelines for **investigation, prosecution, and punishment** in such cases.

## What are Legal Provisions to Check Honour Killing?

- **Sections 299-304 of IPC (Now BNS)**: Penalises any person guilty of **murder and culpable homicide** not amounting to murder.
  - **Murder and culpable homicide** can result in **life imprisonment or death**.
  - Culpable Homicide is causing death with **criminal intent or negligence**.
- **Section 307 of IPC**: Penalises attempt to murder with imprisonment for **up to 10 years** and a fine.
  - **Section 308 of IPC** penalises attempt to commit culpable homicide by **imprisonment** for up to 3 years or with fine or with both.
- **Section 34 and 35 of IPC**: Penalises **criminal acts done by several persons** in furtherance of common intention.

## What is the Judicial Stand on Honour Killing?

- **Lata Singh vs State Of UP Case, 2006**: The [Supreme Court \(SC\)](#) condemned the harassment and violence faced by young couples in **inter-caste marriages**, calling honour killings **barbaric** and stressing **harsh penalties** for perpetrators.
- **State Of U.P vs Krishna Master Case, 2010**: SC held the perpetrators of an honour killing **accountable** and sentenced them to **life imprisonment**.
  - SC stressed the importance of **accountability for heinous crimes**.
- **Arumugam Servai vs. State Of Tamil Nadu Case, 2011**: SC clarified that parents can **sever ties** but **cannot intimidate or harass** children for inter-caste marriages.
  - SC directed the government to provide **legal protections** for inter-caste couples and take action to prevent harassment or violence.
- **Shakti Vahini Case, 2018**: SC ruled that honor killings are a **violation of fundamental rights** and emphasized the need for **strict action** against such crimes.
  - SC directed State Governments to **prevent honour killings by setting up special cells** and protecting couples facing family threats.

## Way Forward

- **New Legislation**: A **dedicated anti honour killing law** is needed to provide **targeted protection, ensure accountability, standardize legal procedures**, align with international human rights standards, and **promote societal change**.
- **Electoral Disqualification**: Convicts of honour killings should be **barred from elections** for at least **five years**, sending a strong message that such individuals should not hold power, thereby reducing the **practice's social legitimacy**.
  - It will **check caste-community based panchayats** and **prevent justification** of such honour killing orders and acts.
- **Fast Track Courts**: Specialized fast-track courts for honour killings should be set up to ensure **swift justice**, preventing delays that undermine victims' rights.

- **Amendment to Special Marriage Act, 1954:** Amend the Special Marriage Act, 1954 to **shorten the registration period from one month to one week**, protecting couples from potential threats or violence.
  - Introduce a provision in the **IPC** defining **honour killing** and **specifying punishments**, helping the legal system address and deter such crimes.

### **Drishti Mains Question:**

What are the legal provisions and judicial stand on honor killings in India? What reforms are needed to address them?

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

### **Mains**

**Q.**“Caste system is assuming new identities and associational forms. Hence, caste system cannot be eradicated in India.” Comment. (2018)

**Q.** Khap Panchayats have been in the news for functioning as extra-constitutional authorities, often delivering pronouncements amounting to human rights violations. Discuss critically the actions taken by the legislative, executive and the judiciary to set the things right in this regard. (2015)

---

## **Combating Adolescent Pregnancy in India**

**For Prelims:** [Child Marriages](#), [NFHS-5](#), [Stunted Growth](#), [Higher Infant Mortality](#), [Gender Inequality](#), [ASHAs](#), [Mental Well-Being](#), [Bpl Families](#), [Ayushman Bharat](#), [Child Sex Ratio](#), [Delay Marriage](#).

**For Mains:** Issues of child marriage, Significance of education and health care facilities in addressing issues related to Women.

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

### **Why in News?**

The study, **Teenage Pregnancy and Motherhood in India: Exploring Status and Identifying Prevention and Mitigation Strategies**, highlights the ongoing challenge of adolescent pregnancies in the country.

### **What are the Findings of the Study Regarding Adolescent Pregnancies in India?**

- **Teenage Pregnancy and Child Marriage:** Teenage pregnancy in India is linked to **child marriage** and **gender inequality**.
  - While **child marriage rates have dropped (from 47% in 2005 to 24% in 2020)**, **teenage pregnancies remain high (6%)**, especially in states like **West Bengal, Bihar, and Rajasthan**.

- **Societal and Economic Factors:** Key drivers of teenage pregnancies include **poverty**, **societal norms**, and **lack of reproductive education**.
  - Early marriage is often seen as a **financial solution**, and young brides face pressure for **early motherhood to prove marital success**.
- **Regional Variation:** The **National Family Health Survey (NFHS)-5** (2019-21) found that 6.8% of women aged 15-19 were pregnant or had given birth, with **West Bengal (16%)** and **Bihar (11%)** having the highest rates.
- **Lack of Support and Welfare Gaps:** Teenage mothers face **stigmatization** and lack **institutional support**, leading to **school dropout** and perpetuating **poverty**.
  - **Welfare schemes** often exclude them due to **age-based eligibility**, denying vital resources.
- **Policy Gaps:** Despite efforts, **policy bottlenecks** prevent effective services for teenage mothers.
  - **Exclusion** from welfare programs intended to reduce teenage pregnancies worsens their socio-economic situation.

## What are the Impacts of Adolescent Pregnancy?

- **Maternal Health Risks:** Adolescent mothers face higher risks of **anaemia**, **preterm labor**, and **maternal mortality**.
  - According to **NFHS-5**, many adolescent mothers lack access to essential **healthcare services**, exacerbating risks.
- **Child Health and Stunting:** Children born to adolescent mothers are at a higher risk of **low birth weight**, **stunted growth**, and **higher infant mortality** rates.
  - A study by the **International Food Policy Research Institute (IFPRI)** revealed that **stunting and underweight prevalence** was **11% points higher** among children born to teenage mothers.
- **Societal Consequences:** Teenage pregnancy poses **health risks** for both mother and child, such as **maternal complications** and **child malnutrition**, while severely limiting **economic** and **educational opportunities** for young mothers.
  - Teenage mothers often **drop out** of school, limiting their **economic opportunities** and perpetuating **poverty cycles (Intergenerational Poverty)**.
  - According to **2019 data**, **55%** of unintended pregnancies among adolescent girls result in abortions, many of which are unsafe in **low- and middle-income countries (LMICs)**.
- **Gender Inequality & Violence:** **Gender inequality** and patriarchal norms further marginalize adolescent mothers, denying them opportunities to rebuild their lives.
  - **Child marriage** leads to increased **domestic violence**, and perpetuates gender inequality. Also, these practices limit opportunities for young girls.

## What are the Schemes for Maternity Health, Education, and Avoid Teenage Pregnancy?

- **Pradhan Mantri Matru Vandana Yojana (PMMVY):** **PMMVY** provides **Rs 5,000** to pregnant and lactating mothers **aged 19 years and above** for their first live birth, promoting better maternal health and nutrition.
  - The age requirement reinforces efforts to **combat adolescent pregnancies** and **child marriage**.
- **Janani Suraksha Yojana (JSY):** **JSY** promotes institutional deliveries by providing financial incentives to pregnant women **aged 19 years and above**, especially in rural areas, and **ASHAs**.
  - The age criterion is a significant measure to counter adolescent pregnancies and child marriage.
- **Rashtriya Kishor Swasthya Karyakram (RKSK):** **RKSK** targets **adolescents aged 10-19 years**, focusing on nutrition, **reproductive health**, and **mental well-being**, thereby directly addressing issues related to adolescent health and early marriages.
- **Balika Samridhi Yojana:** **BSY** provides financial incentives to **BPL families** for **girl child education**, encouraging school retention and **delaying marriage**, thereby improving girls' socio-economic and **educational status**.
- **Integrated Child Development Services (ICDS):** **ICDS** provides **nutrition**, **immunization**,

**health check-ups**, and pre-school education for children under six years of age, along with support for pregnant and lactating women.

- **School Health and Wellness Program:** Introduced in 2020 under [Ayushman Bharat](#), it focuses on adolescent health for students **aged 6-18 years**, including sexual and **reproductive health education**, mental health counseling, and hygiene awareness.
- **Beti Bachao Beti Padhao Scheme:** It aims to prevent [gender-biased sex selection](#) and **promote education** and empowerment of girls up to 18 years of age, with a focus on improving the [child sex ratio](#) and ensuring **equal opportunities**.

## Way Forward

- **Role of Education: Comprehensive reproductive education** must be integrated into school curriculums to address taboos and promote safe reproductive practices.
  - Programs like **Kanyashree Prakalpa** in West Bengal, offering financial incentives to [delay marriage](#), should be scaled up nationwide.
- **Community Involvement:** Local committees can monitor and prevent **child marriages**, creating awareness about the **adverse impacts** of teenage pregnancies.
  - Active involvement of **parents, teachers, social workers** and healthcare workers in educating adolescents about **sexual and reproductive health (SRH)** is crucial.
  - Incentivizing local workers like **ASHA, Anganwadi workers**, and **Police Sakhi** is crucial in tackling **child marriage**.
  - A successful example of this approach is seen in **Assam**, where local workers have been effectively mobilized to combat child marriage.
- **Policy Recommendations:** Strengthen enforcement of laws such as the **Prohibition of Child Marriage Act 2006** to deter early marriages.
- **Improved Data Collection:** Establish a **national database** on teenage pregnancies and conduct **longitudinal studies** to design targeted interventions.

### Drishti Mains Question:

How can India improve reproductive healthcare access and education in preventing teenage pregnancies?

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

### Prelims:

**Q. Which of the following statements is/are correct regarding the Maternity Benefit (Amendment) Act, 2017? (2019)**

1. Pregnant women are entitled for three months pre-delivery and three months post-delivery paid leave.
2. Enterprises with creches must allow the mother minimum six creche visits daily.
3. Women with two children get reduced entitlements.

**Select the correct answer using the code given below.**

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

**Ans: (c)**

## **Mains:**

Q. "Empowering women is the key to control the population growth." Discuss.(2019)

## **Global Risks Report 2025**

**Source: LM**

### **Why in News?**

The **World Economic Forum (WEF)** released the **20th Global Risks Report 2025**.

**Note: Global Risks Report** is an **annual** report published by the **WEF**. It presents an analysis of the **most pressing global risks** anticipated over **short-term (2 years)** and **long-term (10 years)** periods.

- Global risk is the **potential** for an event to **significantly harm global GDP, population, or natural resources**.

### **What are Key Findings of the Global Risks Report 2025?**

- **Top Risks for India:** The report highlighted the **top five risks** for India include **water supply shortages, misinformation and disinformation, erosion of human rights and civic freedoms, pollution** (air, water, and soil), and **labour and talent shortages**.
- **Top Global Risks:**
  - **Immediate Risks (Next 2 years):** **Misinformation and disinformation, Extreme weather events**, and State based armed conflict.
  - **Long-Term Risks (Next 10 Years):** **Extreme weather events, Biodiversity loss and ecosystem collapse and Critical changes to earth systems**.

//

Risk categories	2 years	10 years
Economic	1 <sup>st</sup> Misinformation and disinformation	1 <sup>st</sup> Extreme weather events
Environmental	2 <sup>nd</sup> Extreme weather events	2 <sup>nd</sup> Biodiversity loss and ecosystem collapse
Geopolitical	3 <sup>rd</sup> State-based armed conflict	3 <sup>rd</sup> Critical change to Earth systems
Societal	4 <sup>th</sup> Societal polarization	4 <sup>th</sup> Natural resource shortages
Technological	5 <sup>th</sup> Cyber espionage and warfare	5 <sup>th</sup> Misinformation and disinformation

- **Geopolitical Bridges:** India and Gulf countries are emerging as **key multilateral alternatives** amid rising US-China rivalry, **bridging the West and East** to reduce tensions and promote cooperation.
- **Trade Protectionism: Inflation Reduction Act, 2022** of US and **Make in India** in India highlights the growing trend of **gloeconomic confrontation** and **trade protectionism**.
  - **Non-tariff barriers**, such as **subsidies** and **industrial policy**, are emerging as key drivers of **protectionism**.
- **Multilateral Solutions:** **Rising geopolitical tensions, the fracturing of global trust, and the climate crisis** need **multilateral solutions** for achieving cooperation across borders.

## World Economic Forum (WEF)

- **About:** WEF is an international organization for **public-private cooperation**, headquartered in **Geneva, Switzerland**.
  - It engages global leaders to shape agendas across **industries, regions, and globally**.
- **Foundation:** It was founded by **Klaus Schwab in 1971** as the **European Management Forum**, WEF emphasizes long-term benefits for all stakeholders, **not just short-term profits** for shareholders.
- **Evolution:** In **1973**, the WEF expanded its focus to **economic and social issues**. It introduced membership for the world's **leading 1,000 companies in 1975**.
  - In **1987**, it became the **World Economic Forum**, broadening its role as a platform for dialogue. It was recognized as an international organization in 2015.
- **Major Reports:** WEF publishes key reports, including the [Global Competitiveness Index](#), [Global Gender Gap Index](#), [Energy Transition Index](#), [Global Risk Report](#), and [Global Travel and Tourism Competitiveness Index](#).

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

### Prelims

**Q. The Global Competitiveness Report is published by the (2019)**

- (a) International Monetary Fund
- (b) United Nations Conference on Trade and Development
- (c) World Economic Forum
- (d) World Bank

**Ans: (c)**

**Q. Which of the following gives 'Global Gender Gap Index' ranking to the countries of the world? (2017)**

- (a) World Economic Forum
- (b) UN Human Rights Council
- (c) UN Women
- (d) World Health Organization

**Ans: (a)**

---

## PM-Surya Ghar: Muft Bijli Yojana

[Source: PIB](#)

## Why in News?

The Union Ministry of New and Renewable Energy has issued operational guidelines for the [PM-Surya Ghar Muft Bijli Yojana](#), detailing **RESCO (Renewable Energy Service Company)** and **Utility-Led Aggregation (ULA)** models.

- These guidelines will supplement the existing consumer-driven implementation of [rooftop solar installations](#) through the **National Portal of the scheme**.

## What are the Key highlights of the Guidelines for the PM-Surya Ghar?

- **Two Models for Solar Installation:**
  - **RESCO (Renewable Energy Service Company) Model:** Third-party entities invest in rooftop solar installations. Consumers only pay for the electricity consumed, without bearing upfront costs. Excess power can be sold to DISCOMs.
  - **Utility Led Aggregation (ULA) Model:** Power distribution companies (DISCOMs) or state-designated entities install rooftop solar systems for residential households.
- **Payment Security Mechanism (PSM):** A Rs 100 crore PSM fund has been established to de-risk investments in RESCO-based rooftop solar models. It can be enhanced with additional grants, subject to Ministry approval.

## What are the Key Facts About PM-Surya Ghar Muft Bijli Yojana?

- **About:** The PM Surya Ghar Muft Bijli Yojana, launched in February 2024 by the Ministry of New and Renewable Energy (MNRE), aims to provide **free electricity to one crore households** by **installing rooftop solar panels**.
  - With a total budget of Rs 75,021 crore, the scheme is planned for implementation until **FY 2026-27**.
    - It offers up to **300 units of free electricity per month** and provides a **subsidy covering up to 40% of the installation cost**, promoting widespread solar energy adoption across the country.
- **Eligibility:** Indian citizens, homeowners, valid electricity connection, no prior solar subsidy.
- **Implementation:** The PM Surya Ghar Muft Bijli Yojana will be implemented by the **National Programme Implementation Agency (NPIA)** at the national level and **State Implementation Agencies (SIA)** at the state level.
- **Key Components:**
  - **Central Financial Assistance (CFA):** Provides financial support to residential consumers for installing rooftop solar panels through the National Portal.
  - **Model Solar Village:** Create one **Model Solar Village per district**, promoting solar energy adoption.
    - Villages with populations over 5,000 (or 2,000 in special states) are eligible for selection, and are evaluated on **renewable energy capacity** six months after being identified by the **District Level Committee (DLC)**.
      - The village with the highest **RE capacity in each district receives Rs 1 crore** in financial assistance.
- **Expected Outcomes:**
  - The scheme is expected to reduce **carbon emissions** by 720 million tonnes over the lifetime of the rooftop systems.
  - An estimated **17 lakh direct jobs** will be generated across sectors like manufacturing, logistics, installation, and operations.
  - The scheme will contribute 30 GW to India's solar energy capacity through residential rooftop systems.
  - Households can earn income by selling surplus electricity to DISCOMs, with systems like the **3 kW rooftop setup generating over 300 units per month**.



# PM Surya Ghar

## Muft Bijli Yojana



**Free electricity** for households.



Reduced **electricity costs** for the government.



Increased use of **renewable energy**.



Reduced **carbon emissions**.



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

#### Prelims

**Q. With reference to the Indian Renewable Energy Development Agency Limited (IREDA), which of the following statements is/are correct? (2015)**

1. It is a Public Limited Government Company.
2. It is a Non-Banking Financial Company.

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

- (a) 1 only  
(b) 2 only  
(c) Both 1 and 2  
(d) Neither 1 nor 2

**Ans: (c)**

## Semi-Dirac Fermion and Fundamental Particles

[Source: TH](#)

**Why in News?**

Physicists from Columbia University and Pennsylvania State University discovered a unique particle known as the **semi-Dirac fermion**.

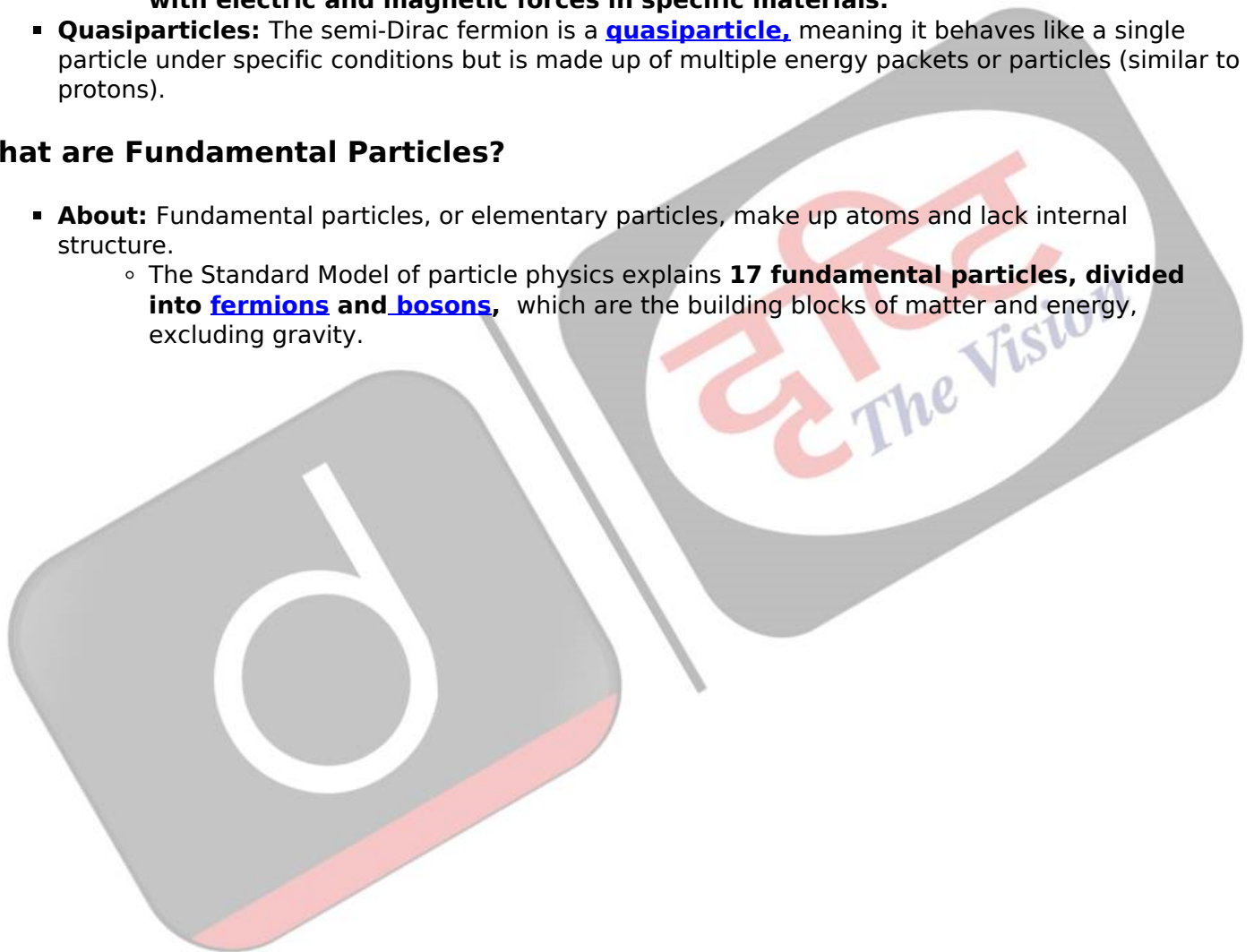
- This finding not only offers fresh insights into the properties of [fundamental particles](#) but also holds potential implications for [quantum physics](#).

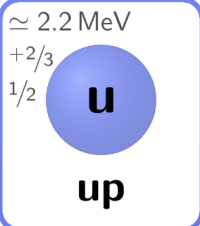
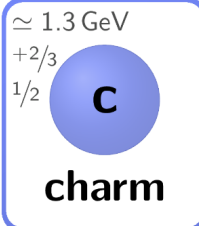
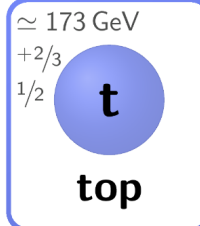
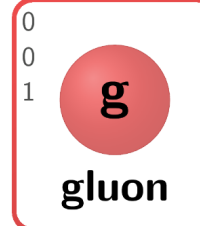
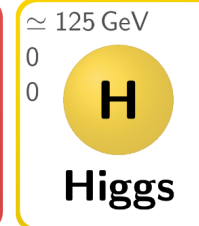
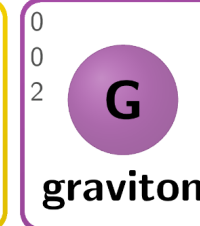
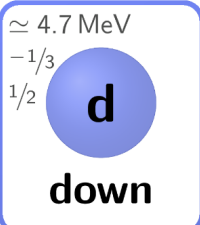
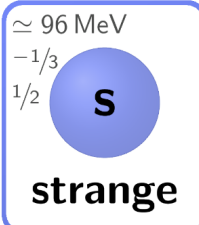
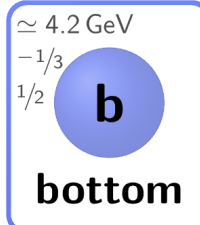
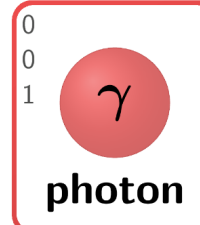
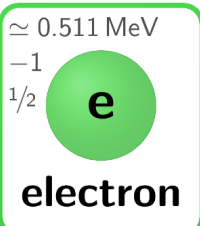
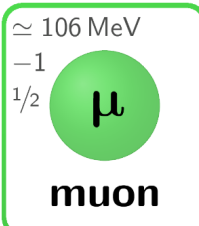
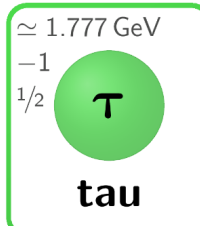
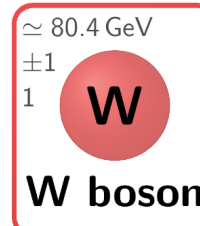
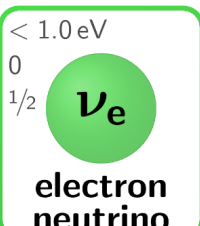
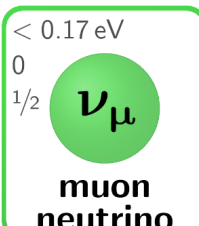
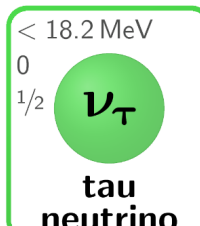
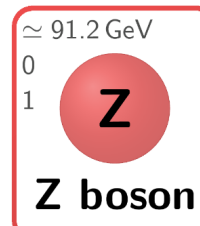
## What is a Semi-Dirac Fermion?

- **About:** A semi-Dirac fermion is a particle that has **mass when moving in one direction but not in a perpendicular direction**, which is a unique behavior. It was discovered in the crystalline material **zirconium silicon sulphide (ZrSiS)**.
- **Dirac Fermions vs. Semi-Dirac Fermions:**
  - **Dirac Fermions:** Have mass and are distinct from their anti-particles.
  - **Semi-Dirac Fermions:** Have mass along certain directional axes and can behave differently under various conditions. This unique mass behavior is due to their **interaction with electric and magnetic forces in specific materials**.
- **Quasiparticles:** The semi-Dirac fermion is a [quasiparticle](#), meaning it behaves like a single particle under specific conditions but is made up of multiple energy packets or particles (similar to protons).

## What are Fundamental Particles?

- **About:** Fundamental particles, or elementary particles, make up atoms and lack internal structure.
  - The Standard Model of particle physics explains **17 fundamental particles, divided into [fermions](#) and [bosons](#)**, which are the building blocks of matter and energy, excluding gravity.

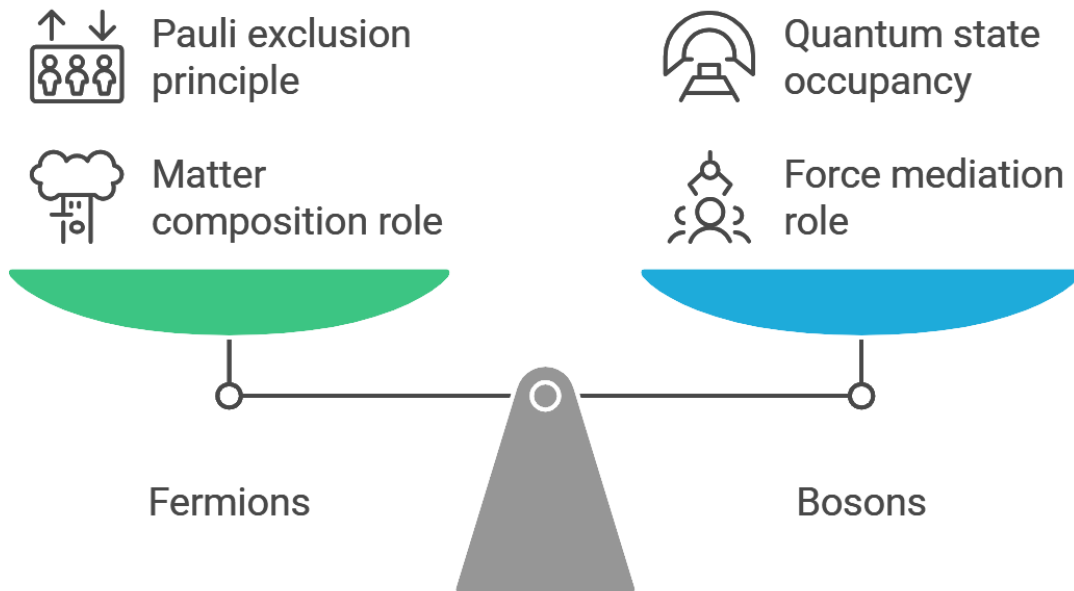


three generations of matter (fermions)			interactions / forces (bosons)			
	I	II	III			
QUARKS	mass $\approx 2.2$ MeV charge $+2/3$ spin $1/2$  <b>u</b> up	mass $\approx 1.3$ GeV charge $+2/3$ spin $1/2$  <b>c</b> charm	mass $\approx 173$ GeV charge $+2/3$ spin $1/2$  <b>t</b> top	mass 0 charge 0 spin 1  <b>g</b> gluon	mass $\approx 125$ GeV charge 0 spin 0  <b>H</b> Higgs	mass 0 charge 0 spin 2  <b>G</b> graviton
	mass $\approx 4.7$ MeV charge $-1/3$ spin $1/2$  <b>d</b> down	mass $\approx 96$ MeV charge $-1/3$ spin $1/2$  <b>s</b> strange	mass $\approx 4.2$ GeV charge $-1/3$ spin $1/2$  <b>b</b> bottom	mass 0 charge 0 spin 1  $\gamma$ photon		
	LEPTONS	mass $\approx 0.511$ MeV charge $-1$ spin $1/2$  <b>e</b> electron	mass $\approx 106$ MeV charge $-1$ spin $1/2$  $\mu$ muon	mass $\approx 1.777$ GeV charge $-1$ spin $1/2$  $\tau$ tau	mass $\approx 80.4$ GeV charge $\pm 1$ spin 1  <b>W</b> W boson	SCALAR BOSONS
mass $< 1.0$ eV charge 0 spin $1/2$  $\nu_e$ electron neutrino		mass $< 0.17$ eV charge 0 spin $1/2$  $\nu_\mu$ muon neutrino	mass $< 18.2$ MeV charge 0 spin $1/2$  $\nu_\tau$ tau neutrino	mass $\approx 91.2$ GeV charge 0 spin 1  <b>Z</b> Z boson		

#### ▪ Fermions and Bosons:

- **Fermions:** These particles make up matter and follow the **Pauli Exclusion Principle** (no two fermions can occupy the same quantum state), which helps them maintain their form and not collapse.
  - They have odd half-integer spins (angular momentum) ( $1/2$ ,  $3/2$ , and  $5/2$ ).
  - They include **protons, neutrons, electrons, neutrinos, and quarks**. These are the basic building blocks of everything around us.
  - Fermions can be further classified as **Dirac or Majorana fermions**.
    - **Dirac fermions** are fermions that **may or may not have mass** but are always different from their **anti-particles (particles with opposite charge and properties)**.
    - **Majorana fermions** are fermions that are also their own antiparticles.
- **Bosons:** Bosons are responsible for **transmitting forces between particles**. Unlike fermions, bosons do not follow the **Pauli exclusion principle**, can exist in **large numbers in the same quantum state**, as observed in phenomena like **superfluidity** and leading to the formation of a **Bose-Einstein Condensate (bosonic atoms are cooled to near absolute zero)**.
  - Bosons include **photons, gluons, and Higgs boson**, all of which act as force carriers. They have whole number spins ( $0$ ,  $1$ ,  $2$ , etc.).
  - Bosons are divided into two categories as gauge bosons and scalar bosons.
    - **Gauge bosons (spin of 1)**, such as photons, gluons, carry fundamental forces like electromagnetic, strong, and weak nuclear forces.
    - **Scalar bosons**, with a spin of  $0$ , include the **Higgs boson**, which is responsible for giving particles mass.

- **Applications:** Fundamental particles have various applications, including in [medical imaging](#), **nuclear energy** ([neutrons in fission](#)).
  - They also play a key role in [quantum computing](#), particle therapy for [cancer treatment](#), and electronics, where electrons power devices like **transistors** and [semiconductors](#).
  - These particles are central to advancing both practical technologies and fundamental physics research.



Comparing Roles and Properties of Fundamental Particles

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

**Q1. The terms 'Event Horizon', 'Singularity', 'String Theory' and 'Standard Model' are sometimes seen in the news in the context of (2017)**

- Observation and understanding of the Universe
- Study of the solar and the lunar eclipses
- Placing satellites in the orbit of the Earth
- Origin and evolution of living organisms on the Earth

**Ans: (a)**

## Symbols of State

[Source: TH](#)

**Why in News?**

Tripura unveiled its first **official state emblem** after approval from the **Union Ministry of Home Affairs (MHA)**.

- The proposal for the **emblem of the Government of Tripura** has been approved under **Rule 4(2) of the State Emblem of India (Regulation of Use) Rules, 2007**.



### What are the Provisions Related to the State's Flag, Emblem and Song?

- **State Flag:** States in India can have a state flag, as long as it does not supersede or contradict the Indian national flag as per the **Emblems and Names (Prevention of Improper Use) Act, 1950**, **Flag Code of India, 2002** and the [Prevention of Insults to National Honour Act, 1971](#).
  - The [Supreme Court of India \(SC\)](#) in [S. R. Bommai v. Union of India Case 1994](#) ruled that states can have their own flags, as long as they do not dishonor the national flag.
    - SC further stated that the **Constitution of India does not prohibit states from having their own flags**.
    - It held that the **state flag should always be flown below the national flag**, cannot be flown alongside it, and **cannot be used for official or statutory purposes**.
- **State Emblem:** The **State Emblem of India** is regulated **under the State Emblem of India (Prohibition of Improper Use) Act, 2005**.
  - **States in India** can adopt their emblem but require **Union Home Ministry approval for state symbols**.
  - Authorized **uses of states' emblems include official seals**, stationery, vehicles, and key public buildings. Unauthorized use for personal, organizational, or commercial purposes is strictly prohibited.
- **State Song:** India **lacks uniform legislation on state songs**, which are typically **approved by state legislatures or executives**. These songs reflect the state's heritage and **are sung at official events**, ensuring **respect for national unity** and the national anthem.
  - **Example:** West Bengal announced [Poila Baisakh](#) (first day of the Bengali month of Baisakh) as **State Day** (or Bangla Divas), and [Banglar Mati Banglar Jal](#), composed by [Rabindranath Tagore](#), as the **State Song**.

**Note:** [Article 51A \(Fundamental Duties\)](#) of the Constitution **imposes a moral duty on citizens** to respect the **national and state symbols** as part of their fundamental duties.

- **Article 51 A (a):** To abide by the Constitution and **respect its ideals** and institutions, **the National Flag and the National Anthem.**

## What is the Emblems and Names (Prevention of Improper Use) Act, 1950?

- **About:**
  - The **Emblems and Names (Prevention of Improper Use) Act, 1950** prohibits the **unauthorized use of national emblems, names, and symbols** for commercial purposes by private entities without proper permission.
  - The Act also **extends to state symbols**, meaning that **state emblems and names are protected under this legislation** as well to ensure that state symbols are **not misused for commercial purposes** without proper authorization.
- **Prohibition of Improper Use :**
  - **Section 3** of the Act prohibits the use of names or emblems listed in the Schedule, or their imitations, for trade, business, profession, or as trademarks/patents, without prior approval from the Central Government or an authorized officer.

## Flag Code of India, 2002

- **About:**
  - The **Flag Code of India, 2002** outlines the **rules for the use, display, and hoisting of the Indian National Flag.**
  - It is governed by the **Prevention of Insults to National Honour Act, 1971.**
- **Key Provisions:**
  - **Materials and Construction:**
    - The National Flag can be made from **hand-spun, hand-woven, or machine-made** materials like cotton, polyester, wool, or silk, following the December 2021 amendment allowing **polyester and machine-made flags.**
  - **Hoisting and Display:**
    - **Individuals, organizations, or institutions** may hoist the flag on **any day with respect.** The amendment in July 2022 allows it to be **flown day and night** in the open or on private properties.
  - **Design and Dimensions:**
    - The flag must be **rectangular**, with a **length-to-width ratio of 3:2.**
  - **Restrictions:**
    - The flag cannot be flown from a single masthead along with other flags.
    - It cannot be flown on vehicles except for designated dignitaries like the **President, Vice-President, Prime Minister, Governors,** etc.
    - No other flag or bunting should be placed above or alongside the National Flag.

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

**Q. With reference to Madanapalle of Andhra Pradesh, which one of the following statements is correct?**

- (a) Pingali Venkayya designed the tricolour Indian National Flag here.
- (b) Pattabhi Sitaramaiah led the Quit India Movement of Andhra region from here.
- (c) Rabindranath Tagore translated the National Anthem from Bengali to English here.
- (d) Madame Blavatsky and Colonel Olcott set up headquarters of Theosophical Society first here.

**Ans: (c)**

## Threats to Wild Bees

[Source: DTE](#)

A study published in *Journal Science*, has revealed that over **70% of wild bee species**, crucial for [pollination](#), are at risk from pesticide residues in soil.

- **Key Finding of the Study:** Current [pesticide](#) risk assessments mainly focus on honey bees, ignoring the impact on wild bees that nest in the soil.
  - Pesticides like **cyantraniliprole** harm wild bees by reducing their survival and reproductive success, threatening future generations.
- **Importance of Bees:** Bees are vital for pollinating many food crops, contributing directly to food security. A **third of the world's food production depends** on them according to the [Food and Agriculture Organization \(FAO\)](#).
  - Honey bees, living in large colonies, use **social detoxification strategies** (collective behaviors to manage toxins) to buffer pesticide impacts. Wild, solitary bees lack this protection and are more vulnerable to pesticide exposure.
- **Pollination:** It is the process of transferring pollen from the male part of a flower to the female part, which allows the plant to reproduce.
- **Pollinator Decline Impact:** The decline in wild bees populations due to habitat loss, pesticides, and climate change threatens plants that rely on bees for pollination, impacting global **food security**, [Beekeeping \(or apiculture\)](#) and biodiversity.



## INDIAN HONEY BEE

*Apis cerana indica*

Also known as the Asian Honey bee, they are frequently used in beekeeping for pollination.



## GIANT ROCK BEE

*Apis dorsata*

The giant bees are the largest of all honey bee species in India and are highly effective pollinators.



## NATIVE BEES OF INDIA



## ASIAN DWARF BEE

*Apis florea*

The smallest of all indigenous bees, they are also known as the little bee.

## STINGLESS BEE

*Melipona sp. and Trigona sp.*

Also known as dammer bees, they are able to penetrate flowers and extract honey with vitamins and minerals.



Read more: [World Bee Day](#)

## Gaddi Dog

Source: [DTE](#)

The [Indian Council of Agricultural Research-National Bureau of Animal Genetic Resources \(ICAR-NBAGR\)](#) has officially recognized the **Gaddi dog**, an indigenous breed from the Himalayan region.

- The Gaddi dog is the fourth indigenous **canine breed** to be registered, following the **Rajapalayam and Chippiparai** breeds of Tamil Nadu and the **Mudhol Hound** of Karnataka.



- The breed, named after the **Gaddi tribe** of Himachal Pradesh, is used to guard sheep and goats from predators and is nicknamed the '**Indian Panther Hound**' or '**Indian leopard Hound**' for its ability to fend off carnivores like the **Snow Leopard**.
  - The Gaddi tribe of Himachal Pradesh is a **semi-nomadic community** traditionally involved in shepherding and wool processing.
- **Physical Features:** The Gaddi dog is known for its massive, arched neck and a robust muscular body, with a black coat and occasional white markings.
- **Population Decline:** The Gaddi dog, with a population under **1000**, is facing extinction due to **gene pool dilution** and lack of breeding programs.
- **Conservation Effort:** The recognition aims to help conserve the Gaddi breed, which is not yet acknowledged by major kennel clubs.

Read more: [Dholes](#)

---

## Reevaluating Obesity Metrics

Source: [HT](#)

The long-standing reliance on [Body Mass Index \(BMI\)](#) for diagnosing [obesity](#) is increasingly being questioned due to its **limitations**.

- BMI can **overestimate** obesity in **muscular individuals** like athletes and **underestimate** obesity in those with excessive fat but **low muscle mass**.
- [The Lancet](#) recommends using alternative metrics such as **waist circumference**, **waist-hip ratio**, and **waist-height ratio**, which consider **gender, age, and ethnicity** differences.
  - Obesity should be classified as **pre-clinical (no organ dysfunction)** and **clinical** (with **organ dysfunction** and activity impairment).
- **BMI** is a measure used to **assess** whether a person has a **healthy body weight** for a given **height**. It is calculated using a person's weight and height.
- **Obesity in India:** As per [The Lancet](#), **70%** of India's **urban population** is classified as **obese or overweight**.
  - **India ranks 3rd**, just behind the **US and China**, in the list of top 10 countries with the **highest number** of obese individuals.
  - Obesity is a health condition caused by **excessive body fat**, diagnosed when **BMI is 30 or higher**.

Read More: [Growing Obesity in India](#)

---

## Interpol's Silver Notice

Source: [TH](#)

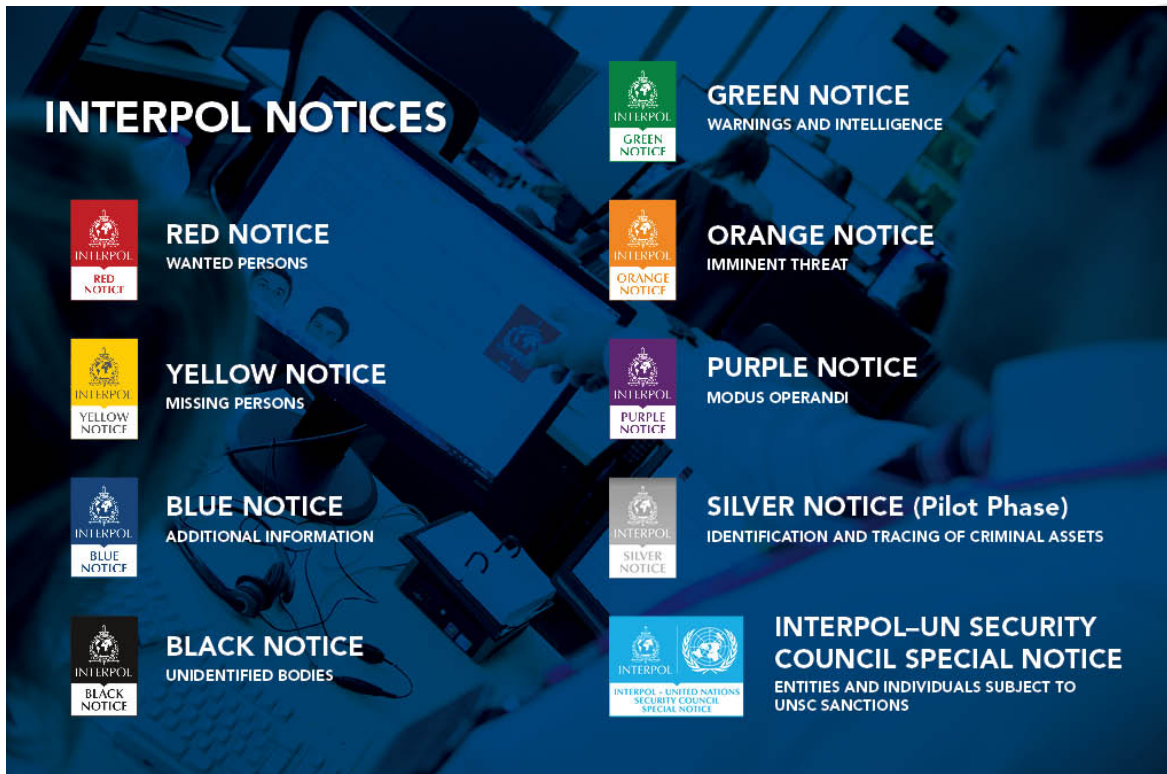
The [Central Bureau of Investigation \(CBI\)](#) has emphasized that the new **Interpol 'Silver Notice'** is a **more effective** tool than [Mutual Legal Assistance Treaties \(MLAT\)](#) for tracing illicit assets across borders.

**Silver Notice**

- **INTERPOL** Silver Notice was **launched in 2023** as part of a **pilot phase**, running **until 2025**, following consultations during the **2022 United Nations (UN) General Assembly**.
  - The initiative **involves 52 countries, including India**.
- It is aimed at **identifying and recovering criminal assets** linked to **illegal activities** and **trace laundered assets** such as properties, vehicles, financial accounts, and businesses.
- It enables member countries to **request information about assets connected to criminal activities** like fraud, corruption, drug trafficking, and environmental crimes.

#### INTERPOL Notices:

- **INTERPOL Notices** are **international alerts** that enable **police** in member countries to **share crime-related information**.
- There are **8 types** of Notices, in addition to the **INTERPOL-UN Security Council (UNSC) Special Notice**.



- **Notices can be requested by:**
  - A **member country's** INTERPOL National Central Bureau (**BHARATPOL** in India).
  - **United Nations, International Criminal Tribunals** and the **International Criminal Court**.
- India has launched the '**BHARATPOL**' **portal** to enhance the efficiency of **Indian investigation agencies**.

#### INTERPOL:

- **INTERPOL** is a **global police organization** that facilitates international cooperation to control crime.
- It was founded in **Vienna in 1923** and is **headquartered in Lyon, France**.
- India became a member of INTERPOL in **1949**.

**Read More:** [Mutual Legal Assistance Treaty: India- Poland](#), [Notices of Interpol](#)

PDF Reference URL: <https://www.drishtias.com/current-affairs-news-analysis-editorials/news-analysis/17-01-2025/print>

