

IMPORT OF PULSES: ECONOMY

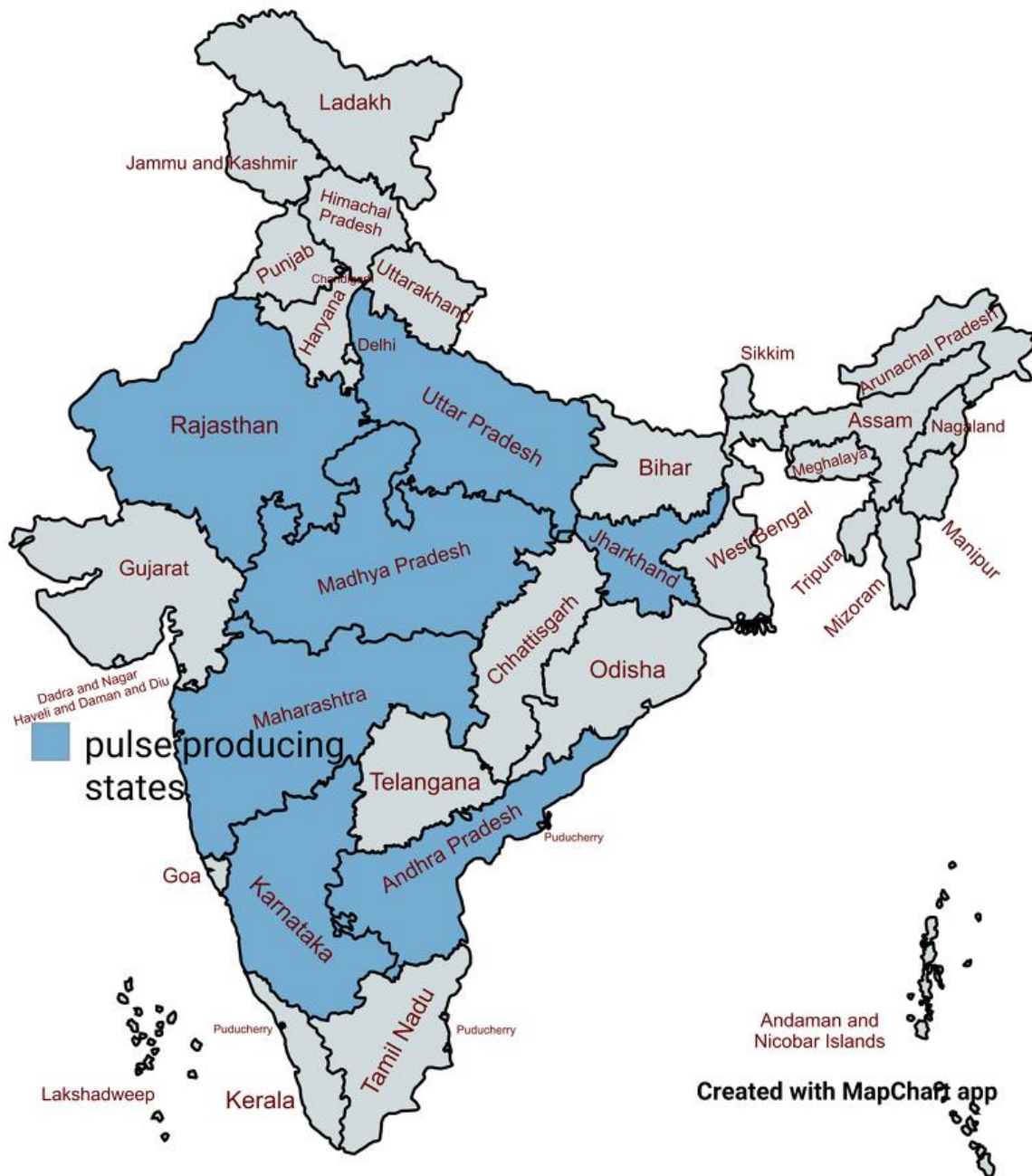
NEWS: *Govt extends free imports of yellow peas till May-end; imposes 11% duty on lentils*

WHAT'S IN THE NEWS?

India faces challenges in pulse production due to shifting cropping patterns, lower profitability, and climate issues, leading to increased reliance on imports. The government has introduced several initiatives, including the NFSM-Pulses and the Mission for Aatmanirbharta, to boost domestic production and reduce dependency on imports.

Pulses in India:

- **Temperature and Rainfall Requirements:**
 - Pulses grow best between 20-27°C.
 - They require rainfall of around 25-60 cm.
 - Preferred soil type: Sandy-loamy soil.
- **Role of Pulses in a Vegetarian Diet:**
 - Pulses are a major source of protein for vegetarians.
 - Being leguminous crops, pulses help restore soil fertility by fixing nitrogen from the air. This makes them suitable for crop rotation, though arhar (pigeon pea) is an exception.
- **Pulses Grown Throughout the Year:**
 - **Rabi Pulses:** Over 60% of pulses are grown during the Rabi season. Major crops include:
 - Gram (chickpea), Chana (Bengal gram), Masoor (lentil), Arhar (pigeon pea).
 - Rabi crops require a mild cold climate for sowing, cold conditions during vegetative to pod development, and a warm climate during maturity and harvesting.
 - **Kharif Pulses:** Grown during the Kharif season. Major crops include:
 - Moong (green gram), Urad (black gram), Tur (arhar dal).
 - Kharif pulses require a warm climate throughout their life cycle.



Recent Government Policies on Pulse Imports

- **Duty-Free Import Policies:**
 - The government allowed duty-free imports of yellow peas from December 2023 to February 2025 but has now reimposed the duty.
 - Duty-free import for pigeon peas (tur) has been extended until March 31, 2026.

- The government is still awaiting a decision on chickpeas (chana) and black gram (urad).
- The Ministry of Food has recommended reimposing customs duty on lentils, but no notification has been issued yet.
- **Impact of Duty-Free Imports on the Domestic Market:**
 - **Increased Imports:** India imported 6.63 million tonnes of pulses in 2024, compared to 3.31 million tonnes in 2023.
 - **Falling Domestic Prices:** Prices of pulses in India have fallen below the Minimum Support Price (MSP) due to increased imports. Examples:
 - Urad prices dropped by 25% from over ₹100/kg since June 2024.
 - Pigeon pea (tur) prices fell from \$1,400/tonne to \$800/tonne in mid-2024.
 - Yellow peas prices fell from \$700/tonne to \$450/tonne when duty-free imports were allowed.
- **Impact on Foreign Farmers:**
 - Australian and Canadian farmers benefited from the increased export of pulses.
 - Example: Australian farmers earned ₹160/kg for chickpeas, while Indian farmers earned ₹100/kg.
- **Impact on Domestic Farmers:**
 - Lower prices discourage Indian farmers from growing pulses, which can impact the country's self-sufficiency in food production.
 - Some farmers may switch to other crops like maize, driven by increasing demand for ethanol production.

Reasons Behind India's Dependence on Pulse Imports

- **Shifting Cropping Patterns:**
 - There has been a shift from traditional pulse cultivation to water-intensive cereals like rice and wheat.
 - Factors contributing to this shift:
 - Rice and wheat are staple foods in India.
 - Government incentives like higher MSP and assured procurement for these cereals.
 - Availability of better irrigation facilities.
- **Lower Profitability of Pulses:**
 - Pulses offer lower returns per hectare compared to cereals, discouraging farmers from growing them on fertile or irrigated land.
- **Climate Challenges:**
 - Pulses, which are generally rain-fed crops, face challenges from erratic rainfall and droughts, negatively affecting production.
- **Limited Technological Advancements:**
 - Compared to cereals and cash crops, research and development in pulses is limited. Pulses are more susceptible to diseases and pests.

India's Initiatives to Boost Pulses Production

1. National Food Security Mission (NFSM)-Pulses:

- Led by the Department of Agriculture & Farmers Welfare.
- Operates in 28 States and 2 Union Territories, including Jammu & Kashmir and Ladakh.
- Key Interventions:
 - Assistance to farmers through states/UTs for various activities.
 - Demonstrations of cropping systems.
 - Seed production and distribution of high-yielding varieties (HYVs) and hybrids.
 - Establishment of 150 Seed Hubs to improve the availability of quality seeds.

2. Pradhan Mantri Annadata Aay Sanrakshana Abhiyan (PM-AASHA) Scheme:

- Comprises three components:
 - **Price Support Scheme (PSS):** Procurement from registered farmers at MSP.
 - **Price Deficiency Payment Scheme (PDPS):** Compensates farmers for price differences.
 - **Private Procurement Stockist Scheme (PPSS):** Encourages private sector participation in procurement.

3. Mission for Aatmanirbharta (Self-reliance) in Pulses:

- Announced in Budget 2025, a 6-year mission focusing on Tur, Urad, and Masoor pulses.
- Key Focus Areas:
 - Development and commercialization of climate-resilient seeds.
 - Enhancing protein content in pulses.
 - Increasing productivity.
 - Improving post-harvest storage and management.
 - Ensuring remunerative prices for farmers.
- Rs 1,000 crore allocated for MSP-based procurement and post-harvest storage solutions.

4. ICAR's Role in Research and Development:

- ICAR focuses on basic and strategic research in pulses.
- Collaborative research with State Agricultural Universities to develop location-specific, high-yielding varieties.
- From 2014 to 2023, 343 high-yielding varieties of pulses have been officially recognized for commercial cultivation.

Way Forward: A Balanced Approach

• Imposing Customs Duties on Pulses:

- There is an urgent need to curb imports of chickpeas and lentils to protect domestic farmers.

- A moderate duty on pulses can help stabilize prices while preventing excessive dependence on imports.
- **Import Quotas for Future Stability:**
 - Instead of a blanket duty-free policy, the government should consider setting import quotas and adjusting duties based on domestic production estimates.
- **Stakeholder Consultation for Long-term Policy:**
 - Engaging farmers, traders, and policymakers in creating a stable pulse import policy to ensure long-term sustainability and fair prices.
- **Supporting Farmers with MSP and Procurement:**
 - Strengthening procurement mechanisms to ensure farmers receive prices above MSP.
 - Promoting pulse cultivation with incentives and improved storage facilities.

Source: <https://www.thehindubusinessline.com/economy/agri-business/govt-extends-free-imports-of-yellow-peas-till-may-end-imposes-11-duty-on-lentils/article69306134.ece>

SEAGRASSES: ENVIRONMENT

NEWS: *Seagrass conservation key to global biodiversity and climate targets, studies show*

WHAT'S IN THE NEWS?

Seagrasses, vital for carbon sequestration, biodiversity, and coastal protection, are declining globally at a rate of 1-2% per year due to human activities. Restoration efforts, both globally and in India, focus on mitigating these threats through conservation and sustainable management strategies.

About Seagrasses

- **Definition and Characteristics:**

Seagrasses are unique submerged, flowering plants that grow in coastal and marine environments. They evolved from terrestrial plants millions of years ago and have adapted to live in marine conditions. Unlike seaweed (which is a type of algae), seagrasses have roots, stems, leaves, and even produce flowers and seeds. They play an important role in marine ecosystems by forming underwater meadows, providing habitat and food for many marine species.
- **Evolution and Adaptation:**

Seagrasses represent a remarkable adaptation of land plants to aquatic life. Over time, they evolved from land plants and developed specialized structures, including roots that anchor them to the seabed, stems for structural support, and leaves for photosynthesis. This adaptation allows them to thrive in coastal regions, where they form dense, productive meadows that support a variety of marine life.

Importance of Seagrass Ecosystems

- **Carbon Sequestration and Climate Action:**

Seagrasses are extremely efficient at storing carbon, a process known as carbon sequestration. They can store carbon up to 35 times faster than tropical rainforests. This makes seagrass meadows a crucial natural solution to combat climate change by absorbing and locking away carbon from the atmosphere. These ecosystems play an integral role in mitigating the effects of climate change, particularly in the context of increasing atmospheric CO₂ levels.
- **Biodiversity and Marine Life Protection:**

Seagrass meadows provide essential habitat for a wide variety of marine species. They are considered a nursery for juvenile fish and other marine organisms, providing shelter and food for many species throughout their early life stages. Seagrasses also support a diverse range of invertebrates, such as crabs, shrimps, and mollusks, which in turn attract predators. They are home to numerous endangered species and play a critical role in maintaining the health and diversity of marine ecosystems.
- **Coastal Protection:**

Seagrasses act as natural buffers against coastal erosion by stabilizing the seabed and preventing the loss of sediments. Their dense root systems help in stabilizing the coastline, reducing the impact of strong waves and storm surges. This role is particularly important for protecting coastal communities from the effects of extreme weather events, including hurricanes and rising sea levels, which are becoming more frequent due to climate change.
- **Economic Values:**

Seagrass meadows have immense economic value, providing benefits worth around US \$6.4 trillion annually. These ecosystems support coastal economies by sustaining critical industries, including fisheries and tourism. They are also important for local communities, offering resources like fish, shellfish, and other marine life that contribute to food security and livelihoods. Additionally, healthy seagrass meadows support tourism, particularly eco-tourism and activities like diving and fishing.

Seagrass in India

- **Geographical Distribution:**

India, with a coastline of 11,098 km (as of 2023-24), hosts extensive seagrass meadows, primarily in the regions of the Gulf of Mannar, Palk Bay, Andaman and Nicobar Islands, Lakshadweep Islands, and the Gulf of Kutch. These areas are home to rich biodiversity and are integral parts of India's coastal ecosystems.
- **Ecological Significance in India:**

Seagrass meadows in India play a crucial role in enhancing coastal resilience, protecting biodiversity, and contributing to carbon sequestration. In addition, they support local fisheries by providing nursery grounds for several commercially important fish species. India's seagrass meadows, especially in the Gulf of Mannar and Palk Bay, also have significant cultural and ecological value, supporting both the environment and the livelihoods of local communities.

Threats to Seagrass Ecosystems

- **Anthropogenic Activities:**

Human activities, such as urbanization, pollution from industrial and agricultural runoff, and coastal development, are among the primary threats to seagrass meadows. Increased sedimentation, nutrient overloads from fertilizers, and chemical pollution significantly degrade seagrass habitats. These pollutants reduce the amount of sunlight reaching the plants, affecting their photosynthesis and overall health.

- **Weak Enforcement of Protection Laws:**

Despite the recognition of seagrass meadows as critical ecosystems, laws and regulations protecting coastal ecosystems are often poorly enforced. A lack of proper monitoring and insufficient funding for enforcement mechanisms make it difficult to protect seagrass habitats from illegal activities like overfishing, unregulated boating, and unplanned coastal development.

- **Biodiversity Loss and Unregulated Practices:**

Unregulated fishing practices, such as bottom trawling, damage the delicate structures of seagrass meadows. In addition, increasing boating activities, including anchors being dropped in seagrass beds, cause physical damage to the ecosystems. These activities, combined with the ongoing loss of biodiversity, reduce the resilience of seagrasses, making them more vulnerable to environmental stressors like climate change.

Global and Indian Restoration Efforts

- **Global Success Stories:**

- **Seagrass Watch:**

Seagrass Watch is a global collaborative citizen science initiative that involves volunteers, NGOs, and research organizations working together to monitor, document, and conserve seagrass habitats worldwide. The project focuses on raising awareness about the importance of seagrasses, conducting research, and empowering local communities to protect these vital ecosystems.

- **Blue Carbon Initiative:**

The Blue Carbon Initiative is an international project that focuses on enhancing the role of coastal ecosystems—such as mangroves, salt marshes, and seagrasses—in carbon sequestration. This project aims to promote the restoration of these ecosystems and to integrate them into global climate change mitigation strategies. The initiative underscores the importance of seagrasses in the broader context of blue carbon ecosystems.

- **Indian Conservation Initiatives:**

- **National Policy on Marine Fisheries (2017):**

The National Policy on Marine Fisheries acknowledges the importance of seagrass meadows alongside other vital coastal ecosystems like mangroves and coral reefs. The policy aims to protect and manage marine resources effectively, with a focus on sustainable fisheries and the conservation of critical marine habitats.

- **Climate Resilience Project:**
In states like Andhra Pradesh, Maharashtra, and Odisha, the Climate Resilience Project, supported by the Global Climate Fund (GCF), aims to enhance the climate resilience of coastal communities by restoring vital ecosystems like seagrass meadows. This project seeks to increase the adaptive capacity of coastal areas to climate change by focusing on ecosystem-based adaptation.
- **Seagrass Restoration in Gulf of Mannar and Palk Bay:**
Restoration efforts in these two areas of India focus on rehabilitating degraded seagrass meadows. The aim is to restore the ecological functions of these meadows, enhance biodiversity, and improve the livelihood of local fishing communities. These efforts are part of India's broader commitment to coastal ecosystem conservation.

Conclusion

- **Urgency of Action:**
The global decline of seagrasses due to human activities presents a significant threat to biodiversity, climate regulation, and coastal protection. The loss of seagrasses is accelerating, with a global decline of 1-2% per year. Immediate action is needed to protect and restore these ecosystems to preserve their crucial benefits for climate action, biodiversity conservation, and coastal resilience.
- **Global and Local Collaboration:**
The combined efforts of global initiatives, such as Seagrass Watch and the Blue Carbon Initiative, along with India's national restoration projects, provide a framework for seagrass conservation. It is critical that both local and global stakeholders continue to work together to ensure the survival and restoration of seagrass ecosystems, which are vital for combating climate change, protecting biodiversity, and sustaining coastal economies.
- **Sustained Efforts for Long-Term Success:**
To ensure the future of seagrass ecosystems, long-term commitments and sustained efforts are required. These should include better enforcement of protective laws, reduction of human-induced pressures, and continued restoration projects aimed at rehabilitating degraded seagrass meadows. The protection of seagrasses is not only an environmental issue but also an economic and social one, with long-lasting impacts on communities and ecosystems around the world.

Source: https://www.downtoearth.org.in/wildlife-biodiversity/seagrass-conservation-key-to-global-biodiversity-and-climate-targets-studies-show#google_vignette

ASTRA MK-III RENAMED GANDIVA : SCIENCE & TECHNOLOGY

NEWS: *Designing India's AI Safety Institute*

WHAT'S IN THE NEWS?

India's Astra Mk-III air-to-air missile, now renamed Gandiva, is a Beyond Visual Range (BVR) missile with long-range capabilities designed to enhance India's air combat power. Developed by DRDO, it will be deployed on Sukhoi Su-30MKI jets and Tejas, transforming aerial warfare with advanced targeting and engagement features.

Astra Mk-III Renamed Gandiva

- **Renaming:** India's latest air-to-air missile, the Astra Mk-III, has been officially renamed **Gandiva**, after the legendary bow of **Arjuna** from the Mahabharata. This name signifies the missile's power and precision, akin to the mythological bow used by the great warrior.
- **Development:** The missile is still under development by the **Defence Research and Development Organisation (DRDO)**, and it is set to transform aerial warfare with its capabilities in **Beyond Visual Range (BVR)** combat.

Key Features

- **Type:** The **Astra Gandiva** is a **Beyond Visual Range (BVR) air-to-air missile**, meaning it can engage enemy targets at ranges beyond the pilot's visual sight, improving the effectiveness of air combat.
- **Purpose:** It is specifically designed to be mounted on **fighter aircraft**, enhancing the air-to-air combat capabilities of Indian Air Force (IAF) aircraft.
- **Deployment:** Once operational, the missile will be deployed on **Sukhoi Su-30MKI jets** and the **Light Combat Aircraft Tejas**, both of which will gain enhanced long-range strike capabilities.
- **Development Stage:** Although still under development, the missile is expected to be fully inducted soon, becoming a crucial part of India's air defence arsenal.

Performance & Specifications

- **Range:**
 - The missile has a range of **340 km** at **20 km altitude** and **190 km** at **8 km altitude**. These distances make it one of the longest-range BVR missiles, capable of engaging targets from far beyond the pilot's line of sight, enhancing India's air superiority.
- **Engine:**
 - The **Astra Gandiva** features a **dual-fuel ducted ramjet engine**, which allows for sustained high speeds and efficiency over long distances. It is capable of launching from sea level up to an altitude of **20 km**, providing flexibility in various operational environments.

- **Speed:**
 - **Launch Speed:** The missile can be launched at speeds ranging from **0.8 to 2.2 Mach**, ensuring quick deployment in combat scenarios.
 - **Target Engagement Speed:** The missile has a high target engagement speed of **2.0 to 3.6 Mach**, allowing it to intercept fast-moving targets with high precision.
- **Target Engagement:**
 - **Angle of Attack:** The missile can engage highly maneuverable enemy aircraft at an **angle of attack up to 20 degrees**, ensuring flexibility in tracking fast and agile targets.
 - **Snap-up/Snap-down Capability:** The missile has a **±10 km snap-up/snap-down capability**, which allows it to engage targets at varying altitudes (higher or lower than the launch aircraft). This is crucial for intercepting targets in dynamic aerial combat situations.

Capabilities

- **Targeting:**
The Astra Gandiva is capable of targeting a wide range of aerial threats, including:
 - **Enemy fighter jets**
 - **Military transport aircraft**
 - **Refueling planes**
 - **Airborne Warning and Control Systems (AWACS)**

These capabilities make it a versatile tool for both offensive and defensive air operations, enhancing the IAF's ability to counter multiple types of aerial threats.
- **Global Standing:**
With the induction of **Astra Mk-III (Gandiva)**, India will possess one of the **longest-range BVR missiles** in the world, which places India at the forefront of global air defence technology. This missile not only enhances India's air combat capabilities but also strengthens its deterrence posture in the region.

Strategic Importance

- **BVR Warfare Transformation:**
The Astra Gandiva is designed to **transform the dynamics of BVR warfare** by enabling Indian aircraft to engage enemy targets with high precision at extended ranges. This significantly alters the traditional model of aerial combat, where aircraft must often close in on targets to engage them effectively.
- **Aerial Warfare Capabilities:**
With the induction of Astra Gandiva, India's aerial warfare capabilities will be greatly enhanced, allowing for both **defensive and offensive operations** across regional and global airspaces. The missile's long-range precision strike capability will allow Indian aircraft to engage adversaries at a greater distance, keeping them out of enemy radar and weapon range.

Conclusion

- **Leap in Defence Technology:**

The renaming and development of the **Astra Mk-III to Gandiva** represents a **major leap** in India's defence technology, offering enhanced **strike capability** against a variety of aerial threats at **long ranges**.

- **Strengthening Air Defence:**

Once inducted, the missile will significantly **strengthen India's air defence** by providing unmatched precision and range. This will improve India's ability to counter advanced threats in the modern air combat environment, ensuring greater national security and deterrence capability. The missile will play a crucial role in enhancing India's **air superiority** in the region and globally.

Source: <https://www.thehindu.com/opinion/op-ed/designing-indias-ai-safety-institute/article69289911.ece>

BUTTERFLY POPULATION: ENVIRONMENT

NEWS: *US butterfly populations plummet by 22% in two decades*

WHAT'S IN THE NEWS?

Butterfly populations in the U.S. have declined by 22% over two decades due to climate change, habitat loss, and pesticide use, with 66% of species facing population declines. Conservation efforts, including stricter pesticide regulations and broader habitat protection, are urgently needed to protect these essential pollinators.

Decline in U.S. Butterfly Populations

- **Significant Population Decline:**

- Over the past two decades, U.S. butterfly populations have seen a **22% decline**. This is a concerning trend highlighting the rapid loss of butterfly species.

- **Species-Level Impact:**

- A large portion of recorded species (66% of 554 species) are experiencing population losses.
- Among the 342 species studied, **33% (114 species)** have shown **significant declines**, with **107 species** losing more than **50%** of their population.

- **Severe Declines in Some Species:**

- The situation is dire for some species, with **22 species** experiencing a **90%+ decline** in population, showing severe ecological and environmental threats.

- **Minimal Growth:**

- Only **3%** of the species (which accounts for **9 species**) exhibited any form of population growth over the same period, indicating the challenge in sustaining butterfly populations.

Key Causes of Decline

- **Climate Change:**
 - One of the main contributors to the decline is **climate change**, particularly the warming of southern regions, which are becoming **uninhabitable** for many butterfly species.
 - This change is forcing many species to shift **northward**, which may lead to habitat loss and other disruptions in ecosystems.
- **Habitat Loss:**
 - Urbanization, deforestation, and other forms of habitat destruction have contributed significantly to the **reduction in available butterfly habitats**.
 - As cities expand and forests are cleared, butterflies lose the environments they rely on for feeding, breeding, and migration.
- **Pesticide Use:**
 - The widespread use of **pesticides**, especially **insecticides**, has been linked to the **decline in butterfly populations**.
 - These chemicals are harmful to not only pests but also non-target species like butterflies, negatively impacting their numbers and ecosystems.

Regional Trends & Data Insights

- **Population Declines Across Families:**
 - Population declines have been observed across all butterfly families, with **60-75%** of species affected, showing that this issue is widespread across different types of butterflies.
- **Northern vs. Southern Regions:**
 - **Northern regions** showed **higher butterfly abundance** compared to southern regions, which supports the theory that climate-driven factors are affecting southern regions more severely.
 - This supports the impact of rising temperatures and habitat shifts due to climate change.
- **Study Methodology:**
 - The study analyzed **12.6 million individual butterflies** from **2,478 locations** across **35 monitoring programs** between the years **2000-2020**, providing a comprehensive dataset on butterfly population trends.

Conservation Recommendations

- **Stricter Regulations on Pesticide Use:**
 - Experts recommend implementing **stricter regulations on pesticide use**, similar to the **EU's restrictions on insecticides**, to mitigate the negative impact on pollinators like butterflies.
- **Integrated Pest Management:**
 - **Integrated pest management** strategies and **diversified cropping systems** are suggested to create environments that are friendly to butterflies and other pollinators, while still controlling pest populations.

- **National and Local Conservation Efforts:**
 - A broad-scale, coordinated effort is needed at both **local and national levels** to protect butterfly habitats and ensure the long-term survival of pollinators.
 - These efforts should include habitat restoration, protection from further urbanization, and creating safe corridors for butterflies to move.

Urgent Call to Action

- **Faster Decline Compared to Growth:**
 - Experts warn that butterfly species are disappearing **13 times faster than population growth rates**, which means without urgent action, more species will face extinction.
- **Immediate Intervention Required:**
 - Researchers emphasize the **need for immediate intervention** to prevent further losses of butterfly species and to protect biodiversity. Immediate actions include habitat protection, conservation funding, and addressing climate change impacts.

Laws and Regulations for Butterfly Protection in India

1. **Wildlife (Protection) Act, 1972:**
 - Butterflies are legally protected under **Schedule II and IV** of the Wildlife Protection Act.
 - Protected species, such as the **Kaiser-i-Hind** (*Teinopalpus imperialis*) and **Common Peacock** (*Papilio bianor*), cannot be collected or harmed legally.
 - Illegal activities like collection, trade, or harm to these species are punishable by fines and imprisonment.
2. **The Biological Diversity Act, 2002:**
 - Regulates the **collection, research, and commercial use** of butterflies and their habitats.
 - Requires permission from the **National Biodiversity Authority (NBA)** for accessing biological resources like butterflies and their parts.
3. **The Forest (Conservation) Act, 1980:**
 - Protects forest habitats, indirectly benefiting butterfly populations in critical areas such as the **Western Ghats, Himalayas, and Northeastern India**.
4. **The Environment Protection Act, 1986:**
 - Used to regulate industrial and agricultural activities that affect butterfly habitats.
 - Provides legal grounds for controlling **pesticide use and pollution** that directly or indirectly harms butterfly populations.
5. **CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora):**
 - India is a signatory to **CITES**, which regulates international trade of endangered species, including rare butterflies like **Kaiser-i-Hind**.
 - Exporting these protected species without proper authorization is banned.

6. Protected Areas & Butterfly Sanctuaries:

- **Butterfly Parks and Reserves:**
 - **Bannerghatta Butterfly Park** (Karnataka), **Sikkim Butterfly Park**, **Assam Butterfly Conservatory**, and **Aralam Wildlife Sanctuary** (Kerala) are key conservation areas.
- **National Parks & Sanctuaries:**
 - **Silent Valley National Park** (Kerala), **Namdapha National Park** (Arunachal Pradesh), and **Kaziranga National Park** (Assam) support rich butterfly diversity and play a key role in their conservation.

Conclusion

- **Urgent Need for Butterfly Conservation:**
 - With alarming declines in butterfly populations due to climate change, habitat loss, and pesticide use, there is an urgent need for both **national and international** efforts to protect and restore butterfly habitats.
- **India's Legal and Conservation Framework:**
 - India has a solid legal framework, including several protection laws and conservation programs, to safeguard butterfly species and their habitats.
 - However, the implementation and enforcement of these laws need to be strengthened to ensure that the butterfly populations thrive for future generations.

Source: <https://www.downtoearth.org.in/wildlife-biodiversity/us-butterfly-populations-plummet-by-22-in-two-decades>

INTERNATIONAL WOMEN'S DAY

NEWS: *Prime Minister reiterates commitment for Women Empowerment on International Women's Day.*

WHAT'S IN THE NEWS?

1. **Annual Celebration:** International Women's Day (IWD) is observed every year on **March 8** to recognize and celebrate the achievements of women across various fields.
2. **Historical Significance:**
 - The day has its roots in the early 20th-century women's movements advocating for labor rights, suffrage, and social equality.
 - In **1922**, **Vladimir Lenin** declared March 8 as International Women's Day in recognition of women's contributions to the **1917 Russian Revolution**.
3. **United Nations Recognition:**
 - The **United Nations officially recognized** International Women's Day in **1977**, further strengthening global efforts toward gender equality.
4. **Themes for 2025:**

- **United Nations (UN) Theme:** *“For All Women and Girls: Rights. Equality. Empowerment.”*
 - **Official IWD Theme:** *“Accelerate Action.”*
5. **30 Years of the Beijing Declaration:**
- The year **2025** marks **30 years since the adoption of the Beijing Declaration and Platform for Action (1995)**.
 - This framework remains one of the most **comprehensive global agreements** for promoting the rights and empowerment of women and girls.

Legal Framework for Women’s Empowerment in India

1. Constitutional Provisions:

- **The Indian Constitution guarantees gender equality** through provisions in its **Preamble, Fundamental Rights, and Directive Principles of State Policy**.
- **Article 14:** Ensures **equality before the law and equal protection of the law** for all citizens.
- **Article 15:** Prohibits **discrimination based on sex** along with religion, race, caste, or place of birth.
- **Article 51A(e):** Encourages citizens to **renounce practices derogatory to women’s dignity**.
- **Directive Principles of State Policy:**
 - **Article 39:** Emphasizes **equal rights to livelihood, equal pay for equal work, and protection of children and workers**.
 - **Article 42:** Mandates the **provision of just and humane working conditions, including maternity relief**.

Challenges Faced by Women

1. Gender Discrimination:

- Deep-rooted **cultural biases, stereotypes, and social norms** continue to restrict women’s opportunities in various fields, including education, employment, and leadership.

2. Lack of Access to Education:

- Many girls, especially in rural areas, face **limited access to quality education** due to poverty, societal pressures, and safety concerns.

3. Economic Inequality:

- Women encounter **lower wages, fewer job opportunities, and limited financial independence**, leading to a **persistent gender wage gap**.

4. Safety and Security:

- High rates of **gender-based violence** including **domestic violence, sexual harassment, trafficking, and honor killings** continue to threaten women’s safety.

5. Health and Reproductive Rights:

- Limited access to **maternal healthcare, family planning services, and reproductive rights** leads to high maternal mortality rates and poor health outcomes.
6. **Child Marriage:**
 - Despite legal restrictions, **child marriage remains prevalent**, especially in rural areas, affecting **women's health, education, and personal autonomy**.
 7. **Political Representation:**
 - Women remain **underrepresented in political offices and decision-making positions**, leading to inadequate policy focus on gender-related issues.
 8. **Social Norms and Expectations:**
 - Rigid societal roles often **restrict women's freedom of expression, mobility, and career choices**, reinforcing traditional gender roles.
 9. **Workplace Harassment:**
 - Many women experience **gender-based harassment at workplaces**, with limited **support structures and grievance redressal mechanisms** in place.

India's Commitments to International Treaties on Women's Rights

India is a signatory to several international agreements promoting gender equality, including:

1. **Universal Declaration of Human Rights (1948)** – Recognizing fundamental human rights, including gender equality.
2. **International Covenant on Civil and Political Rights (ICCPR, 1966)** – Ensuring civil and political rights for all, including non-discrimination based on gender.
3. **Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW, 1979)** – A global framework against gender discrimination.
4. **Beijing Declaration and Platform for Action (1995)** – A blueprint for advancing women's rights worldwide.
5. **United Nations Convention Against Corruption (2003)** – Addressing corruption, which often disproportionately affects women.
6. **Agenda 2030 for Sustainable Development (SDGs)** – Promoting gender equality as a key goal (SDG 5).

Achievements in Women's Empowerment in India

1. **Nari Shakti Vandan Adhiniyam, 2023:**
 - Seeks to **reserve one-third of seats for women in Lok Sabha, State Legislative Assemblies, and the Delhi Assembly**.
2. **Improvement in National Sex Ratio:**
 - The **sex ratio in India improved to 1020 females per 1000 males**, as per the **National Family Health Survey-5**.
3. **Paid Maternity Leave Extension:**
 - Maternity leave increased from **12 weeks to 26 weeks** under the **Maternity Benefit (Amendment) Act, 2017**.
4. **Sukanya Samridhi Yojana:**

- Over **3.2 crore accounts** have been opened under this scheme to promote financial security for girl children.
5. **Women's Ownership under PM Awas Yojana - Gramin:**
 - **72% of the houses under this scheme are owned by women**, promoting financial independence.
 6. **Maternal Mortality Rate (MMR) Reduction:**
 - **MMR declined from 130 per lakh live births (2014-16) to 97 per lakh live births (2018-20).**
 7. **Abolition of Triple Talaq:**
 - Strengthened **legal protections for Muslim women** against instant divorce practices.
 8. **Women in Armed Forces:**
 - **Permanent commission granted to women officers in 12 arms and services.**
 - **Entry of women as Agniveers in all three Indian Armed Forces (Army, Navy, and Air Force).**
 9. **Women in STEM Fields:**
 - **43% of STEM graduates in India are women, the highest in the world.**

Government Initiatives for Women's Empowerment

1. **Mission Shakti (2021-2025):**
 - A **comprehensive women empowerment programme** by the Ministry of Women and Child Development (MWCD).
 - Focuses on **women's safety, welfare, and participation in nation-building.**
2. **Beti Bachao, Beti Padhao:**
 - Aims to **improve the child sex ratio and promote girls' education.**
3. **Sukanya Samridhi Yojana:**
 - Encourages **financial security for girls** by providing a **high-interest savings scheme** for their future education and marriage.
4. **Janani Shishu Suraksha Karyakram & PM Matru Vandana Yojana:**
 - Improve **maternal and child health** by providing **financial aid and medical assistance.**
5. **Mission Saksham Anganwadi & Poshan 2.0:**
 - Focus on **nutrition, immunity, and holistic health** of women and children.
6. **Women in Science and Engineering - KIRAN (WISE KIRAN):**
 - Supported **1,962 women scientists** from **2018 to 2023**, encouraging female participation in STEM fields.
7. **Nari Shakti Puraskar:**
 - National award recognizing **outstanding contributions of women in various fields.**

India has made **significant progress in women's empowerment**, but **persistent challenges** remain. Continued **policy efforts, societal change, and global collaborations** are essential for achieving true gender equality.

Source: <https://indianexpress.com/article/lifestyle/life-style/international-women-day-2025-theme-significance-date-8-march-9873286/>

GLOBAL OBESITY EPIDEMIC (LANCET)

NEWS: *A pair of studies published in The Lancet have projected that by 2050, over half of all adults (380 crore people) and one-third of all children and adolescents (74.6 crore people) worldwide will be overweight or obese. These studies provide crucial insights into the rising prevalence of obesity and overweight individuals globally, including forecasts till 2050.*

WHAT'S IN THE NEWS?

1. Global Overweight and Obesity Trends:

- As of **2021**, approximately **211 crore (2.11 billion) people**, which accounts for **45% of the global population**, were classified as **overweight or obese**.

2. Countries with the Highest Obese Populations:

- Half of the global obesity cases are concentrated in just **eight countries**, with the highest numbers recorded in:
 - **China: 40.2 crore (402 million)**
 - **India: 18 crore (180 million)**
 - **USA: 17.2 crore (172 million)**
 - **Brazil: 8.8 crore (88 million)**
 - **Russia: 7.1 crore (71 million)**
 - **Mexico: 5.8 crore (58 million)**
 - **Indonesia: 5.2 crore (52 million)**
 - **Egypt: 4.1 crore (41 million)**

Obesity in India: Alarming Trends

1. Adults (25+ years):

- The number of overweight and obese adults in **India has increased significantly since 1990**.
- By **2050**, India is projected to have the **second-largest obese and overweight adult population** globally.

2. Older Adolescents (15-24 years):

- In **2021**, India overtook **China** as the country with the **highest number of overweight and obese adolescents**.
- This trend is expected to **continue rising in the coming decades**.

3. Children (5-14 years):

- Currently, **India ranks second only to China** in terms of **overweight and obese children**.

- By **2050**, India is expected to **narrow the gap**, with obesity levels in China **stabilizing** while they **continue to rise in India**.

NFHS-5 Statistics on India's Obesity (2019-21)

1. **Overall Obesity Rates:**
 - **24% of Indian women** and **23% of Indian men** are classified as **overweight or obese**.
2. **High-Risk Waist-to-Hip Ratio:**
 - **56.7% of Indian women** and **47.7% of Indian men** have a **high-risk waist-to-hip ratio**, increasing their susceptibility to metabolic diseases.
3. **Obesity in Age Group 15-49 Years:**
 - **6.4% of women** and **4.0% of men** in this age group are classified as **obese**.
4. **Rising Childhood Obesity:**
 - The percentage of **children under 5 years** who are overweight (**weight-for-height**) has increased from **2.1% in NFHS-4 (2015-16)** to **3.4% in NFHS-5 (2019-21)** at the **national level**.

Impacts of Rising Obesity Levels

1. **Long-Term Obesity Cycle:**
 - Overweight and obese children are at a **higher risk of becoming obese adults**, perpetuating the obesity cycle across generations.
2. **Early Onset of Diseases:**
 - Obesity significantly **increases the risk of Type 2 diabetes, cardiovascular diseases, hypertension, stroke, and certain cancers** at an **earlier age**.
3. **Rising Healthcare Burden:**
 - Higher obesity levels **increase demand for medical treatments and surgeries**, leading to a **surge in healthcare costs**.
4. **Aging Population at Risk:**
 - By **2050, 25% of obese individuals** will be aged **65 and above**, placing **greater strain on healthcare and elderly care systems**.
5. **Coexistence of Undernutrition and Obesity:**
 - Many **low- and middle-income countries (LMICs)**, including India, face a **double burden of malnutrition**, where **undernutrition coexists with rising obesity rates** in different population segments.

Causes of the Obesity Epidemic

1. **Shift in Dietary Patterns:**
 - Increased consumption of **calorie-dense foods** high in **sugar, salt, unhealthy fats, and refined carbohydrates**.
2. **Rise of Ultra-Processed Foods:**
 - The **rapid expansion of multinational food corporations** has led to the **proliferation of packaged and processed foods**, replacing **traditional diets**.

3. **Weak Regulatory Frameworks:**
 - Many **developing nations, including India, lack stringent policies** to regulate **fast food, junk food advertisements, and misleading nutrition claims.**
4. **Market Trends and Processed Food Consumption:**
 - Between **2009 and 2019**, the highest increase in **ultra-processed food consumption** was recorded in:
 - **Cameroon**
 - **India**
 - **Vietnam**

Potential Solutions to Address the Obesity Epidemic

1. **Protect Local Food Systems:**
 - Strengthening **traditional food markets and encouraging the consumption of locally sourced foods over imported processed foods.**
2. **Public Health Policies:**
 - Implementing **national obesity prevention programs**, promoting **nutritional awareness**, and **taxing unhealthy foods** to discourage their consumption.
3. **Clinical Interventions:**
 - Increasing **investment in obesity management, prevention, and treatment**, including **bariatric surgeries and lifestyle interventions.**
 - Exploring **next-generation obesity drugs** to aid in weight management.

How is Obesity Measured?

1. **Traditional BMI Classification (WHO Standards):**
 - **Underweight: BMI < 18.5**
 - **Normal weight: BMI 18.5 - 24.9**
 - **Overweight: BMI 25 - 29.9**
 - **Obese: BMI > 30**
2. **Issues with BMI-Based Classification:**
 - **Limitations in assessing body fat distribution:**
 - Some **lean individuals (especially in India)** with a **normal BMI** may still have **excess abdominal fat**, leading to **obesity-related health risks** despite appearing "healthy" by BMI standards.
 - Some individuals with **high muscle mass** may have a **BMI over 30** but still be **metabolically healthy**, leading to potential misclassification.
3. **New Lancet Proposal (2024):**
 - **Clinical Obesity:**
 - Diagnosis based on **BMI, waist circumference, muscle mass, and overall body function** rather than just BMI alone.
 - **Pre-Clinical Obesity:**

- A new category for individuals with **high BMI but no immediate metabolic health issues**, highlighting those at **risk of developing obesity-related diseases in the future**.

Conclusion

- **Obesity has emerged as a significant public health crisis worldwide, with India witnessing a steep rise across all age groups.**
- **Changing dietary habits, increasing urbanization, and weak regulatory policies** have contributed to this epidemic.
- **Multi-sectoral interventions involving public health policies, education, food regulation, and clinical treatments** are necessary to **mitigate the long-term impact of obesity on healthcare systems and overall well-being.**

Body Mass Index (BMI)

- **Body Mass Index (BMI)**, previously known as the **Quetelet index**, is a simple way to check if an adult has a healthy weight.
 - It is calculated by dividing a person's weight in kilograms by their height in meters squared (kg/m^2).
 - To find BMI, take a person's **weight (kg)** and divide it by their **height (m) squared**.
- **Healthy BMI Range:** A normal BMI falls between **18.5** and **24.9**, based on the **World Health Organization (WHO)** guidelines.
- **Government interventions to promote healthy lifestyle**
- The Government of India has launched several initiatives to promote healthier lifestyles, better nutrition, and physical activity.
 - Fit India Movement
 - National Programme for Prevention and Control of Non-Communicable Diseases (NP-NCD)
 - POSHAN Abhiyaan
 - Eat Right India
 - Khelo India
 - National Health Mission
 - FSSAI's 'Aaj Se Thoda Kam' Campaign
 - FSSAI's **RUCO (Repurpose Used Cooking Oil)** initiative
 - Regulating High Fat, Salt, and Sugar (HFSS) Foods

Source: <https://indianexpress.com/article/explained/explained-health/lancet-studies-obesity-overweight-9872323/>

PREVENTIVE DETENTION IN INDIA - POLITY

NEWS: *The Supreme Court of India recently underscored the necessity of strict adherence to constitutional and statutory safeguards in cases of*

preventive detention, pointing out that such a “draconian measure” cannot override fundamental rights without strict adherence to procedural protections.

WHAT’S IN THE NEWS?

1. Background of the Case:

- Ashraf Hussain Choudhary and Adaliu Chawang were detained under the **Prevention of Illicit Traffic in Narcotic Drugs and Psychotropic Substances Act, 1988 (PITNDPS Act)** by the Nagaland government.
- The detention orders were issued on **May 30, 2024**, following the seizure of **239 grams of heroin** from a vehicle in **Khuzama village** on **April 5, 2024**.
- The couple was arrested on **April 12, 2024**, based on statements provided by another accused in the case.

2. Preventive Detention Debate in India:

- Preventive detention has been a subject of intense debate, particularly after the **abrogation of Article 370 in Jammu and Kashmir**.
- Several political leaders, including former **Chief Ministers Farooq Abdullah, Omar Abdullah, and Mehbooba Mufti**, were placed under **preventive detention** for months under the **Public Safety Act**.

Court’s Findings on Procedural Lapses in the Case

1. Language Barrier in the Detention Order:

- The detention orders were written in **English**, a language the detainees did not understand.
- The authorities claimed that the orders were **orally explained in Nagamese**, but the **Supreme Court ruled** in reference to the case **Harikisan vs. State of Maharashtra (1962)** that **oral communication alone is insufficient** and that detainees must be provided with a written translation they can comprehend.

2. Lack of Justification for Detention:

- At the time of detention, **neither of the detainees had applied for bail**.
- The authorities had **no valid reason** to assume that the couple would **resume illicit activities** if released.
- The **Supreme Court quashed the detention orders**, citing procedural violations and the absence of necessary justification.

3. Mechanical Application of Law:

- The authorities failed to **apply their mind** and merely followed the procedure without providing **proper reasoning** to justify the detention.
- The Supreme Court emphasized that preventive detention **should not be used as a mechanical tool** without substantial justification.

Constitutional Provisions for Preventive Detention in India

1. Preventive Detention as an Integral Part of the Constitution:

- Unlike most democratic nations, **India has explicitly incorporated preventive detention into its Constitution.**
2. **Article 22 of the Indian Constitution:**
 - Grants **protections to individuals** who are arrested or detained, including specific provisions for **preventive detention.**
 3. **Key Constitutional Provisions on Preventive Detention:**
 - **Article 22(3)(b):** Allows preventive detention for maintaining **public order and state security.**
 - **Article 22(4):** Limits detention to a **maximum of three months**, unless an **advisory board** finds sufficient cause for an extension.
 - **Advisory Board Composition:** Must include individuals who are or **qualified to be appointed as High Court judges.**
 4. **Extended Preventive Detention under Article 22(7):**
 - **Empowers Parliament to:**
 - Define cases where **detention can extend beyond three months** without advisory board approval.
 - Specify the **maximum detention period** under preventive detention laws.
 - Establish the **procedural framework** for advisory board reviews.

Preventive Detention vs. Punitive Detention

Aspect	Preventive Detention	Punitive Detention
Right to be Informed	The detainee must be informed of the grounds for detention , but information deemed against public interest may be withheld.	The detainee has the absolute right to be informed of the grounds for arrest.
Legal Representation	The detainee should be given an opportunity to present their case against the detention order.	The detainee has the right to consult and be defended by a legal practitioner.
Applicability of Safeguards	Safeguards are available to both citizens and aliens.	Safeguards are not available to enemy aliens.

About Preventive Detention

1. Definition of Preventive Detention:

- Preventive detention refers to the detention of a person **without trial or conviction by a court**, based on a **reasonable suspicion** that they may engage in activities that **disrupt public order.**

2. **NCRB Data on Preventive Arrests (2021):**
 - **Total arrests in 2021: 1,48,20,298**
 - **Arrests under preventive detention (Section 151 CrPC / Now Section 170 BNSS): 89,00,174 (60.5% of total arrests)**

Key Preventive Detention Laws in India

1. **National Security Act (NSA), 1980:**
 - Allows detention without trial for reasons related to **state security, public order, and national threats**.
2. **Unlawful Activities (Prevention) Amendment Act (UAPA), 2019:**
 - Focuses on **terrorism and unlawful activities**, with provisions for preventive detention.
3. **The Conservation of Foreign Exchange and Prevention of Smuggling Activities Act, 1974 (COFEPOSA):**
 - Designed to curb **smuggling and foreign exchange violations** through preventive detention.
4. **Public Safety Acts (PSA):**
 - Allows authorities to detain individuals **suspected of threatening state security or public order**.

Concerns Regarding Preventive Detention

1. **Judicial Limitations in Preventive Detention Cases:**
 - Courts can review whether **procedural safeguards were followed** but **cannot question the necessity of detention**.
2. **Violation of Human Rights:**
 - Preventive detention **lacks strong procedural safeguards**, increasing the risk of **torture, discrimination, and arbitrary detention**.
 - **Prolonged detention without trial** contradicts principles of **natural justice and human dignity**.
3. **Arbitrary Use & Political Misuse:**
 - Preventive detention laws are often used **beyond judicial oversight**, raising concerns about **unchecked and discretionary detentions**.
 - Governments may misuse these laws to **suppress political dissent, silence opposition voices, and curb activism**.
4. **Contradiction with International Norms:**
 - Preventive detention laws are **rare in other democracies** and contradict **international human rights agreements**, such as the **International Covenant on Civil and Political Rights (ICCPR)**.

Way Forward

1. **Stringent Enforcement of Procedural Safeguards:**

- **Judicial scrutiny** must be strengthened, as emphasized by the Supreme Court, to **prevent the misuse of preventive detention laws**.
2. **Time-Bound Reviews:**
 - **Mandatory periodic reviews** of detention cases should be conducted to prevent **indefinite detention**.
 3. **Independent Advisory Boards:**
 - Advisory boards should be **independent of the executive** to ensure **fair and unbiased assessments**.
 - Example: The **Telangana Prevention of Dangerous Activities Act, 1986**, requires advisory boards to be composed of **qualified judges** for fair evaluation of detentions.
 4. **Balancing Security & Human Rights:**
 - Preventive detention must be **used judiciously**, maintaining a balance between **national security and personal liberty**.
 5. **Transparent Investigation & Compensation:**
 - Fair investigations must be ensured, and **adequate compensation** should be provided in cases of **wrongful detention**.

Conclusion

- Preventive detention remains a **contentious issue** in India, as it impacts **individual liberty** while being a tool for **maintaining public order**.
- The Supreme Court has consistently emphasized that **preventive detention should be exercised cautiously**, with strict adherence to **constitutional safeguards and procedural fairness**.

Source: <https://timesofindia.indiatimes.com/india/preventive-detention-draconian-authorities-must-apply-mind-supreme-court/articleshow/118769327.cms>

TIT BITS:

1. Prime Minister Narendra Modi received the **Honorary Order of Freedom of Barbados** for his leadership and assistance during the COVID-19 pandemic. The recognition highlights his role in India's **Vaccine Maitri Initiative**, which provided COVID-19 vaccines to over 90 countries globally.
2. Ukraine alleges that Russia is launching "suicidal missions" to gain control over the **Dnipro River**, which divides Ukraine into right-bank and left-bank regions. The river flows into the **Black Sea**, with **Kiev**, the capital, situated on its banks.

MCQ

1. Which of the following statements about pulses in India are correct?

1. Pulses are mainly grown during the Rabi season, contributing to over 60% of the total pulse production.

2. India has implemented a Mission for Aatmanirbharta in Pulses to focus on enhancing productivity and ensuring remunerative prices for farmers.
3. Due to increased imports, prices of pulses in India have significantly risen, benefiting domestic farmers.

- A) 1 and 2 only
B) 2 and 3 only
C) 1 and 3 only
D) 1, 2, and 3

Answer: A) 1 and 2 only

Explanation:

- **Statement 1 is correct:** Over 60% of pulses are grown during the Rabi season in India. Major Rabi pulses include gram (chickpea), chana (Bengal gram), masoor (lentil), and arhar (pigeon pea), which require a mild cold climate for growth.
- **Statement 2 is correct:** The Mission for Aatmanirbharta in Pulses, announced in Budget 2025, focuses on enhancing productivity, developing climate-resilient seeds, and ensuring remunerative prices for farmers.
- **Statement 3 is incorrect:** The increase in imports of pulses has led to a decrease in prices in India, which has negatively impacted domestic farmers. Lower prices have discouraged pulse cultivation, rather than benefiting farmers.

2. Which of the following statements about seagrasses are correct?

1. Seagrasses are submerged flowering plants that evolved from aquatic plants.
2. Seagrasses play a crucial role in carbon sequestration, storing carbon up to 35 times faster than tropical rainforests.
3. Seagrass ecosystems in India are mainly found along the eastern coastline, including the Gulf of Kutch and the Andaman and Nicobar Islands.

- A) 1 and 2 only
B) 2 and 3 only
C) 1 and 3 only
D) 1, 2, and 3

Answer: A) 1 and 2 only

Explanation:

- **Statement 1 is correct:** Seagrasses are submerged flowering plants that evolved from terrestrial plants and adapted to marine environments.
- **Statement 2 is correct:** Seagrasses are highly efficient in carbon sequestration, storing carbon much faster than tropical rainforests, which helps in climate change mitigation.
- **Statement 3 is incorrect:** While seagrasses are found in several coastal areas in India, they are mainly located along the western coastline, including the Gulf of Mannar and Palk Bay, and not predominantly on the eastern coastline as stated.

3. Which of the following statements about India's Astra Mk-III (Gandiva) missile are correct?

1. The Astra Mk-III (Gandiva) is a Beyond Visual Range (BVR) missile designed for engagement at long ranges, up to 340 km at 20 km altitude.
2. The missile will be deployed on fighter aircraft like Sukhoi Su-30MKI jets and the Light Combat Aircraft Tejas, enhancing India's aerial combat capabilities.
3. It is powered by a single-fuel ramjet engine, capable of engaging targets at speeds between 0.8 to 1.5 Mach.

A) 1 and 2 only

B) 2 and 3 only

C) 1 and 3 only

D) 1, 2, and 3

Answer: A) 1 and 2 only

Explanation:

- **Statement 1 is correct:** The Astra Mk-III (Gandiva) is indeed a **Beyond Visual Range (BVR)** missile, capable of engaging targets at ranges of up to **340 km at 20 km altitude**, significantly improving India's air-to-air combat capability.
- **Statement 2 is correct:** The missile will be deployed on **Sukhoi Su-30MKI jets** and **Light Combat Aircraft Tejas**, making these aircraft more effective in BVR combat scenarios.
- **Statement 3 is incorrect:** The missile is powered by a **dual-fuel ducted ramjet engine**, not a single-fuel engine, enabling it to operate effectively across various altitudes and speeds.

4. Which of the following statements about the decline of butterfly populations in the U.S. are correct?

1. Butterfly populations in the U.S. have declined by 22% over the past two decades, with two-thirds of species experiencing population losses.
2. Climate change, habitat loss, and pesticide use have been identified as key drivers of the decline in butterfly populations.
3. The U.S. butterfly population has shown consistent growth, with no species experiencing a significant population decline in the past two decades.

A) 1 and 2 only

B) 2 and 3 only

C) 1 and 3 only

D) 1, 2, and 3

Answer: A) 1 and 2 only

Explanation:

- **Statement 1 is correct:** Butterfly populations in the U.S. have indeed declined by **22%** over the past two decades, and **two-thirds** of species have experienced population losses.
- **Statement 2 is correct:** **Climate change, habitat loss, and pesticide use** have been identified as the key factors contributing to the rapid decline in butterfly populations, with evidence showing these factors impact species' ability to thrive.

- **Statement 3 is incorrect:** The U.S. butterfly population has not shown consistent growth. In fact, the study reveals a significant **decline** in butterfly populations, with many species suffering severe population losses, not growth.

5. Preventive detention allows authorities to detain individuals without trial if they are suspected of engaging in activities that may threaten public order or national security.

Consider the following statements regarding preventive detention in India:

1. Preventive detention laws in India are entirely prohibited under the Constitution.
2. Article 22 of the Indian Constitution provides safeguards for individuals subjected to preventive detention.
3. A person detained under preventive detention must be presented before a magistrate within 24 hours.
4. The Supreme Court has no authority to review preventive detention cases.

How many of the above statements are correct?

- A) Only one
- B) Only two
- C) Only three
- D) All four

Correct Answer:

B) Only two (Statements 2 is correct, while statements 1, 3, and 4 are incorrect.)

6. Consider the following statements regarding the global obesity epidemic:

1. As of 2021, nearly 45% of the global population was overweight or obese.
2. The highest number of obesity cases are concentrated in eight countries, including India, China, and the USA.
3. Body Mass Index (BMI) is the only globally accepted metric for diagnosing obesity.
4. The rise of ultra-processed food consumption has contributed significantly to increasing obesity rates.

How many of the above statements are correct?

- A) Only one
- B) Only two
- C) Only three
- D) All four

Correct Answer:

C) Only three (Statements 1, 2, and 4 are correct, while statement 3 is incorrect because BMI is widely used but not the only metric; new classifications consider factors like waist circumference and muscle mass.)