



# Daily Current Affairs



## To The Point by Dhananjay Gautam

### Table Of Content 07 Nov 2024

1. Asian Buddhist Summit (ABS), 2024
2. Every Private Property Not a Community  
Resource: Supreme Court
3. World Solar Report Series
4. Biopiracy
5. Regional Rural Banks (RRBs)
6. Protected Planet Report 2024
7. International Energy Agency
8. IL-35 Protein
9. What is Minuteman III?
10. Vitamin D



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## 1 Asian Buddhist Summit (ABS), 2024

**Context:** The Ministry of Culture, in collaboration with the International Buddhist Confederation (IBC), organized the First Asian Buddhist Summit (ABS), aiming to bring together Buddhist leaders, scholars, and practitioners to foster unity and cooperation across Asia through the teachings of Buddhism.

**About the Summit:**

- **Theme:** "Role of Buddha Dhamma in Strengthening Asia" — reflecting the summit's goal of utilizing Buddhist principles to promote peace, stability, and unity in the Asian continent.
- **Participants:** Sangha leaders, scholars, and practitioners from diverse Buddhist traditions across Asia gathered to discuss Buddhism's potential to address contemporary issues.
- **Key Themes Discussed:**
  - **Buddhist Art, Architecture, and Heritage:** Exploring how Buddhist cultural expressions can foster regional unity.
  - **Buddha Cārikā and Dissemination of Buddha Dhamma:** Focusing on spreading Buddha's teachings to promote ethical values.
  - **Role of Holy Buddhist Relics:** Discussing the relevance of relics as symbols of spiritual heritage and unity.
  - **Significance of Buddha Dhamma in Scientific Research and Well-Being:** Bridging Buddhism with science to enhance mental well-being and resilience.
  - **Role of Buddhist Literature and Philosophy in the 21st Century:** Emphasizing the timeless relevance of Buddhist philosophy in today's society.

The summit aligns with India's Act East Policy, which seeks regional collaboration grounded in shared spiritual and cultural heritage to promote Asia's development.

**Buddhism: An Overview**

Buddhism, founded on the teachings of Siddhartha Gautama (the Buddha) in the 5th–4th century BCE, is centered on understanding and overcoming human suffering through a spiritual path. Key principles include:

- **Four Noble Truths:** The nature of suffering, its cause, its cessation, and the path to overcome it.
- **Nirvana:** The ultimate goal, which is the liberation from the cycle of birth, death, and rebirth.

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Page No

2



## Relevance of Buddhist Teachings in Today's World:

- **Mindfulness and Meditation:** Widely adopted for mental health benefits, promoting focus and stress reduction.
- **Emotional Resilience:** Buddhism encourages acceptance of suffering (dukkha), fostering resilience in adversity.
- **Peace and Nonviolence:** The principle of ahimsa advocates for peaceful resolutions and tolerance.
- **Forgiveness and Compassion:** Relevant in conflict-ridden societies, emphasizing reconciliation and compassion.
- **Countering Materialism:** Offering an alternative perspective that values inner peace and contentment over material wealth.

## Buddhism as India's Cultural Soft Power Diplomacy:

Buddhism plays a pivotal role in India's soft power strategy, fostering cultural ties and promoting peace across Asia. Key aspects include:

- **Strengthening Regional Ties:** Many Southeast Asian nations, like Thailand, Myanmar, and Sri Lanka, have strong Buddhist traditions. India's Buddhist diplomacy aims to strengthen these connections, particularly in countering China's influence in the region.
- **Promoting India's Historical Roots:** India, as the birthplace of Buddhism, hosts significant sites like Bodh Gaya, emphasizing shared heritage.
- **The Dalai Lama's Influence:** India's support for the Dalai Lama has strengthened its influence among Buddhist communities worldwide.
- **Revival of Nalanda University:** The new Nalanda University, rooted in the legacy of the ancient institution, aims to be a global center for Buddhist studies.
- **Buddhist Art and Monuments:** UNESCO World Heritage sites like the Ajanta and Ellora Caves, Sanchi Stupa, and Great Stupa at Sarnath are iconic representations of India's Buddhist heritage.
- **Tourism:** India, home to seven of the eight most important Buddhist pilgrimage sites, promotes Buddhist Circuit tourism to connect devotees and travelers with the sacred sites associated with the Buddha's life and teachings.

**Conclusion:** India's initiatives, such as the Asian Buddhist Summit and the revival of Nalanda University, reflect its commitment to strengthening historical, cultural, and religious ties with Asia. By promoting Buddhist tourism and educational collaboration, India seeks to bolster its leadership in academia and cultural diplomacy, fostering mutual understanding, goodwill, and cooperation in the region.

## 2 Every Private Property Not a Community Resource: Supreme Court

The recent Supreme Court ruling in India marks a significant development in the legal understanding of private property rights, especially concerning the State's ability to acquire private assets for the "common good." Here are the key takeaways from this landmark judgment:



### Background of the Case:

The case stemmed from a challenge by the Property Owners Association in Mumbai against Chapter VIII-A of the Maharashtra Housing and Area Development Act, 1976. This provision allowed the State to acquire private property with a compensation cap at one hundred times the monthly rent, which the petitioners argued was inadequate. Initially filed in 1992, the case reached a nine-judge Constitution Bench in 2002 and was finally ruled upon in 2024.

### Evolution of Private Property Rights in India:

Initially, private property was protected as a fundamental right under Article 19(1)(f) and Article 31 of the Indian Constitution. However, the 44th Amendment in 1978 changed this, making it a constitutional right under Article 300A, thereby allowing State acquisition of private property but only with due process and fair compensation.

### Supreme Court's Ruling:

The majority opinion led by the Chief Justice held that not all private property could be considered "community resources." The ruling overturned the broader interpretation of Article 39(b) put forth by Justice Krishna Iyer in 1978, which suggested that private property could broadly serve as community resources. The recent ruling asserts that such classifications require careful case-by-case analysis.

### Key points include:

- **Article 39(b)** directs the State to distribute resources in ways that "subserve the common good." However, this ruling establishes that private property should not automatically be included under this mandate.
- **Article 31C** protects laws under Articles 39(b) and 39(c), allowing the State to acquire resources crucial for the welfare of the community. However, the recent judgment suggests this power should be used judiciously, balancing individual rights with community interests.

### Dissenting Opinion:

Justice B.V. Nagarathna emphasized a need for a balanced approach, distinguishing between State-owned resources held in public trust and privately owned resources. She highlighted that "material resources" should not include intimate or personal belongings of individuals and suggested a more context-specific understanding of "community resources."



## Criteria for 'Material Resources of the Community'

The court set out criteria to help determine whether a private resource could be classified as a community resource:

1. **Nature and characteristics** of the resource.
2. **Impact on public welfare.**
3. **State control** vs. private ownership.
4. **Scarcity and availability** of the resource.
5. **Ownership concentration** among private entities.

## Implications of the Ruling:

The ruling has significant implications for future cases involving property rights and state powers, including:

- **Protection Against Arbitrary Acquisition:** The court emphasized the need for due process and fair compensation in any State acquisition of private property.
- **Shift Toward Market-Oriented Policies:** This reflects a gradual shift from the socialist economic policies that influenced earlier judgments, aligning more closely with India's evolving, market-oriented economy.
- **Impact on Economic Growth:** The court noted that India's recent economic policies have helped establish it as one of the fastest-growing economies, and this ruling may further support that trajectory by upholding property rights.

**Conclusion:** The Supreme Court's decision underscores the balance between individual property rights and community needs. It reinforces the protection of private property rights against arbitrary state actions while acknowledging the State's role in redistributing resources. This judgment is poised to shape India's property rights landscape as the country advances economically, ensuring a balanced approach to resource distribution.

### 3 World Solar Report Series

**Context:** The release of the 3rd edition of the World Solar Report series at the 7th Assembly of the International Solar Alliance (ISA) highlights crucial insights into global solar energy advancements, investment trends, technology developments, and green hydrogen potential in Africa.

#### Overview of the World Solar Report Series

The World Solar Report series, first launched in 2022, provides a comprehensive view of the global solar landscape, focusing on industry trends, challenges, and technological progress in solar energy. The 3rd edition includes four reports:

#### 1. World Solar Market Report:

- **Growth in Solar Capacity:** Global solar capacity surged from **1.22 GW in 2000 to 1,418.97 GW in 2023**, with an impressive **40% annual growth rate**.
- **Employment Impact:** The solar sector supports **16.2 million jobs globally**, with **7.1 million** directly in solar—a rise of **44%** in recent years.

#### 2. World Investment Report:

- **Investment Growth:** Global energy investments are expected to rise from **\$2.4 trillion in 2018 to \$3.1 trillion in 2024**, growing at around **5% annually**.
- **Regional Leaders:** The Asia-Pacific (APAC) region leads in solar investments, channeling **\$223 billion into solar energy in 2023**.

#### 3. World Technology Report:

- **Efficiency & Cost Reduction:** The report showcases record-breaking **24.9% efficiency in solar PV modules** and an **88% reduction in silicon usage since 2004**. Utility-scale solar PV costs have decreased by **90%**, making solar a more resilient and cost-effective energy solution.

#### 4. Green Hydrogen Readiness Assessment for African Countries

- **Transition Potential:** Green hydrogen offers a sustainable alternative to fossil fuels for Africa, supporting the continent's clean energy transition.

#### About the International Solar Alliance (ISA):

- **Established:** Jointly by Indian Prime Minister Narendra Modi and French President Francois Hollande in 2015.
- **Headquarters:** ISA is the first international intergovernmental organization headquartered in **India**.
- **Mission:** To mobilize **\$1 trillion in solar investments by 2030**, reduce solar technology costs, and ease access to financing.



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Page No

6



## India's Renewable Energy Landscape:

- **Installed Capacity:** India's total electricity generation capacity is **452.69 GW**, with non-fossil fuel sources contributing nearly **half**.
- **Renewable Energy:** By 2024, India's renewable capacity is **201.45 GW** (46.3% of total capacity), including:
  - **Solar Power:** 90.76 GW
  - **Wind Power:** 47.36 GW
  - **Hydroelectric Power:** 46.92 GW
  - **Small Hydro Power:** 5.07 GW
  - **Biopower** (biomass and biogas): 11.32 GW

## India's Climate Targets:

India is committed to achieving **Net Zero Emissions by 2070** and has set ambitious short-term targets, including:

- **Increasing renewable capacity to 500 GW by 2030.**
- **Meeting 50% of energy needs from renewables.**
- **Reducing cumulative emissions by 1 billion tonnes by 2030.**
- **Lowering emissions intensity of GDP by 45% from 2005 levels by 2030.**

**Conclusion:** The World Solar Report series underscores the transformative role of solar energy, investment trends, and emerging technologies in achieving global energy goals. India's proactive stance in renewable energy aligns with the ISA's vision and showcases its commitment to a sustainable energy future. This progress, along with international collaboration, positions solar energy as a pivotal force in the global energy transition.

## 4 Biopiracy

**Biopiracy** involves the unauthorized appropriation of biological resources and traditional knowledge, often by corporations, researchers, or nations, for commercial gains without proper compensation to the communities or countries of origin. It frequently affects biodiversity-rich regions, particularly in the Global South, where indigenous plants, animals, or knowledge are patented without permission or benefit-sharing.

**Common Forms of Biopiracy:**

- **Patent Claims on Traditional Medicinal Plants:** Companies or individuals may patent traditional medicinal plants, exploiting indigenous knowledge without acknowledgment or compensation.
- **Unauthorized Collection of Genetic Resources:** Genetic resources are taken from biodiversity-rich regions for research or product development without permission.

**Digital Biopiracy:**

With the advancement of biotechnology, **digital biopiracy** has emerged, where genetic and biological data is accessed through digital tools, often from online databases, and used for profit in areas like pharmaceuticals, agriculture, and synthetic biology.

**Key Concerns:**

- Digital databases of genetic information allow companies to bypass traditional biopiracy laws, as they no longer need physical samples.
- Nations and indigenous communities risk losing control over their genetic resources in the digital sphere, complicating regulation and benefit-sharing.

**India's Legal Frameworks Against Biopiracy:**1. **The Biological Diversity Act, 2002:**

- Regulates access to India's biological resources and associated knowledge.
- Requires foreign entities to seek permission from the National Biodiversity Authority (NBA) for resource access.
- Mandates benefit-sharing if commercial products are developed from Indian biological resources.

2. **Protection of Plant Varieties and Farmers' Rights (PPVFR) Act, 2001:**

- Grants rights to plant breeders and recognizes farmers for conserving plant varieties.
- Prevents the patenting of traditional crop varieties developed by Indian farmers, preserving farmers' knowledge and contributions.





### 3. Traditional Knowledge Digital Library (TKDL):

- A digital repository of documented traditional knowledge on Indian medicinal plants and practices.
- Prevents unjust patent claims by providing evidence of this knowledge in the public domain.

### International Laws and Agreements on Biopiracy:

#### 1. Convention on Biological Diversity (CBD), 1992:

- This landmark treaty aims to conserve biological diversity, promote sustainable use, and ensure fair benefit-sharing.
- Provides countries with sovereign rights over their biological resources and sets guidelines for access and benefit-sharing (ABS) arrangements with indigenous communities.

#### 2. Nagoya Protocol on Access and Benefit-Sharing (ABS), 2010:

- A supplement to the CBD, providing a legal framework for equitable benefit-sharing of genetic resources.
- Supports benefit-sharing through agreements, often involving monetary or technology transfer arrangements.

#### 3. TRIPS Agreement (Trade-Related Aspects of Intellectual Property Rights), 1995:

- Administered by the WTO, it sets minimum standards for intellectual property rights globally.
- Although not directly addressing biopiracy, it has been criticized for allowing patents on genetic resources without adequate compensation.

#### 4. International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), 2001:

- Also known as the "Seed Treaty," it emphasizes the conservation and sustainable use of plant genetic resources in agriculture.
- Promotes farmers' rights to share benefits derived from plant genetic resources and supports equitable exchange and benefit-sharing.

### Challenges and Issues in Biopiracy Regulation:

- **Enforcement:** Enforcing biopiracy laws is challenging, especially on a global scale, due to variations in legal frameworks and advancements in biotechnology.
- **Equitable Benefit-Sharing:** Ensuring that indigenous communities receive fair compensation for the use of their knowledge and resources is complex and varies by country.
- **Digital Biopiracy Regulation:** Current legal frameworks are not fully equipped to address the challenges posed by digital biopiracy, where genetic information can be digitized, shared, and used without physical access to resources.

The ongoing challenge with biopiracy highlights the need for updated international agreements and robust enforcement mechanisms to protect the rights of biodiversity-rich countries and indigenous communities in both physical and digital spaces.

## 5 Regional Rural Banks (RRBs)

**Context:** The Finance Ministry has proposed a fourth phase of consolidation for **Regional Rural Banks (RRBs)**, aiming to reduce the number from 43 to 28, enhancing their efficiency and aligning with the vision of **One State-One RRB**. The consolidation is expected to streamline operations, reduce overhead costs, promote technology adoption, strengthen capital, and expand operational areas for RRBs, enabling them to serve rural communities better.

**Background on Regional Rural Banks (RRBs):**

- **Established:** In 1975, following recommendations from the **Narsimhan Working Group (1975)**, under the **Regional Rural Banks Act, 1976**.
- **Objective:** To support the rural economy by offering credit and other essential financial services to small and marginal farmers, agricultural laborers, and small entrepreneurs.
- **Shareholding Structure:**
  - Government of India: 50%
  - State Government: 15%
  - Sponsor Bank: 35%
- **Regulation and Supervision:** RRBs are **Scheduled Commercial Banks** regulated by the **Reserve Bank of India (RBI)** and supervised by the **National Bank for Agriculture and Rural Development (NABARD)**.
- **Primary Focus:** Rural regions, though RRBs can also establish urban branches.

**History of RRB Consolidation:**

Consolidation began in **2004-05**, based on recommendations from the **Dr. Vyas Committee (2001)**, reducing RRBs from 196 to 43 by **2020-21** through three phases.

**Significance of RRB Consolidation**

- **Cost Efficiency:** Reduces overhead expenses.
- **Capital and Technology:** Enhances capital base and promotes modern technological integration.
- **Expanded Operations:** Increases the geographical reach and service capabilities.
- **Exposure:** Provides RRBs with greater resources and support to cater to rural clients effectively.

**Additional Initiatives for RRBs:**

- **Recapitalization:** The Government of India decided to infuse **₹10,890 crore** into RRBs during FY 2021-22 and FY 2022-23 to strengthen their capital base.
- **Sustainable Viability Plan:** Focuses on credit expansion, business diversification, reducing non-performing assets (NPAs), cost rationalization, and enhancing corporate governance.
- **Supervisory Action Framework for Prompt Corrective Action (PCA):** Targets financial stability and a stronger capital structure, ensuring RRBs remain robust and well-regulated.

Through these consolidation and support measures, the government aims to make RRBs more viable and capable of fostering rural economic growth.

## 6 Protected Planet Report 2024

The **Protected Planet Report 2024**, released by the **UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC)** and **IUCN**, provides the first global assessment of **Protected and Conserved Areas (PCA)** under **Target 3** of the **Kunming-Montreal Global Biodiversity Framework (GBF)**. This target calls for expanding PCAs to cover **30%** of global terrestrial and marine areas by 2030, with an emphasis on equity and the inclusion of **Indigenous Peoples and Local Communities (IPLC)**.



## Key Concepts:

- **Protected Areas:** Defined, regulated areas managed for specific conservation goals.
- **Conserved Areas:** Areas outside traditional protected zones managed to conserve biodiversity, ecosystem services, and local values.

## Key Findings:

- **Global Coverage:**
  - **17.6%** of terrestrial and inland waters and **8.4%** of marine areas are protected.
  - Over **two-thirds** of **Key Biodiversity Areas (KBAs)** are partially or fully protected, but **32% remain unprotected**.
- **Connectivity and Governance:**
  - Only **8.5%** of terrestrial areas are both protected and ecologically connected.
  - Limited governance data indicates **only 4%** of protected areas are managed by IPLCs.

## Way Forward:

- **Recognize Indigenous and Traditional Territories:** These territories, covering **13.6%** of global land, should be integrated into conservation frameworks.
- **Enhance International Financing:** Under the GBF, countries committed to **USD 200 billion per year** in biodiversity investment by **2030** to support conservation efforts, especially in developing countries.

## Initiatives Supporting Protected and Conserved Areas:

1. **Wildlife (Protection) Act, 1972 (India):** Establishes five types of protected areas—**Sanctuaries, National Parks, Conservation Reserves, Community Reserves, and Tiger Reserves**.
2. **Biodiversity Beyond National Jurisdiction (BBNJ) Agreement:** India's commitment to protect ocean biodiversity beyond national borders.
3. **Climate Adaptation and Protected Areas (CAPA) Initiative:** Uses nature-based solutions to enhance climate resilience in and around protected areas.

The **Protected Planet Report 2024** highlights the need for accelerated global action, equitable inclusion of IPLCs, and greater investment to achieve biodiversity and conservation targets.

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Page No

11

## 7 International Energy Agency

**Context:** The **International Energy Agency (IEA)** is a key global authority on energy, providing data, analysis, and policy solutions for all fuel types and technologies, with a strong focus on clean energy and sustainability. Its recent study highlights that the global market for clean energy technologies is projected to expand from **\$700 billion in 2023 to over \$2 trillion by 2035**, nearing the value of the crude oil market in recent years.



### About the IEA:

- **Established:** 1974, following the 1973–74 oil crisis, to ensure oil supply security and reduce dependency on imports.
- **Mission:** To collaborate with governments and industries to shape a secure, sustainable energy future for all.
- **Expanded Mandate:** The IEA has broadened its role to include global energy trend analysis, sound energy policy promotion, and multinational cooperation in energy technology. It has recently prioritized renewable energy and climate initiatives.
- **Membership:**
  - **31 member countries** (OECD countries), **13 association countries**, and **5 accession countries**.
  - **India** joined as an Associate member in **2017**.

### Membership Criteria:

For membership, a candidate must be an OECD member and meet specific criteria:

1. **Oil reserves** equivalent to 90 days of previous year's net imports.
2. **Demand restraint programs** to reduce national oil consumption by up to 10%.
3. **National legislation** to execute the Coordinated Emergency Response Measures (CERM).
4. **Data reporting** from oil companies under its jurisdiction.
5. **Contribution to collective action** in case of global oil supply disruptions.

### Key Reports Published by IEA:

- **World Energy Outlook**
- **World Energy Balances**
- **Energy Technology Perspectives**
- **World Energy Statistics**
- **Net Zero by 2050**

### Organisation for Economic Co-operation and Development (OECD)

- **Established:** 1960, with 38 democratic, market-economy nations.
- **Goal:** To shape policies fostering prosperity, equality, and well-being globally.

The IEA, as part of the OECD framework, is instrumental in shaping sustainable energy policies worldwide, especially in clean energy advancements essential for addressing climate change.

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Page No

12

## 8 IL-35 Protein

**Context:** Researchers at the Institute of Advanced Study in Science and Technology (IASST) in Guwahati have discovered that **IL-35**, a protein comprised of **IL-12 $\alpha$**  and **IL-27 $\beta$**  chains, may offer new avenues for treating **type 1 diabetes (T1DM)** and other autoimmune forms of diabetes.



### About IL-35 Protein:

- **Function:** IL-35 plays a role in modulating immune responses, specifically aiding in the protection against T1DM and autoimmune diabetes.
- **Mechanism:**
  - **Macrophage Activation and T-cell Regulation:** IL-35 helps control macrophage and T-cell proteins, which are involved in immune responses.
  - **Regulatory B Cells:** It supports regulatory B cells that play a role in suppressing autoimmune reactions.
  - **Inhibition of Immune Cells:** IL-35 reduces the activity of immune cells that attack pancreatic beta cells, which produce insulin.
  - **Reduction of Inflammatory Chemicals:** It lowers levels of immune cells that release inflammatory chemicals, limiting pancreatic cell infiltration—a key factor in T1DM progression.

### About Autoimmune Diabetes Mellitus (Type 1 Diabetes Mellitus, T1DM):

- **Definition:** An organ-specific autoimmune disorder that targets the insulin-producing **pancreatic beta cells**, leading to a chronic **insulin deficiency**.
- **Lifelong Dependency:** Individuals affected by T1DM require lifelong **exogenous insulin** due to their inability to produce insulin naturally.
- **Causes:**
  - **Genetic Susceptibility:** T1DM often occurs in those with genetic predispositions.
  - **Environmental Triggers:** These may include viral infections, high birth weight, rapid weight gain during infancy, gut microbiota imbalance, and dietary factors such as low vitamin D, omega-3 fatty acid deficiencies, and high milk intake.
- **Challenges:** Currently, there are no therapies capable of preventing or reversing the autoimmune destruction of pancreatic beta cells.

The discovery of IL-35's potential therapeutic role is promising, as it could lead to treatments that better manage immune responses, helping to protect pancreatic cells and reduce the need for continuous insulin therapy.

## 9 What is Minuteman III?

**Context:** The LGM-30G Minuteman III is a U.S. intercontinental ballistic missile (ICBM) designed as part of the nation's nuclear deterrence strategy.

### Overview:

- **Type:** Intercontinental ballistic missile (ICBM)
- **Role in U.S. Nuclear Triad:** The Minuteman III is the only land-based component of the U.S. nuclear triad, which also includes submarine-launched and air-launched nuclear weapons.
- **Manufacturer:** Boeing Corporation
- **Operational Since:** Early 1970s
- **Future Replacement:** Initially planned for a 10-year service life, it has been continuously modernized, with the **Ground-Based Strategic Deterrent (GBSD)** expected to replace it around 2029.

### Designation Breakdown

- **LGM:**
  - L - Silo-launched
  - G - Surface attack
  - M - Guided missile

### Features and Specifications:

- **Stages:** Three-stage, solid-fuel missile
- **Dimensions:** 18.2 meters in length and 1.85 meters in diameter
- **Launch Weight:** 34,467 kg
- **Speed:** Approximately **15,000 mph** (Mach 23 or 24,000 kph) at burnout, classifying it as a hypersonic missile.
- **Range:** Maximum range of **13,000 km**
- **Payload:** Originally designed to carry multiple independently targetable re-entry vehicles (MIRVs), but it currently carries a **single nuclear warhead** in line with arms control agreements between the U.S. and Russia.
- **Deployment:** Dispersed in hardened underground silos, with hardened cables linking to control centers for resilient command and control.



### Strategic Capabilities:

- **Retaliatory Capacity:** The Minuteman III features a rapid launch capability, high reliability, and backup systems, including airborne launch controllers, to ensure retaliatory capabilities even in extreme scenarios.
- **Current Arsenal:** The U.S. possesses approximately **440 Minuteman III missiles**.

The Minuteman III has been periodically tested to ensure its effectiveness and maintain strategic deterrence. Despite its age, it remains an essential component of the U.S. defense strategy until it is eventually replaced by the GBSD.

## 10 Vitamin D

**Context:** Vitamin D, also known as **calciferol**, is essential for various bodily functions, including immune support and bone health. Recent research highlights how early vitamin D deficiency can disrupt immune system development.

## What is Vitamin D?

- **Type:** Fat-soluble vitamin
- **Sources:**
  - **Natural:** Found in foods like egg yolks, saltwater fish, and liver.
  - **Supplemented:** Added to fortified foods and available as supplements.
  - **Sunlight:** Synthesized by the body when skin is exposed to UV rays from sunlight.
- **Storage:** Stored in body fat during sunny months, releasing in times of low sunlight.



## Why is Vitamin D Important?

1. **Bone Health:** Promotes calcium and phosphorus absorption, supporting strong bones and teeth.
  - **Deficiency Risks:** Can lead to brittle, misshapen bones, and conditions like **osteoporosis** and **rickets**.
2. **System Support:**
  - **Nervous System:** Aids in nerve signaling.
  - **Musculoskeletal System:** Supports muscle function.
  - **Immune System:** Boosts immune function, potentially reducing susceptibility to infections.

## Vitamin D Deficiency:

- **Consequences:**
  - **Bone Disorders:** Leads to bone diseases like osteoporosis (weakened bones) and rickets (bone softening).
  - **Hypocalcemia:** Low blood calcium due to poor calcium absorption.
  - **Secondary Hyperparathyroidism:** Overactive parathyroid glands in response to low calcium.
- **Symptoms:**
  - Muscle weakness, cramps, fatigue, and even depression.

Ensuring adequate vitamin D intake, through sunlight exposure, diet, or supplementation, is crucial for maintaining overall health, particularly for bones and immune function.