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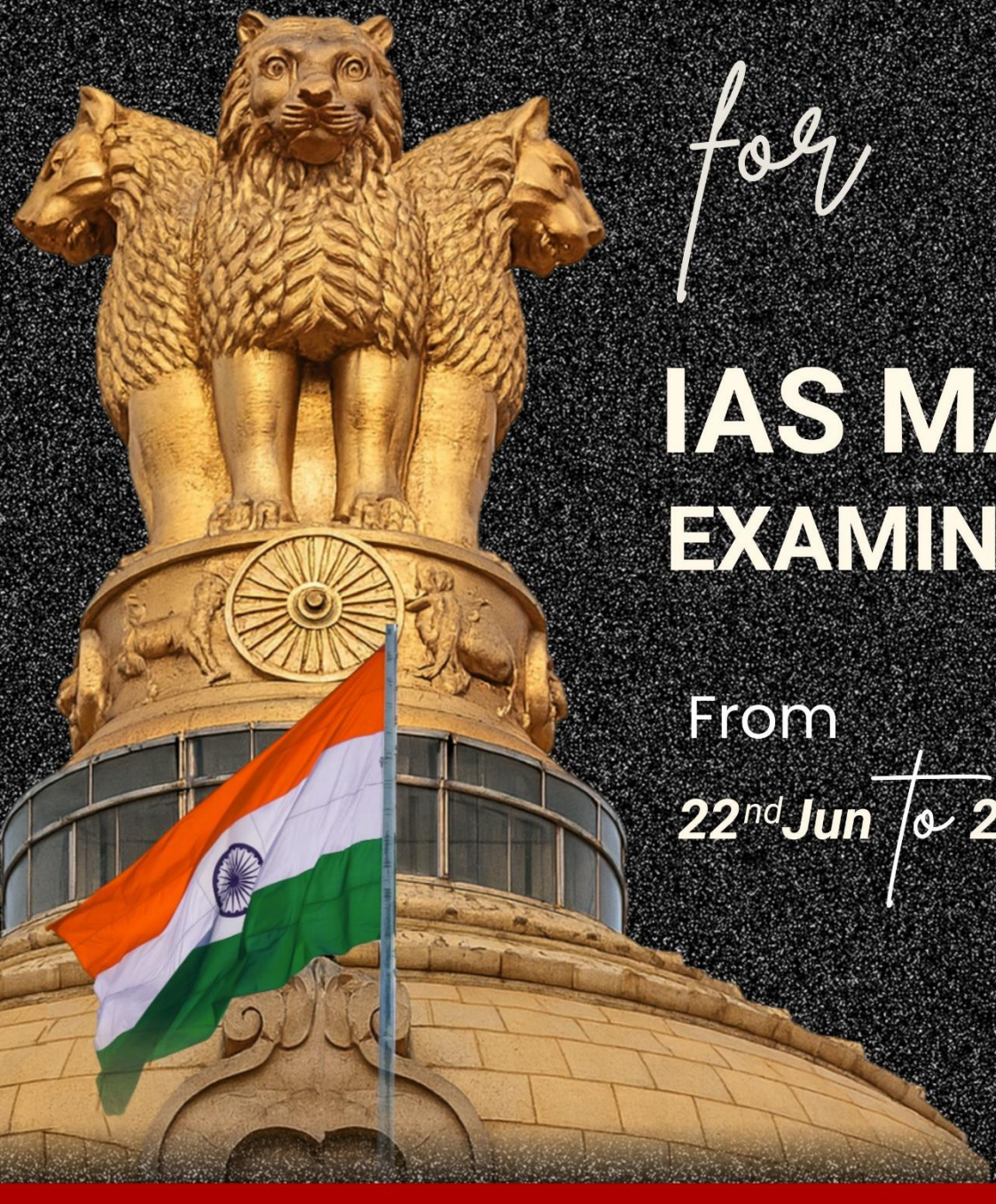
DEEP ANALYSIS



for

IAS MAINS EXAMINATION

From

22nd Jun to 27th Jun 2026

INDEX

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GENERAL STUDIES 2

1.1. POLITY & GOVERNANCE

1.1.1. INDIA'S DIGITAL & TECHNOLOGICAL SOVEREIGNTY

Context

Recent incidents have exposed critical vulnerabilities in India's digital infrastructure, signaling that "software-defined" networks are the new frontiers of national security:

- **The CCTV Breach (April 2026):** Hostile entities compromised Indian closed-circuit television (CCTV) networks to spy on strategic defense assets. The vulnerability was traced back to the use of a Chinese software platform (**EseeCloud**) embedded in the hardware.
- **The Cloud Access Denial (July 2025):** Nayara Energy was abruptly cut off from its corporate emails, cloud data, and collaboration tools. This happened because Microsoft unilaterally enforced EU sanctions against Nayara due to its partial ownership by Russian energy giant Rosneft.

Core Security Concerns & Vulnerabilities

- **Extraterritorial Jurisdiction of Data:** Even if data is physically stored within India, global data governance regimes allow foreign home governments to compel their tech giants to hand over data or restrict services.
- **Shift of Effective Control:** Control over critical infrastructure (authentication systems, productivity suites, cloud platforms) shifts away from Indian entities to overseas corporations and foreign sovereigns.
- **Weaponization of Code in Warfare:** Modern defense systems (fighter jets, missiles, radars) rely heavily on embedded software code rather than hardware. Foreign manufacturers can remotely:
  - Degrade targeting accuracy.
  - Reduce operational ranges.
  - Redirect battlefield intelligence to adversaries via software updates.
- **Historical Precedent:** During the **1999 Kargil conflict**, India was denied precise GPS access by the US at a operationally decisive moment in mountainous terrain.

Global Trends: The Move Toward Sovereign Tech

Major global powers are actively trying to reduce dependence on US-dominated digital ecosystems:

- **France:** Transitioning government departments from Microsoft Teams and Zoom to a sovereign video-conferencing platform by 2027.
- **EU & Others:** The Netherlands, Denmark, and German states are exploring domestic alternatives to Microsoft Word, Excel, and Outlook.
- **Türkiye:** Actively reducing reliance on foreign technologies to preserve strategic autonomy.

India's Unique Geo-Political Challenge

India's situation is uniquely precarious when viewed through the lens of **Power Transition Theory**:

- **The Theory:** When a rising power approaches parity with an established hegemon, the hegemon invariably acts to constrain or co-opt the competitor (as seen currently between the U.S. and China).
- **The Indian Dilemma:** As an accelerating economy approaching this "critical zone," India faces the daunting task of building its economic and military future on technology infrastructure that is currently vulnerable to foreign influence.

Way Forward

A. Restructuring the Defense Production Model

- **Shift from Public to Private Sector:** India's heavy reliance on the public sector has delayed critical projects (e.g., the indigenous fighter aircraft program running since the 1980s).
- **Adopt the US Model:** Emulate a system where private corporations develop cutting-edge capabilities through government research funding and assured procurement.
- *Recent Progress:* Inviting private-sector participation in developing the **Advanced Medium Combat Aircraft (AMCA)** under a competitive framework.

B. Strategic Technological Partnerships

Instead of total isolation (like China), India should pursue **interdependence** through trusted bilateral ties to avoid unilateral service denials:

- **Co-development:** Emulate the success of the **BrahMos missile programme** (India-Russia joint venture).
- **Supply Chain Security:** Deepen engagement with initiatives like **Pax Silica** (a U.S.-led initiative on AI and supply-chain security) to reduce dependence on hostile tech ecosystems.

C. Plugging the R&D Deficit

- **The Problem:** India's Gross Expenditure on R&D (GERD) averaged just **0.74% of GDP** (2000–2020), vastly underperforming against the global average of **2.07%**.
- **The Solution:** Urgently scale up public and private R&D spending to match global leaders to secure future technological sovereignty.

Conclusion

For a nation with India's demographic scale and global ambitions, achieving comprehensive technological sovereignty is no longer an optional luxury but a strategic necessity. Mitigating foreign digital dependencies will ultimately dictate India's economic competitiveness, national security, and strategic autonomy in an increasingly fragmented international order.

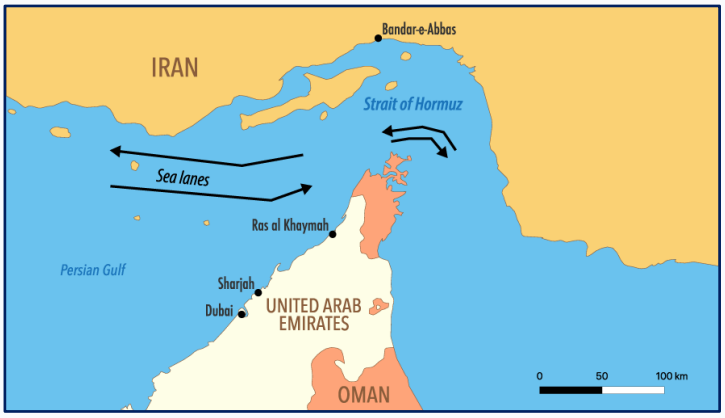
Q. *Recent incidents involving foreign-controlled software and cloud services have exposed vulnerabilities in India's digital ecosystem. Critically analyse the implications of such dependence for governance, economy, and national security. 15 Marks*

1.2. INTERNATIONAL RELATIONS

1.2.1. MARITIME GEOPOLITICS, THE STRAIT OF HORMUZ CRISIS, AND IMPLICATIONS FOR INDIA

Context

Iran's control over the strategic Strait of Hormuz chokepoint exposes global energy vulnerabilities, turning India's heavy import reliance into a critical national security risk.



Background of the Crisis

- **Historical Precedent:** Global superpowers (UK, USA, Japan, China) have historically fused economic prosperity with maritime dominance.
- **The Indian Contrast:** India's weak shipping sector reflects a gap in its geopolitical ambitions, despite its seafarers generating billions in foreign exchange under risky conditions (piracy, conflict zones).

The Strait of Hormuz: A Strategic Chokepoint

- **Geopolitical Leverage:** The recent conflict highlighted that controlling strategic waterways is as consequential as imposing economic sanctions.
- **Iran's Strategic Gains:** Despite sustaining heavy military damage from Israel and the US, Iran leveraged the Strait of Hormuz to expose global economic vulnerabilities by disrupting energy flows.
- **The New Maritime Order:** Iran has announced the creation of the **Persian Gulf Strait Authority** to act as the sole administrator for transits.
    - The Shift: Historically, transit vessels paid no tolls and did not report to Iran/Oman. Under a new MoU, shipping companies must now accept Iran as a decisive stakeholder.
    - Quid Pro Quo*:* The framework envisages lifting sanctions on Iran and its trading vessels in exchange for transit stability.

Challenges for India

The crisis has underscored a major strategic and energy vulnerability for India due to a lack of credible contingency planning.

- **Energy Vulnerability:** India's critical fuel and LPG strategies rely heavily on uninterrupted energy imports moving directly through this volatile chokepoint.
- **Inadequate Cavern Storage:** The country lacks sufficient long-term underground strategic reserves and cavern storage to handle sudden, extended supply disruptions.
- **Commercial Shipping Deficit:** India suffers from a weak domestic shipping sector and a limited fleet of Indian-flagged carriers, leaving it heavily dependent on foreign vessels during global crises.
- **Strategic Vulnerability:** The absence of a robust, credible maritime contingency plan exposes India's economic lifeline to unexpected regional blockades.
- **Geopolitical Policy Missteps:** India diluted its own bypass options by underutilizing and losing momentum on critical alternative routes like Iran's **Chabahar Port**.
- **New Transit Hegemony:** India must now navigate a rewritten maritime order where shipping lines are forced to comply with Iran's newly formed **Persian Gulf Strait Authority** for transits.

Global Responses: The Shift to "Zero-Dependency"

- Nations worldwide are actively reassessing their reliance on the Strait of Hormuz.
- **Example:** The UAE is aggressively pursuing a **"Zero Hormuz Dependency"** strategy by investing heavily in alternative land corridors and pipeline infrastructure that bypass the chokepoint.

Way Forward

To safeguard its strategic and economic interests, India must pivot from passive dependence to active strategic autonomy:

- **Diversification of Supply Chains:** Reduce over-reliance on a single geographic chokepoint for LPG and crude oil sourcing.
- **Infrastructure Resilience:** Invest heavily in long-term **underground cavern storage** to buffer against sudden maritime blockades.
- **Reviving Alternate Corridors:** Re-engage with and accelerate alternative maritime and land corridors (e.g., maximizing the potential of Chabahar, INSTC, or India-Middle East-Europe Economic Corridor equivalents).
- **Strengthening the Shipping Sector:** Build a robust, Indian-flagged commercial fleet to ensure trade security during global conflicts.
- **Strategic Partnerships:** Deepen maritime diplomacy and administration talks with regional players like Oman and other Gulf states.

Conclusion

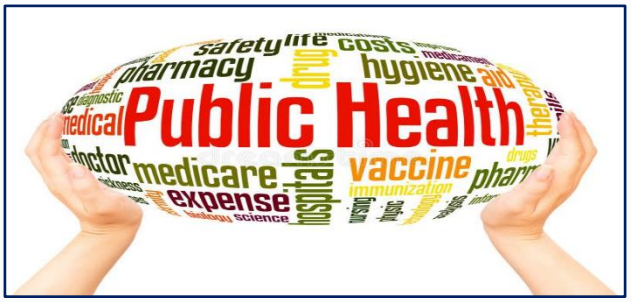
For India, reducing dependence on the Strait of Hormuz is no longer just an economic goal, it has graduated into an absolute **strategic necessity** for national security.

Q. *"Examine how Iran's control over the Strait of Hormuz impacts global energy security. In this context, analyze India's strategic vulnerabilities and suggest measures to ensure its energy resilience." 15 Marks*

1.3. HEALTH

1.3.1. RETHINKING INDIA'S PUBLIC HEALTH POLICY

Context



Recent public health policies aim to achieve universal health coverage but fail to improve access due to rising private sector costs and poor public sector quality. Two government initiatives—the Ayushman Bharat Health and Wellness Centres and the Ayushman Bharat Digital Health Mission—clearly illustrate these inadequacies and the shift in policy focus.

Introduction

Public health policies are crucial in determining population health and securing a nation's demographic dividend. However, recent policies are concerning because they often lack an evidence-based approach and fail to guarantee minimal health benefits. A noticeable shift away from preventive and promotive healthcare toward subjective, individualized goals has left the structural deficiencies of India's healthcare system largely unresolved.

Understanding the Government Health Policy and Its Core Ideas

The Institutional Transition to Ayushman Bharat Health and Wellness Centres

- The policy altered the identities of grassroots-level institutions, namely the health sub-centres, primary health centres, and community health centres, by mandatorily adding a "Health and Wellness Centre" prefix.
- This universal renaming created considerable ambiguity among policymakers and professionals regarding the actual mandate of these three-tier institutions.
- Consequently, the core focus of these centers shifted away from measurable population health outcomes toward the highly subjective goal of individual well-being.

The Difference Between General Health Promotion and Individual Wellness

- **Health Promotion:** This is a population-based approach that recognizes how broad social, economic, and environmental conditions actively shape a community's ability to adopt healthy behaviors. It relies on concrete, measurable metrics.
- **Individual Wellness:** This concept places the primary responsibility of health entirely on the individual, assuming they have the capacity to modify their lifestyle choices.
- Focusing on wellness heavily underestimates the deep structural and social determinants of health and creates outcomes that are inherently subjective and impossible to measure universally.

The Digitization Gap in the Ayushman Bharat Digital Health Mission

- The Ayushman Bharat Digital Health Mission aims to create a digital repository of health information for every individual through a unique health ID (Ayushman Bharat Health Account card).
- While it maps health facilities and professionals, generating digital databases and operating in silos cannot address the severe lack of physical access to affordable care.
- An information portal alone does not justify massive budget allocations when healthcare infrastructure remains grossly inadequate for large sections of the population.

Significance of Evidence-Based Public Health

1. **Reaping the Demographic Dividend:** Structured public health policies optimize human capital, which is a major contributor to national economic growth.
2. **Achieving Universal Health Coverage:** Proper implementation ensures individuals access needed health services without suffering catastrophic financial hardship.
3. **Addressing Structural Determinants:** Evidence-based approaches target essential community needs, such as drinking water, nutrition, and emergency care.
4. **Ensuring Measurable Improvements:** Using quantifiable health metrics allows policymakers to accurately evaluate health systems and address concrete deficiencies.
5. **Mitigating Private Sector Reliance:** Strengthening public facilities protects citizens from the unaffordability of private sector healthcare.

Challenges in the Current Public Health Framework

1. **Subjective Outcome Measures:** The concept of individual well-being is inherently subjective, triggering the management risk that "if you cannot measure it, you cannot improve it."
2. **Loss of Institutional Identity:** The mandatory renaming of primary and community health centres has blurred their historically evolved roles within the district health system.
3. **Failure to Address Physical Access:** Digital ID cards and facility registries do not resolve the pressing lack of quality physical healthcare infrastructure.
4. **Operating in Information Silos:** Digital portals primarily generate data on individuals and professionals who continue to function in isolated silos without robust institutional delivery mechanisms.
5. **Weakening of the Three-Tier System:** Current policies lack concrete measures to physically strengthen the three-tier health-care system, causing these institutions to weaken across many parts of the country.
6. **Unaffordability of Private Care:** Rising medical costs in the private sector continue to restrict healthcare access, making basic medical needs unaffordable for large sections of the population.
7. **Misallocation of Financial Resources:** Allocating an annual budget of around ₹300 crore to digital missions lacks strong public health justification when there are no measurable outcomes to solve inadequate physical care access.

Way Forward

1. **Strengthen Physical Healthcare Institutions:** Shift policy focus back to investing concrete resources into the physical infrastructure of sub-centres, primary health centres, and community health centres.
2. **Prioritize Immediate Curative Needs:** Recognize that access to affordable curative care is a pressing need that must be met before individuals can meaningfully engage with promotive interventions.
3. **Adopt Measurable Population Metrics:** Discard subjective wellness goals in favor of rigorous, population-level health promotion metrics that capture unmet health needs.
4. **Acknowledge Social Determinants:** Design policies that actively address the social, economic, and environmental conditions shaping health, rather than placing the burden solely on the individual.
5. **Integrate Digital Data with Provisioning:** Ensure that digital missions move beyond data collection and actively facilitate the physical delivery of care through robust institutional mechanisms.
6. **Align Policy with Public Concerns:** Reorient health initiatives so they address the felt, actual concerns of the population rather than merely advancing the administrative priorities of policymakers.
7. **Ensure Evidence-Based Policy Formulation:** Formulate and implement public health policies based strictly on empirical evidence and rigorous data, avoiding populist ideas that fail to deliver minimal health benefits.

Conclusion

For public health policies to genuinely succeed, they must look beyond subjective wellness concepts and isolated digital repositories. Achieving true Universal Health Coverage requires returning to evidence-based health promotion, addressing social determinants, and urgently rebuilding the physical capacities of India's three-tier healthcare system to meet the immediate curative needs of the population.

Q. *Critically evaluate the impact of Ayushman Bharat Health and Wellness Centres and the Ayushman Bharat Digital Health Mission on achieving Universal Health Coverage. 15 Marks*

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2.1. DISASTER MANAGEMENT

2.1.1. EARTHQUAKES

Why in the News?

The recent twin earthquakes (Magnitude **7.1 and 7.5**) in **Venezuela** caused widespread destruction, raising concerns about earthquake preparedness globally. The event also highlights India's vulnerability due to delayed revision of seismic building standards.

What is an Earthquake?

An **earthquake** is the sudden shaking of the Earth's surface caused by the abrupt release of energy accumulated due to the movement of **tectonic plates** along faults.

How Do Earthquakes Occur?

Plate Tectonic Theory

Earth's lithosphere consists of tectonic plates that constantly move over the semi-molten asthenosphere.

Earthquakes mainly occur along **plate boundaries**:

1. **Convergent Boundary**
   a. Plates collide.
   b. Produces the most destructive earthquakes.
   c. Example: Himalayas.
2. **Divergent Boundary**
   a. Plates move apart.
   b. Moderate earthquakes.
   c. Example: Mid-Atlantic Ridge.
3. **Transform Boundary**
   a. Plates slide past one another.
   b. Sudden release of stress causes earthquakes.
   c. Example: San Andreas Fault, Venezuela's Caribbean Plate boundary.

Key Terminologies

- **Focus (Hypocentre):** Point inside the Earth where energy is released.
- **Epicentre:** Point directly above the focus on Earth's surface.
- **Fault:** Fracture in rocks where movement occurs.
- **Foreshock:** Smaller quake before the main earthquake.
- **Aftershock:** Smaller earthquakes after the main event.

- **Doublet Earthquake:** Two large earthquakes occurring within a short interval due to interconnected fault ruptures.

Causes of Earthquakes

Natural Causes

- Plate tectonic movements
- Volcanic eruptions
- Isostatic adjustments
- Landslides
- Meteor impacts (rare)

Human-Induced Causes

- Large reservoir impoundment
- Deep mining
- Oil and gas extraction
- Hydraulic fracturing
- Nuclear testing

Earthquake Distribution in India

India lies on the collision zone of the **Indian Plate** and the **Eurasian Plate**, making it highly vulnerable.

Seismic Zones (BIS)

- Zone II – Low Risk
- Zone III – Moderate Risk
- Zone IV – High Risk
- Zone V – Very High Risk

Nearly **59% of India's land area** and around **79% of the population** are exposed to varying levels of seismic risk.

Major Earthquake-Prone Regions

- Himalayan Region
- North-East India
- Andaman & Nicobar Islands
- Kutch (Gujarat)
- Delhi-NCR
- Indo-Gangetic Plain

Impacts of Earthquakes

1. **Human Impact**
    - **Mortality and Physical Trauma:** Causes immediate mass casualties and severe trauma from structural collapses and crushing injuries. *(WHO)*
    - **Public Health Crises:** Disrupts emergency healthcare infrastructure, triggering disease outbreaks in overcrowded relief camps. *(WHO)*

- **Human Capital Erosion:** Reduces long-term cognitive and educational outcomes due to early childhood exposure to seismic stress.

2. **Economic Impact**
   - **Direct Asset Destruction:** Inflicts massive capital loss through the total obliteration of housing, industries, and critical public infrastructure.
   - **Macroeconomic Strain:** Depresses GDP growth by disrupting domestic supply chains and diverting fiscal resources into debt-ballooning reconstruction.
   - **Livelihood Disruption:** Paralyses regional production, causing exports to plummet while forcing a sharp surge in reconstruction-driven imports.
3. **Environmental Impact**
   - **Landscape Modification:** Triggers severe secondary terrain hazards like widespread landslides, avalanches, and permanent ground deformations. *(WHO)*
   - **Toxic Contamination:** Releases dangerous particulate matter, asbestos, and heavy metals from collapsed structures into local ecosystems. *(PMC-NIH)*
   - **Hydrological Alteration:** Disrupts regional groundwater tables, causes soil liquefaction, and risks devastating flood events via dam or river blockages.
4. **Societal Impact**
   - **Mass Displacement:** Forces large-scale internal migration, triggering long-term humanitarian crises and structural deficits in affordable housing.
   - **Social Disruption:** Breaks down vital informal community safety nets, leaving displaced and scattered populations highly vulnerable.
   - **Structural Inequities:** Disproportionately devastates lower-income groups living in non-engineered housing, trapping vulnerable families in deep poverty.

Challenges in India's Earthquake Preparedness

- **Institutional Dilution of Risk Data:** Scientific updates to seismic hazard maps (like proposing a stricter Zone VI) face administrative resistance or delays due to cost and compliance concerns for ongoing mega-infrastructure projects.
- **Grossly Underestimated Design Standards:** India's maximum seismic design threshold (Zone V at 0.36g) remains significantly lower than global standards and neighboring countries on the same Himalayan front, like Nepal and Pakistan (0.75g).
- **The "Unregulated Housing" Trap:** Nearly 95% of earthquake casualties occur in informal, one- to three-storey residential buildings that completely bypass formal municipal building codes and engineering supervision.
- **Massive Population Exposure:** Approximately 79% of India's population resides in moderate-to-severe seismic zones, exponentially amplifying the potential human and economic toll of a major tectonic rupture.
- **Severe Deficit in Structural Retrofitting:** There is a critical lack of proactive, large-scale structural auditing and retrofitting for existing, vulnerable lifeline infrastructure like older hospitals, schools, and bridges.

- **Over-Reliance on Post-Disaster Response:** National strategy remains heavily skewed toward post-event search, rescue, and relief operations rather than pre-disaster enforcement of resilient engineering and community-level drills.

Government Initiatives

- **NDMA Guidelines:** Drives a strategic paradigm shift from reactive post-disaster relief to proactive structural mitigation.
- **Earthquake Risk Indexing (ERI):** Maps specific hazards and structural vulnerabilities across high-risk urban centers to guide local planning.
- **Techno-Legal Mandates:** Enforces compulsory compliance with the National Building Code (NBC) and BIS seismic codes (IS 1893) for infrastructure.
- **National Seismological Network:** Maintained by the NCS with 165+ stations for real-time monitoring and early-warning research.
- **Community Safety Frameworks:** Leverages the National School Safety Programme (NSSP) and multi-state mock drills for localized capacity building.

International Best Practices

- **Japan (Technology & Engineering):** Deploys a nationwide **Earthquake Early Warning (EEW)** sensor network for real-time public alerts, paired with mandatory **"Base Isolation"** engineering to absorb seismic energy.
- **Chile (Policy & Enforcement):** Enforces **strict seismic construction codes** that mandate structural flexibility, anchored by a centralized disaster agency (**SENAPRED**) for uniform municipal enforcement

Way Forward

- **Implement Science-Backed Standards:** Adopt the updated Bureau of Indian Standards (BIS) seismic maps and upgrade Zone V design forces toward realistic global standards without letting fiscal infrastructure costs delay compliance.
- **Enforce Grassroots Building Codes:** Empower local municipal and panchayat bodies to strictly regulate and inspect informal one- to three-storey residential constructions where 95% of casualties occur.
- **Mandate Large-Scale Retrofitting:** Launch a targeted, institutional framework for structural auditing and retrofitting of existing lifeline infrastructure, particularly older schools, hospitals, and transit hubs.
- **Expand Early Warning Infrastructure:** Scale up real-time Earthquake Early Warning (EEW) sensor networks across the high-risk Himalayan front, integrating them with automated public broadcast systems.
- **Institutionalize Community Resiliency:** Conduct regular, localized community mock drills and integrate mandatory disaster preparedness training into school curriculums to create a bottom-up culture of readiness.

Case Study: Bhuj Earthquake (2001)

Magnitude: 7.7

Lessons Learned

- Importance of earthquake-resistant construction.
- Need for community participation.
- Modernisation of disaster management institutions.
- Adoption of the Disaster Management Act, 2005.
- Establishment of NDMA and NDRF.

Conclusion

Securing India's future demands transitioning from **reactive relief** to **risk-informed, smart engineering**. Integrating **automated early-warning networks** and enforcing **next-generation building codes** will build absolute **tectonic resilience** against inevitable seismic shocks

Q. *Discuss about the vulnerability of India to earthquake related hazards. Give examples including the salient features of major disasters caused by earthquakes in different parts of India during the last three decades. 10 Marks*

2.1.2. FIRE SAFETY & URBAN GOVERNANCE

Introduction

The recent Lucknow fire tragedy, which claimed 15 lives (mostly students), highlights the critical intersection between India's demographic dividend and its regulatory deficits. It reflects a booming, unregulated education economy thriving amidst unplanned urbanization, emphasizing that India's transition to a developed nation (**Viksit Bharat**) is fundamentally incomplete without ensuring a safe nation (**Surakshit Bharat**).

Core Reason of the Fire Safety & Urban Governance Crisis

A. Socio-Economic Drivers

- **Booming Coaching Ecosystem:** A young population eager to acquire skills for a rapidly changing job market (driven by AI disruptions) has fueled a high-profit, low-capital ecosystem of coaching centres.
- **Institutional Lag:** Formal educational institutions are failing to keep pace with modern skill requirements, forcing students toward these parallel, informal training hubs.

B. Structural & Regulatory Failures

- **Unauthorized Commercialization:** Educational hubs frequently operate out of buildings not zoned or authorized for commercial use.
- **Enforcement Deficit:** Despite repeated demolition notices by civic authorities, illegal structures continue to operate, highlighting corruption and administrative inertia.

- **Commodification of Safety:** Business owners consistently bypass basic fire safety norms and mandatory building codes to maximize profit margins.

C. Systemic Bottlenecks in India's Fire Governance

- **Lack of Investigative Culture:** Post-disaster investigations are superficial, rarely moving beyond superficial blame to identify systemic engineering or electrical flaws.
- **Infrastructure & Human Resource Deficit:** India suffers from a severe shortage of modern firefighting equipment and trained **fire-forensics experts** capable of conducting rigorous root-cause analyses.
- **Absence of Standard Systems:** Unlike developed nations, Indian commercial buildings largely lack automated, mandatory fire detection and suppression systems (e.g., smart sprinklers, integrated smoke alarms).

Government scheme and legislation

1. **Article 243W & the 12th Schedule of the Constitution:** Empowers Urban Local Bodies (ULBs) and municipalities with the constitutional functional domain to organize, regulate, and execute fire services locally.
2. **Disaster Management Act, 2005 (NDMA Guidelines):** Shifts the national fire response paradigm from reactive firefighting to proactive mitigation by mandating periodic, regular vulnerability assessments and structural fire safety audits.
3. **AMRUT 2.0 (Atal Mission for Rejuvenation and Urban Transformation):** Links central fiscal devolution to urban programmatic reforms, incentivizing municipalities to digitize, monitor, and streamline building plan approvals alongside safety compliance.

Global Examples of Fire Safety and Urban Governance Models

- **United Kingdom (Hackitt Review Implementation):** Introduced strict, continuous "safety case" regimes for high-rise buildings following the Grenfell Tower tragedy to eliminate regulatory loopholes.
- **Singapore (Fire Safety Act & SCDF Regulation):** Enforces mandatory, automated fire-shutter and sprinkler links directly tied to the Civil Defence Force for real-time monitoring of commercial properties.
- **United States (NFPA Code Enforcement):** Utilizes the National Fire Protection Association's highly standardized, legally binding codes coupled with third-party forensic investigations to prevent electrical failures.
- **Japan (Disaster-Resilient Urban Zoning):** Integrates strict fire-retardant material mandates with localized community firefighting infrastructure within dense, historic commercial districts.

Way Forward

- **Launch National Risk Audits:** Initiate scientifically designed, sample-based national building surveys to create a data-driven vulnerability database for urban centers.
- **Enforce Smart Technology:** Update building bye-laws to mandate **Arc-Fault Protection Devices (AFPDs)** and sensor-based, automated fire suppression systems in all commercial hubs.
- **Fix Institutional Accountability:** Establish strict legal and administrative penalties for civic officials who fail to execute issued demolition or safety violation notices.

- **Institutionalize Fire Forensics:** Establish a dedicated cadre of trained fire-forensics experts to move post-disaster investigations from superficial blame to technical root-cause analysis.
- **Empower Urban Local Bodies:** Enhance the fiscal and technical capacities of municipalities under **Article 243W** to modernization local firefighting infrastructure and emergency response times.
- **Formalize Parallel Education Hubs:** Implement a strict, mandatory registration and licensing framework specifically targeting informal coaching centers to regulate their spatial and structural safety.

Conclusion

Transforming India into a **Viksit Bharat** demands prioritizing a *Surakshit Bharat* through data-driven sample safety audits, mandatory smart sensor-based automated suppression systems, and strict municipal accountability to secure its demographic dividend.

Q. *Fire safety is an integral component of disaster risk reduction in rapidly urbanising India. Discuss the causes of recurring urban fire accidents and evaluate the preparedness of India's fire safety ecosystem. 15 Marks*

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