

EXPECTED

MAINS TOPIC

DEEP ANALYSIS

for

**IAS MAINS
EXAMINATION**

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1.1. POLITY & GOVERNANCE

1.1.1. STRUCTURAL PARALYSIS IN INDIA'S PANCHAYATI RAJ

Context

A recent Rural Development Ministry survey highlights declining participation in **Gram Sabha meetings**, attributing it to "participation fatigue." While the report recommends greater monitoring and digital tools, it overlooks deeper structural issues such as weak fiscal autonomy, livelihood constraints, and the erosion of local decision-making, raising concerns about the health of India's grassroots democracy.



Core Analysis: The Anatomy of Grassroots Erosion

The 73rd Constitutional Amendment Act, 1992, envisioned the *Gram Sabha* as the bedrock of participatory democracy. However, the ground reality shows a shift from *substantive democracy* to *procedural compliance*.

- **The Digital Bureaucracy Trap:** Administrative mandates like the NIRNAY app and real-time uploading of minutes shift the focus of Panchayat secretaries from community facilitation to digital data entry.
- **Manufactured Consent under PESA:** Despite strong physical infrastructure in PESA (Provisions of the Panchayats Extension to the Scheduled Areas) zones, the statutory right of *Gram Sabhas* to give "prior informed consent" for mining and land acquisition is frequently bypassed or manufactured by officials, as highlighted by protests in areas like Hasdeo Arand.
- **The "Leisured Elite" Domination:** Because attendance at *Gram Sabhas* is not financially protected or institutionalized as a component of social security, the daily-wage working class cannot afford to lose a day's livelihood. Consequently, meetings are dominated by landlords and contractors.

Systemic Challenges

- **Fiscal Centralization and Tied Grants:** *Gram Panchayats* spend only 4% of their time discussing revenue generation because they are structurally constrained from raising local taxes. Furthermore, the 14th and 15th Finance Commission grants heavily "tie" funds to central flagships like the Jal Jeevan Mission and Swachh Bharat Abhiyan, leaving zero fiscal autonomy for local priorities.
- **Technological Disenfranchisement:** Excessive reliance on centralized digital systems creates opportunities for bureaucratic evasion. Lax oversight allows officials to dismiss valid MGNREGA work demands by blaming unverified "server errors."
- **Structural Livelihood Barriers:** More than half of the barriers preventing citizens from attending *Gram Sabhas* are tied directly to the precarious nature of rural labor and low wages, forcing a choice between immediate survival and civic participation.

- **Reduction to Clearinghouses:** Instead of acting as self-governing deliberative bodies that identify local issues (which currently occupies only 13% of their time), *Gram Sabhas* have been reduced to top-down clearinghouses meant to validate schemes designed in Delhi.
- **The Illusion of Choice:** The state routinely treats *Gram Sabha* consultations as a rubber-stamping exercise. If the right of a local community to say "no" to a project is not legally and operationally protected, democratic consultation becomes an empty ritual.

Significance of Empowered Gram Sabhas

- **Ensures True Inclusivity:** Active *Gram Sabhas* give a political voice to marginalized sections, women, and Scheduled Tribes, breaking traditional rural hierarchies.
- **Bottom-Up Accountability:** Regular deliberative meetings act as a permanent social audit mechanism over local bureaucracy and the utilization of public funds.
- **Context-Specific Development:** Local populations are best equipped to identify unique ecological and economic needs, leading to efficient resource allocation rather than one-size-fits-all central models.
- **Conflict Resolution and Direct Democracy:** In tribal and ecological hotspots, robust *Gram Sabhas* prevent alienation and radicalization by legally protecting community land rights and resource ownership.
- **Deepening Democratic Culture:** It transitions the citizenry from being passive beneficiaries of state charity to active stakeholders and decision-makers in governance.

Way Forward

- **De-link and Untie Development Funds:** A substantial portion of Finance Commission allocations must be converted into "untied grants," giving *Gram Panchayats* the autonomy to fund local needs outside central flagship templates.
- **Institutionalize "Paid Participation" Compensations:** To counter economic exclusion, the state should explore compensating lost daily wages for rural laborers attending statutory *Gram Sabha* meetings, integrating it into broader social protection frameworks.
- **Enforce Veto Rights under PESA and Forest Rights Act:** Legislative and administrative loopholes must be plugged to ensure that the "prior informed consent" of tribal *Gram Sabhas* is an absolute, non-negotiable prerequisite for industrial and mining projects.
- **Revitalize Local Revenue Generation:** Incentivize and legally empower Panchayats to levy and collect local property taxes, professional taxes, and user fees to reduce their complete dependence on devolution grants.
- **De-bureaucratize and Humanize Technology:** Reposition digital tools like the NIRNAY app as backend support systems rather than real-time compliance burdens, freeing up Panchayat secretaries to focus on community mobilization.
- **Capacity Building and Awareness Drives:** Conduct structured training for *Gram Panchayat* representatives and regular awareness campaigns for citizens regarding their statutory rights to deliberate, dissent, and decide.

Conclusion

To realize the true vision of the 73rd Amendment, the state must replace digital compliance with genuine devolution of the **3Fs**. Transforming *Gram Sabhas* into autonomous, economically secure self-governments is vital to safeguarding India's democratic and ecological future.

Q. *The effectiveness of democratic decentralisation depends more on the quality of citizen participation than on the number of local institutions. In this context, examine the challenges faced by **Gram Sabhas** in India and suggest measures to strengthen grassroots democracy. 15 Marks*

1.1.2. THE LANGUAGE CONUNDRUM

Context

India's education system is transitioning towards a flexible, multilingual framework under NEP 2020. However, CBSE's recent mandate enforcing the three-language formula from Class 6 has exposed severe faculty shortages and implementation complexities, highlighting the challenge of balancing national integration with native linguistic preservation.



Introduction

The NEP 2020's three-language formula aims to promote linguistic diversity and cognitive growth by mandating the study of at least two native Indian languages. However, its abrupt enforcement and the sudden restriction of foreign language options have sparked widespread concerns regarding infrastructural readiness and global competitiveness.

About National Education Policy (NEP) 2020

- The NEP 2020 is a comprehensive framework introduced to overhaul India's education system, replacing the 34-year-old National Policy on Education of 1986.
- It envisions transforming India into a vibrant knowledge society and global knowledge superpower by making education more holistic, flexible, and multidisciplinary.
- The policy replaces the traditional 10+2 academic structure with a 5+3+3+4 model, aligning pedagogical stages directly with the cognitive developmental phases of children.
- A central pillar of the NEP is the promotion of multilingualism and foundational literacy, aiming to bridge the gap between regional cultures and modern global educational demands.

What is the Three-Language Formula?

- It is a multilingual pedagogical mechanism that requires students to learn three languages during their schooling.
- It aims to foster deeper connections with India's diverse linguistic heritage without imposing a single language nationwide.
- The mechanism mandates that out of the three languages taught, at least two must be native to India.

Legislative and Policy Foundations

- The framework builds upon the historical foundations laid by the Kothari Commission (1964-66) and the National Policy on Education (1968).
- Article 351 of the Constitution directs the Union to promote the spread and development of the Hindi language, acting as a historical backdrop for such policies.
- Unlike the 1968 policy, NEP 2020 replaces rigid regional mandates with flexibility, allowing States and students to choose their preferred languages.
- The CBSE issued circulars in 2026 mandating affiliated schools to implement this framework strictly from Class 6.

Significance of the Three-Language Formula

1. Enhances Access and Inclusion

- It helps children from diverse linguistic backgrounds access education in a language they comprehend.
- This boosts parental engagement in rural areas and integrates marginalized groups into the formal education system.

2. Improves Cognitive Learning Outcomes

- Multilingual education nurtures socio-emotional growth and helps children understand diverse perspectives.
- Research shows multilingual students excel in other academic subjects due to enhanced cognitive abilities.

3. Facilitates National Integration

- By encouraging the cross-learning of regional languages, it bridges the historical cultural divides between different states.
- It promotes respect for diverse cultures and strengthens a unified national identity.

4. Supports Sustainable Development

- Emphasizing native tongues protects indigenous languages and traditions for future generations.
- It aids in preserving traditional environmental knowledge and sustainable practices embedded in local dialects.

5. Provides Regional Flexibility

- It abandons the "one-size-fits-all" imposition of earlier policies by granting linguistic autonomy to states.
- This localized approach allows educational boards to tailor curriculums to their specific socio-linguistic realities.

Challenges Associated with the Three-Language Formula

1. Severe Infrastructure Deficit

- There is a critical shortage of trained regional language teachers across the country, especially for southern languages in northern states.
- This lack of capacity forces schools to default to Sanskrit, defeating the purpose of modern inter-state linguistic cross-pollination.

2. Diplomatic and Global Friction

- Phasing out European languages like French and German conflicts with bilateral educational roadmaps and skilled labor migration plans.
- Their exclusion deprives students of global certifications (like DELF) and limits international higher education opportunities.

3. Socio-Political Resistance

- Language remains a politically sensitive issue, with states like Tamil Nadu historically resisting three-language mandates in favor of a two-language model.
- Executing the policy in highly diverse regions, such as Nagaland, faces resistance due to the sheer volume of local dialects and lack of resources.

4. Abrupt Academic Disruption

- The hasty, mid-session implementation by the CBSE caused administrative chaos and the sudden termination of foreign language faculty.
- This disrupted the long-term career planning of students who had already invested years in learning specific foreign languages.

5. Overburdening the Primary System

- Many students in India currently lack basic foundational literacy in even one language.
- Forcing a compulsory third language could overburden an already strained education system and confuse children from monolingual homes.

Global Best Practices

1. European Union – Plurilingualism Approach

- Access to language education is determined by the goal of every citizen communicating in their mother tongue plus two other European languages.
- The framework prioritizes cultural mobility and economic integration while ensuring broad institutional support for teacher training.

2. Switzerland – Multilingual Heritage Model

- A wide range of cantons seamlessly integrate three to four national languages alongside English into the curriculum.
- The mechanism provides flexibility by matching language instruction to the economic and geographic realities of different regions.

Way Forward

1. Adopt a Phased Implementation Approach

- The language transition must be introduced progressively from foundational classes rather than abruptly in middle school.
- This would create a less disruptive academic environment and eliminate mid-session chaos.

2. Invest Heavily in Teacher Capacity Building

- Comprehensive, centrally funded training programs must be launched to rapidly upskill educators in diverse regional languages.
- Such an approach is required to resolve the severe cross-state educator deficit.

3. Maintain Foreign Language Flexibility

- Foreign languages should be offered as integrated elective modules or extra-credit courses.
- This would align the framework with global academic competitiveness and preserve diplomatic educational ties.

4. Develop Robust Digital Infrastructure

- Centralized technology platforms like DIKSHA should be leveraged to provide standardized study materials.
- Reliable digital access would reduce disparities in learning materials for minority and regional languages.

5. Promote Cooperative Federalism

- Continuous dialogue with states possessing distinct socio-linguistic contexts is essential to build consensus.
- Avoiding rigid, top-down directives ensures that the policy adapts to regional realities.

6. Prioritize Education Quality

- The primary focus must remain on improving foundational teaching quality and learning outcomes.
- Enhancing basic literacy should precede the introduction of complex multilingual mandates.

Conclusion

The implementation of the three-language formula under NEP 2020 marks a shift towards preserving indigenous languages alongside cognitive development. However, abruptly restricting foreign language options and enforcing mandates without adequate infrastructure may undermine educational quality. A flexible, consensus-driven framework based on capacity building and cooperative federalism can create a more inclusive, effective, and globally competitive education regime.

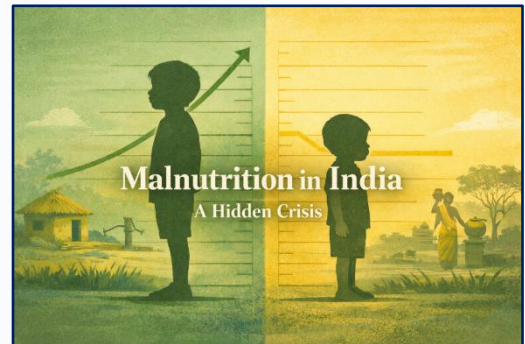
Q. *The implementation of the three-language formula under the National Education Policy (NEP) 2020 aims to balance indigenous heritage with cognitive development. Discuss its significance and associated challenges. 15 Marks*

1.2. HEALTH

1.2.1. THE SILENT EMERGENCY: RESTRUCTURING INDIA'S PUBLIC HEALTH AND NUTRITION

Context

Recent health data reveals a sharp rise in obesity and high blood sugar across India, affecting both urban and rural areas. This highlights a dual crisis of childhood undernutrition and adult obesity. Since these lifestyle-related health issues often begin in adolescence, schools are now the most critical setting for early prevention.



Introduction

Malnutrition in India has evolved into a "thin-fat" phenotype, where children appear lean but carry high metabolic risks. To combat this, schools must act as centres for preventive healthcare. Similar to how preventive detention neutralizes security threats before they materialize, early nutritional interventions in schools can pre-emptively stop the rise of severe, diet-related non-communicable diseases (NCDs) before they become a national crisis.

Current Statistics and Global Context

- **Global Hunger Index:** In the 2025 index, India ranked 102nd out of 123 countries, falling under the "serious" hunger category.
- **NFHS-6 (2023-24) Trends:** Obesity among women aged 15-49 years has risen to 30.7%, and among men to 27.3%. High blood sugar prevalence has also jumped significantly in both demographics.
- **Surge in UPFs:** A recent World Health Organization study revealed that UPF consumption in India is surging at more than 13.7% year-after-year.
- **Lancet Projections:** A 2025 Lancet study projects that 21.8 crore men and 23.1 crore women in India will be overweight by 2050 without immediate interventions.

What is Malnutrition?

- Malnutrition occurs when a person does not get the right balance of nutrients.
- It encompasses both **undernutrition** (wasting, stunting, underweight, and micronutrient deficiencies) and **overnutrition** (overweight, obesity, and related NCDs).

Types of Malnutrition:

- **Undernutrition:**
 - **Wasting:** Defined as low weight-for-height. It occurs when a person has not had enough food to eat and/or they have had an infectious disease.
 - **Stunting:** Defined as low height-for-age. It often occurs due to chronic, insufficient calorie intake and repeated illnesses.
 - **Underweight:** Defined as low weight-for-age. A child who is underweight may be stunted, wasted, or both.

- **Micronutrient-related Malnutrition:**
 - **Vitamin A Deficiency:** Insufficient intake can lead to vision impairment, weakened immunity, and other severe health issues.
 - **Iron Deficiency:** Causes anemia, which impacts the body's ability to transport oxygen, leading to chronic fatigue and weakness.
 - **Iodine Deficiency:** Results in thyroid-related disorders, heavily affecting physical growth and cognitive development.
- **Obesity and Overweight:**
 - Caused by excessive calorie intake often coupled with a sedentary lifestyle, leading to an accumulation of excess body fat.
 - In adults, being **overweight** is defined as having a Body Mass Index (BMI) of 25 or more, whereas **obesity** is defined as a BMI of 30 or more.
- **Diet-related Noncommunicable Diseases (NCDs):**
 - Conditions stemming primarily from unhealthy diets and inadequate nutrition. This encompasses cardiovascular diseases (such as heart attacks and strokes) and diabetes, which are frequently associated with high blood pressure.

Core Causes Behind Malnutrition

- **Poverty and Food Insecurity:** Approximately 74% of people in India cannot afford a healthy diet, leading to a reliance on cheap, nutrient-poor carbohydrates.
- **Changing Dietary Habits:** High Fat, Sugar, and Salt (HFSS) foods and Ultra-Processed Foods (UPFs) are rapidly replacing traditional meals.
- **Poor Sanitation (WASH):** A lack of clean water and proper sanitation (accessible to only about 69% of households) leads to infections like diarrhea, which hinder nutrient absorption.
- **Maternal Health and Gender Inequality:** Malnourished mothers frequently give birth to low-weight infants, perpetuating an inter-generational cycle of poor health exacerbated by gender disparities in food distribution.

Significance of Addressing Malnutrition

- **Securing the Demographic Dividend:** A healthy adolescent population prevents the projected 3-4% GDP loss caused by weak health and lowered workforce productivity.
- **Mitigating Healthcare Burdens:** Preemptive nutritional care reduces future out-of-pocket expenditure and state healthcare spending on chronic conditions like diabetes and heart disease.
- **Combating the Double Burden:** Targeted school-based interventions simultaneously address historical undernutrition (stunting/wasting) and the modern epidemic of obesity.
- **Enhancing Cognitive Development:** Adequate protein and micronutrient intake directly correlates with improved brain development, memory, concentration, and academic performance.
- **Bridging the Rural-Urban Divide:** With urban lifestyle diseases penetrating rural India, nationwide school interventions ensure equitable health outcomes across all geographies.

Challenges Associated with Malnutrition

- **Aggressive Corporate Marketing:** Unregulated advertising of UPFs and sugary beverages directly targets vulnerable demographics, overriding traditional dietary knowledge.
- **The Sedentary Epidemic:** Screen-heavy behaviors and a lack of structured physical activity are inversely affecting daily fruit and vegetable intake among adolescents.
- **Implementation Gaps:** Government programs often suffer from poor delivery; for example, only about 50% of children under six receive comprehensive services from Anganwadi centres.
- **Nutrition Literacy Deficit:** Nutrition education in schools remains theoretical and textbook-bound, failing to impart practical, life-saving skills like reading food labels.
- **Infrastructural Deficits:** Many schools, particularly in rural or densely populated urban areas, lack the physical infrastructure (playgrounds, nutrition gardens) required to promote holistic health.

Way Forward

- **Establish UPF-Free School Zones:** Enforce stringent national policies to completely ban the sale, promotion, and advertising of UPFs and sugary beverages in and around school premises.
- **Mandate Practical Nutrition Literacy:** Transition from textbook learning to skill-based curricula, teaching students how to decode food labels, recognize marketing tactics, and prepare basic healthy meals.
- **Revamp Institutional Feeding Programs:** Expand the PM-POSHAN scheme to include millets, pulses, and oilseeds, ensuring half the meal plate comprises fruits and vegetables as per the Dietary Guidelines for Indians 2024.
- **Elevate Physical Education:** Integrate structured sports and physical activities as mandatory, core educational components rather than optional extracurriculars.
- **Scale Up Food Fortification:** Build on the success of the National Iodine Deficiency Disorders Control Program by expanding the fortification of staples (rice, wheat) to combat widespread micronutrient deficiencies.
- **Convergent Governance:** Integrate nutrition initiatives with WASH programs (like the Swachh Bharat Mission and Jal Jeevan Mission) to systematically reduce diarrhea-linked undernutrition.

Conclusion

The projected surge of over 44 crore overweight adults in India by 2050 serves as a stark warning. Combating this trajectory requires shifting the definition of malnutrition from mere caloric deficit to overall nutritional quality. By transforming schools into powerful public health institutions and ensuring convergent governance, India can dismantle the 'thin-fat' phenotype and protect a generation from becoming the patients of tomorrow.

Q. Poverty and malnutrition create a vicious cycle, adversely affecting human capital formation. What steps can be taken to break the cycle? 10 Marks

1.2.2. MANDSAUR'S HPV VACCINATION MODEL AND THE FUTURE OF PREVENTIVE HEALTHCARE

Why in News?

As part of the Government of India's nationwide **HPV vaccination campaign** launched in **February 2026**, **Mandsaur district (Madhya Pradesh)** achieved **100% vaccination coverage** of eligible adolescent girls within 40 days through an innovative governance model combining **data-driven planning, behavioural nudges, community participation, and last-mile service delivery**.



Introduction

Cervical cancer is largely preventable through HPV vaccination and early screening, yet it remains a major public health challenge in India. Mandsaur's HPV vaccination model demonstrates how **data-driven, inclusive, and community-led implementation** can strengthen preventive healthcare and last-mile governance.

Why HPV Vaccination is Important

1. Preventing Cervical Cancer

Nearly **95% of cervical cancer cases** are caused by high-risk strains of the Human Papillomavirus (HPV), making vaccination one of the most effective preventive interventions.

2. Reducing Disease Burden

India accounts for nearly **one-fourth of the global cervical cancer burden**, with over **1.2 lakh new cases and around 80,000 deaths annually**.

3. Promoting Women's Health

Vaccinating adolescent girls before HPV exposure significantly lowers future cancer risk and improves women's long-term health outcomes.

4. Advancing Preventive Healthcare

HPV vaccination shifts the healthcare approach from treating disease to preventing it, reducing future healthcare costs and improving quality of life.

Mandsaur's Governance Model: Key Features

1. Data-Driven Identification of Beneficiaries

The district integrated multiple government databases such as **RBSK, SAMAGRA MP, and Ladli Laxmi Yojana** to identify every eligible girl, especially those from vulnerable and hard-to-reach communities.

2. Targeting the Most Vulnerable First

The campaign prioritised girls from denotified tribes, nomadic communities, urban slums, and school dropouts, ensuring that the most excluded populations were not left behind.

3. Behavioural Nudges to Address Vaccine Hesitancy

Instead of relying solely on awareness campaigns, the administration used behavioural insights through repeated counselling, peer influence, public recognition, and default vaccination messaging to overcome hesitation and misinformation.

4. Community Participation and Local Leadership

Teachers, ASHA workers, Anganwadi workers, Panchayats, religious leaders, youth icons, healthcare professionals, and local influencers worked together to build trust and improve vaccine acceptance.

5. Integration with Existing Health Programmes

The HPV campaign was linked with routine immunisation sessions, antenatal care, and the **Pradhan Mantri Surakshit Matritva Abhiyan**, enabling efficient service delivery and reducing implementation costs.

6. Real-Time Monitoring and Micro-Planning

Village-level master lists, digital reminders, continuous monitoring, and identification of low-coverage areas enabled quick corrective action and ensured complete vaccination coverage.

Good Governance Principles Reflected in the Model

- 1. Evidence-Based Governance:** Use of integrated databases and real-time monitoring improved targeting and decision-making.
- 2. Inclusive Governance:** Special focus on marginalised communities ensured equitable access to public healthcare.
- 3. Participatory Governance:** Active involvement of community institutions strengthened ownership and trust.
- 4. Citizen-Centric Service Delivery:** The campaign reduced logistical, social, and informational barriers for beneficiaries.
- 5. Convergence:** Coordination among multiple government departments and health programmes improved implementation efficiency.
- 6. Behavioural Public Policy:** Application of behavioural economics ("nudge approach") enhanced voluntary participation without coercion.

Major Challenges in HPV Vaccination

1. Vaccine Hesitancy

Myths about infertility, fear of side effects, and misinformation discourage families from accepting HPV vaccination.

2. Social and Cultural Stigma

Taboos surrounding adolescent and reproductive health make discussions on HPV vaccination uncomfortable, reducing public acceptance.

3. Data Gaps and Exclusion

Incomplete beneficiary records often exclude school dropouts, migrants, and vulnerable communities from vaccination campaigns.

4. Last-Mile Service Delivery

Poor health infrastructure, difficult terrain, and logistical constraints hinder timely vaccine access in remote and underserved areas.

5. Weak Community Engagement

Limited trust in public health systems and inadequate community participation reduce the effectiveness of vaccination drives.

6. Low Health Literacy

Insufficient awareness about cervical cancer prevention and the benefits of HPV vaccination leads to delayed or poor health-seeking behaviour.

Successful Global Models for HPV Vaccination

1. Australia's National HPV Vaccination Programme

Australia's **school-based HPV vaccination and regular cervical screening programme** has achieved high coverage and is on track to become the **first country to eliminate cervical cancer as a public health problem**.

2. Rwanda's National HPV Immunisation Programme

Rwanda has achieved **over 90% HPV vaccination coverage** through strong political commitment, school-based immunisation, and extensive community mobilisation, making it a model for low- and middle-income countries.

3. United Kingdom's NHS HPV Vaccination Programme

The **National Health Service (NHS)** delivers HPV vaccination through schools alongside organised screening programmes, significantly reducing HPV infections and precancerous cervical lesions among young women.

Way Forward

1. Universalise HPV Vaccination Coverage

Expand free HPV vaccination through sustained funding, school-based immunisation, and targeted outreach for out-of-school girls, migrants, and other vulnerable groups to ensure equitable coverage.

2. Build an Integrated Digital Health Ecosystem

Leverage platforms such as the **Ayushman Bharat Digital Mission (ABDM)** by integrating health, education, and social welfare databases for real-time beneficiary identification, tracking, and monitoring.

3. Institutionalise Behavioural Science in Public Health

Adopt behavioural "nudge" strategies, evidence-based communication, and myth-busting campaigns to address vaccine hesitancy, improve health literacy, and encourage informed decision-making.

4. Strengthen Community-Centred Health Governance

Empower ASHA and Anganwadi workers, Panchayati Raj Institutions, schools, civil society organisations, and local influencers to build community trust, promote awareness, and improve vaccine acceptance.

5. Strengthen Last-Mile Healthcare Delivery

Enhance primary healthcare infrastructure, cold-chain logistics, mobile vaccination units, and digital monitoring systems to ensure timely and uninterrupted vaccine access in remote and underserved areas.

6. Promote a Preventive Healthcare Ecosystem

Shift from a curative to a preventive healthcare model by integrating HPV vaccination with regular screening, adolescent health programmes, health education, and awareness campaigns to reduce the long-term disease burden.

Conclusion

The Mandsaur HPV vaccination model demonstrates that **effective governance is achieved not merely through policy formulation but through inclusive implementation, community participation, and data-driven decision-making**. Its success offers a replicable blueprint for strengthening preventive healthcare and achieving equitable health outcomes across India.

Q. The success of public health programmes depends as much on effective last-mile governance as on sound policy design. Examine this statement in the context of Human Papillomavirus (HPV) vaccination model. 15 Marks

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GENERAL STUDIES 3

3.1. ECONOMY

3.1.1. INCLUSIVE & INTEGRATED URBAN CLIMATE ACTION

Context

Traditional urban development heavily prioritizes physical infrastructure and technology-driven solutions. However, true urban resilience is tested by how its systems support the health, dignity, and well-being of the essential workforce that sustains city life. As climate change accelerates, urban governance must transition into a socio-ecological model that addresses systemic human vulnerability.



Institutional Gaps in Current Urban Systems

- **Policy and Departmental Silos:** Public health, labor welfare, urban housing, and climate adaptation function as parallel, uncoordinated tracks rather than a single, integrated safety net for workers.
- **Fragmented Institutional Mandate:** The presence of unelected state parastatals (e.g., water or development authorities) strips Urban Local Bodies (ULBs) of unified command over city services.
- **Incomplete Fiscal Devolution:** Despite the 74th Constitutional Amendment, state governments hold back revenue powers, keeping municipalities financially dependent and under-resourced for local climate emergencies.
- **Delivery Deficits in Social Safety Nets:** Complicated paperwork, rigid documentation, and lack of ground-level awareness block contract and informal laborers from accessing existing health and welfare benefits.
- **Severe Climate and Human Data Gaps:** Municipalities lack localized, empirical data tracking micro-level heat exposure, out-of-pocket health costs, and climate-induced damages within low-income grids.

Why Urban India Needs an Integrated Approach

- **The "Double Burden" of the Urban Poor:** Marginalized frontline workers (e.g., sanitation workers, waste collectors, street vendors) experience climate vulnerabilities as both an **occupational hazard** (prolonged outdoor exposure to heat stress, dehydration, vector diseases) and a **residential crisis** (living in overcrowded, poorly ventilated informal settlements with inadequate drainage).
- **Amplification of Urban Heat Islands (UHI):** Concrete-heavy urban spaces trap heat, elevating nighttime temperatures by 3–5°C relative to surrounding areas. This uneven distribution of environmental risk hit low-income blocks without cooling access the hardest.
- **Rapid, Unplanned Spatial Agglomeration:** Unregulated structural growth converts natural water buffers (wetlands, floodplains) into real estate, leading to frequent urban flash floods (e.g., Bengaluru, Chennai) that wipe out the assets of marginalized communities.

Government Scheme

- **National Mission on Sustainable Habitat (NMSH) 2.0:** One of the eight core missions under the National Action Plan on Climate Change (NAPCC) that mandates climate risk-informed urban planning, energy-efficient building codes, and low-carbon urban growth.
- **ClimateSmart Cities Assessment Framework (CSCAF):** A first-of-its-kind self-assessment roadmap tracking cities across 28 indicators (like green cover, water, and waste management) to integrate climate resilience into municipal budgets and policies.
- **AMRUT 2.0 (Atal Mission for Rejuvenation and Urban Transformation):** Focuses on creating climate-resilient cities through circular water economies, 100% sewage coverage, flood-mitigating stormwater drains, and the development of elderly-friendly green spaces.
- **Pradhan Mantri Awas Yojana - Urban (PMAY-U):** Integrates sustainable construction practices like thermal-comfort designs and passive cooling to protect informal settlement residents from rising extreme temperatures.

Way Forward

A. Labour & Occupational Sensitization

- **Tailored Heat Action Plans (HAPs):** Formalize occupational guidelines for municipal and third-party contract workers. Implement altered summer shift timings, set up shaded rest zones across transit routes, and mandate hydration infrastructure.
- **Routine Epidemiological Tracking:** Establish early clinical tracking systems to identify symptoms of chronic heat exhaustion and kidney stress in outdoor workforces.

B. Transforming Built Infrastructure & Informal Settlements

- **Localized Environmental Retrofitting:** Channel capital toward targeted upgrades in slums—such as passive cooling designs, white/cool roofs, decentralized drinking water networks, and robust storm-water drainage.
- **Nature-Based Solutions (NbS):** Expand green-blue infrastructure (e.g., pocket forests, restoring urban wetlands like the East Kolkata Wetlands) to naturally buffer micro-climates and curb UHI effects.

C. Strengthening the Social & Public Health Safety Net

- **Climate-Ready Primary Healthcare:** Train Urban Primary Health Centres (UPHCs) to diagnose and treat climate-sensitive ailments (heat strokes, vector-borne surges) proactively.
- **Convergent Social Portals:** Eliminate bureaucratic bottlenecks by creating unified, documentation-light social security registries that link migrant/informal workers to medical insurance and climate disaster relief funds.

D. Data-Driven & Fiscal Decentralization

- **Urban Climate Vulnerability Assessment (UCVA):** Map high-resolution socioeconomic grids to identify which communities suffer from the highest environmental exposures.
- **Empowering Urban Local Bodies (ULBs):** Devote real financial autonomy to ULBs under the **74th Constitutional Amendment**, allowing cities to issue green bonds or municipal bonds tailored for localized adaptation needs.

Conclusion

Cities are fundamentally defined by the socio-ecological systems that enable their people to live, work, and stay healthy—not just by their concrete, steel, and digital infrastructure. For states like Karnataka to chart a sustainable urban future, climate adaptation must pivot from purely protecting physical assets to actively reducing human vulnerability at the margins.

Q. *Climate change is no longer merely an environmental issue but a challenge of urban governance, public health, and social justice. Discuss this statement in the context of India's rapidly urbanising cities. Suggest measures for building inclusive and climate-resilient urban systems. 15 Marks*

2.2. SCIENCE & TECHNOLOGY

2.2.1. INDIA'S NUCLEAR POSTURE

Context

The SIPRI 2026 Yearbook reveals India has operationally deployed 12 of its 190 nuclear warheads for the first time. This shift to active deployment aboard ballistic missile submarines (SSBNs) signals heightened readiness while strictly maintaining the 'No First Use' policy.



Introduction

India is transitioning from a historically de-mated nuclear posture to active sea-based deployment. Equipping Arihant-class submarines with nuclear warheads mathematically secures India's second-strike capability. This maturation of the nuclear triad practically fortifies the credibility of its deterrence doctrine against expanding regional arsenals.

What is India's Nuclear Doctrine and its Core Principles?

1. No First Use (NFU) & Credible Minimum Deterrence

- India commits to never launching a pre-emptive nuclear strike.
- It relies on a limited but highly survivable arsenal to deliver a massive retaliatory response that inflicts unacceptable damage on the adversary.

2. Recessed Deterrent (De-mated Posture)

- A peacetime strategy where nuclear warheads are stored separately from their delivery vehicles.
- This is done under strict civilian oversight to maximize safety, prevent accidental use, and signal global restraint.

3. Operational Deployment & The Nuclear Triad

- Deployment means a weapon has been actively paired with a delivery system (like an SSBN) and positioned in a state of readiness.
- This completes the nuclear triad, solidifying the military capability to deliver atomic weapons via three distinct methods: aircraft, land-based missiles, and sea-based submarines.

Significance of Operational Deployment

1. **Guaranteed Second-Strike Capability:** Deployment on stealth submarines ensures that a significant portion of the nuclear arsenal survives a disarming first strike. This guarantees the ability to deliver a devastating retaliatory blow, the cornerstone of India's deterrence.
2. **Reinforcement of 'No First Use':** A doctrine relying on retaliation is only effective if the forces can survive an initial attack. Sea-basing solves this survivability problem, making the NFU commitment strategically credible rather than a liability.
3. **Closing Land-Based Vulnerabilities:** Land-based missiles sit at known and mappable locations, making them theoretically vulnerable to preemptive strikes. A submerged SSBN conducting a deterrence patrol in the ocean cannot be easily tracked or destroyed, closing this critical gap.
4. **Strategic Counterbalance to China:** China's nuclear arsenal is expanding rapidly, currently estimated at 620 warheads, far outpacing regional neighbors. India's SSBN deployment preserves strategic stability and credible deterrence against this expanding threat.
5. **Maturation of the Nuclear Triad:** The operationalization of tri-SSBNs marks the coming-of-age of India's strategic forces. It confirms that India's long-envisioned deterrent posture is now fully functional across land, air, and sea domains.

Challenges in the Global Strategic Environment

1. **Collapse of Arms-Control Regimes:** The post-Cold War nuclear order is experiencing severe strain globally. Traditional disarmament and arms-control agreements have systematically weakened or collapsed.
2. **Rapid Adversarial Expansion:** China's nuclear arsenal is expanding at a pace unmatched by any other nuclear power. It is simultaneously aggressively expanding its sea-based nuclear deterrent capabilities.
3. **Threat of Emerging Technologies:** Intense global competition in artificial intelligence (AI) enabled decision support systems increases the risk of strategic miscalculation. The development of hypersonic delivery systems heavily compresses response times for national defense systems.
4. **Advancements in Anti-Submarine Warfare (ASW):** Rapid developments in advanced ASW tracking and missile defense systems continue to evolve. These technologies continually threaten to compromise the stealth, secrecy, and survivability of sea-based deterrents.
5. **Reversal of Global Disarmament:** States are increasingly relying on nuclear weapons as active, deployable instruments of national power. This signals a dangerous reversal of decades of gradual global progress in nuclear disarmament.

Current Global Situation

1. **The Expanding Global Arsenal:** As of January 2026, the world's nine nuclear-armed states collectively possess an estimated 12,187 nuclear warheads. This indicates a broader trend of nuclear modernization across all major powers.
2. **China's Modernization Drive:** Beijing is heavily focused on developing long-range delivery systems and sea-based patrols. This unmatched expansion forces shifts in the deterrence postures of neighboring states, including India.

Way Forward

1. **Sustain and Expand the SSBN Fleet:** India must ensure a sufficient fleet size of Arihant-class submarines. This guarantees that at least one nuclear ballistic missile submarine is submerged and on deterrence patrol at all times.
2. **Focus on Long-Range Delivery Systems:** The strategic modernization program should prioritize land and sea-based systems capable of reaching diverse targets. This is essential for maintaining credible deterrence against larger adversarial territories.
3. **Uphold Strict Civilian Oversight:** Robust command and control mechanisms must be rigorously maintained over mated delivery systems. This ensures maximum operational readiness while eliminating the risk of accidental or unauthorized launches.
4. **Invest in Counter-Technologies:** Systematic investments are required in advanced stealth and acoustic countermeasures. This will protect Indian submarines from next-generation anti-submarine warfare tracking systems.
5. **Enhance Strategic Communication:** Policymakers must proactively communicate the defensive nature of these deployments to the international community. It must be clear that increased readiness does not imply a lowering of the threshold for nuclear employment.
6. **Modernize Global Risk Frameworks:** International institutions designed to manage nuclear risk must quickly adapt their frameworks. They need to effectively regulate the unprecedented risks posed by AI and hypersonic weaponry.

Conclusion

India's deployment of 12 nuclear warheads is a necessary maturation of its credible minimum deterrence posture. By securing a highly robust second-strike capability through its SSBN fleet, India fortifies the practical foundations of its 'No First Use' doctrine, ensuring national sovereignty and strategic stability in an increasingly volatile global environment.

Q. Discuss the strategic implications of India's recent operational deployment of nuclear warheads for its 'No First Use' (NFU) policy. 15 Marks

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