



APTI PLUS

Academy for Civil Services Pvt. Ltd.

CREATING CIVIL SERVANTS FOR THE NATION

OPSC OAS MAINS EXAMINATION ANSWERS 2023

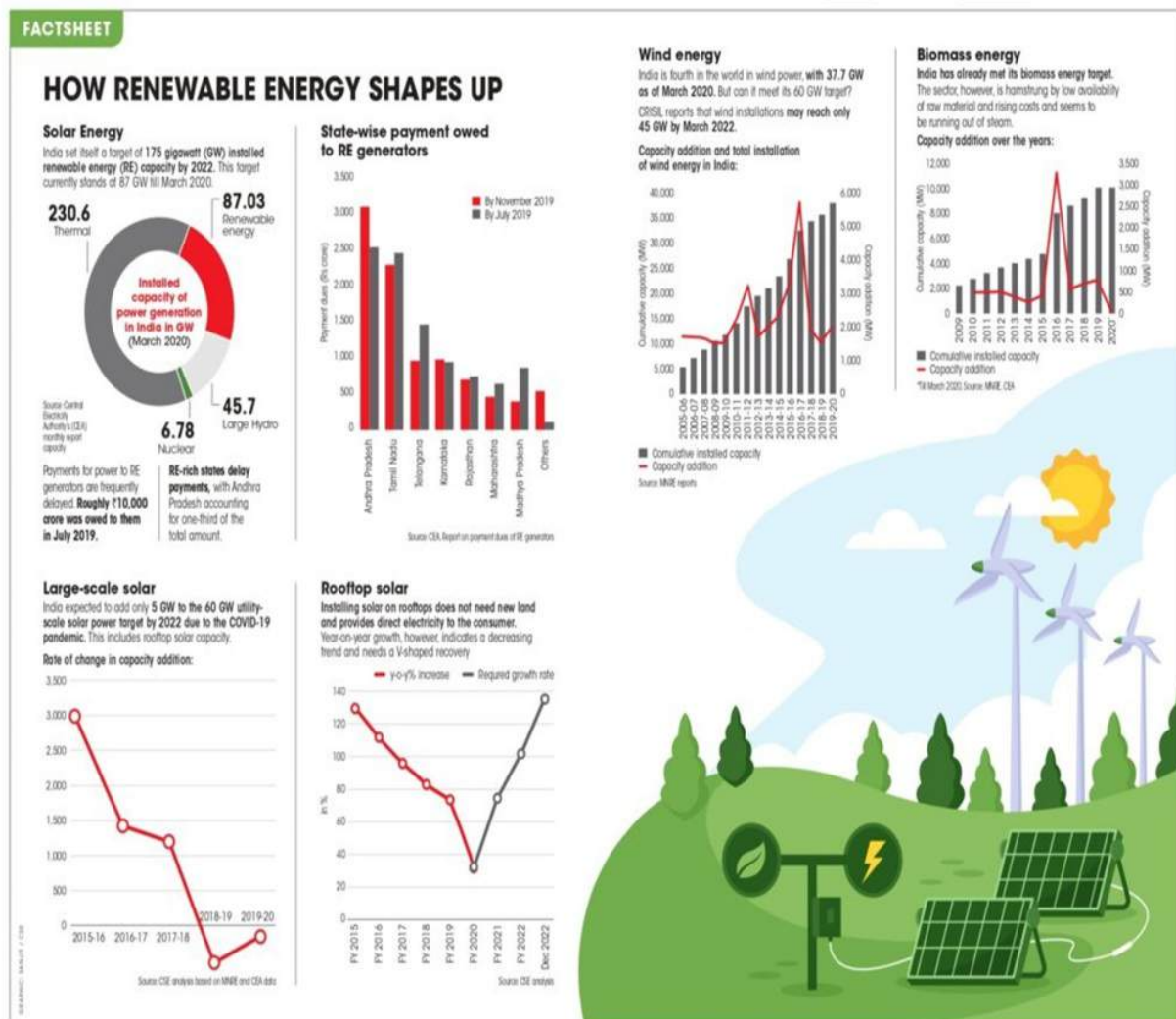
GS-III

GROUP A

1. Describe the benefits of deriving electric energy from sunlight in contrast to the conventional energy. What are the initiatives offered by our Government for this purpose?

Introduction:

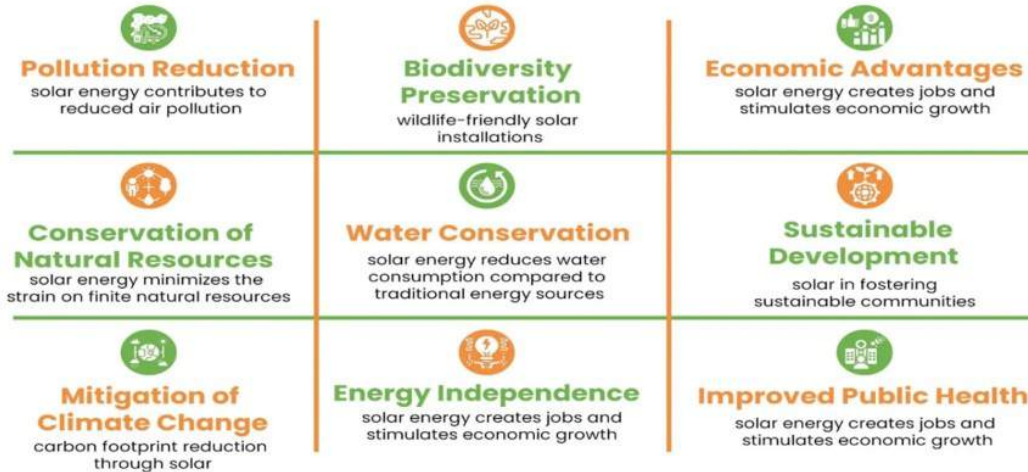
India, endowed with abundant solar potential (748 GW as per NISE), is leveraging solar energy to meet rising energy demands sustainably. Deriving electricity from sunlight offers significant advantages over conventional fossil fuel-based energy, aligning with India's climate goals and energy security needs. Government initiatives are pivotal in accelerating this transition.



Body:

Benefits of Solar Energy over Conventional Energy:

Advantages of Solar Energy



- **Environmental Sustainability:** Solar power is pollution-free, reducing CO₂ emissions. In 2024, India's 102.57 GW solar capacity avoided millions of tonnes of emissions compared to coal-based power.
- **Cost-Effectiveness:** Solar tariffs have dropped below Rs.2.50/kWh, cheaper than coal in some cases, with minimal maintenance costs.
- **Energy Security:** Solar reduces reliance on imported fossil fuels (80% of oil imports), saving forex reserves.
- **Rural Electrification:** Decentralized solar solutions like microgrids power remote areas, enhancing socio-economic development.

Government Initiatives:

Initiative	Year Launched / Target Year	Objective / Target	Progress / Highlights
National Solar Mission (NSM)	2010 / Target: 2022	Achieve 100 GW of solar capacity	Achieved 105.65 GW in 2025
PM-KUSUM Scheme	Target: 2026	Add 30.8 GW via solar pumps and decentralised solar systems for farmers	Promotes clean energy access in agriculture
Solar Park Scheme	Target: 2025-26	Establish 50 solar parks with total 38 GW capacity	Includes Bhadla Solar Park (2,245 MW)
Production Linked Incentive (PLI)	Rs.24,000 crore allocation	Boost domestic manufacturing of solar PV modules, add 39,600 MW capacity	Encourages self-reliant solar ecosystem
International Solar Alliance (ISA)	Formed in 2015 (Paris Agreement)	Promote global cooperation in solar energy, mobilize \$1 trillion by 2030	Over 110 member countries; aims to ensure energy access globally

Conclusion:

Solar energy's environmental, economic, and social benefits make it a cornerstone of India's energy transition. Robust government initiatives like **NSM**, **PM-KUSUM**, and **PLI** are driving solar adoption, positioning India as a global leader in renewable energy. Sustained policy support and innovation will ensure a cleaner, energy-secure future.



2. Discuss about India's space sector achievements in the years 2023 and 2024. What are the achievements of ISRO in 2023?

Introduction:

India's space sector, led by ISRO, has solidified its global standing with remarkable achievements in 2023 and 2024, showcasing technological prowess and cost-effective innovation. These milestones, from lunar landings to space docking, align with India's vision of becoming a leading space-faring nation by 2040.



Body:

Achievements in 2023:

- **Chandrayaan-3 Success:** On August 23, ISRO achieved the world's first soft landing near the lunar south pole, making India the fourth nation to land on the Moon. The mission earned the 2023 Leif Erikson Lunar Prize.
- **Aditya-L1 Launch:** Launched on September 2, India's first solar observatory reached the L1 point on January 6, 2024, to study solar phenomena, enhancing space weather forecasting.
- **Gaganyaan Progress:** The first test flight (TV-D1) on October 21 successfully tested the crew escape system, paving the way for India's human spaceflight by 2026.
- **Reusable Launch Vehicle (RLV):** On April 2, ISRO conducted the RLV LEX-01, achieving autonomous landing, advancing sustainable space technology.

Achievements in 2024:

- **XPoSat Launch:** On January 1, ISRO launched the X-ray Polarimeter Satellite, making India the second nation to study X-ray emissions from celestial bodies.
- **SpaDeX Mission:** On December 30, ISRO successfully demonstrated space docking with two satellites, joining the US, Russia, and China in this elite capability.
- **RLV LEX-02 & 03:** Conducted on March 22 and June 23, these tests validated autonomous landing technologies for reusable spacecraft.
- **Proba-3 Launch:** On December 5, ISRO launched ESA's Proba-3 satellites, showcasing precision formation flying for solar studies.



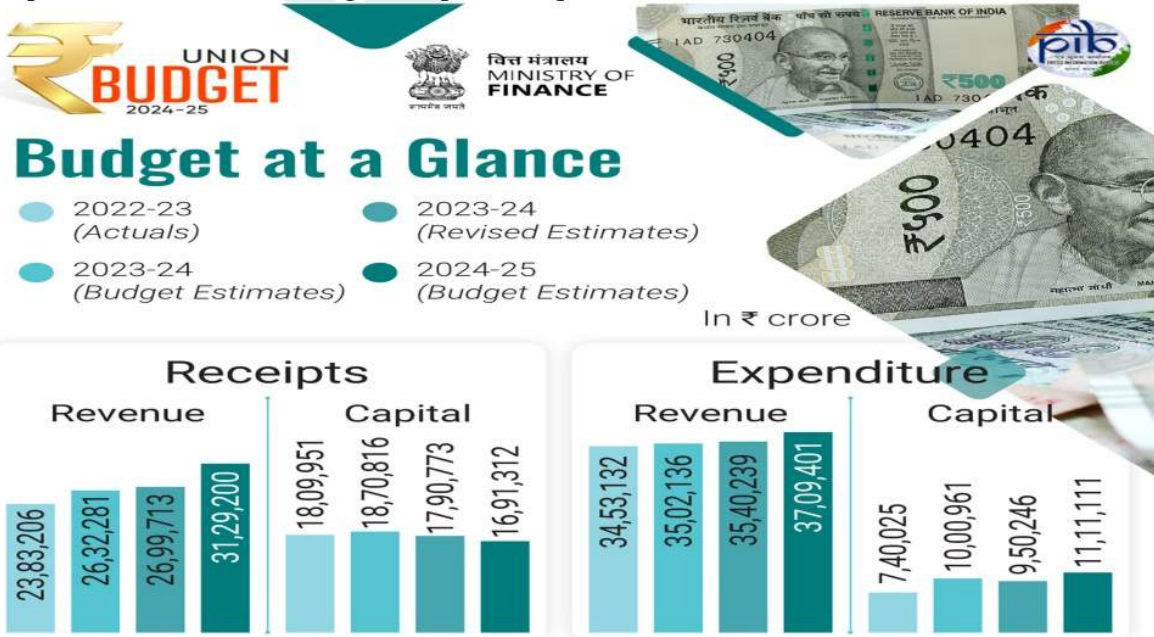
Conclusion:

India's space sector in 2023 and 2024 marked historic milestones, from Chandrayaan-3's lunar triumph to SpaDeX's docking feat, reinforcing ISRO's global leadership. With Gaganyaan, Chandrayaan-4, and Venus Orbiter Mission on the horizon, sustained investment and private sector collaboration will propel India toward its 2035 space station and 2040 lunar landing goals.

3. Why is Government budgeting considered a critical tool for economic development in India? How does the budgeting process in Odisha align with or differ from the national framework?

Introduction:

Government budgeting is a pivotal tool for economic development in India, steering resource allocation, fiscal policy, and socio-economic priorities. It aligns public expenditure with national goals like growth, equity, and sustainability. Odisha's budgeting process, while rooted in the national framework, incorporates state-specific innovations, reflecting its unique developmental needs.



Body:

Why Government Budgeting is Critical for Economic Development:

- **Resource Allocation:** Budgets prioritize sectors like health, education, and infrastructure, driving inclusive growth. Union Budget 2024-25 allocated Rs.3 lakh crore for women-centric schemes, boosting social equity.
- **Economic Stability:** Fiscal policy through budgets manages deficits and inflation. India's fiscal deficit target for 2024-25 is 4.9% of GDP, ensuring stability.
- **Capital Formation:** Budgets fund public investments, e.g., Rs.11.11 lakh crore for infrastructure in 2024-25, spurring economic activity.
- **Reducing Inequalities:** Progressive taxation and welfare schemes like PM Garib Kalyan Anna Yojana redistribute resources, addressing disparities.

Odisha's Budgeting Process - Alignment and Differences:

Aspect	Odisha's Approach	National Approach
Alignment with National Framework	Adheres to Articles 112-117 of the Constitution and the FRBM Act; targets a fiscal deficit of 3% of GSDP in 2023-24.	Similar fiscal discipline as mandated under the FRBM Act and constitutional provisions.
Innovative Budgeting	Pioneered climate budgeting (2019-20) and SDG budgeting , integrating global goals into fiscal planning.	National budget maintains a broader focus without specific climate/SDG budgeting frameworks.
Participatory Approach	Invites public suggestions for budget preparation (e.g., 2025-26), enhancing transparency and citizen engagement.	Less emphasis on public participation in the budget-making process.
Sectoral Focus	Allocates 7.6% to health (above national average) and 6.2% to water supply , showcasing strong social sector commitment.	Health and water supply receive comparatively lower allocations in the Union Budget.

Conclusion:

Government budgeting drives India's economic development by channeling resources, stabilizing the economy, and reducing inequalities. Odisha's budgeting aligns with national fiscal norms but stands out with climate and SDG-focused innovations and participatory processes. Strengthening such state-level initiatives within the national framework can enhance inclusive and sustainable growth.

4. "Good roads are key to economic progress". Elucidate with reference to Odisha State Road Policy, 2025, and the proposed Odisha State Highway Authority.

Introduction:

Good roads are vital for economic progress, enhancing connectivity, trade, and socio-economic development. Odisha's State Road Policy, 2025, and the proposed Odisha State Highway Authority aim to transform the state's road infrastructure, **targeting 75,000 km** of world-class roads by 2029-30, fostering economic growth and regional equity.

Photo for representation only

SMOOTH TRAVEL

- > Existing road network and proposed roads will be uploaded on **PM Gati Shakti portal** and **dashboard of the works department** for real-time monitoring of construction
- > During improvement of the road network, **renovation of existing bridges** along with **construction of new ones** will be proposed by the **road-owning departments**
- > While constructing or improving existing roads, specific effort will be made to address the **existing black spots** and ensure **road safety measures**



- > **Special training** will be provided to engineers at the **rural development department's training institute**, which will be renamed as **State Academy of Construction**
- > **Transport department** asked to come up with plans for facilities such as **truck terminals** and **wayside amenity centres** along the roads

Body:

Role of Good Roads in Economic Progress:

- **Enhanced Connectivity:** Efficient roads reduce travel time and logistics costs. The Raipur-Visakhapatnam highway will cut travel time from 8.5 to 4 hours by 2025, boosting trade.
- **Industrial Growth:** Quality roads attract investments. Odisha's 2022 Make in Odisha Conclave secured Rs.10.5 trillion in proposals, partly due to improved connectivity.
- **Rural Development:** Roads link rural areas to markets, improving livelihoods. Odisha's Greenfield Corridor (Berhampur-Jeypore) will uplift underserved regions.
- **Tourism and Trade:** Upgraded highways like Bhubaneswar-Puri (six-laned, Rs.1,200 crore) enhance tourism and port connectivity (e.g., Chandikhol-Paradip).

Odisha State Road Policy, 2025 and Highway Authority:

- **Policy Framework:** The policy ensures safe, sustainable roads with guidelines for funding, inter-departmental coordination, and safety measures, backed by Rs.60,000 crore in 2025-26.
- **Bridge Information System (BIS):** A digital platform for annual bridge assessments enhances infrastructure resilience.
- **Odisha State Highway Authority:** Modeled on NHAI, it will oversee road development, maintenance, and high-value projects, ensuring efficient execution.

Conclusion:

Good roads drive economic progress by fostering connectivity, investment, and inclusive growth. Odisha's State Road Policy, 2025, and the proposed Highway Authority provide a robust framework to achieve these goals, aligning with India's infrastructure vision. Sustained implementation and monitoring will position Odisha as a model for infrastructure-led development.

5. What were the objectives of land reforms in India and how successful have these policies been in addressing land inequality? How do outcomes in Odisha compare to the national scenario?

Introduction:

Land reforms in India aimed to rectify historical inequities in land ownership, promote social justice, and boost agricultural productivity. Post-independence, these reforms sought to dismantle feudal structures and empower marginalized farmers. Despite notable successes, challenges persist, with varying outcomes across states like Odisha compared to the national scenario.

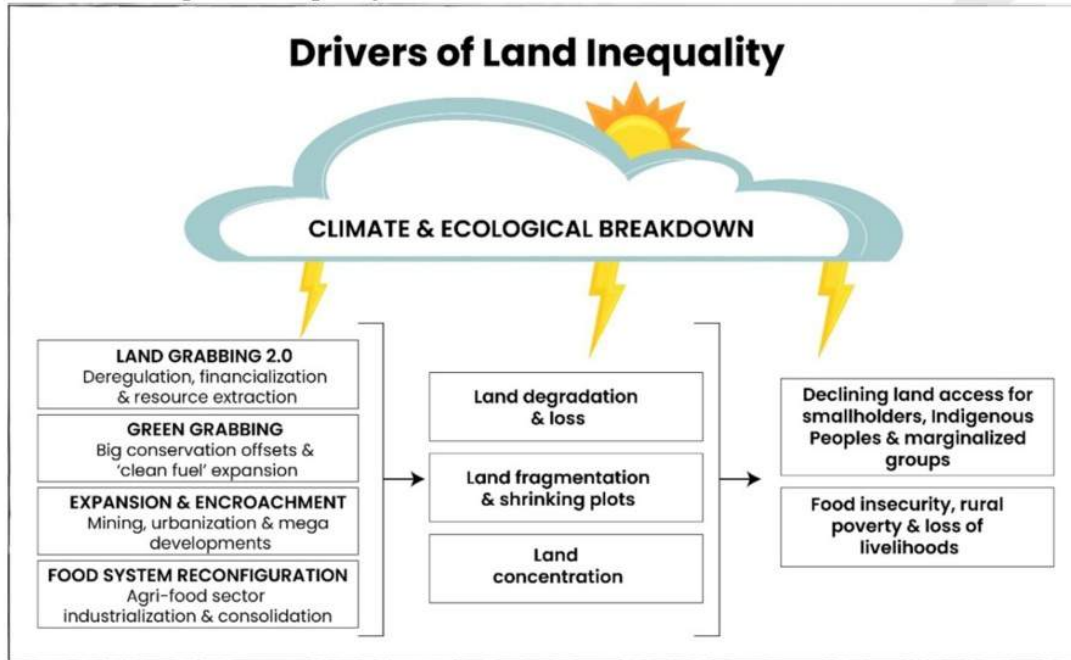


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Objectives of Land Reforms:

- **Social Justice:** Abolish intermediaries (e.g., Zamindari) and redistribute land to landless farmers, reducing inequality.
- **Agricultural Productivity:** Enhance efficiency through tenancy reforms and land consolidation, as seen in the Green Revolution.
- **Poverty Alleviation:** Provide land to marginal farmers, improving livelihoods.
- **Tenure Security:** Protect tenants' rights, ensuring fair rents and preventing evictions.

Success in Addressing Land Inequality:



Achievements: Zamindari abolition (1950s) transferred land to tillers, benefiting 20 million tenants. By 2003, 52.93 lakh acres of surplus land were redistributed to 56.73 lakh beneficiaries, with 36% SCs and 15% STs. West Bengal's Operation Barga and Kerala's reforms secured tenancy rights, reducing inequality.

Limitations: Uneven implementation, loopholes (e.g., benami transfers), and weak political will in states like Bihar and Uttar Pradesh. NSSO 2022-23 data shows 11% rural households remain landless.

Odisha vs. National Scenario:

Odisha: Distributed 5.92 lakh acres to 3.45 lakh beneficiaries (mostly SC/ST) by 2023, but incomplete land records and caste barriers limit impact. The Vasundhara scheme aids landless families, yet awareness remains low.

National: States like Kerala and West Bengal achieved greater success due to political will, while Odisha lags due to administrative inefficiencies and slower tenancy reforms.

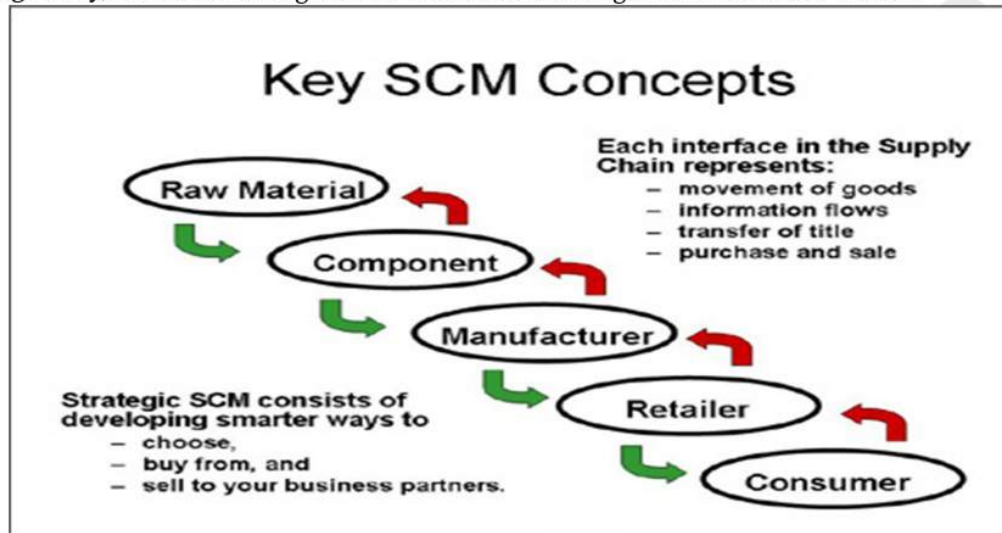
Conclusion:

Land reforms in India have partially succeeded in reducing land inequality, with significant achievements in Zamindari abolition and surplus land redistribution. However, uneven implementation and persistent landlessness highlight the need for stronger enforcement and digitized records. Odisha's efforts, though progressive, trail national leaders like Kerala, necessitating enhanced policy execution to bridge the gap.

6. How does (supply chain management affect the efficiency of food processing industries in India? What steps can be taken to address bottlenecks in Odisha's supply chain?

Introduction:

Supply chain management (SCM) is critical for the efficiency of India's food processing industries, which contribute **32% to the food market** but face challenges like wastage and inefficiencies. In Odisha, a key agricultural state, SCM bottlenecks hinder the sector's potential, despite policies like the **Odisha Food Processing Policy, 2016**. Addressing these is vital for economic growth and farmer welfare.

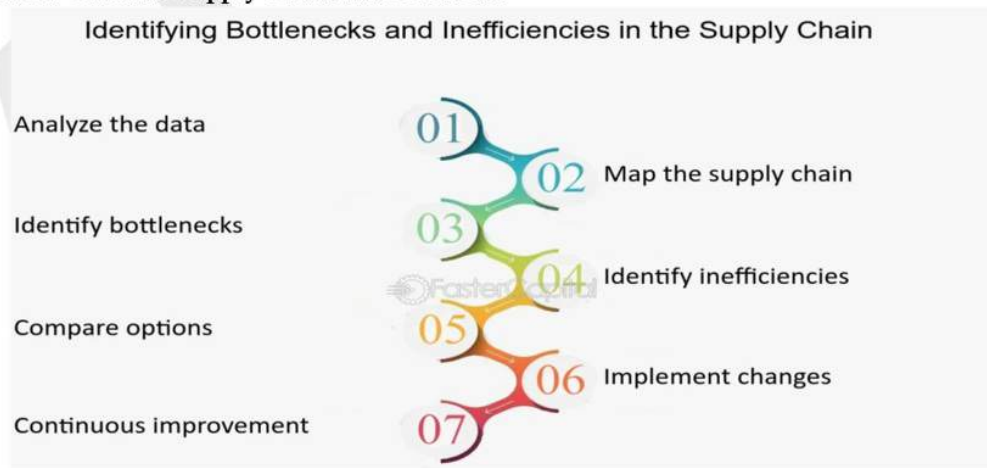


Body:

Impact of SCM on Food Processing Efficiency:

- **Reduced Wastage:** Efficient SCM minimizes post-harvest losses, which reach 30-40% for perishables due to inadequate cold chains.
- **Cost Optimization:** Streamlined logistics lower transportation costs, e.g., cold chain adoption reduced costs by 15% in some units.
- **Market Access:** Direct farmer-processor linkages, like eNAM, enhance market reach, boosting profitability.
- **Quality Assurance:** Technologies like blockchain ensure traceability, improving consumer trust, as seen in Green Earth's Odisha pilot.

Bottlenecks in Odisha's Supply Chain and Solutions:



Challenge	Details	Solution
Inadequate Infrastructure	Only 11% of produce is stored due to limited cold storage, leading to spoilage.	Expand cold chain capacity through Public-Private Partnerships (PPPs), leveraging Rs.60,000 crore allocated in 2025-26.
Fragmented Supply Chain	Dominated by small-scale producers, lacking economies of scale.	Promote cluster-based processing hubs like Mega Food Parks.
Poor Connectivity	Weak rural road networks delay transport of perishable goods.	Implement Odisha State Road Policy, 2025, targeting construction of 75,000 km of rural roads.
Technology Gaps	Low adoption of IoT hampers real-time monitoring and traceability.	Incentivize IoT and blockchain adoption, as piloted by TraceX in Odisha.

Conclusion:

Efficient SCM enhances the food processing industry's productivity, profitability, and sustainability in India. In Odisha, addressing infrastructure, connectivity, and technology gaps through targeted policies and innovations like blockchain can unlock the sector's potential, aligning with national goals of reducing wastage and doubling farmers' income.

7. Examine the diverse conservation/strategies adopted for the protection of endangered species in India. Assess the efficacy of protected areas, captive breeding programs and community-led conservation initiatives in ensuring long-term biodiversity preservation.

Introduction:

India, a biodiversity hotspot, hosts 7-8% of global species, with many endangered due to habitat loss, poaching, and climate change. Conservation strategies like protected areas, captive breeding, and community-led initiatives aim to protect species and ensure biodiversity preservation. Their efficacy varies, shaping long-term conservation outcomes.

Body:

Conservation Strategies and Their Efficacy:

Conservation Strategy	Scope	Efficacy
Protected Areas (PAs)	India has 1,093 PAs (as of 2024), covering 5.28% of land area, including 106 National Parks and 573 Wildlife Sanctuaries.	PAs like Kaziranga (Assam) have helped increase the one-horned rhino population to 2,938 (2022). However, issues like human-wildlife conflicts and encroachment (e.g., in Sundarbans) reduce effectiveness.
Captive Breeding Programs	Initiatives for species like Asiatic lions (Gir) and red pandas (Darjeeling) to augment populations .	The Vulture Conservation Breeding Centre (Haryana) increased vulture numbers from near extinction to 400 (2023). Yet, high costs and reintroduction challenges (e.g., gharials) limit scalability.
Community-Led Conservation Initiatives	Local participation through mechanisms like Joint Forest Management (JFM) and eco-tourism (e.g., Periyar, Kerala).	The Snow Leopard Conservancy (Ladakh) reduced human-wildlife conflict by 60% through community training. However, inconsistent funding and awareness gaps (e.g., Odisha's turtle conservation) are barriers.

Challenges and Gaps:

- PAs face land-use conflicts; only 23% are effectively managed (2023 MoEFCC report).
- Captive breeding struggles with genetic diversity and habitat restoration.
- Community initiatives need sustained government support for scalability.

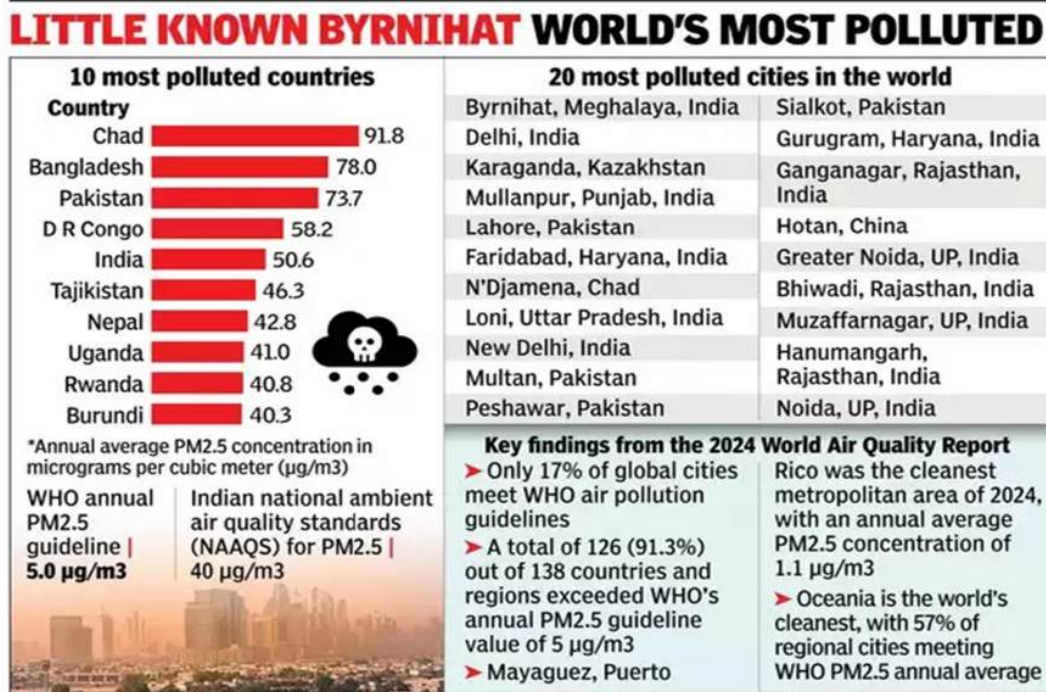
Conclusion:

India's diverse conservation strategies have achieved successes, with PAs protecting habitats, captive breeding reviving species, and community initiatives fostering coexistence. However, their long-term efficacy requires addressing funding, conflict resolution, and capacity-building gaps. Integrating technology and incentivizing community participation can ensure sustainable biodiversity preservation.

8. Identify the key anthropogenic factors contributing to environmental pollution in Indian cities. Propose sustainable urban planning strategies and policy interventions that can effectively mitigate pollution levels while balancing economic growth and ecological integrity.

Introduction:

Indian cities, home to 50% of the population by 2024, face severe environmental pollution due to rapid urbanization and industrialization. Anthropogenic factors exacerbate air, water, and soil degradation, threatening public health and ecosystems. Sustainable urban planning and policy interventions are crucial to mitigate pollution while fostering economic growth and ecological integrity.



Body:

Key Anthropogenic Factors Contributing to Pollution:

- **Industrial Emissions:** Factories emit PM2.5 and SO2, with Delhi's air quality index (AQI) often exceeding 300 (CPCB, 2024).
- **Vehicular Pollution:** Over 3 crore vehicles in top cities contribute 40% of urban PM10 emissions (MoRTH, 2023).
- **Waste Mismanagement:** 70% of 62 million tonnes of annual municipal solid waste is untreated, polluting water bodies like Yamuna (CPCB, 2024).
- **Construction Activities:** Dust from urban projects accounts for 20% of PM2.5 in cities like Bengaluru (IITM, 2023).

Sustainable Urban Planning Strategies and Policy Interventions:

Focus Area	Initiative/Details
Green Transportation	Promote Electric Vehicles (EVs) and metro systems. India targets 30% EV penetration by 2030 under FAME-II.
Waste Management	Implement Swachh Bharat Mission 2.0 , aiming for 100% waste segregation and recycling by 2026 .
Urban Spaces	Expand green cover, e.g., Surat increased green spaces by 20% , helping reduce urban heat and PM levels.
Industrial Regulation	Enforce BS-VI emission norms , incentivize renewable energy. 44% non-fossil fuel capacity achieved by 2024 .
Smart Mission	Use IoT for pollution monitoring, e.g., Pune's real-time AQI dashboards for better air quality management.

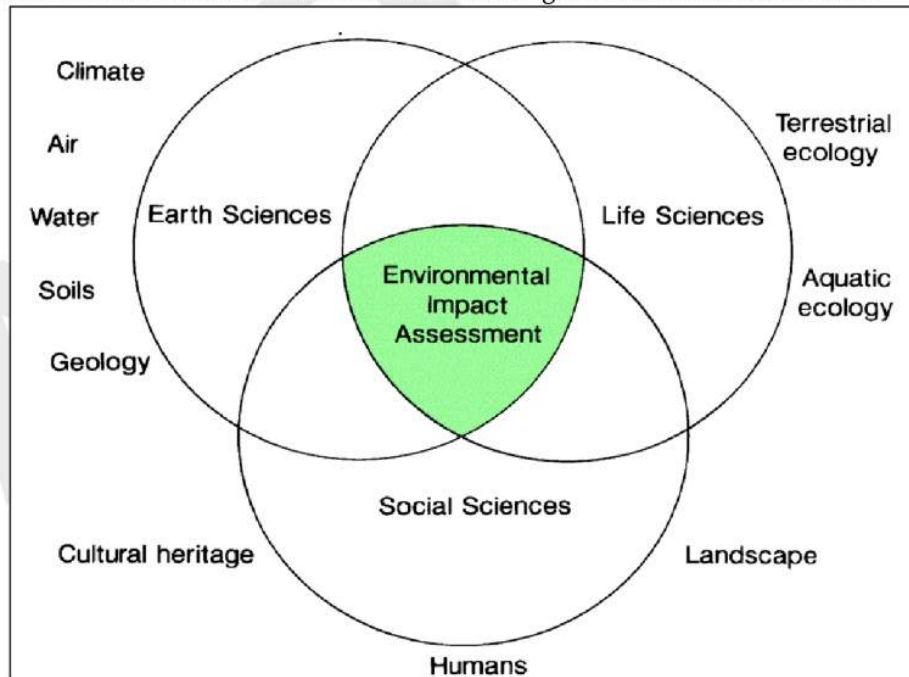
Conclusion:

Anthropogenic factors like industrial emissions and waste mismanagement drive pollution in Indian cities. Sustainable urban planning, through green transport, waste management, and smart technologies, can mitigate pollution while supporting economic growth. Strengthening policy enforcement and public awareness is vital for ecological integrity and livable cities.

9. Evaluate the significance of **Environmental Impact Assessment (EIA)** in shaping developmental policies on Odisha. How does the integration of scientific research and local community perspectives enhance environmental governance? Critically assess the effectiveness and limitations of the current EIA framework in the State.

Introduction:

Environmental Impact Assessment (EIA) is a critical tool for balancing development and environmental sustainability in Odisha, a state rich in biodiversity yet reliant on mining and industry. By integrating scientific research and local community perspectives, EIAs shape policies to ensure ecological integrity. However, the current EIA framework in Odisha faces challenges that limit its effectiveness.



Body:

Significance of EIA in Odisha's Developmental Policies:



- **Sustainable Development:** EIAs guide projects like the Paradip Port expansion, ensuring minimal ecological damage through mitigation measures.
- **Biodiversity Protection:** EIAs protect Odisha's ecosystems, e.g., Bhitarkanika mangroves, by assessing impacts of industrial projects.
- **Policy Alignment:** EIAs align with Odisha's Industrial Policy Resolution, 2022, mandating environmental clearances for 90% of large projects.

Integration of Scientific Research and Community Perspectives:

- **Scientific Research:** Studies, like SACON's EIA for Sulaipat Iron Ore Mines (2020-21), provide data-driven mitigation strategies, enhancing governance.
- **Community Engagement:** Public consultations, as in the Posco Steel Plant case, led to revised EIAs after community protests, ensuring social equity.
- **Outcome:** Integration fosters transparent, inclusive policies, reducing conflicts and improving project acceptability.

Effectiveness and Limitations of Odisha's EIA Framework:

Effectiveness: Odisha's SEIAA cleared 120 projects in 2023-24, with 80% incorporating mitigation plans, reflecting robust processes.

Limitations: Weak public participation, as seen in Vedanta's bauxite mining EIA, and inadequate post-clearance monitoring (**only 30% compliance, CPCB 2023**) undermine efficacy. Political interference and outdated baseline data further weaken assessments.

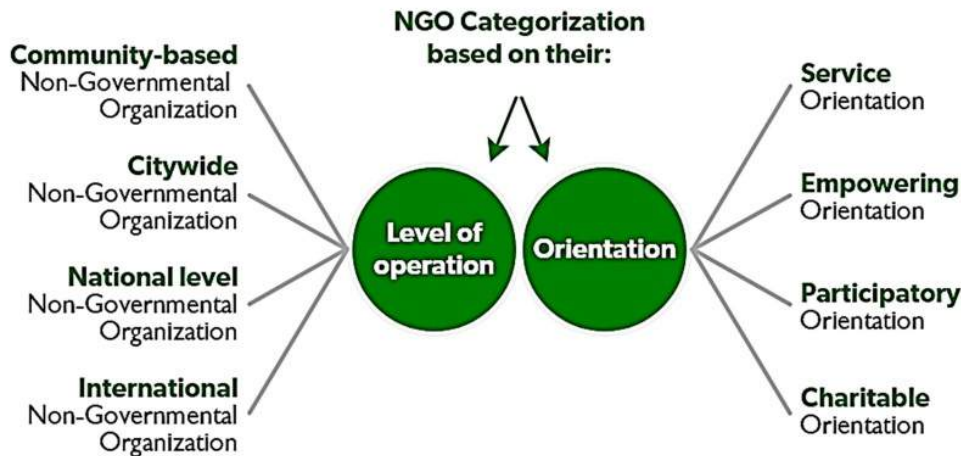
Conclusion:

EIAs are pivotal in shaping Odisha's developmental policies, promoting sustainability and biodiversity conservation. Integrating scientific research and community perspectives strengthens environmental governance. However, limitations like weak participation and monitoring demand reforms, including digital EIA platforms and stricter compliance, to enhance effectiveness and ensure sustainable development.

10. Analyze the multifaceted role of Non-Governmental Organizations (NGOs) in biodiversity conservation and environmental protection. How do these entities complement governmental frameworks and what structural, financial and operational challenges hinder their effectiveness?

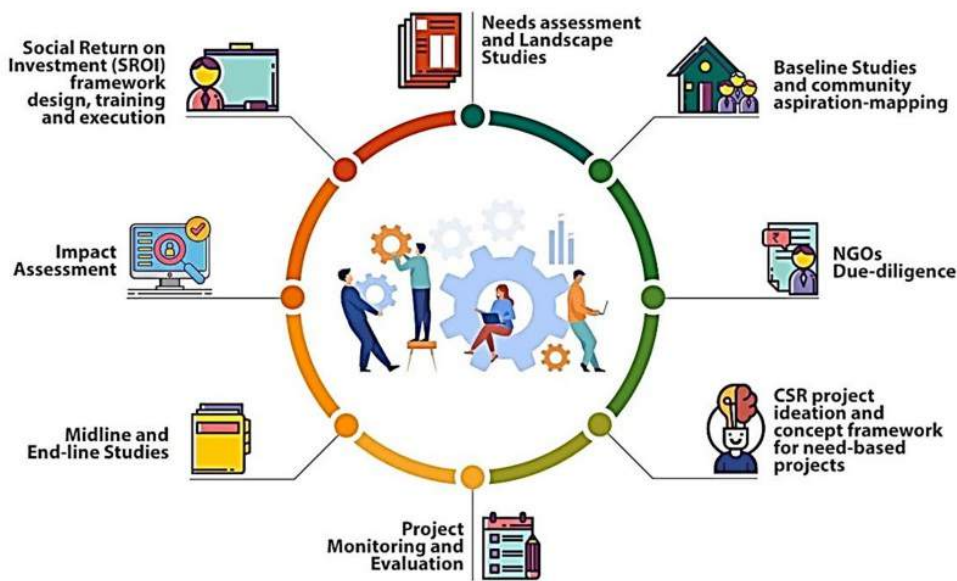
Introduction:

Non-Governmental Organizations (NGOs) play a pivotal role in biodiversity conservation and environmental protection in India, complementing governmental efforts through grassroots action and advocacy. With over 3.2 million NGOs (2023), their contributions are vital, yet structural, financial, and operational challenges limit their impact.



Body:

Multifaceted Role of NGOs:



- **Conservation Initiatives:** NGOs like WWF-India restore habitats, e.g., conserving 1,200 sq.km of Terai grasslands (2023).
- **Community Engagement:** Organizations like ATREE empower locals, as seen in Odisha's mangrove restoration, benefiting 10,000 fishermen.
- **Policy Advocacy:** Greenpeace India's campaigns influenced the 2020 EIA draft revisions, promoting stricter norms.
- **Awareness and Education:** NGOs like CEE conduct programs, reaching 5 million students annually on sustainability (2024).

Complementing Governmental Frameworks:

- **Filling Gaps:** NGOs implement projects in remote areas, e.g., BNHS's vulture conservation in Assam, where government reach is limited.



- **Monitoring and Accountability:** NGOs like CSE monitor pollution, complementing CPCB's efforts with real-time data.
- **Collaborative Projects:** Partnerships, like WWF with MoEFCC, support Project Tiger, increasing tiger numbers to 3,682 (2022).

Challenges Hindering Effectiveness:

- **Financial Constraints:** Over 60% of NGOs rely on inconsistent funding (FCRA, 2023), limiting scalability.
- **Structural Issues:** Lack of professional management, as in small NGOs, reduces efficiency.
- **Operational Challenges:** Regulatory hurdles, like FCRA cancellations (20,693 NGOs, 2022), and government-NGO mistrust hamper activities.
- **Limited Reach:** Urban-centric operations restrict impact in rural areas.

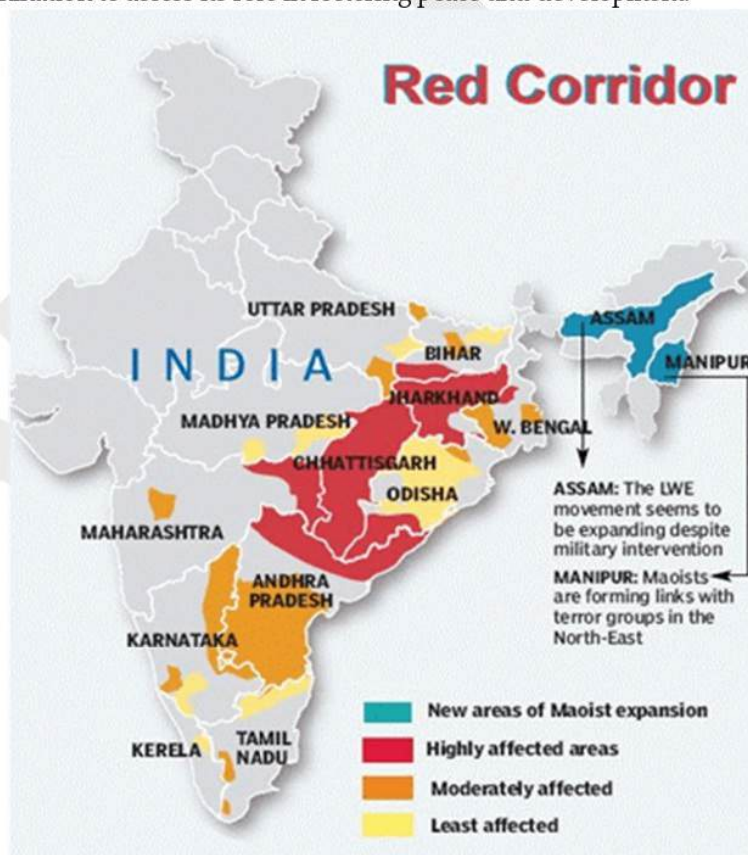
Conclusion:

NGOs significantly enhance biodiversity conservation and environmental protection by bridging gaps, engaging communities, and advocating policies. However, financial instability, regulatory constraints, and structural inefficiencies hinder their potential. Strengthening government-NGO partnerships, streamlining funding, and building capacity can amplify their role in sustainable development.

11. Critically examining the Government of Odisha's surrender and rehabilitation policy aimed at combating Left Wing Extremism in the State.

Introduction:

The Government of Odisha's surrender and rehabilitation policy is a cornerstone of its strategy to combat Left Wing Extremism (LWE), aiming to reintegrate Maoists into mainstream society while addressing socio-economic grievances. With LWE now confined to 10 districts (2023), the policy's effectiveness and limitations warrant critical examination to assess its role in fostering peace and development.



Body:

Key Features of the Policy:

Category	Details
Financial Incentives	- Immediate grant of Rs.1.5 lakh - Monthly stipend of Rs.2,000 for 3 years - Housing under PMAY (Odisha Police, 2023)
Skill Development	- Vocational training through Industrial Training Institutes (ITIs) 300 surrendered Maoists trained in 2023–24
Reintegration Support	- Land allocation - Psychosocial support for former extremists

Effectiveness:



- Surrender Trends:** 21 Maoists surrendered in 2021, 17 in 2020, and 13 in 2019, reflecting policy appeal (New Indian Express, 2022).
- Geographical Impact:** Removal of 11 districts from LWE-hit status (2018-20) indicates reduced extremism, partly due to rehabilitation success.
- Community Trust:** Initiatives like Malkangiri's security camps and skill centers have lowered LWE activities by 60% in cut-off areas (2023).

Limitations:

- Implementation Gaps:** Inconsistent fund disbursement and lack of post-reintegration monitoring, as reported in Kandhamal, reduce trust.
- Limited Awareness:** Rural Maoists often unaware of benefits, limiting outreach in remote areas like Nuapada.
- Security Concerns:** Surrendered cadres face retaliation risks, with 10% reporting threats (2023 police data).

Conclusion:

Odisha's surrender and rehabilitation policy has significantly curbed LWE by offering financial and social support, contributing to reduced violence and territorial control. However, implementation gaps, limited awareness, and security risks hinder its full potential. Strengthening outreach, ensuring consistent support, and enhancing protection mechanisms can make the policy a model for LWE-affected states, aligning with India's 2026 LWE elimination target.

12. Discuss the role, function and structure of National Investigation Agency. How has it assumed importance in present day?

Introduction:

The **National Investigation Agency (NIA)**, established under the NIA Act, 2008, post the 26/11 Mumbai attacks, is India's premier counter-terrorism agency. Operating under the Ministry of Home Affairs, it addresses terrorism, Left Wing Extremism (LWE), and other national security threats, gaining prominence amid rising global and domestic terror challenges.

Body:

Role and Functions

<i>Counter-Terrorism</i>	Investigates and prosecutes terror-related offenses (e.g., bomb blasts, cyber-terrorism) under scheduled acts like UAPA, 1967.
<i>Inter-State Coordination</i>	Probes cases with inter-state and international linkages (e.g., 2022 Udaipur tailor killing).
<i>Data Repository</i>	Maintains a database on terror financing and Fake Indian Currency Notes (FICN), aiding state agencies.
<i>Global Reach</i>	Post-2019 amendments, empowered to investigate attacks on Indians abroad (e.g., Kabul Gurudwara bombing).

NEED OF NIA

Government of India justification for creation



Structure:

Leadership	Headed by a Director-General (IPS officer), supported by Additional DGs and Inspectors General (IGs).
Regional Presence	Headquartered in New Delhi with 14 branches, including in Hyderabad and Guwahati.
Personnel	Comprises officers from IPS, IRS, and CAPF, totaling 649 staff (as of 2023).

Present-Day Importance:

- **High Conviction Rate:** Achieved 94.7% conviction in 147 cases by 2023, deterring terrorism.
- **LWE Combat:** Exclusive LWE cell tackles Naxal financing, reducing LWE-affected districts to 45 (2023).
- **Global Threats:** Addresses emerging issues like cryptocurrency misuse and dark web, as discussed in BRICS Seminar 2021.
- **Policy Influence:** Shapes anti-terror laws, e.g., UAPA amendments, enhancing national security.

Conclusion:

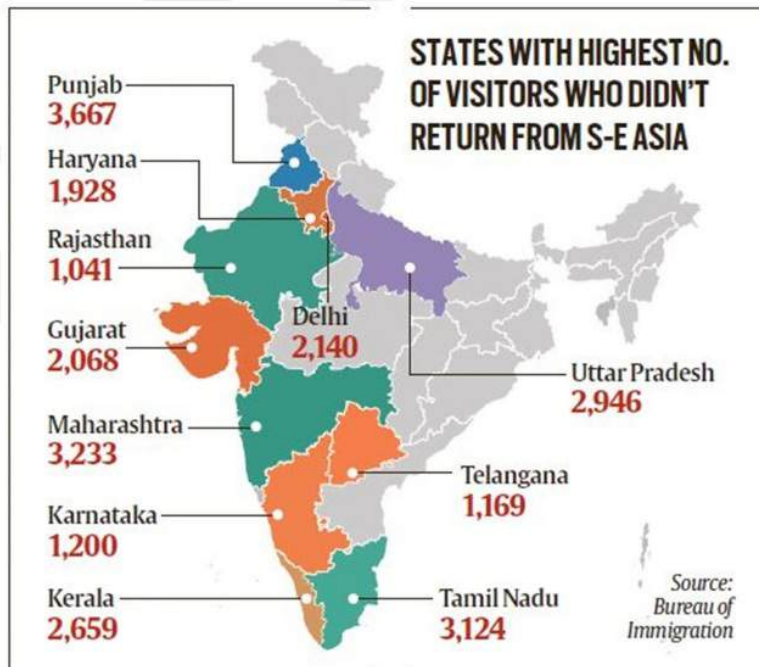
The NIA's robust role, structured organization, and scientific approach make it indispensable in combating terrorism and LWE. Its growing importance lies in addressing complex threats, ensuring sovereignty, and fostering inter-agency collaboration. Strengthening domain expertise and state coordination can further enhance its efficacy.

GROUP-B

13. There are lots of discussions on 'cyber slavery' and 'scam compound'. Discuss its context, causes, modus operandi and geographical prevalence. Describe the steps taken by the Government of India to counter the challenges posed in this regard.

Introduction:

Cyber slavery and scam compounds, emerging forms of organized crime, involve trafficking individuals to perpetrate cyber frauds under coercion. Prevalent in Southeast Asia, these operations exploit India's youth, posing significant socio-economic and security challenges. The Government of India has responded with multi-pronged measures to counter this menace.





Body:

Category	Details
Context	• Cyber slavery involves forced labor in scam compounds, where victims are coerced into executing online frauds like digital arrests and cryptocurrency scams. • In 2024, over 5,000 Indians were trapped in Cambodia.
Causes	• High unemployment: 7.5% among urban youth (2023) • Attractive but fake job offers • Lax border controls enable trafficking • Social media plays a major role in spreading deceptive recruitment ads
Modus Operandi	• Victims are lured with fake job advertisements (e.g., data entry) on social media • They pay Rs.1–2 lakh to agents for placement • On arrival, passports are confiscated • Victims are forced to work 12–17 hours a day in scam centers (e.g., Jinbei 4, Cambodia) under threats and coercion

Geographical Prevalence: Predominantly in Cambodia, Myanmar, Laos, and Thailand's Golden Triangle SEZ. Myanmar's Myawaddy and Cambodia's Sihanoukville are notorious hubs, with losses of Rs.3.2 lakh crore globally (UNODC, 2023).

Government Steps to Counter Challenges:

- **Rescue Operations:** Indian embassies rescued 650 from Cambodia, 518 from Laos (2024).
- **NIA Actions:** Arrested key traffickers like Kamran Haider (2024) and chargesheeted Laos-based agents.
- **I4C Initiatives:** Blocked 3,25,000 mule accounts and 595 apps (2024).
- **Awareness Campaigns:** MHA's alerts and telecom warnings on digital arrests.

CyberPeace Policy Recommendations:

1. **Social media companies and regulatory authorities** must collaborate to address emerging cybercrimes and develop robust preventive measures against misuse of technology.
2. Enhance international cooperation to **tackle jurisdictional challenges** and anonymity issues in cyber human trafficking.
3. **Implement strong legislation** addressing both national and international human trafficking, with strict penalties for offenders.
4. Raise awareness among netizens about cybercriminal tactics, such as **fake job offers**.

Conclusion:

Cyber slavery, driven by economic vulnerabilities and organized crime, threatens India's youth and security. While rescue efforts and NIA interventions show progress, challenges like cross-border jurisdiction persist. Enhanced international cooperation, stricter recruitment regulations, and public awareness are crucial to dismantle scam compounds and ensure justice.

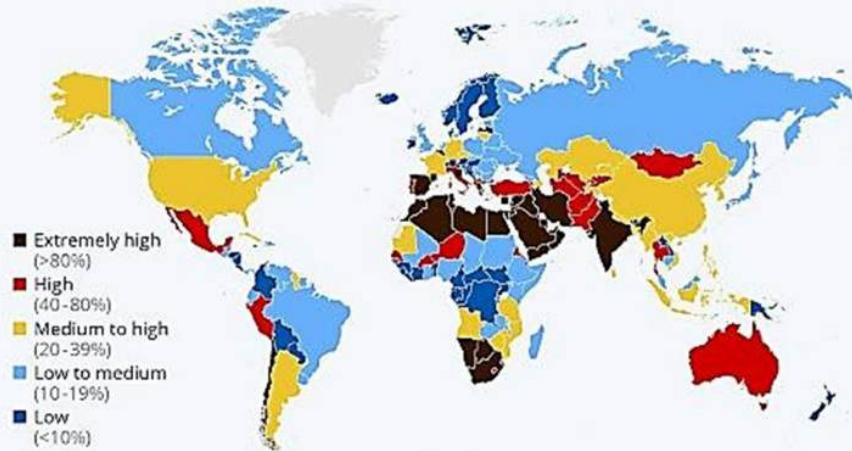
14. The World is facing an acute shortage of clean and safe freshwater. What are the alternative technologies which can solve this crisis? Briefly discuss any three such technologies citing three such technologies citing their key merits and demerits.

Introduction:

The global freshwater crisis, with **2.2 billion people lacking safe water (WHO, 2023)**, threatens health, agriculture, and economies. India, facing 18% of global water stress (NITI Aayog, 2024), requires innovative technologies to address this. Alternative technologies like desalination, wastewater recycling, and atmospheric water generation offer solutions, each with unique merits and challenges.

Where Water Stress Will Be Highest by 2050

Projected ratio of human water demand to water availability (water stress level) in 2050*



* According to "business as usual" scenario = middle-of-the-road future where temperatures increase by 2.8°C to 4.6°C by 2100

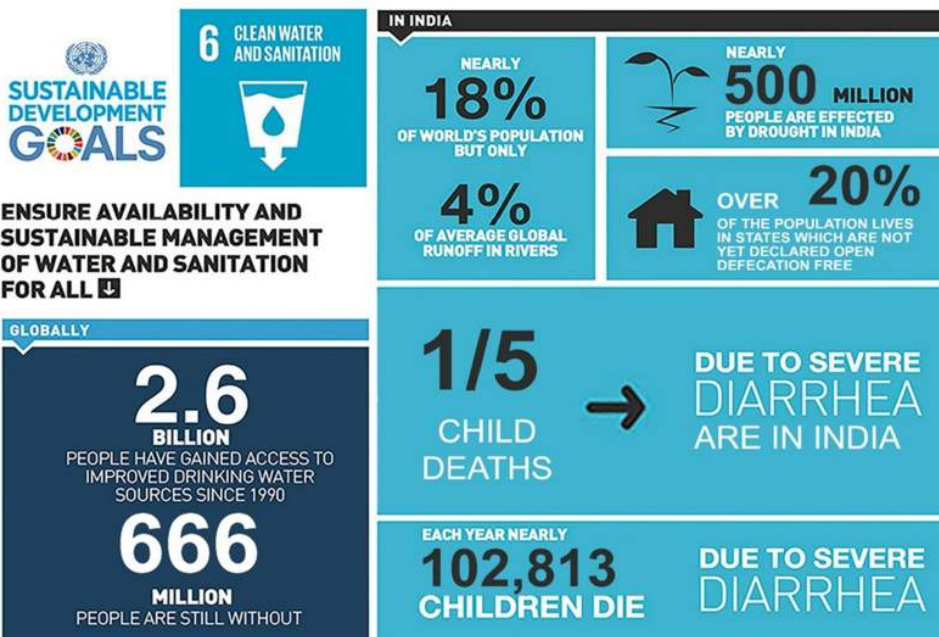
Source: World Resources Institute



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Alternative Technologies:



Technology	Process	Merits	Demerits
Desalination	Converts seawater to freshwater using reverse osmosis or thermal distillation.	- Provides abundant freshwater 10 operational plants in India produce 1.5 million liters daily (2024)	- High energy consumption (3–5 kWh/m³) - Brine disposal harms marine ecosystems (e.g., Minjur plant, Chennai)
Wastewater Recycling	Treats sewage or industrial water for reuse via filtration and chemical processes.	- Reduces freshwater demand - Bengaluru's 440 MLD plants irrigate 20,000 acres (2023) - Cost-effective (Rs.15–20/kl)	- Public resistance due to stigma - High setup costs (Rs.50–100 crore for 100 MLD plant)
Atmospheric Water Generation (AWG)	Extracts water from humid air using condensation or adsorption.	- Useful in arid regions - Maithri Aquatech units produce 1,000 liters/day using solar power	- Low yield in dry climates (20–30 liters/day/unit) - High cost (Rs.2–3 lakh/unit)

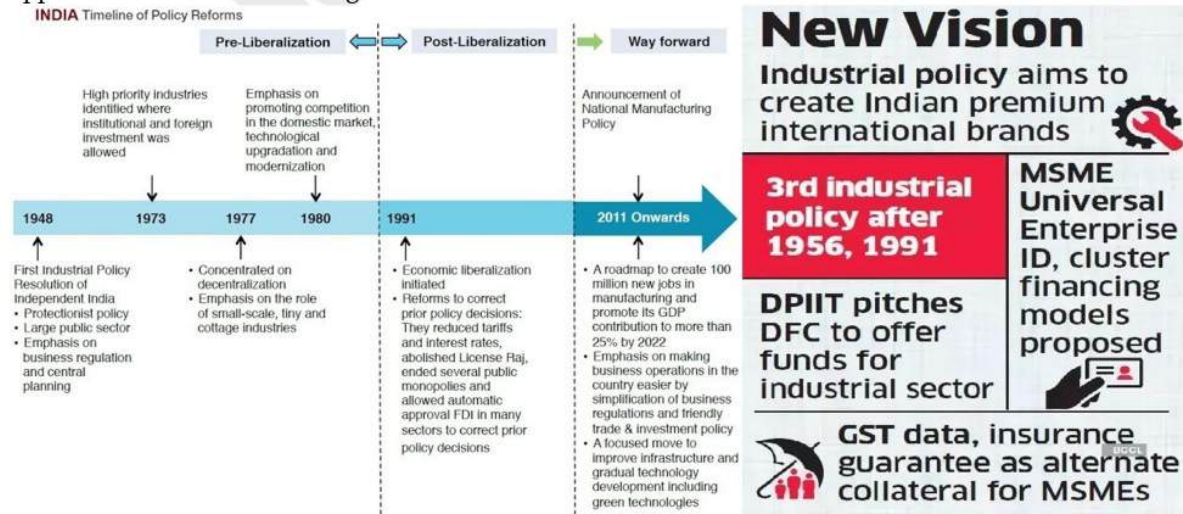
Conclusion:

Desalination, wastewater recycling, and AWG offer viable solutions to the freshwater crisis, each addressing specific contexts. While desalination suits coastal areas, recycling maximizes urban water use, and AWG serves remote regions. Overcoming high costs, energy demands, and ecological impacts through innovation and policy support is essential for sustainable water security in India and globally.

15. How did changes in industrial policy post-liberalization affect India's global competitiveness? What are the key opportunities for industrialization in Odisha, given its resource base? How can the State overcome challenges like environmental concerns and skill shortages?

Introduction:

Post-1991 liberalization, India's industrial policies shifted from protectionism to market-driven reforms, enhancing global competitiveness. Odisha, with its rich mineral and coastal resources, is poised for industrialization but faces environmental and skill-related challenges. Strategic interventions can leverage opportunities while addressing these concerns.



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Impact on Global Competitiveness:

- **Policy Reforms:** The 1991 New Industrial Policy dismantled licensing, reduced tariffs (from 300% to 50% by 2000), and allowed 100% FDI in sectors like IT, boosting competitiveness.
- **Sectoral Growth:** IT, pharmaceuticals, and auto sectors flourished, with India's IT exports reaching \$194 billion (2023). Maruti Suzuki and Tata Motors became global players.
- **Challenges:** Premature deindustrialization and reliance on imports (electronics, 60% of consumption) limited manufacturing's GDP share (14%, 2023).

Opportunities for Industrialization in Odisha:



- **Resource Base:** Odisha holds 33% of India's iron ore, 24% coal, and 98% chromite, supporting steel and mining industries. Vizag Port aids exports.
- **Policy Support:** Industrial Policy Resolution (IPR) 2022 offers 30% capital subsidies and 100% SGST reimbursement, attracting Rs.2.5 lakh crore investments (2023-24).
- **Emerging Sectors:** Green energy, EVs, and textiles are prioritized, with JSW's Rs.40,000 crore EV project in Cuttack (2024).

Overcoming Challenges:

Issue	Details	Solution
Environmental Concerns	Mining degrades 20% of Odisha's forests (FSI, 2023).	Enforce green clearances, adopt zero-waste technologies, expand Odisha's 11% renewable energy share.
Skill Shortages	Only 15% of Odisha's workforce is formally skilled (2023).	Scale up ITIs, align with Germany's apprenticeship model, and leverage Skill India programs.
Infrastructure Gaps	Poor logistics raise costs.	Implement National Logistics Policy to reduce logistics cost from 14% to 8% of GDP by 2030.

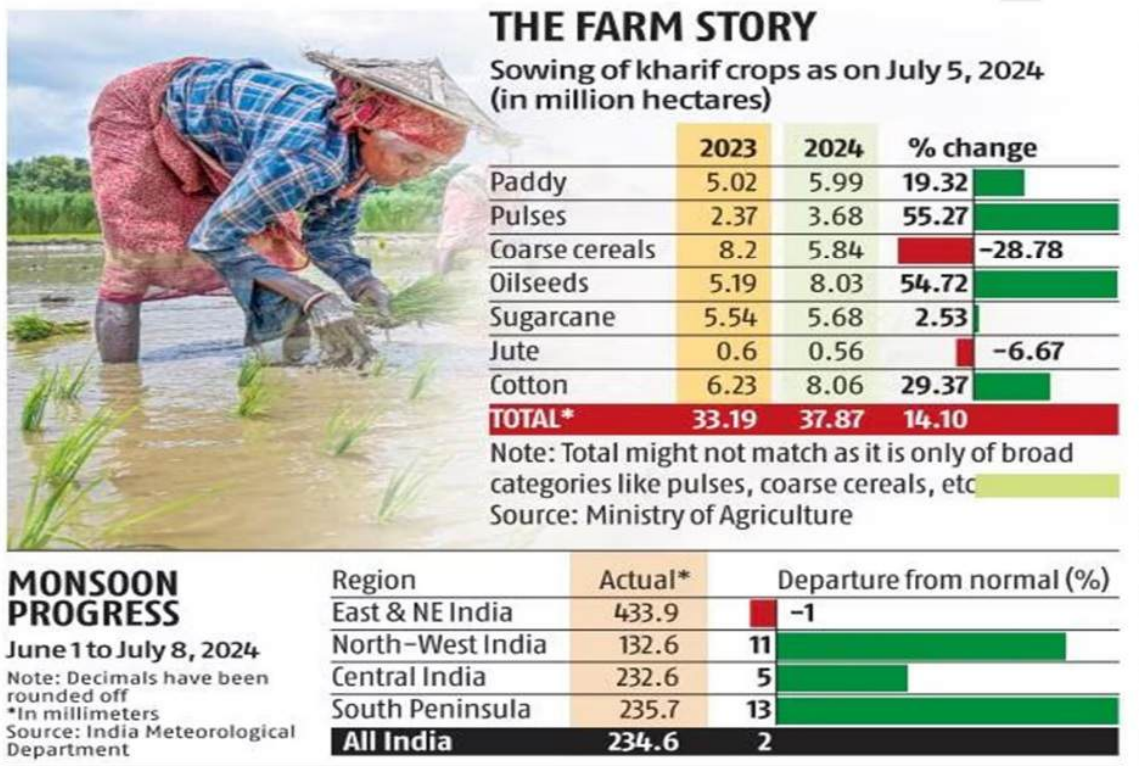
Conclusion:

Post-liberalization policies enhanced India's competitiveness in services and select industries, though manufacturing lags. Odisha's resource wealth and policies offer industrialization potential, but environmental degradation and skill gaps require urgent action. Sustainable technologies, robust skilling, and infrastructure upgrades can position Odisha as a global industrial hub, aligning with India's \$5 trillion economy goal by 2025.

16. How do cropping patterns in India vary across regions and what role does irrigation play in enhancing productivity? What are the major constraints in irrigation development in Odisha?

Introduction:

Cropping patterns in India reflect agro-climatic diversity, influencing agricultural productivity and food security. Irrigation plays a pivotal role in enhancing yields, but regional disparities and infrastructural challenges persist. In Odisha, despite rich water resources, irrigation development faces significant constraints, limiting agricultural potential.



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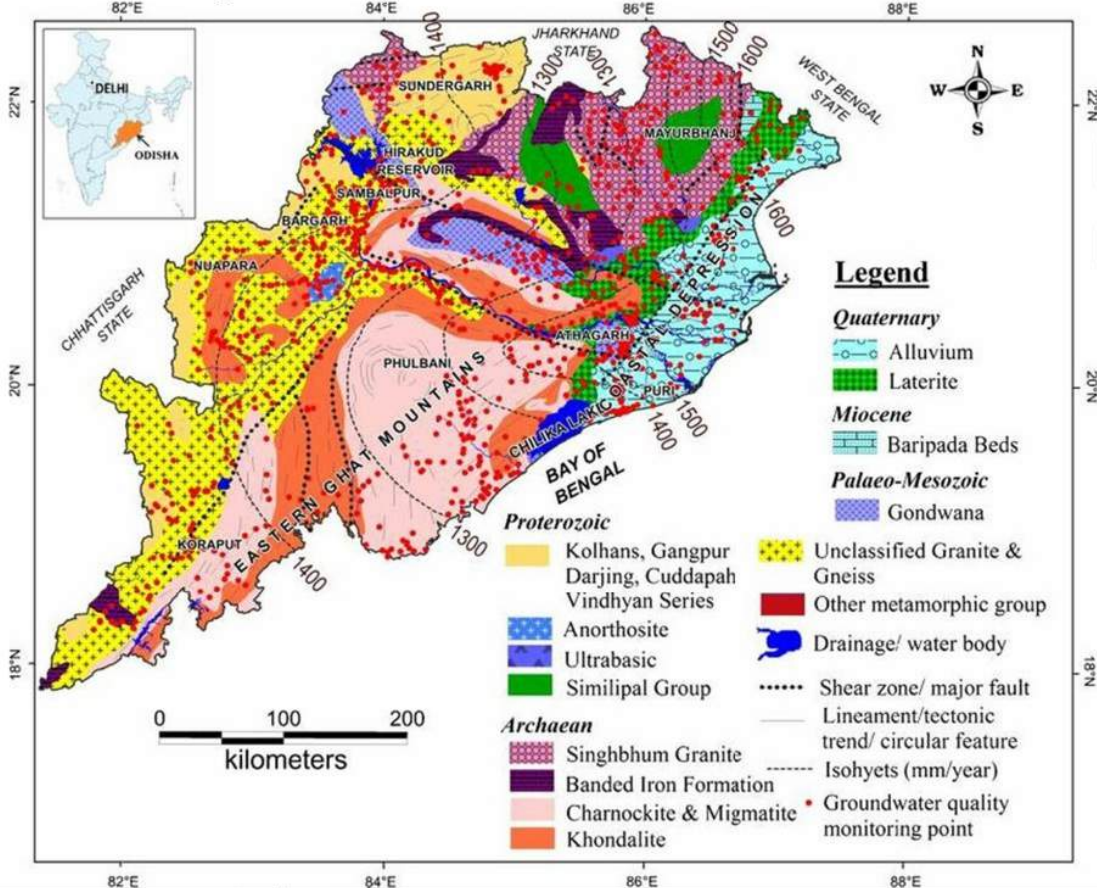
Variation in Cropping Patterns Across Regions:

Region	Key Crops	Agro-Climatic Features	Special Notes
Northern Plains (Punjab, Haryana)	Wheat, Rice	Fertile alluvial soils, extensive canal irrigation	Punjab's 80% irrigated land supports 20% of India's wheat production (2023)
Central India (Madhya Pradesh)	Coarse cereals (Jowar, Bajra), Pulses	Semi-arid regions, rainfed farming	Contributes 25% of India's total pulse production (2022-23)
Southern India (Tamil Nadu, Andhra Pradesh)	Rice, Sugarcane, Coconut (plantation crops)	Tropical climate, moderate to high rainfall, 60% irrigated land	Rice yields reach 3.5 tonnes/hectare due to favorable irrigation and climate
Eastern India (West Bengal, Odisha)	Paddy, Vegetables	High rainfall and fertile deltaic plains	While paddy dominates, diversification into vegetables is increasingly notable

Role of Irrigation in Productivity:

- **Yield Enhancement:** Irrigation boosts yields by 30-50%; irrigated wheat yields 4.5 tonnes/ha vs. 2 tonnes/ha rainfed (ICAR, 2023).
- **Crop Diversification:** Enables multiple cropping, e.g., Punjab's rice-wheat cycle.
- **Climate Resilience:** Mitigates drought risks, ensuring stable output during erratic monsoons.

Constraints in Irrigation Development in Odisha:



Issue	Details
Low Irrigation Coverage	Only 35% of 61.8 lakh ha cultivable land is irrigated (2023), compared to Punjab's 98%.
Incomplete Projects	Mega projects like Subarnarekha Canal, delayed by 20 years, cover just 40% of targeted areas.
Financial Constraints	Budget allocation of Rs.9,600 crore (2024-25) is insufficient for launching new irrigation schemes.
Environmental Issues	Over-extraction and waterlogging have degraded 15% of irrigated land (Odisha Irrigation Dept., 2023).
Maintenance Gaps	30% of canals are non-functional due to poor upkeep and lack of regular maintenance.

Conclusion:

India's cropping patterns vary by region, driven by climate and irrigation access, which significantly boosts productivity and resilience. Odisha's irrigation development is hampered by low coverage, delays, and maintenance issues. Prioritizing micro-irrigation, timely project completion, and sustainable practices can unlock Odisha's agricultural potential, aligning with India's goal of doubling farmers' income by 2026.

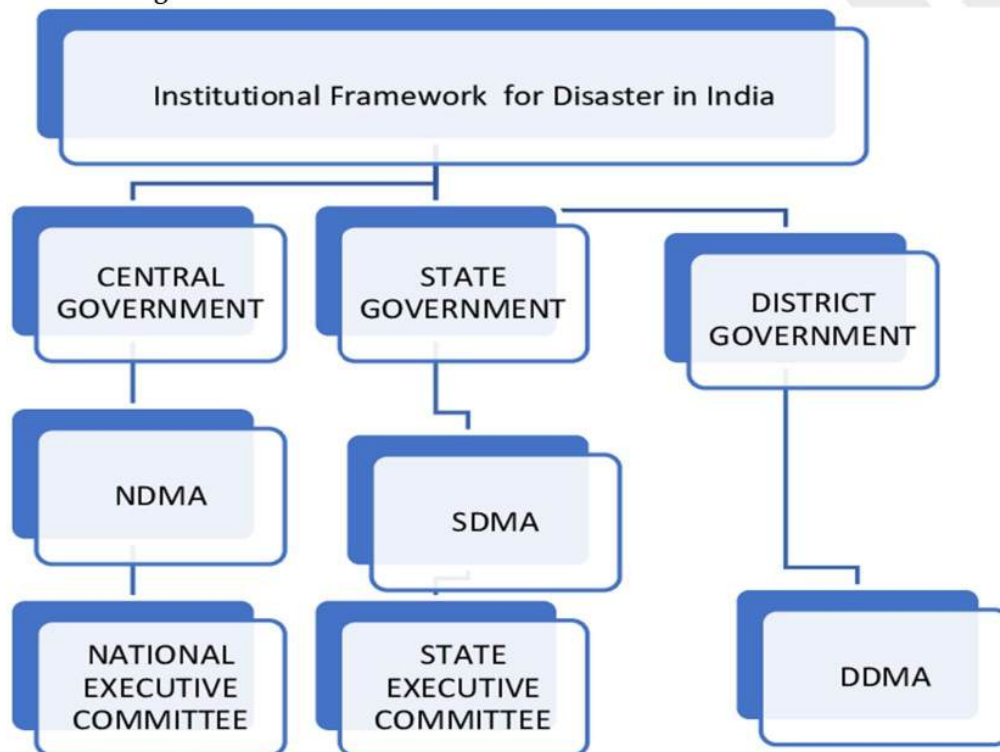
17. Examine India's disaster management framework with a specific focus on Odisha's approach to disaster preparedness, mitigation and response. Evaluate the role of State institutions policy interventions and community-driven initiatives in disaster risk reduction and suggest strategic measures to strengthen resilience and interagency coordination.

Introduction:

India's disaster management framework, shaped by the Disaster Management Act, 2005, emphasizes prevention, mitigation, and preparedness to reduce disaster risks. Odisha, often called the 'disaster capital' due to frequent cyclones and floods, has emerged as a global model for disaster resilience, notably post-1999 Super Cyclone. Its approach, blending state institutions, policy interventions, and community-driven initiatives, offers lessons for enhancing resilience and interagency coordination.

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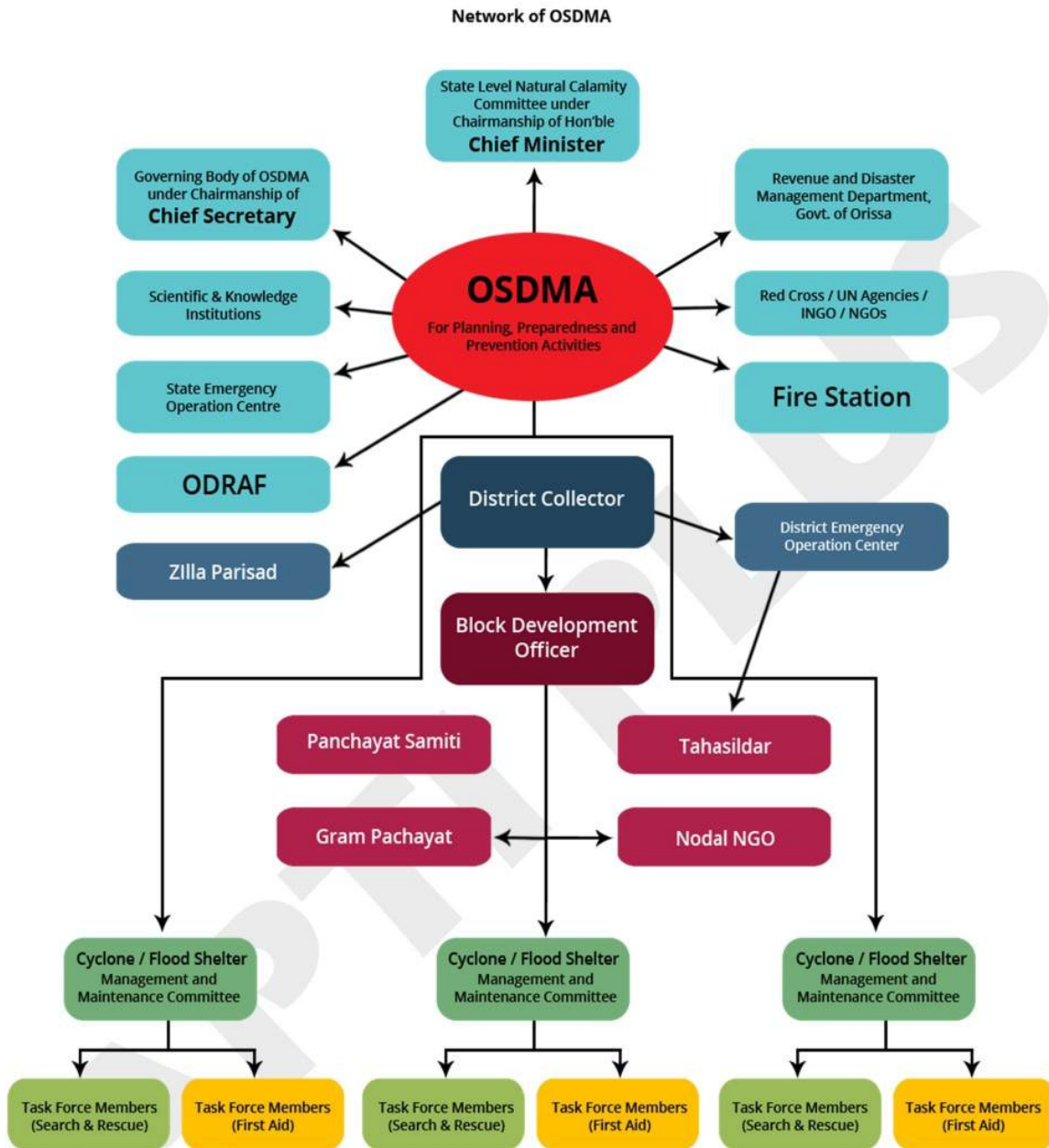
India's Disaster Management Framework:



Structure: The National Disaster Management Authority (NDMA), chaired by the Prime Minister, sets policies, while State Disaster Management Authorities (SDMAs) implement them. The National Disaster Response Force (NDRF) ensures rapid response.

Focus Areas: Aligns with **Sendai Framework (2015-2030)**, prioritizing risk reduction, early warning systems, and resilient infrastructure. In 2023, NDMA's Rs.1.8 lakh crore budget supported mitigation projects.

Odisha's Approach to Disaster Management:



Aspect	Details
State Institutions	Odisha State Disaster Management Authority (OSDMA), established in 1999, coordinates multi-layer responses. Evacuated 1.2 million during Cyclone Fani (2019), limiting deaths to 64.
Policy Interventions	Odisha Climate Change Action Plan and Village Disaster Management Plans integrate risk reduction with climate adaptation. The 2020 amendment to the Odisha Gram

	Panchayat Act empowered local bodies for swift decision-making.
Community-Driven Initiatives	Community-Based Disaster Preparedness (CBDP) trains volunteers; 450 cyclone shelters maintained by local committees. Women's participation ensures inclusivity, reducing vulnerabilities in coastal villages like Venkatraipur (Tsunami Ready, 2023).

Evaluation and Challenges:

- **Strengths:** Odisha's early warning systems, backed by RIMES Thailand, and 120 coastal watchtowers minimized casualties during Cyclone Amphan (2020).
- **Challenges:** Funding gaps (only 60% of Rs.10,000 crore allocated for 2024-25 utilized) and interagency overlaps hinder scalability.

Strategic Measures:

- **Enhance Funding:** Leverage 15th Finance Commission for DRR financing.
- **Interagency Coordination:** Develop unified data-sharing platforms, as recommended by NDMA (2023).
- **Community Empowerment:** Scale up CBDP with NGOs for rural outreach.

Conclusion:

India's disaster management framework, with Odisha's model, showcases proactive resilience through robust institutions and community engagement. OSDMA's success in risk reduction highlights the value of localized strategies. **Strengthening funding, coordination, and grassroots initiatives can enhance resilience, positioning India as a global leader in disaster management by 2030.**