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POLLUTION SCHEMES 2026 PRELIMS

1. National Clean Air Programme (NCAP)

The **National Clean Air Programme (NCAP)** is India's flagship national-level framework designed to tackle air pollution across the country. Positioned as a **Central Sector Scheme** under the "Control of Pollution" umbrella program, it works through localized city-specific action plans.

Core Structure and Institutional Framework

- **Governing Ministry:** Executed under the **Ministry of Environment, Forest and Climate Change (MoEFCC)**.
- **Implementing Agency:** The **Central Pollution Control Board (CPCB)** coordinates implementation at the national level, partnering with State Pollution Control Boards (SPCBs) and Urban Local Bodies (ULBs) on the ground.
- **Scheme Classification:** It operates as a **Central Sector Scheme** via MoEFCC's "Control of Pollution" budget line, but functions natively as a **flagship, long-term, time-bound national mission**.

Aims and Objectives

- **Airshed & City Management:** To prevent, control, and reduce ambient air pollution across 131 targeted cities.
- **Target Cities:** Focuses strictly on "Non-Attainment Cities" (those failing to meet National Ambient Air Quality Standards (NAAQS) for 5 consecutive years) and Million-Plus Cities.
- **Current Reduction Targets (Updated for 2026):** Originally aiming for a 20-30% reduction by 2024, the government updated the target to achieve **up to a 40% reduction in Particulate Matter** or to reach the national ambient standard by **financial year 2025–26**, taking 2017–18 as the baseline year.

Funding Mechanism

NCAP leverages a hybrid, performance-linked financial model:

1. **Million-Plus Cities:** Directly funded via the 15th Finance Commission (XV-FC) Air Quality Performance Grant, where disbursals are strictly tied to verified annual air quality improvements.
2. **Non-Attainment Cities (<1 Million Pop):** Funded through the MoEFCC's central scheme allocation.
3. **Convergence Model:** Pools funds from existing parallel central schemes such as the Swachh Bharat Mission (SBM-U), AMRUT, Smart Cities Mission, PM e-Bus Sewa, and the FAME-II EV transition project.

Key Features

- **PRANA Portal:** Tracked transparently via the Portal for Regulation of Air-pollution in Non-Attainment cities (PRANA), evaluating both physical and financial progress.
- **City Action Plans (CAPs):** Municipalities must create localized plans targeting precise local sources like road dust, industrial clusters, vehicular emissions, and solid waste burning.

- **Scientific Infrastructure:** Mandatory expansion of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) alongside source-apportionment studies to identify chemical pollution compositions.

Status Update, Achievements, and Criticisms (As of 2026)

Reports published by the Centre for Research on Energy and Clean Air (CREA) highlight a highly mixed trajectory as the 2026 target line concludes:

Major Achievements

- **Expanded Infrastructure:** Over 1,600 monitoring stations are active across India, substantially increasing data transparency and real-time public access through the PRANA network.
- **Localised Accountability:** 131 cities have instituted dedicated municipal cells and high-level state task forces led by Chief Secretaries, establishing structural accountability for environmental goals.
- **Target Successes:** Roughly 25 to 51 cities (depending on the localized data framework used) successfully logged major declines in with select jurisdictions achieving the elusive 40% reduction mark.

Core Criticisms

- **Missed 2026 Targets:** On a national scale, the revised 40% particulate reduction target remained unmet for the majority of participating cities; in high-profile regions like Delhi and parts of the Indo-Gangetic plain, average pollution numbers actually stagnated or worsened.
- **Skewed Funding Allocations:** Out of nearly ₹13,415 crore released under NCAP and XV-FC grants, roughly **68% was spent purely on road dust management** (sweeping, water sprinkling), while critical contributors like industrial transformation, domestic clean fuel transit, and public awareness received less than 1% each.
- **The Blind Spot:** The framework primarily measures and penalises based on (coarse dust particles). It lacks uniform, strict reduction targets for (fine, toxic particles that deeply penetrate human organs), allowing extreme public health risks to continue unaddressed.
- **"Flying Blind" without Data:** Around 40 targeted cities reached the 2026 mark without completing their mandatory source apportionment studies, meaning public funds were spent without localized scientific proof of what was actually polluting the air

2. Namami Gange programme (National Mission for Clean Ganga)

The **Namami Gange Programme** is a **Central Sector Scheme** and an **integrated flagship umbrella initiative** launched by the Central Government to accomplish the twin objectives of **effective abatement of river pollution** and the **conservation and holistic rejuvenation** of the National River Ganga and its tributaries.

Governance & Administrative Framework

- **Nodal Ministry:** Operated under the Ministry of Jal Shakti (specifically the Department of Water Resources, River Development, and Ganga Rejuvenation).
- **Implementing Agency:** Executed nationally by the **National Mission for Clean Ganga (NMCG)** and supported at the ground level by State Programme Management Groups (SPMGs).
- **Institutional Structure:** Governed by a 5-tier system topped by the National Ganga Council, chaired directly by the Prime Minister.

Core Aims, Objectives, and Structural Pillars

- **Aims:** Achieving *Nirmal Dhara* (unpolluted flow), *Aviral Dhara* (continuous flow), and maintaining the baseline ecological integrity of the river basin.
- **Structural Pillars:** Divided into 8 actionable prongs—Sewage Treatment Infrastructure, Industrial Effluent Monitoring, River-Front Development, River-Surface Cleaning, Afforestation, Bio-Diversity Conservation, Public Awareness (*Jan Ganga*), and *Ganga Gram* (rural sanitation).

Funding Mechanism

- **Scheme Type:** 100% centrally funded via the **Central Sector Scheme** model.
- **Budget Phase II (Up to March 2026):** Implemented via **Namami Gange Mission-II** with a dedicated budgetary outlay of **₹22,500 crore** for the April 2021 to March 2026 window.
- **Fiscal Allocations (2025–2026):** The allocation stood at ₹3,400 crore for FY 2025-26. The subsequent budget allocation for FY 2026-27 is configured at **₹3,100 crore**.
- **External Assistance:** Supported through hybrid loans backed by multi-national institutions including the **World Bank**, Japan International Cooperation Agency (JICA), and the Asian Development Bank (ADB).
- **Clean Ganga Fund (CGF):** A dedicated corporate/non-resident pool to drive public-private volunteer funding.

Status & Core Achievements (As of 2026)

According to status updates published by the Press Information Bureau (PIB):

- **Project Completion Metric:** Out of 524 sanctioned projects spanning the river basin, **355 projects (68%) stand fully completed** and functional.
- **Sewage Infrastructure Capacity:** Total operational Sewage Treatment Plant (STP) capacity expanded significantly, crossing **3,976 MLD** (Million Litres per Day) via 173 commissioned STPs. Over 538 MLD of treatment capacity was integrated into the operational grid during the FY 2025–26 cycle alone.
- **Ecological Flow & Conservation:** Sustained baseline minimum environmental flows (*e-flows*) across the main stem monitored dynamically by the Central Water Commission (CWC). Over **33,024 hectares** have been actively afforested along the river banks.
- **Biodiversity Milestones:** Over 203 lakh fingerlings were ranched to replenish aquatic prey bases, alongside the rollout of India's first **Dolphin Rescue Ambulance** at the Wildlife Institute of India to safeguard the endangered Gangetic Dolphin population.
- **Grassroots Governance:** 139 District Ganga Committees (DGCs) have actively institutionalised localized monitoring via regular verified performance cycles.

Critical Challenges and Criticisms

- **Infrastructure Deficit:** Opposition groups and industrial reports allege a persistent gap in core processing capabilities. Despite aggressive rollouts, a structural shortfall remains between gross daily wastewater generated in tier-1 urban areas and functional localized treatment plant capacity.
- **CAG Report Disclosures:** Official audits from the Comptroller and Auditor General (CAG) flagged systemic implementation shortfalls in state segments like Uttarakhand. The report highlighted design deficiencies in high-altitude STPs, under-utilization of targeted afforestation grants (only 16% of certain localized forestry

interventions were utilized), and systemic shortfalls in tapping active wastewater channels discharging directly into the river.

- **Pollution Metrics & Biological Oxygen Demand:** Central Pollution Control Board (CPCB) samplings show that while dissolved oxygen parameters have stabilized, **fecal coliform counts** still breach permissible limits around critical dense human convergence points such as Prayagraj and Varanasi.
- **Heavy Infrastructure Bias:** Environmental research groups note that national budget metrics are heavily prioritized towards capital-heavy engineering solutions (STPs, embankments, concrete riverfront assets) rather than a natural, climate-adaptive structural restoration of historical floodplains, groundwater aquifers, and natural streamflow dynamics

3. Swachh Bharat Mission - Urban (SBM-U) 2.0

Swachh Bharat Mission - Urban (SBM-U) 2.0 is India's **flagship centrally sponsored scheme** explicitly dedicated to transforming urban spaces into **"Garbage-Free Cities"**. Formally launched on **1 October 2021** as the second iteration of India's largest sanitation initiative, the five-year mission is scheduled to conclude its initial timeline on **1 October 2026**.

Core Governance & Framework

- **Nodal Ministry:** Managed natively by the Ministry of Housing and Urban Affairs (MoHUA).
- **Implementing Agencies:** Monitored centrally by MoHUA but executed on the ground by **States, Union Territories (UTs), and Urban Local Bodies (ULBs)** across all statutory towns.
- **Scheme Type:** Operates as a **Centrally Sponsored Scheme (CSS)**, where the fiscal burden is distributed via a cost-sharing model between the Union Government and States.
- **Classification:** Classified as a **flagship scheme** targeted toward macro-development priorities, running parallel to and complementing the AMRUT 2.0 infrastructure mission.

Aims, Objectives, and Key Features

```
[SBM-U 2.0 Multi-Pronged Sanitation Approach]
 ├── Solid Waste ──> 100% Source Segregation & Processing + Dumpsite Remediation
 ├── Liquid Waste –> Complete Grey/Blackwater Treatment (<1 Lakh Population)
 └── Social ──────> SafaiMitra Safety + "Jan Andolan" Civic Behavioural Shift
```

1. Fundamental Objectives

- **Garbage-Free Status:** Attaining a complete garbage-free baseline for every urban local body.
- **Sanitation Sustainability:** Moving beyond initial Open Defecation Free (ODF) milestones to ensure long-term, functional toilet usage.

- **Water Ecosystem Safety:** Preventing any raw, untreated wastewater or commercial sludge from leaking into environmental water bodies.

2. Distinctive Features

- **Used Water Management (UWM):** A brand new segment catering to cities with populations below 1 lakh to manage sewage, septage, and greywater safely.
- **Legacy Dumpsite Remediation:** Committing to bio-remediating and restoring nearly **2,400 open legacy dumpsites** occupying urban land across India.
- **Circular Economy Focus:** Scaling source segregation and material collection to utilize plastic, electronic, and organic waste for energy and recycled building scrap.
- **SafaiMitra Suraksha:** Eliminating manual hazardous entry into municipal sewers and septic tanks through 100% mechanization and safety equipment protocols.

Funding Mechanism

The program works with a comprehensive budgetary outlay of **₹1,41,600 crore**, representing a 2.5 times increase over Phase 1 funding. The central share commitment stands fixed at **₹30,980.20 crore**.

- **Funding Allocations:** Central Share (CS) releases are tied to progress. States must submit action plans vetted by a State Level Technical Committee (SLTC) for National Advisory and Review Committee (NARC) approval.
- **Performance-Linked Devolution:** Release of subsequent fiscal tranches is tied directly to local results, such as cities securing at least a 1-star Garbage Free Cities (GFC) rating.
- **Centre-State Sharing Ratios:**
  - **90:10** for North-Eastern and Himalayan States.
  - **100:0** directly funded for Union Territories without Legislatures.
  - **80:20** for Union Territories with Legislatures.
  - **Varied sliding scales (25% to 50%)** for General Category States based on urban municipal population brackets.

2026 Status & Strategic Achievements

Operational data from the SBM Urban Portal and official MoHUA reports indicate substantial infrastructure progress:

Performance Sector	Target Baseline	Realized Achievement	Progress %
Individual Household Latrines	58,99,637 units	**63,74,355 units**	**108.6%**

(IHHL)			
Community & Public Toilets (CT/PT)	5,07,587 seats	**6,36,826 seats**	**125.4%**
Solid Waste Processing Rate	18% (2014)	**81.2%**	**Sustained Gain**
Door-to-Door Waste Collection	Negligible (2014)	**97% of urban wards**	**High Saturation**

- **Urban Sanitation Certification:** Out of India's cities, **4,692 are declared ODF**, 4,314 are certified ODF+ (focusing on functional, clean public facilities), 1,973 are ODF++ (focusing on fecal sludge management), and 214 have achieved the highest **Water+** standard (focusing on advanced wastewater reuse).
- **Waste-to-Energy Scaling:** Collaborative frameworks with global financial institutions have expanded commercial funding for high-capacity **Compressed Bio-Gas (CBG) plants**. Seven regional mega-facilities are operational across cities like Chennai, Hyderabad, Surat, and Prayagraj.
- **SafaiMitra Transition:** Over **3,158 towns** have officially transitioned to **"SafaiMitra Surakshit Shehar"** protocols, institutionalizing strict machine cleaning to protect sanitation workers.

Critical Gaps and Criticisms

Despite extensive statistical expansion, field studies and independent policy evaluations highlight persistent challenges:

- **Infrastructure Quality Deficits:** Audits indicate that rapid target achievement sometimes resulted in poor-quality toilet construction, causing rapid structural deterioration and subsequent abandonment.
- **Water Availability Constraints:** Many community installations lack a reliable piped water supply. This issue makes maintaining basic hygiene difficult and leads to a drop in regular toilet use.
- **Flawed Source Segregation:** While door-to-door collection covers 97% of urban areas, mixed waste remains a major issue due to inadequate public separation habits and a lack of local sorting facilities. This situation leads to waste being mixed together during transport.
- **Socio-Cultural Barriers:** Deeply ingrained cultural practices mean that having a toilet does not always guarantee its use. Some households repurpose toilet structures for storage instead.

- **Marginalized Urban Slums:** Disproportionate benefits are observed across different urban demographics. Densely populated inner-city slums and informal settlements still face a shortage of functional public facilities, forcing a reliance on informal manual waste handling

4. FAME-II/III:

The **FAME India Scheme** (Faster Adoption and Manufacturing of Hybrid & Electric Vehicles) is a **Central Sector Scheme** (100% funded by the central government budget) and serves as India's **flagship scheme** under the [National Electric Mobility Mission Plan (NEMMP)](1.1.3, 1.1.10).
भारी उद्योग मंत्रालय +2

Ministry and Implementing Agency

- **Nodal Ministry:** [Ministry of Heavy Industries (MHI)](1.1.2, 1.1.6).
- **Implementing Agency:** Department of Heavy Industry (DHI) under the MHI.

Phase Wise Aims, Funding, and Features

1. FAME-II (April 2019 – March 2024)

- **Aims & Objectives:** To reduce vehicular pollution, lower reliance on fossil fuels, and achieve commercial scale for electric mobility by subsidising public, shared, and commercial transportation segments.
- **Funding Mechanism:** Fully central budgetary support with an initial outlay of **₹10,000 crore**, which was later revised.
- **Key Features:**
  - Targeted demand incentives for **10 lakh e-2 wheelers, 5 lakh e-3 wheelers, 55,000 e-4 wheelers**, and **7,000 e-buses**.
  - Subsidies directly restricted to vehicles with advanced batteries (like Lithium-ion) and registered for commercial use (except private e-2Ws).
  - Mandated a Phased Manufacturing Programme (PMP) requiring **50% local localization** to prevent cheap component imports.

2. The 2024–2026 Transition: FAME-III / PM E-DRIVE

Following the expiration of FAME-II, the Union Cabinet institutionalised its successor policy framework, formalised as the **PM E-DRIVE Scheme** (PM Electric Drive Revolution in Innovative Vehicle Enhancement), operating from **October 1, 2024, to March 31, 2026**.

- **Aims & Objectives:** Mass-scale deployment of green public transport, indigenisation of EV supply chains, and addressing consumer range-anxiety.
- **Funding Mechanism:** Central Sector budget allocation of **₹10,900 crore** over two years.
- **Key Features:**

- **Subsidies/Demand Incentives (₹3,679 crore):** Targets 24.79 lakh e-2Ws and 3.16 lakh e-3Ws. It completely omitted incentives for private e-4W cars to prioritize heavy public transports.
- **New Inclusions:** Introduced dedicated subsidies for **e-Trucks** and **e-Ambulances**.
- **E-Bus Procurement (₹4,391 crore):** Funding for 14,028 e-buses through State Transport Undertakings (STUs).
- **Infrastructure (₹2,000 crore):** Dedicated fund to expand nationwide EV Public Charging Stations (EVPCS).
- **Testing Agency Upgradation (₹780 crore):** Budget for testing agencies to address safety, R&D, and battery standards.

Major Achievements (Cumulative as of 2026)

- **Vehicles Supported:** Over **16.71 lakh (1,671,606) electric vehicles** were successfully sold and incentivised during the scheme timeline.
- **Public Fleet Expansion:** A total of **5,195 e-buses** have been officially deployed across Indian metropolitan cities as of early 2026.
- **Infrastructure Growth:** More than **9,159 EV public charging stations** have been commissioned and installed nationwide under the central layout.
- **Ecosystem Spinoff:** Spurred over **20 states to create localized EV industrial policies**, lowered EV GST from 12% to 5%, and catalyzed the emergence of domestic battery assembly setups.

Criticisms and Policy Challenges

- **Localisation vs. Adoption Disconnect:** The strict 50% domestic sourcing rule initially penalised manufacturers because India lacked a domestic semiconductor and lithium cell manufacturing footprint, forcing an artificial slowdown in vehicle supply.
- **The Subsidy Scam Scandal:** Multiple prominent e-2W Original Equipment Manufacturers (OEMs) (e.g., Hero Electric, Okinawa) were caught violating localization clauses by using rebranded imported components or artificially keeping ex-factory prices low to claim subsidies. This led the government to **withhold/claw back over ₹1,100 crore** in subsidies, causing major market disruptions.
- **Skewed Segment Growth:** Nearly 95%–98% of the policy's real-world penetration was localized strictly inside the e-2W and e-3W markets. Private e-4W adoption lagged severely due to high base costs and the progressive retraction of passenger car subsidies.
- **Quality & Battery Safety Issues:** Early rounds under the scheme lacked strict thermal management and cell quality audits, resulting in high-profile **spontaneous EV battery fires** across major cities, which damaged public trust.
- **Range Anxiety Outside Metros:** Charging infrastructure remains heavily concentrated in Tier-1 cities, leaving sub-urban, rural, and highway networks poorly serviced

5. National Green Hydrogen Mission:

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The **National Green Hydrogen Mission (NGHM)** is an ambitious **Central Sector Scheme** designed to make India a global hub for the production, usage, and export of Green Hydrogen and its derivatives. Launched in January 2023, the mission serves as an **umbrella and flagship scheme** for India's clean energy transition.

Core Institutional Framework

- **Governing Ministry:** Headed and coordinated by the Ministry of New and Renewable Energy (MNRE).
- **Implementing & Nodal Agency:** The Solar Energy Corporation of India (SECI) acts as the primary central implementation body.
- **Scheme Classification:** A **Central Sector Scheme**, meaning it is 100% funded and managed by the Central Government.

Aims and Objectives (Target: 2030)

- **Production Capacity:** Reach at least **5 Million Metric Tonnes (MMT)** of Green Hydrogen per annum.
- **Renewable Energy Surge:** Add roughly **125 GW** of dedicated renewable energy capacity.
- **Economic Investment:** Attract over **₹8 lakh crore** in total sector investments.
- **Employment Creation:** Generate more than **6,00,000 green jobs** across the supply chain.
- **Fossil Fuel Reduction:** Prevent over **₹1 lakh crore** in fossil fuel imports.
- **Environmental Impact:** Abate nearly **50 MMT** of annual greenhouse gas emissions.

Funding Mechanism & Financial Structure

The mission was sanctioned with an initial overall financial outlay of **₹19,744 crore** allocated across distinct components:

1. **SIGHT Programme (₹17,490 crore):** Strategic Interventions for Green Hydrogen Transition. It provides direct financial incentives split between **domestic electrolyser manufacturing** and **direct green hydrogen production**.
2. **Pilot Projects (₹1,466 crore):** Supports operational testing in commercial shipping, steel production, and heavy mobility.
3. **Research & Development (₹400 crore):** Managed under the public-private partnership framework named **Strategic Hydrogen Innovation Partnership (SHIP)**.
4. **Ecosystem & Skill Support (₹388 crore):** Assigned for regulatory development, infrastructure, and workforce training.

- **2026 Budgetary Update:** The budget allocation for FY 2025–26 was doubled to **₹600 crore** (up from ₹300 crore in FY 24–25) to accelerate immediate deployment.

Key Features

- **Financial Incentives:** Production-linked incentives via the SIGHT scheme.

- **Green Hydrogen Hubs:** Regions with high infrastructure potential are bundled to integrate localized production, processing, and export.
- **Waiver of Transmission Charges:** Inter-State Transmission System (ISTS) charges are waived until **December 2030** for green hydrogen generation plants.
- **Standardisation & Compliance:** Includes a rigid carbon-intensity cap (not exceeding **2 kg CO2e per kg of H2**) to qualify as "Green".

Performance & Key Achievements

- **Commissioned Capacity:** Approximately **8,000 tonnes per annum (TPA)** of green hydrogen production capacity has been actively commissioned across India.
- **SIGHT Phase-1 Allocations:** Tenders awarded for **3,000 MW per annum** of domestic electrolyser manufacturing and 862,000 tonnes of annual green hydrogen production capacity.
- **Industrial Integration:** JSW Steel successfully commissioned a 3,600 MTPA production plant, while Adani New Industries deployed India's first **5 MW off-grid solar-and-battery-powered** green hydrogen pilot plant.
- **Green Hydrogen Hubs Designated:** Three major maritime installations—**Deendayal Port (Gujarat), Paradip Port (Odisha), and V.O. Chidambaranar Port (Tamil Nadu)**—were formally approved as foundational export hubs.
- **Regulatory Compliance Framework:** The Green Hydrogen Certification Scheme of India (GHCI) launched with the **Bureau of Energy Efficiency (BEE)** supervising the monitoring process.
- **Commercial Demand Underwriting:** India finalized long-term **Green Ammonia Purchase Agreements (GAPA)** securing a steady local off-take of 670,000 tonnes per year.

Challenges and Criticisms

- **High Production Cost:** At **$4.00 to $4.50 per kg**, Green Hydrogen remains significantly more expensive than fossil-fuel-based grey hydrogen (~$2.00/kg).
- **Incentive Disparity:** Critics highlight that India's subsidy framework (~₹50/kg decreasing annually) is less competitive compared to the US Inflation Reduction Act, which offers up to $3/kg.
- **Resource Strain (Water Intensity):** Splitting water requires massive volumes of purified, demineralized water (roughly **9 to 11 litres per kg of H2**), raising alarms regarding water security in drought-prone areas.
- **Geographical Imbalance:** Early project funding and policy benefits are heavily clustered across just five resource-rich coastal states, leaving other regions with minimal participation.
- **Infrastructure Bottlenecks:** Safe transport and storage remain highly constrained due to hydrogen's low volumetric density, flammability, and tendency to leak.

6. Carbon Capture Utilisation and Storage (CCUS):

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7. PM-PRANAM:

The **PM-PRANAM** (PM Programme for Restoration, Awareness Generation, Nourishment, and Amelioration of Mother Earth) scheme is a **central sector scheme** managed under an **umbrella framework** alongside the extended Urea Subsidy Scheme.

Core Institutional Framework

- **Ministry:** Ministry of Chemicals and Fertilizers.
- **Implementing Agency: Department of Fertilizers (DoF)** in close coordination with state governments and Union Territory administrations.
- **Scheme Nature:** A **100% Central Sector Scheme** rather than a centrally sponsored one, meaning its administrative frameworks and funds are managed directly by the central government.

Aims and Objectives

- **Restore Soil Health:** Lower the overall consumption of chemical fertilizers (Urea, DAP, NPK, MOP) to prevent soil degradation.
- **Promote Sustainable Alternatives:** Encourage the usage of biofertilizers, organic farming, and eco-friendly technological nutrients.
- **Reduce Fiscal Strain:** Cut down the Government of India's massive fiscal subsidy bill on chemical imports.

Funding Mechanism

- **No Separate Budget:** The scheme features an innovative financial design with **zero independent allocation**.
- **Subsidy Savings Shared:** It is funded strictly via savings generated from reducing chemical fertilizer usage below a state's trailing 3-year average.
- **50% Grant Incentive:** The Centre passes on exactly **50% of the saved subsidy money** back to the achieving State/UT as a grant.
- **Distribution Rules:**
  - **95% of the grant** goes directly to the state government. Out of this, **70% must fund capital assets** (like setting up alternate fertilizer production units or adopting new tech), while **30% rewards local stakeholders** like farmers, Panchayats, Self-Help Groups (SHGs), and FPOs.
  - **5% of the grant** is retained by the central government to handle administration, research, and technical monitoring.

Key Features

- **Baseline Benchmarking:** A state's performance is tracked digitally using the Integrated Fertilisers Management System (iFMS) portal, matching current data against a fixed three-year average.
- **Technology Interventions:** Promotes drone spraying and structural shifting towards advanced options like Nano Urea Plus and Nano DAP.
- **Inter-scheme Convergence:** Works in tandem with existing organic farming initiatives like the *Paramparagat Krishi Vikas Yojana (PKVY)*.

Achievements (Updated as of 2026)

- **Significant Bulk Reduction:** Across the country, 14 major agricultural states successfully cut down chemical fertilizer consumption by **15.14 Lakh Metric Tonnes (LMT)**.
- **Top Performing States:** Karnataka single-handedly drove 30% of the initial national subsidy savings, with Maharashtra, West Bengal, and Andhra Pradesh collectively delivering an additional 58%.
- **Mass Testing and Trials:** Under the direction of the Indian Council of Agricultural Research (ICAR), the government conducted **over 5,800 Nano DAP field trials** and roughly 932 Nano Urea trials across all 15 agro-climatic zones.

Criticisms and Bottlenecks

- **Zero Financial Disbursement:** The Parliamentary Standing Committee on Chemicals and Fertilizers flagged the scheme as a **"non-starter" in financial terms**. Despite states successfully generating thousands of crores in subsidy savings, the Centre has **not disbursed a single rupee** in incentive grants due to delayed structural approvals and incomplete payout mechanisms.
- **Uneven Regional Adoption:** The motivation has been highly fragmented. For instance, states like **Rajasthan completely failed** to register any reduction in chemical fertilizer consumption.
- **Distorted Asymmetry Unaddressed:** The scheme struggles to counteract the deep-rooted price distortion where highly-subsidized urea is sold at an artificially low, fixed price, driving farmers to heavily over-apply nitrogen

8. **Revised Target (2026):** Originally aiming for a 20–30% reduction by 2024, the goal has been updated to achieve up to a **40% reduction in PM10 levels by 2025–2026**.

9. PRANA Portal:

The **PRANA Portal** (Portal for Regulation of Air-pollution in Non-Attainment Cities) is a digital monitoring platform launched in September 2021. It tracks the physical and financial progress of the National Clean Air Programme (NCAP) across India.

Core Architecture & Governance

- **Ministry:** Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Implementing Agency:** The Central Pollution Control Board (CPCB) in collaboration with Knowledge Lens (a private technology partner).
- **Scheme Categorization:** PRANA itself is a dedicated tracking portal. The umbrella program it monitors—the NCAP—is structured as a **Central Sector Scheme** for direct administrative expenses, combined with a **performance-linked grant mechanism**.
- **Flagship Status:** It serves as the primary tracking engine for the NCAP, which is a **flagship, long-term, time-bound national strategy**.

Aims & Objectives

- **Track NCAP Progress:** Systematically monitor the implementation of city-specific clean air action plans.
- **Public Dissemination:** Share real-time air quality indicators and management data directly with citizens.
- **Accountability:** Offer a centralized interface to log the utilization of funds and check inter-agency execution.
- **Policy Support:** Gather historical and physical performance data to guide future environmental legislation.

Funding Mechanism

The portal tracks an integrated funding pipeline for **131 Non-Attainment Cities** via two major routes:

1. **NCAP Budgetary Allocation:** Direct funds provided to non-million-plus cities for capacity building and monitoring.
2. **XV Finance Commission Grants:** Performance-linked challenge funds released to 42 Million-Plus urban agglomerations based on air quality metrics updated through the portal.

Key Features

- **Physical & Financial Tracking:** Separate dashboards track project milestones versus actual fund utilization.
- **Dual-Module Interface:** Built with an "Internet" module for public reporting and an "Intranet" module for government data logging.
- **Seven Thematic Target Areas:** Evaluates specific actions across vehicular, industrial, dust, waste management, urban greening, public awareness, and air infrastructure.

Status and Achievements (Updated to 2026)

The overall target under NCAP was updated to achieve a **40% reduction in Particulate Matter (PM10 and PM2.5) concentrations by the 2025–2026 timeline** relative to the 2017 baseline.

- **Comprehensive Data Centralization:** Action plans for all 131 targeted cities have been mapped and tracked transparently online.
- **Inter-Ministerial Convergence:** Facilitated data alignment across 8 parallel central ministries (including Transport, Power, and Housing) to consolidate regional cleanup schemes.
- **Expanded Infrastructure:** Helped log the rapid scale-up of continuous ambient air monitoring stations (CAAQMS) across targeted tier-2 and tier-3 cities.

Criticisms & Vulnerabilities

- **Coarse Particle Bias:** Experts from the Centre for Science and Environment (CSE) criticize the portal's metrics for favoring road dust mitigation (PM10) while under-addressing combustion sources that produce highly toxic, fine PM2.5 particles.
- **Reporting Delays:** Independent analytical reviews from the Centre for Research on Energy and Clean Air (CREA) point out gaps between real-world progress and portal entries; for instance, many cities have completed crucial pollution source-apportionment studies but failed to upload reports onto the portal.
- **Sub-optimal Fund Spending:** Portal tracking reveals uneven spending, where a large percentage of allocated city budgets remains underutilized due to weak institutional capability at the urban local body level

10. PM E-DRIVE:

The **PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE)** is a **Central Sector Scheme** under India's **Ministry of Heavy Industries (MHI)**. Officially launched on **1 October 2024** to replace the FAME program, it functions as India's **flagship electric mobility scheme**. It is administered and monitored by the **Project Implementation and Sanctioning Committee (PISC)**, an inter-ministerial empowered committee headed by the Secretary of Heavy Industries.

Aims & Objectives

- **Accelerate EV Adoption**: Exponentially boost the mass adoption of electric vehicles across India.
- **De-carbonise Public Transport**: Transition heavy public transport and freight sectors to green alternatives.
- **Strengthen Infrastructure**: Create an expansive, dense public network of fast-charging EV stations.
- **Build Domestic Manufacturing**: Enhance the local supply chain under the Aatmanirbhar Bharat initiative.
- **Improve Public Health**: Minimize critical urban air pollution caused by internal combustion engines.

Funding Mechanism

- **Total Scheme Outlay**: Over the initial 2-year period, the government allocated a full corpus of **₹10,900 crore**.

- **Central Budget Allocation**: The government explicitly set aside **₹1,500 crore** for the program in the Union Budget 2026–27.
- **Financial Disbursal Split**: Funds are meticulously segregated into capital assets and direct target incentives:
  - **₹4,391 crore**: Grants earmarked strictly for public electric buses.
  - **₹3,679 crore**: Funding for customer-centric electric vehicle demand subsidies.
  - **₹2,000 crore**: Dedicated financial support to establish massive public fast-charging points.
  - **₹780 crore**: Upgradations for premier national automotive vehicle testing agencies.
  - **₹500 crore each**: Independent budgetary components supporting advanced e-trucks and e-ambulances.

Key Features

- **Aadhaar-authenticated e-Vouchers**: Customers generate a unique, digital **Aadhaar FACE authenticated e-Voucher** at purchase to seamlessly reduce upfront EV ex-factory costs.
- **Targeted Vehicle Caps**: Incentives strictly apply down to **15% of ex-factory vehicle costs**, capped at a maximum factory price of ₹1.5 lakh for electric two-wheelers and ₹2.5 lakh for e-rickshaws.
- **Advanced Battery Mandate**: Subsidies are rigorously limited only to vehicles integrating certified, technologically advanced, high-safety batteries.
- **Freight Scrapping Pre-requisite**: Direct financial assistance for e-truck purchases remains contingent on producing a valid vehicle scrapping certificate.
- **Universal EV "Super App"**: Development of an integrated digital public application to assist drivers with charger slot booking, navigation, and payments.

Status and Achievements (As of 2026)

- **Subsidy Lifespan Revisions**: In March 2026, the Ministry officially revised the scheme deadlines, extending support for **electric two-wheelers** to 31 July 2026, and **e-rickshaws/e-carts** to 31 March 2028.
- **Mass Market Targets Met**: The **electric three-wheeler (L5 category)** segment reached 100% of its target and [officially closed to new subsidy claims](1.5.1, 1.5.6) on 26 December 2025.
- **Unprecedented Volume Sales**: Over **1.84 million electric two-wheelers** were deployed under the framework, clearing nearly **87% of the total target volume**.
- **E-Bus Tendering Progress**: Convergence Energy Services Limited (CESL) fully concluded aggressive public procurement tenders for **10,900 e-buses under Phase I**, launching Phase II bids for the remaining 2,900 buses in January 2026.

Criticisms & Roadblocks

- **Exclusion of Private E-Cars**: Complete omission of private passenger four-wheelers (e-4Ws) caused a notable drop in the adoption rate of family-oriented passenger EVs.
- **Charging Infrastructure Deficit**: Despite the ₹2,000 crore funding pool, actual fund rollouts for fast chargers remained slow due to urban land acquisition bottlenecks and complex grid integration.
- **Private Fleet Omission**: Major mass-transit public incentives are entirely locked away from private fleet bus operators, despite private entities comprising the clear majority of India's overall transit lines.
- **Digital Access Gaps**: The heavy dependency on high-speed internet and instant smartphone authentication for Aadhaar e-vouchers created a practical purchase barrier for digitally isolated, remote rural populations.
- **Localization Infractions**: Lingering industry concerns persist regarding weak field enforcement of local component assembly rules, echoing historical compliance controversies during past policy iterations

11. Namami Gange Mission 2.0:

Namami Gange Mission 2.0 (NGM 2.0) is a **100% Central Sector Scheme** and a globally recognized **flagship umbrella program** extended up to **March 2026** with a total budget outlay of **₹22,500 crore**.

Scheme Classification & Administration

- **Scheme Type:** It is a **Central Sector Scheme** (funded 100% by the Central Government, rather than a Centrally Sponsored Scheme which splits costs with states).
- **Classification:** It serves as a **flagship integrated umbrella programme** encompassing multiple components like sewage treatment, biodiversity, and industrial effluent monitoring.
- **Nodal Ministry:** Operated under the Ministry of Jal Shakti.
- **Implementing Agency:** Executed at the center by the **National Mission for Clean Ganga (NMCG)**, supported by State Programme Management Groups (SPMGs) and 139 District Ganga Committees at the grassroots level.

Aims, Objectives, and Key Features

- **Core Aims:** To achieve *Nirmal Dhara* (unpolluted flow) and *Aviral Dhara* (continuous flow), restoring the ecological, geological, and cultural integrity of the Ganga River and its tributaries.
- **The 4 Gyan Pillars:** Pollution abatement (*Nirmal Ganga*), improving ecology/flow (*Aviral Ganga*), strengthening people-river connections (*Jan Ganga*), and facilitating scientific research (*Gyan Ganga*).
- **Salient Features:**
  - Focuses on the main stem and crucial tributaries like Yamuna, Hindon, Gomti, and Kiul.

- Mandates a long-term **15-year Operation & Maintenance (O&M)** contract system to ensure plant longevity.
- Utilizes advanced **Design-Build-Operate-Transfer (DBOT)** and **Hybrid Annuity PPP models**.

Funding Mechanism

- **Direct Budgetary Support:** Fully financed by the Government of India. The Union Budget 2026-27 allocated **₹3,100 crore** under the National Ganga Plan segment.
- **External Assistance:** Partially assisted by multilateral funding agencies, primarily through a **World Bank loan** mechanism for Externally Aided Projects (EAPs).
- **Clean Ganga Fund (CGF):** A dedicated platform enabling voluntary public, corporate (CSR), and Non-Resident Indian (NRI) financial contributions.

Key Achievements (Updated as of 2026)

- **Sewage Treatment Leap:** As of early 2026, the cumulative sewage treatment capacity created has crossed **3,977 MLD** across **173 commissioned STPs**. In 2025 alone, 25 major sewage treatment plants adding 530 MLD capacity were commissioned.
- **Mega Projects Operationalized:** Includes Asia's largest single STP in **Delhi (564 MLD)** using advanced A2O (Anaerobic-Anoxic-Oxic) technology, alongside major treatment plants in Agra, Varanasi, Ayodhya, and Farrukhabad.
- **Industrial Oversight:** Real-time **Online Continuous Effluent Monitoring Stations (OCEMS)** have been linked directly to Central Pollution Control Board (CPCB) servers in 885 out of 1,072 Grossly Polluting Industries (GPIs).
- **Ecological Recovery:** The United Nations officially named the program among the **Top 10 World Restoration Flagships**. Systematic biomonitoring indicates Biological Water Quality has risen to 'Good' or 'Moderate' at 50 designated nodes, resulting in Ganga Dolphin populations growing to an estimated **6,327 individuals**.

Key Criticisms

- **Infrastructure vs. Ecological Focus:** Environmental experts criticize the project for treating river rejuvenation as an **engineering/infrastructure challenge** (building concrete STPs) rather than an ecological restoration project.
- **Underutilized Funds & Delays:** Budget analyses point out that funds often remain unutilized due to slow state-level executing mechanics. For example, the revised spending for FY 2025–26 fell short of original targets, forcing fund roll-overs.

- **Flow Obstruction (*Aviralta* Compromised):** Protesters and hydrologists highlight that while *Nirmal Ganga* (cleaning) is prioritized, *Aviral Ganga* (uninterrupted flow) is neglected due to ongoing upstream dam construction and heavy water diversions for agriculture.
- **Persistent Fecal Coliform Levels:** Despite reductions in Chemical Oxygen Demand (COD) and Biochemical Oxygen Demand (BOD), fecal coliform levels remain dangerously high in downstream sectors near major urban clusters like Kanpur and parts of West Bengal

12. National River Conservation Programme (NRCP):

The **National River Conservation Programme (NRCP)** is a comprehensive **Centrally Sponsored Scheme (CSS)** initiated by the Government of India in **1995**. It functions as an **umbrella scheme** designed to reduce water pollution and improve the water quality of major rivers across the country.

Core Administrative Framework

- **Nodal Ministry:** Ministry of Jal Shakti (originally managed by the Ministry of Environment, Forest and Climate Change until administration was reshuffled).
- **Implementing Agency:** At the central level, the **National River Conservation Directorate (NRCD)** serves as the nodal agency. At the state level, **State Governments, urban local bodies (ULBs)**, and designated state agencies execute the physical works.
- **Scheme Type:** It is a **Core Centrally Sponsored Scheme (CSS)**, meaning expenditures are shared between the central and state governments.
- **Funding Mechanism:**
  - **Standard States:** Cost-sharing ratio of **60:40** between the Centre and the States.
  - **North-Eastern & Himalayan States:** Concessional cost-sharing ratio of **90:10**.
  - **O&M Costs:** State governments and local bodies bear **100% of the operation and maintenance (O&M) costs** once projects are commissioned.

Aims and Objectives

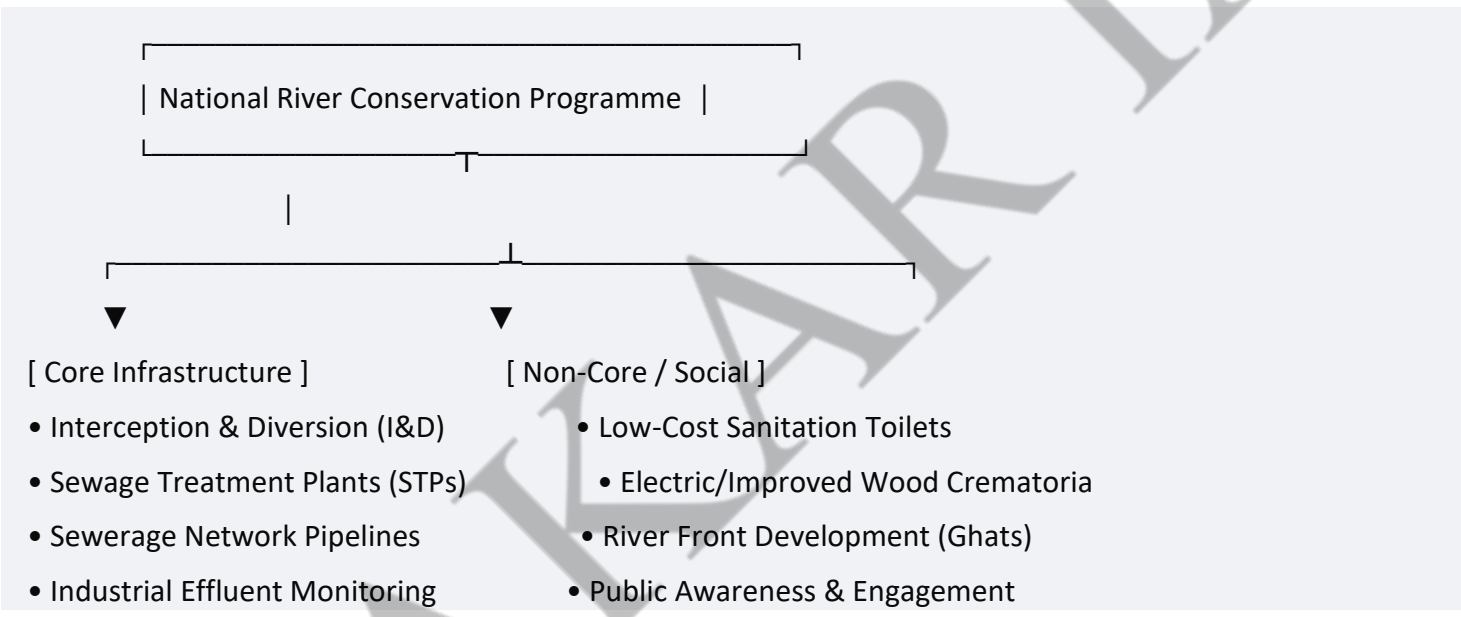
- **Pollution Abatement:** Intercepting and treating domestic sewage before it enters water bodies to significantly reduce the pollution load.
- **Water Quality Maintenance:** Upgrading river health to reach at least the "designated best use" or **bathing quality standards** (focused on Biological Oxygen Demand [BOD] and Dissolved Oxygen [DO]).

- **Sustainable Ecosystems:** Restoring the natural ecological balance of degraded river channels.
- **Public Health Protection:** Curtailing open defecation and untreated waste dumping to enhance community health along river banks.

Key Programmatic Features

The program implements both engineering (core) and socio-environmental (non-core) components:

Government of Tamil Nadu +1



- **Interception and Diversion (I&D):** Trapping raw sewage from open city drains and rerouting it away from the riverbeds.
- **Sewage Treatment Infrastructure:** Building modern Sewage Treatment Plants (STPs) to render wastewater harmless.
- **Low-Cost Sanitation:** Building community toilets on riverbanks to eliminate open defecation.
- **Crematoria Improvements:** Constructing electric and improved wood-saving crematoria to minimize the ritual dumping of unburnt remains and log waste.
- **River Front Development:** Upgrading public bathing ghats to structurally organize human interface with the water.

Program Status Update (As of 2026)

- **Exclusion of Ganga Basin:** The scope of the NRCP strictly **excludes the main stem of the Ganga River and its major tributaries**, which are separately funded and managed under the standalone Central Sector Scheme, the **Namami Gange Programme (NGP)**.
- **Recent Inclusions:** The government regularly scales the program based on pollution mapping. In recent expansions, major interventions have targeted rivers like the **Pampa River in Kerala** and various critical non-Ganga stretches across southern and western India.

Achievements

- **Infrastructure Expansion:** As of **mid-2026**, the NRCP has covered **58 rivers across 100 towns spread over 17 States**.
- **Pollution Mitigation Capacity:** The program has successfully sanctioned projects worth **₹8,970.51 crore**, creating an aggregate sewage treatment capacity of **3,019 Million Litres per Day (MLD)**.
- **Chemical Pollution Reductions:** Recent economic and environmental data show that the infrastructure has significantly lowered Chemical Oxygen Demand (COD) and industrial effluent concentrations in targeted urban centers.
- **Targeted Successes:** Selected river stretches (such as the Cauvery basin projects in Tamil Nadu) have documented sharp visual and biological transformations following localized interceptor completions.

Criticisms and Challenges

- **The O&M Funding Crisis:** While the central government assists with initial capital infrastructure, local bodies frequently fail to run STPs due to municipal budget deficits. This leads to expensive treatment plants sitting idle or underutilized.
- **Sewage Generation vs. Treatment Gap:** Urbanization scales at a rate that outpaces STP construction. Millions of gallons of raw domestic sewage continue to bypass engineering networks daily.
- **Lack of Ecological Flow (E-Flow):** The scheme focuses heavily on "cleaning infrastructure" but fails to address structural water scarcity. Upstream irrigation, industrial extraction, and damming reduce river flows to trickles, leaving no natural water to dilute remaining pollutants.
- **Inter-Agency Delays:** Multi-tiered governance introduces systemic lag. Land acquisition disputes, delayed state matching-fund releases, and uncoordinated work between state pollution boards and local municipalities routinely trigger massive project timeline extensions

13. Jal Jeevan Mission (JJM):

The **Jal Jeevan Mission (JJM)** is a **flagship, Centrally Sponsored Scheme (CSS)** of the Government of India. It operates under the **Ministry of Jal Shakti**, with the nodal implementing body being the **Department of Drinking Water and Sanitation (DDWS)**. At the grassroots level, the **Gram Panchayats (GPs)** and **Village Water and Sanitation Committees (VWSCs)** act as the executing and implementing agencies.

Aims and Objectives

- **Target Every Rural Household:** Provide **Functional Household Tap Connections (FHTC)** to all rural homes.
- **Per Capita Supply:** Ensure a regular supply of at least **55 litres of potable water per person per day** (LPCD).
- **Institutional Delivery:** Provision functional tap water connections in schools, Anganwadi centres, GP buildings, health centres, and wellness centres.
- **Water Quality Assurance:** Prioritise water supply in quality-affected habitations (focusing on arsenic and fluoride contaminants), drought-prone/desert zones, and Sansad Adarsh Gram Yojana (SAGY) villages.

Funding Mechanism

The funding pattern divides financial responsibilities between the Central Government and States/UTs as follows:

- **Union Territories:** 100% funded by the Central Government.
- **North-Eastern and Himalayan States:** 90:10 ratio (90% Centre, 10% State).
- **Other States:** 50:50 ratio (50% Centre, 50% State).
- **Convergence Support:** Co-financed using the 15th Finance Commission grants for rural local bodies, Swachh Bharat Mission (Grameen), and MGNREGS.

Core Features

- **Community-Led Approach:** Employs a decentralized, demand-driven strategy featuring local *Jan Andolan* (people's movement) for absolute community ownership.
- **Source Sustainability:** Mandates water conservation, rainwater harvesting, and greywater management (recharge and reuse).
- **Technological Tracking:** Employs an online JJM Dashboard for live project status tracking, IoT-based remote monitoring, sensor-based quality checking, and Aadhaar-linked verification.

- **Empowerment Focus:** Mandates at least 50% women representation in VWSCs and trains women to use Field Test Kits (FTKs) for localized water quality tracking.

Major Restructuring: JJM 2.0 (2026 Update)

The Union Cabinet formally **approved the extension and transition of the project into JJM 2.0**.

- **Extended Timeline:** The project timeline was extended from 2024 to **December 2028** to achieve 100% household saturation.
- **Enhanced Financial Outlay:** The total budget outlay has been increased to **₹8.69 lakh crore**, with the Central share climbing to ₹3.59 lakh crore. The Union Budget 2026-27 allocated **₹67,670 crore** for this fiscal year.
- **Shift in Core Strategy:** Shifted from an infrastructure-centric model (laying pipes) to a **service delivery model** focused on sustainability and water safety.
- **The "Sujalam Bharat" Framework:** Introduced a uniform digital structure where every village receives a unique **Sujal Gaon/Service Area ID** to map water systems digitally from source to tap.
- **Reform-Linked MoUs:** States must sign strict, performance-based Memorandums of Understanding (MoUs) outlining service standards and O&M mechanisms before accessing central funds.

Key Achievements (As of Mid-2026)

- **Massive Coverage Expansion:** Rural tap water access surged from **16.72% (3.23 crore households) in 2019 to 81.87% (over 15.84 crore households)**.
- **Saturated Regions:** 11 States/UTs (including Goa, Haryana, Telangana, Gujarat, Punjab, Himachal Pradesh, Mizoram, and Arunachal Pradesh) have achieved **100% rural tap connectivity**.
- **Public Health Impact:** A World Health Organization (WHO) assessment confirmed that universal safe drinking water via JJM prevents approximately **400,000 diarrheal deaths** and saves 14 million Disability Adjusted Life Years (DALYs) annually.
- **Socio-Economic Relief:** Reduced physical drudgery for women, saving an estimated **5.5 crore hours daily** previously lost to fetching water.

Criticisms and Challenges

- **Sharp Dip in Fund Utilisation:** In late 2025 and early 2026, actual spending slowed dramatically. The Revised Estimate for FY25 plummeted to ₹29,000 crore against a Budget Estimate of ₹70,163 crore due to large unspent balances sitting with state governments.

- **Administrative Irregularities:** Fund allocation and deployment faced major setbacks after **gross administrative and financial irregularities** surfaced in multiple states, leading to stricter validation rules and an internal pause on releases.
- **Blockage of Vendor Capital:** Due to lowered capital releases in FY25 and FY26, the receivable cycle for Engineering, Procurement, and Construction (EPC) vendors stretched beyond six months, locking up essential working capital.
- **Sustainability of Water Sources:** Severe geogenic contamination (arsenic/fluoride), depleting groundwater levels, and drying upstream sources challenge the long-term continuity of tap connections in laggard, drought-prone districts

14.**GOBARdhan Scheme:**

The **GOBARdhan Scheme** (Galvanizing Organic Bio-Agro Resources Dhan) is a major **waste-to-wealth initiative** launched in 2018 to support a circular economy. It converts organic waste into renewable energy and organic manure.

Structure and Governance

- **Ministry:** The **Ministry of Jal Shakti** is the nodal ministry.
- **Coordinating Department:** The **Department of Drinking Water and Sanitation (DDWS)** manages overall execution.
- **Implementing Agencies: Gram Panchayats** execute rural systems. State governments, Milk Unions, Cooperatives, and private entrepreneurs implement cluster/commercial plants.
- **Scheme Categorisation:** It is an integral sub-component of the **Swachh Bharat Mission (Grameen) Phase-II**. It operates as a **Centrally Sponsored Scheme**.
- **Flagship/Umbrella Status:** It acts as an **umbrella initiative** that converges projects from multiple ministries. Participating bodies include the Ministry of Petroleum & Natural Gas (MoPNG) and the Ministry of New and Renewable Energy (MNRE).

Aims and Objectives

- **Cleanliness:** Reduce open piling of waste to help villages attain ODF-Plus status.
- **Energy Security:** Produce Biogas and Compressed Bio-Gas (CBG) to reduce LPG dependence and fossil fuel imports.

- **Rural Incomes:** Generate revenue for farmers and Self-Help Groups (SHGs) via waste sales and organic fertilizer distribution.
- **Soil Health:** Promote bio-slurry as an eco-friendly chemical fertilizer alternative.

Funding Mechanism

- **Cost-Sharing Ratio:** Funding follows the standard SBM-G framework, split **60:40** between the Central and State governments. (90:10 for North-Eastern and Hill states).
- **Financial Assistance caps:** Rural clusters and community plants receive direct financial assistance of up to **₹50 lakh per district**.
- **Commercial Offtake Support:** The Ministry of Petroleum & Natural Gas runs a Dedicated Pipeline Infrastructure (DPI) scheme to subsidize the injection of CBG into local gas networks.

Core Features and Implementation Models

- **Four Operational Models:**
  - *Individual Model:* Aimed at households owning 3 to 4 cattle.
  - *Cluster Model:* Managed by groups of households, FPOs, or SHGs.
  - *Community Model:* Constructed and maintained directly by Gram Panchayats.
  - *Commercial Model:* Large-scale CBG plants constructed by private developers.
- **Unified Registration Portal:** A centralized database managed by MoPNG that tracks, registers, and monitors plant statuses nationwide.
- **Market Assistance:** Providers receive Market Development Assistance (MDA) of ₹1,500 per Metric Tonne to commercialize Fermented Organic Manure (FOM).

Status and Achievements (As of 2026)

- **Plant Installations:** Over **1,216 functional biogas plants** and **189 functional Compressed Bio-Gas (CBG) projects** are active.
- **Geographic Reach:** The scheme covers over **51.4% of all Indian districts**.
- **Regional Leadership:** Uttar Pradesh leads nationwide in commercial CBG units, while Chhattisgarh leads in community biogas plants.
- **Fiscal Incentives:** The Union Budget 2026-27 explicitly **exempted central excise duty** on the value of biogas contained in blended compressed natural gas (CNG) to incentivize urban markets.

GOBARdhan Unified Registration Portal +4

Key Criticisms and Implementation Challenges

- **Slow Adoption Rate:** Despite an stated goal of 5,000 commercial plants by 2030, only 189 commercial CBG plants are functional.
- **Data and Transparency Gaps:** Reports by think-tanks like the Centre for Science and Environment (CSE) highlight that the portal omits operational efficiency rates and exact feedstock configurations.
- **Feedstock Supply Bottlenecks:** Securing a consistent, uninterrupted daily supply of cattle dung and crop residues remains difficult due to seasonal variations and unorganized rural markets.
- **High Upfront Capital Costs:** Setting up commercial-grade bio-methanation plants requires high initial expenditure, creating risks that deter small rural entrepreneurs

15. PM Surya Ghar: Muft Bijli Yojana:

The **PM Surya Ghar: Muft Bijli Yojana** is a **Central Sector Scheme** launched in February 2024 to provide free electricity up to 300 units per month through rooftop solar installations. Representing India's largest domestic solar initiative, it functions as a **flagship scheme** operating under the **Ministry of New and Renewable Energy (MNRE)**.

Aims & Objectives

- **Target Reach:** Equip **1 crore households** across India with rooftop solar setups by March 2027.
- **Free Power:** Deliver up to **300 units of free electricity** monthly to participating residential consumers.
- **Financial Savings:** Reduce the national financial burden by saving an estimated **₹75,000 crore annually** in power costs.
- **Clean Energy Transition:** Aid India's pledge to attain **500 GW of non-fossil fuel capacity by 2030**.
- **Employment Creation:** Train and generate over **3 lakh jobs** via fresh skilling in solar installation and maintenance.

Funding Mechanism

- **Total Outlay:** Backed by a direct budgetary outlay of **₹75,021 crore**.
- **Central Sector Architecture:** 100% financed by the Central Government via the MNRE budget (which subsumed the former Rooftop Solar Phase II Programme).
- **Direct Subsidy Support:** The government offers **Central Financial Assistance (CFA)** based on system size:
  - **1 kW to 2 kW systems:** Subsidy ranges from ₹30,000 to ₹60,000.
  - **2 kW to 3 kW systems:** Subsidy ranges from ₹60,000 to ₹78,000.
  - **Systems above 3 kW:** Capped at a maximum subsidy of ₹78,000.

- **Concessional Financing:** Collateral-free, low-interest bank loans are arranged at **5.75% interest** (Repo rate plus 0.50 basis points) to meet initial capital gaps.

Implementing Agencies

The framework leverages a two-tier execution matrix:

Drishti IAS

- **National Level:** Managed by **REC Limited**, serving as the **National Programme Implementation Agency (NPIA)**.
- **State Level:** Driven by **State Implementation Agencies (SIAs)**, utilizing regional **electricity distribution companies (DISCOMs)** and state energy departments.

Key Features

- **Simplified Approvals:** Regulatory ease includes **automated load enhancement approvals** up to 10 kW and the removal of technical feasibility checks.
- **Integrated Net Metering:** Net-metering mechanisms are woven into the application journey through the unified online portal.
- **Utility Led Aggregation (ULA):** Incorporates a **RESCO model** to permit developers to pool and manage systems for low-income and rural properties.
- **Domestic Content Requirement (DCR):** Mandates the use of India-made solar modules and cells to expand local manufacturing.
- **Model Solar Villages:** Allocates specific funding to develop one self-reliant solar village in every district.

2026 Status & Achievements

- **Installation Scale:** As of **March 2026**, the scheme achieved **26.19 lakh rooftop solar system installations**, covering nearly 24% of the ultimate target.
- **Capacity Additions:** The cumulative power generation capacity reached a milestone of **9,566.89 MW** under the program.
- **Subsidy Disbursal:** Over **₹17,967 crore** has been directly processed into beneficiaries' bank accounts via the national portal.
- **Financial Impact:** Broad consumer feedback highlights that over **45% of early adopters** have successfully achieved **zero electricity bills**.
- **Top Performing States: Gujarat** leads the adoption curve, followed closely by **Maharashtra**, **Uttar Pradesh**, **Kerala**, and **Rajasthan**.

- **Digital Speed:** Direct portal integration dropped the post-installation subsidy processing time down to an average of **15 days**.

Key Criticisms & Challenges

- **Energy Inequality:** Field audits point out an **equity gap**, revealing the program predominantly benefits middle-class and affluent households who possess clear roof rights and the upfront cash to invest.
- **High Residual Costs:** Despite subsidies, a standard 3 kW layout requires an out-of-pocket balance of **₹1.1 lakh to ₹1.37 lakh**, making it economically unviable or slow-to-recover for low-income households.
- **The "Duck Curve" Strain:** Mass solar generation during peak mid-day periods followed by sharp grid demand hikes at evening sunset introduces steep **volatility and technical strain on DISCOM grids**.
- **DISCOM Reluctance:** Power distributors face revenue drops from losing top-tier billing consumers while carrying the operational weight of storing distributed power without an battery mandate.
- **Quality & Safety Inconsistencies:** The rush to install has spawned vendor-level shortcuts, resulting in uncertified work, structural panel safety hazards at roof boundaries, and faulty net-meter integrations

16. Summary of Key Budgetary Allocations (2024–2026)

Scheme / Area	Target / Timeline	Allocation (Approx.)
NCAP / Air Quality	40% PM10 reduction by 2026	~₹1,300 crore annually
Namami Gange 2.0	Through 2026	₹22,500 crore (total)
SBM-Urban 2.0	Garbage Free by 2026	₹1.41 lakh crore (total)
Renewable Energy	Energy security by 2030	₹26,549 crore (2025–26)

17. National Clean Air Programme (NCAP)

The **PM Surya Ghar: Muft Bijli Yojana** is a **Central Sector Scheme** implemented under the **Ministry of New and Renewable Energy (MNRE)**. Formally categorized as a **flagship scheme**, it directly addresses domestic renewable adoption rather than serving as a multi-sector umbrella program.

The institutional framework, operations, and status as of May 2026 are structured as follows:

Administrative & Implementation Framework

- **Nodal Ministry:** Ministry of New and Renewable Energy (MNRE).
- **Implementing Agencies:** Operations use a two-tier framework:
  - *National Level:* National Programme Implementation Agency (NPIA).
  - *State Level:* State Implementation Agencies (SIAs), which comprise local power distribution companies (DISCOMs) and state energy departments.
- **Funding Mechanism:** Fully funded by the Central Government with a total allocation of **₹75,021 crore**. It incorporates the Grid Connected Rooftop Solar Phase II Programme. Financial workflows combine:
  - **Direct Subsidies:** Central Financial Assistance (CFA) sent directly to beneficiaries via the National Portal.
  - **Concessional Financing:** Collateral-free bank loans capped near 7% interest for configurations up to 3 kW.

Core Aims & Features

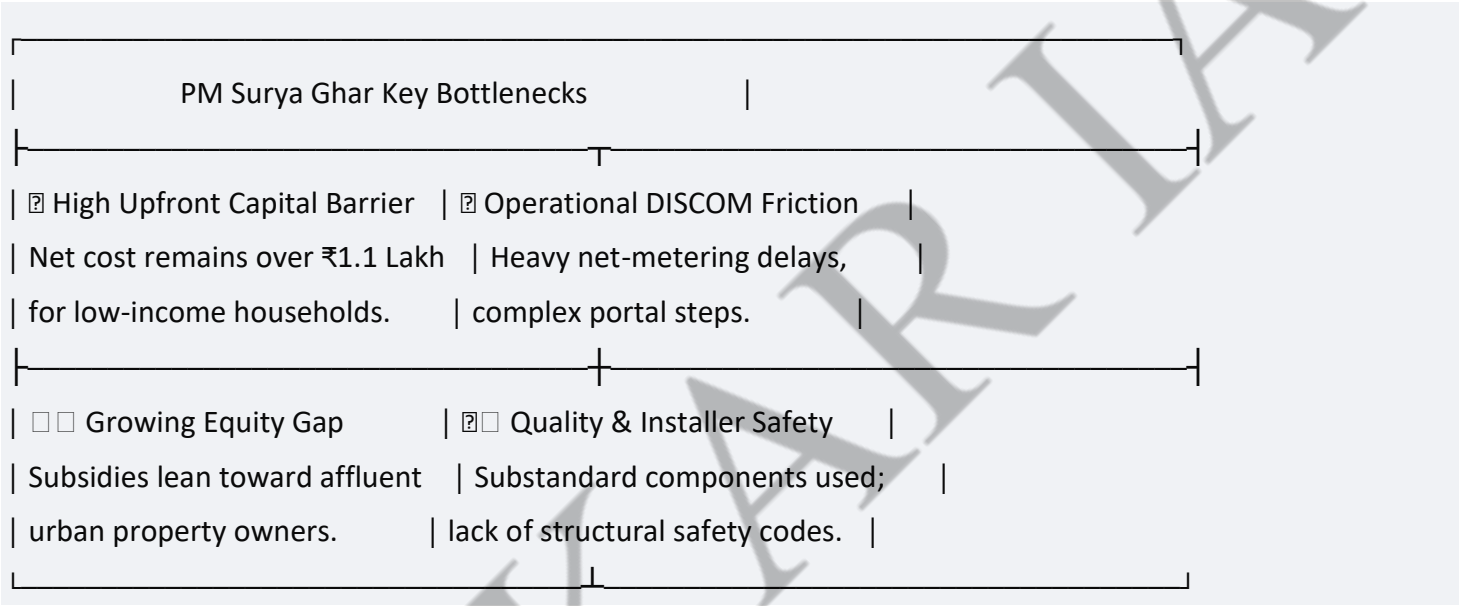
- **Primary Objective:** Equip **1 crore households** across India with rooftop solar (RTS) units by March 2027.
- **Energy Provision:** Enable targeted households to secure up to **300 units of free electricity** monthly.
- **Subsidy Architecture:** Calibrated to system capacity to incentivize optimal household sizing:
  - *Up to 2 kW:* 60% baseline subsidy (₹30,000 to ₹60,000 total).
  - *2 kW to 3 kW:* 40% additional subsidy for the incremental capacity.
  - *Above 3 kW:* Subsidies are strictly capped at a maximum of **₹78,000**.
- **Prosumer Incentives:** Homeowners can monetize surplus energy by selling it back to state DISCOMs.

Current Status & Achievements (As of 2026)

- **Household Coverage:** Over **28 lakh households** have successfully set up rooftop installations.
- **Capacity Milestones:** Total rooftop solar capacity deployed under the scheme crossed **9,566 MW**.
- **Fiscal Disbursements:** The central government has disbursed more than **₹16,000 crore** in direct consumer subsidies.

- **Geographic Leaders:** Gujarat leads nationwide adoption, followed closely by Maharashtra, Uttar Pradesh, and Kerala.
- **Consumer Relief:** Approximately 45% of participating residential consumers report receiving **zero-charge electricity bills**.

Performance Criticisms & Structural Issues



- **Regressive Subsidy Profile:** Policy evaluations from the Centre for Financial Accountability (CFA) reveal a widening equity gap. Lower-income families struggle to manage the **₹1.11 lakh to ₹1.37 lakh net upfront cost** required even after subsidy application. This structural barrier heavily skews scheme adoption toward relatively affluent urban households.
- **DISCOM and Net-Metering Drag:** State-level electricity companies often stall the mandatory net-metering technical approvals. DISCOM financial losses increase as high-paying residential users pivot to generation, using the main grid merely as free backup storage.
- **Quality Control & Safety Gaps:** Rapid vendor scaling has created a shortage of certified field technicians. Consumer complaints highlight improper panel mounting, fire hazards from bad wiring, and low power outputs due to substandard hardware.
- **Space & Structural Vulnerabilities:** Dense, low-income settlements often feature fragile roofs, lack clear terrace rights, or deal with heavy shade. This makes single-household residential solar deployment physically impractical for a large portion of the target demographic

18. Plastic Waste Management regulations.

The regulatory baseline for handling plastic pollution in India is governed by the **Plastic Waste Management Rules, 2016**, which have been systematically strengthened by the Ministry of Environment, Forest and Climate Change via the **Plastic Waste Management (Amendment) Rules, 2026**.

Scheme Classification & Nature

- **Not a Funding Scheme:** These rules represent a **statutory regulatory framework** enacted under the Environment (Protection) Act, 1986, rather than a budgetary "Central Sector" or "Centrally Sponsored" financial scheme.
- **Umbrella Overtones:** While the rules apply uniformly across India, physical infrastructure development and funding for municipal waste systems are separately driven by the **Swachh Bharat Mission (Urban & Gramin)**—which functions as a Centrally Sponsored, flagship umbrella mission.

Administrative Structure

- **Nodal Ministry:** Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Implementing & Enforcement Agencies:**
  - **National Level:** The Central Pollution Control Board (CPCB) manages the Centralized Online EPR Portal and monitors compliance.
  - **State Level:** State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs).
  - **Ground Level:** Urban Local Bodies (ULBs), Gram Panchayats, and District-level authorities enforce the bans and local collection systems.

Aims and Objectives

- **Eliminate High-Litter Plastics:** Phase out single-use plastics (SUPs) possessing low utility and high environmental risk.
- **Institutionalize Circular Economy:** Transition the industrial focus from absolute plastic waste disposal to mandatory reuse and closed-loop recycling.
- **Fix Producer Accountability:** Enforce complete lifecycle liability on businesses through Extended Producer Responsibility (EPR).

Funding Mechanism

- **Polluter Pays Principle:** The framework relies on market-driven compliance rather than a direct government fund.

- **Corporate Funding:** Producers, Importers, and Brand Owners (PIBOs) financially bankroll collection networks, recycling infrastructure, and reverse logistics to meet state targets.
- **Environmental Compensation:** Non-compliant entities face financial penalties (fines) levied by pollution boards, which are channeled back into waste management projects.

Key Features & Updates (As of 2026)

- **Mandatory Recycled Content Targets:** Industries must feature pre-defined minimum ratios of recycled material in new packaging. Category I (Rigid Plastic) starts at **30% recycled content**, climbing to **60% by 2028–29**.
- **Rigid Packaging Reuse Mandates:** Establishes fixed reuse scales; for example, large drinking water containers must achieve a **70% reuse target**.
- **Digital Traceability:** Implementation of **mandatory QR code/barcode markings** on plastic packaging to track its entire supply chain journey digitally.
- **Market-Based Credits:** Formalization of **Tradable EPR Certificates**, allowing companies exceeding targets to sell credits to lagging businesses via the CPCB portal.
- **Expanded Definitions:** "Sellers" of raw resins and pellets are now regulated entities. "End-of-life disposal" specifically legalizes co-processing in cement/steel plants and waste-to-road construction.

Achievements (2026 Status)

- **EPR Portal Scaling:** The Centralized Online EPR Portal hosts over **60,128 registered PIBOs** and **3,012 registered plastic processors**.
- **Massive Seizures & Inspections:** Enforcement squads carried out over **8.6 lakh inspections**, confiscating **1,985 tonnes of banned single-use plastics** and collecting **₹19.82 crore in fines**.
- **Recycling Volumetrics:** More than **20.7 million tonnes of plastic waste** have been funneled into recycling pipelines via the formalized EPR mechanism since 2022.
- **National Portal Expansion:** Launch of the **National Plastic Waste Reporting Portal**, digitizing and removing multi-step paper filing for local government bodies.

Criticisms and Loopholes

- **The "Elastic" Carry-Forward Window:** The 2026 update allows companies missing recycling goals to defer shortfalls for up to **three subsequent years**. Critics argue this dilutes immediate urgency and lets plastics accumulate unchecked.

- **Fake Certificate Scams:** A lack of robust physical auditing enabled the generation of over **6 lakh fraudulent EPR certificates** flagged by the CPCB.
- **Large Industry Exemptions:** Broad exclusions apply to packaging controlled by other regulators, such as the Food Safety and Standards Authority of India (FSSAI), creating massive legal escape routes for the beverage and retail packaging sectors.
- **Self-Reporting Distortions:** System compliance depends heavily on digital data entered by companies themselves, with very minimal independent, ground-level verification

19. Graded Response Action Plan (GRAP):

The **Graded Response Action Plan (GRAP)** is an **emergency, statutory administrative framework** implemented in the National Capital Region (NCR) to prevent the deterioration of air quality. It is **neither a Central Sector Scheme nor a Centrally Sponsored Scheme**; rather, it is a regulatory emergency response protocol mandated by the Supreme Court of India and implemented through statutory directives.

Therefore, it does not function as a standalone fiscal plan, flagship program, or umbrella scheme. Instead, its enforcement and institutional activities are structurally supported through the **Ministry of Environment, Forest and Climate Change (MoEFCC)**.

Aims and Objectives

- **Pre-emptive Interventions**: Execute time-bound, emergency actions based on real-time Air Quality Index (AQI) forecasts.
- **Pollution Abatement**: Prevent particulate matter and from breaching toxic thresholds in winters.
- **Inter-State Coordination**: Bind multiple state governments to a singular, cohesive regulatory agenda.
- **Public Health Protection**: Minimize toxic exposure for high-risk populations like children and senior citizens.

Governance and Implementing Structure

- **Nodal Ministry**: Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Implementing Agency**: The **Commission for Air Quality Management (CAQM)** in NCR & Adjoining Areas.
- **Operational Mechanics**: CAQM's dedicated sub-committee evaluates data from the [India Meteorological Department (IMD)](https://testbook.com/question-answer/what-is-the-primary-objective of-the-graded-respon--695e37d35dba7930f3413012) and the Indian Institute of Tropical Meteorology (IITM) to dynamically invoke or revoke restrictions.

Funding Mechanism

Because GRAP is a regulatory governance tool, it lacks a dedicated public subsidy allocation. Instead, funding flows through two pathways:

1. **Administrative Costing**: Met directly through the statutory budgetary allocations of the CAQM and State Pollution Control Boards (SPCBs).
2. **Operational Enforcement**: Funded independently by the corresponding executing state bodies (e.g., Delhi, Haryana, Uttar Pradesh, Rajasthan) via local traffic police, municipal corporations, and transport departments.

Key Features & 2026 Updated Graded Stages

GRAP works incrementally; lower-stage restrictions stay active even as higher stages trigger. The 2026 operational protocol follows the heavily revised, strict framework:

Stage	AQI Range	Category	Key Enforced Measures
Stage I	201 – 300	**Poor**	Mechanical road sweeping, water sprinkling, strict vehicle PUC tracking, and **uninterrupted power supply mandates** to stop commercial reliance on alternative power generators.
Stage II	301 – 400	**Very Poor**	Enhanced parking fees to discourage private vehicles, daily power generator checks, and targeted dust suppression at local pollution hotspots.
Stage III	401 – 450	**Severe**	Strict ban on non-essential construction/demolition (C&D), closure of brick kilns, entry restrictions on older commercial vehicles, and transitioning primary schools to **hybrid/online education**.
Stage IV	> 450	**Severe Plus**	Total ban on non-essential commercial truck entries into Delhi (allowing only BS-VI diesel, CNG, or electric vehicles), **mandatory hybrid mode** for

higher classes, and 50% work-from-home orders for offices.

Achievements

- **Pre-emptive Mitigation**: Predictive invocation (activating stages 3 days before a projected spike) effectively blunts toxic peaks by 20–30% during winter months.
- **Statutory Enforcement Powers**: CAQM's legal backing enables penal actions, allowing fines up to ₹1 crore and imprisonment up to 5 years for non-compliance.
- **Unified Interstate Action**: Consolidated independent state bodies onto one standard reporting matrix, streamlining regional emergency actions.
- **Structural Fleet Upgrades**: Accelerated the phase-out of legacy, high-emission commercial vehicles across state borders.

Criticisms and Limitations

- **Reactive Nature**: Critics argue it functions primarily as an emergency fire-fighting system rather than addressing the structural, root causes of year-round pollution.
- **Severe Economic Impact**: Prolonged construction bans under Stages III and IV disrupt the livelihoods of up to 10 lakh daily-wage construction workers and cause massive industry losses.
- **Digital & Educational Divide**: Shifting abruptly to online and hybrid schooling strains lower-income households lacking adequate internet infrastructure.
- **Enforcement Gaps**: Ground-level compliance remains weak, with local municipal bodies and police forces struggling to control open biomass burning and micro-level construction violations across expansive regional borders

20. PRANA Portal

The **PRANA Portal** (Portal for Regulation of Air-pollution in Non-Attainment Cities) is a digital monitoring platform launched in September 2021. It tracks the implementation of India's **National Clean Air Programme (NCAP)**.

Core Governance & Structure

- **Nodal Ministry:** Operated under the Ministry of Environment, Forest and Climate Change (MoEFCC).

- **Implementing Agency:** Developed and managed by the Central Pollution Control Board (CPCB) in partnership with Knowledge Lens.
- **Scheme Classification:** PRANA is a tracking portal for NCAP. NCAP itself operates as a **flagship, central sector initiative** that utilizes coordinated central funding directly tied to local bodies.
- **Funding Mechanism:** Supported predominantly (over 80%) via the **15th Finance Commission Million Plus Cities Challenge Fund**. Additional targeted operational funds are directly disbursed by MoEFCC to non-million plus non-attainment cities based on annual performance targets.

Aims & Objectives

- **Compliance Tracking:** Monitors physical and financial milestones of City Air Action Plans (CAPs) across 131 targeted cities.
- **Pollution Reduction Support:** Aids NCAP's structural target to achieve up to a **40% reduction in Particulate Matter (PM10 and PM2.5) concentrations by 2026**, relative to the 2017 baseline.
- **Public Transparency:** Disseminates real-time ambient air quality data and policy initiatives to citizen groups.

Key Portal Features

- **Dual-Module Interface:** Uses a public-facing Internet module alongside a restricted Intranet module for government stakeholders.
- **Public Dashboard:** Provides macro-level national and city-specific visual tracking of daily air indicators.
- **Intranet Accountability Module:** Facilitates official tracking of fund execution, inter-agency MoUs, and city performance grading.
- **Seven Thematic Areas:** Sorts progress tracking into 7 fields: vehicle emissions, industrial pollution, road dust, waste burning, urban greening, public outreach, and physical monitoring.

Status Update & Achievements (As of 2026)

- **Widespread Institutional Onboarding:** Action plans for all **131 non-attainment cities** are structured and updated via the portal.
- **Fund Tracking Footprint:** Successfully mapped the deployment of over **₹10,566 crore** in air-quality mitigation capital across states.
- **Localized Air Quality Gains:** Portal data metrics confirm a noted downward trajectory of coarse PM10 trends across 88 targeted municipal boundaries.
- **Inter-Sectoral Alignment:** Acts as the primary compliance cross-check platform to track local integrations of Swachh Bharat Mission 2.0, FAME-II, and Mission LiFE.

Criticisms & Limitations

- **Imbalanced Sector Spending:** Critical evaluations via Centre for Research on Energy and Clean Air (CREA) reveal over 64% of funds tracked by PRANA are spent loosely on superficial road dust sprinkling rather than addressing heavy industrial or transport source emissions.
- **Neglect of PM2.5 Particles:** Environmental watchdogs highlight that portal metrics track larger dust particles (PM10), while the deadlier fine combustion particles (**PM2.5**) frequently breach safe limits without specific reduction sub-targets.
- **Data Lagoons & Delays:** Studies indicate wide gaps between on-ground research and data reporting. Only 40 out of 130 cities have successfully uploaded complete source-apportionment analysis data to the platform.
- **Lack of Punitive Teeth:** The underlying NCAP structure remains legally non-binding; cities failing to update data or meet 2026 targets face no institutional or penal consequences

21. National Coastal Mission:

The **National Coastal Mission (NCM)** is a **Central Sector Scheme** operating as an **umbrella scheme** under the **National Coastal Management Programme (NCMP)**. It was initiated in 2014 as part of India's National Action Plan on Climate Change (NAPCC).

Ministry and Implementing Agency

- **Nodal Ministry**: Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Implementing Agencies**: The **State Governments of Coastal States and Union Territory (UT) Administrations** directly execute the projects.
- **Scientific Support**: The **National Centre for Sustainable Coastal Management (NCSCM)** in Chennai provides core scientific research, data-driven modeling, and technical policy advisory.

Aims and Objectives

- **Enhance Climate Resilience**: Address risks from rising sea levels, storm surges, and coastal erosion via risk vulnerability mapping.
- **Ecosystem Conservation**: Protect and regenerate sensitive ecological buffers like mangroves, coral reefs, and seagrass meadows.
- **Sustainable Livelihoods**: Safeguard and diversify employment for traditional fisherfolk and coastal communities.

- **Pollution Abatement**: Control marine litter and clean up tourist-heavy shorelines.

Funding Mechanism

- **Scheme Class**: **Central Sector Scheme** where the budget is approved by the central government and distributed based on state-submitted proposals. (Note: Broad elements under the overarching NCMP involve mixed center-state cost-sharing).
- **Budgetary Outlay (As of 2026)**: The mission was initially scaled with an internal Direct Budgetary Support of ₹87 crore (FY 2021–2026). It has officially been extended and expanded into **NCM 2.0 (covering 2025–2031)** with an increased allocation of **₹767 crore**.

Key Features

- **Integrated Coastal Zone Management (ICZM)**: Merges scientific planning with community requirements to regulate coastal infrastructure development.
- **Management Action Plans (MAPs)**: Annual, region-specific plans deployed by states for localized environmental intervention.
- **BEAMS Component**: The *Beach Environment & Aesthetic Management Service* targets the development of safe, eco-friendly, and chemically clean beaches.
- **Nature-Based Infrastructure**: Emphasizes bio-shielding (such as sand dune stabilization and massive mangrove cultivation) over heavy concrete sea walls.

Key Achievements (Updated to 2026)

- **Blue Flag Certifications**: Under the BEAMS infrastructure program, India successfully secured the international **Blue Flag Certification for 18 beaches** across 7 states and 4 UTs by the 2025–2026 season.
- **Hazard Line Mapping**: Successfully collaborated with the Survey of India to complete **comprehensive Hazard Line and sediment cell mapping** across the entire 7,500 km Indian coastline.
- **Community Cleanups**: Executed extensive beach cleaning and environmental awareness drives across major maritime districts, heavily involving local students, NGOs, and the Indian Coast Guard.

Criticisms and Structural Challenges

- **Historical Financial Volatility**: The mission faced significant setbacks when the World Bank-backed *EAPENCORE* project fell through due to administrative changes, previously driving a drastic slash in the 2022–2024 revised budgetary allocations and drawing reprimands from Parliamentary panels.

- **Jurisdictional Overlaps**: Projects often experience bureaucratic friction due to uncoordinated, overlapping jurisdictions between state departments, the Ministry of Ports, Shipping and Waterways, and the MoEFCC.
- **Staffing Shortages**: Reports from the Comptroller and Auditor General (CAG) highlighted that State Coastal Zone Management Authorities (SCZMAs) operate with severe vacancies and often lack proper participation from local traditional fishing representatives.
- **Industrial Counter-Pressures**: The rate of natural coastal restoration is frequently outpaced by aggressive commercial development, rapid urbanization, and unauthorized port expansion

22. MISHTI Initiative:

The **MISHTI (Mangrove Initiative for Shoreline Habitats and Tangible Incomes)** initiative is a central government initiative introduced under the **"Green Growth" priority** of the FY 2023-24 Union Budget.

Its structural, financial, and operational frameworks as of **2026** are detailed below: **Nodal Ministry & Implementing Agency**

- **Nodal Ministry:** Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Implementing Agency:** The primary responsibility for ground implementation vests with the **State Forest Departments**. They collaborate with local bodies like **Van Suraksha Samitis (VSS)**, **Eco-Development Committees (EDC)**, and **Self-Help Groups (SHGs)** to handle operations like nursery raising and plantation monitoring.

Scheme Type & Funding Mechanism

- **Scheme Nature:** Rather than operating as a conventional freestanding central sector or centrally sponsored scheme, MISHTI functions as a **convergence-based framework**. However, the core funding cycle guidelines specify an allocation where **80% of project costs are borne by the Central Government and 20% by State Governments**.
- **Funding Convergence Structure:** It operates primarily through financial integration with existing schemes:
  - **CAMPA Funds:** Roughly **70% of the financial allocation** is pulled from the Compensatory Afforestation Fund Management and Planning Authority (both National and State CAMPA).
  - **MGNREGS & Others:** Roughly **30% of the funds** are leveraged through the Mahatma Gandhi National Rural Employment Guarantee Scheme and existing state plans to cover labour and support tasks.
  - **Gap Funding:** The National CAMPA authority provides additional financial support to states based on their approved annual plans.

Aims, Objectives, and Core Features

- **Primary Aim:** To restore, intensive-plant, and protect mangrove ecosystems along India's coastlines and saltpan lands.
- **Target Scope:** Comprehensive development of approximately **540 sq. km** of mangrove areas across **11 coastal states and 2 Union Territories** over a 5-year tenure spanning 2023 to 2028.
- **Tangible Income:** Empowering local coastal communities by aligning ecosystem restoration with sustainable livelihoods, nature tourism (ecotourism), and local fishery enhancement.
- **Climate Shield:** Utilizing mangroves as a biological barrier to reduce coastal erosion, mitigate storm surges/tsunamis, and meet India's global carbon sequestration goals.
- **Operational Blueprint:** The scheme mimics the operational and multi-tier monitoring pattern used in the **Nagar Van Yojana**. It employs tracking measures like geo-tagged photos and KML digital mapping.

Verified Achievements (Up to 2026)

- **Restoration Expansion:** More than **26,396 hectares (approx. 264 sq. km)** of degraded mangrove areas were successfully brought under restoration via National CAMPA gap funding and state scheme convergence.
- **State Leadership: Gujarat** has emerged as the frontrunner under MISHTI, successfully covering **19,020 hectares** of mangrove afforestation through an investment of ₹76 crore over two years.
- **Carbon and Job Projections:** Ongoing project components remain on track to meet the long-term target of creating **22.8 million man-days of employment** while generating an estimated carbon sink of **4.5 million tons**.
- **Fund Disbursal:** The National CAMPA authority has progressively released substantial funds to active maritime states (such as Gujarat, West Bengal, Kerala, Andhra Pradesh, Odisha, and Puducherry), including dedicated allocations for community ecotourism development.

Main Criticisms

- **Over-reliance on Convergence:** Environmental policy critics highlight that MISHTI lacks a standalone budget line. Pulling 30% of its resources from schemes like MGNREGS can trigger localized implementation delays if regular wage-employment funds face administrative bottlenecks.
- **Policy Contradictions:** Activists argue that while the government promotes mangrove growth through MISHTI, separate statutory changes—such as relaxations in the **Coastal Regulation Zone (CRZ)** rules—allow commercial/industrial post-facto clearances that inherently threaten natural intertidal zones.

- **Survival Rate Concerns:** Scientific critics note that extensive "mass planting" drives frequently focus on specific mangrove varieties (like *Rhizophora*) without analyzing site-specific soil conditions or hydrological changes, which can lead to poor long-term sapling survival rates

24. Ramsar Sites: Expansion to **98 designated wetlands** as of January 2026 to improve natural water purification and biodiversity.

25. National carbon credit trading mechanism

The **Carbon Credit Trading Scheme (CCTS)**, establishing the **Indian Carbon Market (ICM)**, is a regulatory market-based framework enacted under the Energy Conservation (Amendment) Act, 2022. It functions as a **Central Sector Scheme** completely developed, managed, and legally enforced by the Central Government of India. While it acts as an independent regulatory infrastructure rather than a welfare program, it serves as an **umbrella climate initiative** that integrates and absorbs existing efficiency policies.

Aims and Objectives

- **Pricing Carbon:** Internalise environmental costs by putting a direct monetary value on greenhouse gas (GHG) emissions.
- **Decarbonising the Economy:** Provide scalable financial incentives for public and private industries to switch to low-carbon technologies.
- **Meeting NDC Targets:** Ensure India satisfies its Paris Agreement commitment to lower GDP emission intensity by 45% by 2030.
- **Fostering Green Investment:** Mobilise private climate finance and foreign direct investments (FDI) into clean tech and forestry.

Governance, Ministry, and Implementing Agencies

The CCTS uses a multi-layered institutional architecture rather than a single agency:

- **Nodal Ministries:** Governed jointly by the **Ministry of Power (MoP)** and the **Ministry of Environment, Forest and Climate Change (MoEFCC)**.
- **Policy Oversight:** Managed by the **National Steering Committee for Indian Carbon Market (NSCICM)**, co-chaired by the Secretaries of both ministries.
- **Administrator (Implementing Agency):** The **Bureau of Energy Efficiency (BEE)** directly handles day-to-day implementation, formulates emissions trajectories, and approves Accredited Carbon Verification Agencies (ACVAs).

- **Registry Operator: Grid Controller of India Limited (GCI)** acts as the central digital registry tracking certificate transactions.
- **Market Regulator:** The **Central Electricity Regulatory Commission (CERC)** regulates all trading activities across power exchanges to prevent fraud.

Funding Mechanism

- **Self-Sustaining Framework:** The financial support required for implementation is met by the **Bureau of Energy Efficiency (BEE)** using its own institutional resources.
- **Fees and Charges:** Operational expenses are sustained via **fees and transaction charges** collected directly from the registered and obligated industrial entities participating in the market.

Key Features

- **Dual Market System:** Features a **Compliance Mechanism** (mandatory reduction targets for heavy industries) and an **Offset Mechanism** (voluntary emission reduction projects).
- **Unit Value:** Each Carbon Credit Certificate (CCC) issued represents exactly **one tonne of carbon dioxide equivalent (tCO2e)** avoided, reduced, or removed.
- **PAT Transition:** Designed to gradually absorb the Perform, Achieve, and Trade (PAT) energy-saving mechanism into a single compliance market.
- **Trading Flexibility:** Entities that over-achieve targets earn tradeable CCCs; those failing targets must purchase them on designated power exchanges. Unlimited banking of credits is allowed, but borrowing against future cycles is prohibited.

Status and Achievements (Update as of 2026)

- **Target Notifications Accomplished:** Legally binding Greenhouse Gas Emission Intensity (GEI) targets have been formally locked in for **nine high-emission, energy-intensive sectors** (including cement, aluminium, chlor-alkali, pulp and paper, petroleum refining, petrochemicals, and textiles).
- **Substantial Scale Established:** The scope expands the compliance pool to approximately **740 obligated entities**, covering over **700 million tonnes of CO2e**. This positions the ICM as the **third-largest emissions trading system globally**.
- **Operational Rules Finalised:** In early 2026, the CERC officially published the *Terms and Conditions for Purchase and Sale of Carbon Credit Regulations, 2026*.

- **State Carbon Banks Launch:** Strategic agreements have been finalized with provincial governments (such as Maharashtra and Kerala) to deploy domestic carbon platforms acting as localized state carbon banks to draw foreign green funding.
- **Imminent Platform Trading:** With compliance cycles having begun in April 2025, the central registry and live exchange trading are officially projected to launch operations by **mid-2026**.

Criticisms and Gaps

- **Initial Bureaucratic Delays:** The market faced years of regulatory lag and delayed target allocations since the 2022 amendment, slowing private sector momentum.
- **Ambiguity in Penalty Structures:** Critics point out that the precise penalty framework for entities failing to meet targets or purchase offsetting credits remains undefined.
- **Risk of Low Market Liquidity:** Experts cite historical issues from the older PAT scheme, where long compliance intervals and a lack of aggressive buyer demand historically crushed prices.
- **Absence of Free Market Auctioning:** Unlike European standards, India's baseline system does not initially auction credits. This cuts off a potential government revenue source that could otherwise directly finance commercially unviable green tech.
- **Omission of the Power Sector:** The electricity and power segment, which accounts for roughly 40% of national GHG emissions, has been left out of the initial compliance rollouts

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26. Water (Prevention & Control of Pollution) Amendment Act, 2024:

The **Water (Prevention and Control of Pollution) Amendment Act, 2024** is a regulatory legislation—**not a Central Sector, Centrally Sponsored, flagship, or umbrella scheme**. It does not function as a government funding program or social welfare scheme, meaning it possesses **no formal financial funding mechanism or budget allocation**. Instead, it serves strictly as a legal framework to govern and amend the original Water Act of 1974.

Overview and Governing Authority

- **Nodal Ministry:** The Act falls under the jurisdiction of the Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Implementing Agencies:** Enforcement is executed via the Central Pollution Control Board (CPCB) at the national level and individual State Pollution Control Boards (SPCBs) regionally.

Aims and Objectives

- **Promote Trust-Based Governance:** Rationalize minor environmental infractions to reduce the fear of imprisonment for procedural lapses.
- **Enhance Ease of Doing Business:** Streamline industrial compliance while maintaining basic ecological protections.
- **Harmonize Environment Laws:** Align the structural penalty mechanics of the Water Act with those of the Air Act.
- **Ensure Sustainable Quality:** Preserve or restore the overall wholesomeness of India's collective water resources.

Key Features

- **Decriminalisation of Offences:** Removes imprisonment for several minor or technical violations, replacing jail time with fiscal penalties ranging from ₹10,000 to ₹15 lakh.
- **Consent Exemptions:** Empowers the Central Government, in consultation with the CPCB, to entirely exempt specific non-polluting industrial categories from needing prior SPCB consent.
- **Adjudicating Officers:** Shifts penalty-determination powers away from courts to designated, government-appointed civil adjudicating officers (ranked Joint Secretary or above).
- **Centralized Oversight:** Grants the Central Government authority to issue strict guidelines regarding SPCB consent terms and uniform selection rules for SPCB chairpersons.
- **Government Accountability:** Heads of violating government departments are held directly liable, facing fine penalties equal to one month's basic salary.
- **Jurisdictional Rollout:** Applicable automatically to Union Territories, Himachal Pradesh, and Rajasthan, with an optional adoption process for other states.

Status, Achievements, and Progress (As of 2026)

- **Wider Adoption:** State assemblies (including Punjab in early 2025) have progressively passed legislative resolutions to formally adopt the amended regulatory framework.
- **Implementation of Penalty Rules:** The MoEFCC successfully operationalized the *Water Manner of Holding Inquiry and Imposition of Penalty Rules*, enabling designated officers to legally resolve cases.
- **Industrial Relief:** Broad "White Category" industrial units (deemed completely non-polluting) have been effectively cleared of dual compliance hurdles, drastically speeding up setup times.
- **Expedited Redressal:** Environmental violations are processed much quicker through the new administrative adjudication route instead of languishing in heavily backlogged lower judiciary courts.

Criticisms and Concerns

- **Weakened Deterrence:** Environmental activists argue that converting criminal actions into mild fiscal penalties strips away fear from major polluting industrial entities.
- **Erosion of Federalism:** The power given to the central government to dictate state board appointments and issue over-riding consent guidelines undercuts state autonomy.
- **High Discretionary Power:** Broadly allowing the central executive to exempt industrial classes from checks raises significant transparency and corruption worries.
- **Inadequate Local Enforcement:** Fixed financial penalty structures remain logistically tough to police against localized micro-pollution events like garbage dumping around river banks and ghats

27. Groundwater Monitoring 2024:

he core framework for groundwater monitoring in India is executed under the Ground Water Management and Regulation (GWMR) scheme, alongside the Annual Ground Water Quality Monitoring Programme, and the community-led Atal Bhujal Yojana (Atal Jal).

Institutional and Administrative Structure

- **Nodal Ministry:** Operated entirely under the Ministry of Jal Shakti (Department of Water Resources, River Development & Ganga Rejuvenation).
- **Implementing Agency:** The **Central Ground Water Board (CGWB)** acts as the apex national agency, working in collaboration with respective State Ground Water Departments.
- **Scheme Classification:**
  - The core GWMR program is a **Central Sector Scheme** (100% funded by the central government).
  - The Atal Bhujal Yojana is a **Central Sector Scheme** with a total outlay of ₹6,000 crore, split 50:50 as a loan component from the World Bank and matching central budget grants.
- **Flagship/Umbrella Status:** Groundwater regulation falls under the broader framework of the **National Water Mission** (one of India's climate action umbrella missions).

Aims and Objectives

- **Standardise Quality Evaluation:** Establish absolute uniformity in national data tracking by introducing **Standard Operating Procedures (SOPs)** for baseline sampling.
- **Map Stress Zones:** Map aquifer systems to identify over-exploited vs. safe water blocks.

- **Facilitate Demand Management:** Shift from top-down supply governance to community-led water security budgeting.

Core Technical Features

- **Expanded Network Infrastructure:** Operates over 43,228 groundwater level monitoring stations (National Hydrograph Network Stations).
- **High-Frequency Automation:** Implementation of Digital Water Level Recorders (DWLR) equipped with telemetry systems to stream real-time data every six hours.
- **Digital Transparency Platforms:** Uploads automated sensor readings directly to the public-facing **India-WRIS portal** via the Water Information Management System.
- **Advanced Aquifer Mapping (NAQUIM 2.0):** Employs state-of-the-art heliborne geophysical surveys to precisely generate 3D subsurface water maps.

Operational Updates and Achievements (As of 2026)

- **Reversal of Resource Decline:** The percentage of safe assessment units increased to 73.14%, while severely over-exploited units fell to 10.8%.
- **Increased Net Recharge:** Cumulative resource planning expanded annual national groundwater recharge to **448.52 Billion Cubic Meters (BCM)**.
- **Public Health Quality Alerts:** Between mid-2024 and 2025, CGWB effectively deployed a Groundwater Quality Alert system, warning states of localized salinity, nitrate, and heavy metal spikes.
- **Massive Mass Mobilization:** Through sub-programs like **Jal Sanchay Jan Bhagidari (JSJB)**, over 39.6 lakh artificial recharge structures have been delivered via local community convergence.

Structural Criticisms & Ongoing Challenges

- **Persistent Contamination Hotspots:** Despite extensive data, critical fields continue to display severe localized pollution from **[fluoride, arsenic, and uranium](https://testbook.com/question-answer/under-which-scheme-was-the-2024-groundwater-assess--68c802e0b9cc1af306361b37, 1.5.2)**, causing public health delays.
- **Agricultural Behavioral Resistance:** Farmers in high-stress zones demonstrate notable reluctance to pivot away from water-heavy crops like sugarcane and paddy.
- **Grassroots Institutional Gaps:** Village-level local bodies often lack the technical skills required to interpret dynamic data and sustainably manage **Water Security Plans**.

- **Fragmented Interstate Governance:** Subsurface aquifers do not align with administrative borders, leading to weak legal enforcement and cross-border resource conflicts between neighbouring states

28. New Extended Producer Responsibility (EPR) rules

he **Extended Producer Responsibility (EPR)** framework in India is not a central sector or centrally sponsored scheme; rather, it is a **mandatory regulatory framework** enacted through statutory rules under the Environment (Protection) Act, 1986. It does not fall under standard public-funded flagship or umbrella schemes (such as the Swachh Bharat Mission, though it actively supplements them). Instead, it functions as a legally binding market-based mechanism where the financial and physical burden of waste management is shifted entirely from the government to the producers.

Ministry and Implementing Agency

- **Nodal Ministry:** Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Implementing Agency:** The Central Pollution Control Board (CPCB) acts as the apex implementing and monitoring body via centralized online portals. At the ground level, State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) handle local enforcement, physical verification, and registration.

Aims and Objectives

- **Promoting a Circular Economy:** Integrating post-consumer waste back into the production cycle to minimize resource depletion.
- **Polluter Pays Principle:** Holding Producers, Importers, and Brand Owners (PIBOs) financially accountable for the end-of-life management of their products.
- **Design for Environment:** Encouraging businesses to manufacture products that are easier to reuse, refurbish, or recycle.
- **Reducing Landfill Dependency:** Diverting hazardous, plastic, and solid electronic waste away from urban dump sites.

Funding Mechanism

The framework operates on a **self-funding, market-led mechanism** without direct state budget allocations: PIB +3

- **EPR Certificate Trading System:** PIBOs fulfill their mandatory recycling targets by buying tradable EPR certificates from registered, certified waste recyclers.

- **Private Infrastructure Investments:** Producers fund the collection, segregation, and transport of waste by directly hiring Producer Responsibility Organisations (PROs) or local authorized recyclers.
- **Environmental Compensation (EC):** Financial penalties collected from non-compliant companies are pooled into a dedicated fund managed by the CPCB, used specifically for cleaning up polluted sites and improving waste collection.

Key Features & 2026 Core Updates

India's EPR framework expands across multiple waste streams—including Plastics, E-Waste, Batteries, Tyres, Used Oil, and Non-Ferrous Metals. Under the **Plastic Waste Management (Amendment) Rules, 2026**, the framework has been majorly overhauled:

- **Category-Specific Compliance:** PIBOs can no longer interchange recycling credits across different categories. Obligations for rigid, flexible, or multi-layered plastics must be met explicitly within their respective brackets.
- **Ban on End-of-Life (EOL) Offsets:** The MoEFCC strictly withdrew the provision allowing companies to use co-processing or EOL disposal certificates to offset their core recycling obligations.
- **Mandatory Recycled Content:** Starting in the financial year 2025–26, rigid plastic packaging must contain a minimum of **30% recycled material**, scaling up to 60% by 2028–29.
- **Phased Target Extensions:** To support ease of doing business, penalties for missed 2025–26 recycling targets are not slapped instantly. Deficits can be carried forward for up to 3 years, provided companies clear at least one-third of the lag annually.
- **QR Code & Barcode Tracking:** It is now legally enforceable to print specialized, on-pack digital identifiers (QR/barcodes) on plastic packaging to enable real-time traceability.
- **Expansion to Metals:** Effective April 1, 2026, a brand-new comprehensive EPR framework has rolled out for **non-ferrous metals**, encompassing copper, aluminum, zinc, and their respective alloys.

Achievements (As of 2026)

- **Massive Digital Onboarding:** Over 41,000 PIBOs and more than 2,500 Plastic Waste Processors (PWPs) have successfully registered on the centralized CPCB EPR portal.
- **Formalization of Green Jobs:** The mandatory trading platform has redirected private capital directly to recyclers, integrating tens of thousands of informal waste pickers into organized recycling value chains.
- **Industrial Scale Up:** Massive processing capacities have been built across the country, with hundreds of authorized dismantlers safely tracking millions of metric tonnes of plastic and electronic waste annually.

Criticisms and Systemic Bottlenecks

- **Fake Certificate Scams:** A lack of strict physical verification safeguards led the CPCB to detect **over 600,000 fraudulent or fake recycling certificates** traded online by companies trying to bypass actual recycling.
- **Weak Independent Audits:** The digital registry remains highly vulnerable to "paper compliance," where companies overstate their declared processing metrics because third-party validation by SPCBs remains slow.
- **Informal Sector Exclusion:** Despite policy aims, traditional grassroots collectors (like local *kabadiwalas*) struggle to adapt to tech-heavy portal compliance, keeping them vulnerable to exploitation by larger middleman firms.
- **Regulatory Inconsistencies:** Frequent policy U-turns—such as changing rules around EOL certificate usage or delaying targets—create business uncertainty and reward late adopters over compliant companie

- **Extended Producer Responsibility (EPR) for Packaging (2024/2026):** New rules notified in December 2024 (effective April 2026) mandate producers of paper, glass, and metal packaging to manage their waste's entire lifecycle.

29. National Plastic Pollution Reduction Campaign (2025):

The **National Plastic Pollution Reduction Campaign (NPPRC)** was launched on **5th June 2025**, under the central slogan **"One Nation, One Mission: End Plastic Pollution"**, as a nationwide mass mobilization and behavioral change initiative.

Ministry and Implementing Agency

- **Nodal Ministry:** Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Implementing Agencies:** The primary implementation is handled by the MoEFCC in collaboration with MyGov India, State Pollution Control Boards (SPCBs), Pollution Control Committees (PCCs), Urban Local Bodies (ULBs), and District-level Panchayats.

Scheme Classification & Nature

- **Scheme Type:** It operates as a **Central Sector** mass mobilization campaign, fully driven and funded by the Central Government via the MoEFCC budget.
- **Scheme Scope:** Rather than being a standalone financial scheme, it is an **Umbrella Awareness and Compliance Mobilization Campaign**. It functions as a specialized outreach wing that directly integrates with and supports India's flagship Mission LiFE (Lifestyle for Environment) and the Swachhata Hi Sewa (Cleanliness is Service) programme.

Aims and Objectives

- **Promote Behavioral Shift:** Nudge citizens, communities, and local industries to move from passive environmental awareness to active daily reduction of single-use plastics (SUP).
- **Curb Plastic Generation:** Mandate and practice strict plastic source reduction, intensive segregation at the point of disposal, and localized collection networks.
- **Boost Alternatives:** Catalyze the development, commercial manufacturing, and commercial adoption of eco-friendly, biodegradable alternatives to SUPs.

Key Features & Funding Mechanism

- **Whole-of-Government / Whole-of-Society Approach:** Integrates central ministries, state/UT bodies, corporate industries, startups, and academic groups.
- **Targeted Regional Drives:** Tailored sub-campaigns focused on eliminating plastic footprint in environmentally sensitive zones like Tiger Reserves, alongside urban and rural hubs.
- **National Plastic Waste Reporting Portal:** A digital hub launched on World Environment Day 2025 that mandates local bodies, panchayats, and SPCBs to submit automated annual plastic accounting data, substituting legacy paper-trail reports.
- **Funding Mechanism:** Centrally backed out of the programmatic budget allocations of MoEFCC for environmental protection, augmented through Extended Producer Responsibility (EPR) compliance and pollution penalty allocations collected under the "Polluter Pays" principle.

Current Status & Achievements (As of Mid-2026)

- **Massive Public Mobilization:** Over 69,000 distinct localized events organized across the country, attracting direct, recorded participation from more than 21 lakh citizens.
- **Enforcement & Interception:** Ground enforcement teams conducted a massive 8,61,740 compliance inspections, leading to the direct seizure of **1,985 tonnes of banned SUP items** and the levying of ₹19.82 crores in penalties.
- **Eco-Alternative Directory:** Release and scaling of the official *"Compendium of Manufacturers / Sellers of Eco-alternatives to Banned Single Use Plastic Items"* along with standardized standardization via BIS IS 18267 for agri-byproduct utensils.
- **EPR Portal Scale:** The digitized centralized EPR platform for plastic packaging reported registrations of 51,838 producers/brand owners and 2,948 certified plastic waste processors.

Main Criticisms

- **Fraudulent EPR Certificates:** Climate watchdogs and policy analysts have highlighted massive market gaps, notably the discovery of fraudulent recycled plastic certificates traded on the digital EPR platform by fake or non-existent recyclers to meet corporate compliance.
- **Implementation Gaps at the Local Level:** Critics point out that despite the *Whole-of-Society* rhetoric, small urban municipal bodies and remote village panchayats face acute infrastructural deficits, leaving them poorly equipped to process, sort, and sustainably transport collected plastics.
- **Over-reliance on Voluntary Actions:** Environmentalists critique the campaign's significant focus on voluntary behavioral pledges on portals like Meri LiFE over strictly binding legislative controls on large-scale initial commercial plastic production

30. New mandates for Fly Ash Management:

The management of fly ash in India is governed strictly through a regulatory mandate known as the Ash Utilization Notification (issued under the Environment Protection Act, 1986) rather than a traditional developmental scheme. To coordinate execution, the government operates the **Fly Ash Management and Utilisation Mission**.

- **Administrative Classification:** It operates as a statutory **regulatory mandate** rather than a spending scheme. It does not fit the financial definition of a Central Sector or Centrally Sponsored Scheme because it operates on a self-sustaining penalty-based fund rather than budgetary outlays.
- **Scheme Type:** It serves as an **umbrella regulatory framework** overseeing all coal and lignite-based thermal power plants (TPPs) in India.
- **Nodal Ministry:** The **Ministry of Environment, Forest and Climate Change (MoEFCC)**.
- **Implementing & Monitoring Agencies:** Co-headed by the Secretaries of **MoEFCC, Ministry of Power, and Ministry of Coal**. The **Central Pollution Control Board (CPCB)** and **State Pollution Control Boards (SPCBs)** enforce environmental compliance. The **Central Electricity Authority (CEA)** tracks power plant generation data.

Aims & Objectives

- **100% Eco-Friendly Utilization:** Force TPPs to completely consume both newly generated and legacy ash dumps.
- **Circular Economy Integration:** Channel byproduct waste as raw inputs into infrastructure sectors like cement, road building, and bricks.

- **Environmental Protection:** Prevent toxic trace metals and respirable particulate matter from polluting air, land, and water ecosystems.
- **Consumer Protection:** Minimize the cascading financial impact of waste disposal costs on final consumer electricity tariffs.

Funding Mechanism

- **Polluter Pays Principle:** The mechanism is entirely funded by a rigid financial penalty. Non-compliant power plants face an **environmental compensation fine of ₹1,000 per metric tonne** for any unutilized ash remaining at the end of the financial year.
- **Fund Management:** The CPCB collects these penalty funds.
- **Fund Utilization:** Collected funds are legally ring-fenced for the safe removal of unutilized ash mounds and financing research into advanced fly ash consumer products.

Key Features & 2026 Updates

The regulatory framework saw critical revisions through the Ministry of Power (MoP) revised ash utilization guidelines alongside **Draft Amendments to the Ash Utilization Notification**:

- **"Issuable Ash" Mandatory Declaration:** TPPs must publicly declare their precise net available volume of "issuable ash" (fly ash, bottom ash, pond ash) before opening any commercial disposal avenues.
- **Concessional Local Allocation:** Plants must reserve a fixed share of fly ash for micro and small enterprises (MSEs) and local construction users within a **100 km radius** at specialized concessional rates.
- **Open Auction Disposals:** Standard marketplace distribution must use an open, transparent electronic auction mechanism with a baseline floor price of **₹1 per metric tonne**.
- **Transportation Cost Cap:** When transporting fly ash beyond 300 km, the power plant's financial transport liability is legally capped at the equivalent road transport rate for **up to 300 km** to manage utility costs.
- **Ash Pond Green Reclamation:** Restructuring of old ash ponds allows TPPs to reclaim land by deploying **solar or wind power installations** alongside eco-forest plantations.

Achievements (Status as of 2026)

- **Record Utilization Rates:** India generated approximately **340.11 million tonnes** of fly ash, successfully recycling a record **332.63 million tonnes**.

- **Diversified Sector Consumption:** Sector-wide consumption patterns show **32% used in roads/flyovers**, **27% inside the cement sector**, and **14% for brick manufacturing**. Mine backfilling took 11%.
- **Logistical Breakthroughs:** The Ministry of Railways partnered with NTPC Limited to introduce massive rail-freight concessions, enabling cross-country bulk transport of dry ash via specialized rail wagons.
- **Eco-Rejuvenation Technology:** TPPs successfully integrated CSIR-NEERI's specialized bio-stabilization techniques using targeted bamboo species to revitalize toxic, old ash dump sites into biodiverse zones.

Criticisms & Implementation Challenges

- **Uneven Regional Distribution:** Thermal clusters are heavily concentrated in specific geography zones (e.g., Singrauli), creating local massive ash surpluses where regional demand for cement or road building cannot keep pace with daily generation.
- **Logistical Bottlenecks:** Despite railway concessions, physical shortages of closed industrial railway wagons and handling infrastructure prevent the steady evacuation of ash to remote consumption states.
- **Legacy Ash Backlog:** While current annual fly ash output utilization is high, hundreds of millions of tonnes of old "legacy ash" remain trapped in decaying ash ponds, posing persistent seasonal heavy metal leaching risks into local water tables.
- **Cost Pushback:** Power sector operators continue to voice concerns that the strict penalty regime and partial transport subsidies risk escalating their structural operational costs, which could ultimately exert upward pressure on power tariffs

31. Eco-mark Rules (2024):

The **Ecomark Rules, 2024** were officially notified by the Government of India on **26 September 2024**, effectively replacing the outdated Ecomark Scheme of 1991.

Core Administrative Framework

- **Nodal Ministry**: Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Implementing Agency**: The **Central Pollution Control Board (CPCB)** is the primary implementing agency, working in close partnership with the **Bureau of Indian Standards (BIS)**.
- **Scheme Classification**: It operates as a **Central Sector Scheme** because it is fully regulated, structured, and overseen by the Central Government via central statutory bodies (CPCB and BIS) rather than being executed through state budget allocations.

- **Scheme Type**: It is an **Umbrella Scheme** supporting the broader, nationwide **Mission LiFE (Lifestyle for Environment)** framework.

Aims and Objectives

- Encourage consumer demand for **environmentally friendly products**.
- Promote **lower energy consumption**, resource efficiency, and a robust **circular economy**.
- Guide manufacturers to voluntarily transition towards **sustainable production practices**.
- Eliminate greenwashing by ensuring **accurate labelling** and preventing misleading product claims.

Key Features

- **Legal Backing**: Transitions from a loose 1991 administrative guideline to a formalized legislative ruleset under the Environment Protection Act framework.
- **Cradle-to-Grave Criteria**: Evaluates a product's full lifecycle impact, factoring in raw material sourcing, resource/energy usage, waste generation, recyclability, and hazardous emissions.
- **Dual Certification**: Products must meet specific environmental rules *and* possess a mandatory BIS certification or conform to relevant Central Quality Control Orders.
- **Validity and Reporting**: Certification is granted for **three years**. Certified firms must submit mandatory annual reports on a dedicated web portal by 31st May each year.
- **Third-Party Verification**: Introduces independent verifiers appointed by the CPCB to audit, monitor compliance, and prevent fraudulent claims.
- **Anti-Fraud Clauses**: The CPCB retains strict powers to suspend or cancel the Ecomark if false or concealed data is discovered.

Funding Mechanism

Self-Sustaining / Fee-Based: The regulatory mechanism relies primarily on a fee-structure levied on manufacturing applicants for the evaluation, verification, and grant of the Ecomark license. Budgetary support for the overarching technical development and CPCB digital infrastructure is drawn directly from Central Government allocations. **CriticismsAchievements**

- **Expanded Footprint**: Effectively standardized 17 consumer product categories, including household plastics, cosmetics, batteries, textiles, and electronic goods.

- **International Harmonization**: Established cross-border evaluation mechanisms via global partnerships like the Partnership for Action on Green Economy (PAGE) and the UNEP Eco-Advance project, facilitating unhindered international trade for certified Indian exports.
- **Institutionalized Surveillance**: Launched operational guidelines for dedicated market surveillance, an online knowledge platform, and formal independent verifier deployment.

Criticisms

Compliance Cost Barriers: Small and Medium Enterprises (SMEs) face a steep financial burden due to the high costs associated with dual BIS testing and third-party verification.

- **Voluntary Adoption Deficit**: Because the scheme remains completely voluntary, industrial uptake remains heavily limited to a niche segment of ESG-focused corporations.
- **Low Consumer Awareness**: Public recognition of the updated Ecomark logo remains low, leading to negligible domestic market premium or consumer demand for certified goods.
- **Industrial Lobbying Resistance**: Transition friction continues to persist as specific legacy industries (e.g., traditional plastics and chemical detergents) actively contest stringent circularity criteria