

HANDBOOK ON

GURUGRAM SUSTAINABILITY HANDBOOK 2026

A comprehensive guide to a
sustainable and resilient Gurugram



SECTOR OVERVIEWS



Water



Waste



Energy



Mobility



SPECIAL SECTIONS ON



Governance



Success Stories



AUGUST
2026

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Building a sustainable, empowered and inclusive Gurugram through knowledge, awareness and action.



The Gurgaon First Ecosystem

Gurgaon First Foundation (GFF), the non-profit arm of Gurgaon First, is a social impact organization working to promote sustainability, responsible citizenship, good governance, and community engagement. Through donations and CSR funding, GFF strives to undertake trainings, awareness campaigns, stakeholder engagement initiatives, educational programs, and citizen outreach. The Foundation works closely with government agencies, educational institutions particularly schools and colleges, as well as communities to advance sustainability awareness and action across the city.

Workshops/Roundtables: To drive civic change, Gurgaon First has spearheaded over 47 high-impact workshops, creating a credible, action-oriented platform for all stakeholders to voice critical urban concerns. Key roundtables and conclaves include Gurugram as a Smart City, Finding Traffic Solutions, Waste Management, Making Gurgaon Safer for Women, Eco-Green Initiatives, Tackling Water Crisis, RWA Conclave, School Conclave, Empowering Local Bodies, Energising Through Solar, Prevention of Sexual Harassment at Workplaces, Tackling Air Quality, Gurugram Environment Conclave, Solar RWA Meet, and Becoming Waste Wise. We bridge the gap between decision-makers and communities by bringing together government agencies, corporates, citizen groups, NGOs, RWAs, educational institutions and the media to drive collaborative action.

Handbooks: This is our fifth publication. Gurgaon First has published research on Gurugram's electricity sector (2013–14), and two handbooks: Gurugram Handbook on Solar (2015–16) and the Gurugram Handbook for Waste Management (2016–17). It has also collaborated with CSE on "Gurugram: A Framework for Sustainable Development."

Women Safety: Gurgaon First assists organisations in complying with the Sexual Harassment of Women at Work Places (Prevention, Prohibition and Redressal) Act, 2013, through its special window, "SASHAKT."

Music for a Cause: This is Gurgaon First's creative outreach initiative that harnesses the power of music and storytelling to inspire social and environmental action. Through original songs, music videos and short films on themes such as Aravalli conservation, wetland restoration, women's empowerment and constitutional values, it seeks to engage citizens—especially young people—and foster a deeper sense of responsibility towards society and the environment.

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सत्यमेव जयते

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Ministry of Statistics and Programme Implementation;
MOS (I/C) of the Ministry of Planning and
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MESSAGE

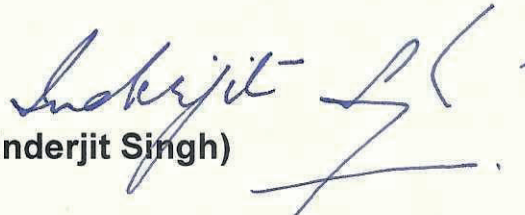
Gurugram stands today as one of India's most dynamic cities. Its remarkable growth over the past few decades has created unprecedented opportunities, but it has also brought complex challenges in the areas of water security, waste management, mobility, energy, governance and social inclusion.

As Gurugram continues to expand, sustainability must become the guiding principle of development. Economic progress and environmental stewardship are not competing priorities; they are complementary goals that will determine the quality of life for future generations. Building a resilient, inclusive and environmentally responsible Gurugram requires the collective efforts of Central / State Government Departments / institutions, industry, civil society, educational institutions and every citizen.

The Gurugram Sustainability Report 2026 is a timely and significant contribution towards this shared vision. By bringing together research, data and practical recommendations across key sectors, the report provides a valuable evidence-based resource for policymakers, administrators, businesses, researchers and citizens alike. More importantly, it encourages informed dialogue and collaborative action to address the city's evolving challenges.

I commend Gurgaon First Foundation for undertaking this important initiative. This is their fifth book on Gurugram. Their continued efforts to promote sustainable development, citizen engagement and knowledge-sharing have contributed meaningfully to Gurugram's development journey. I am confident that this report will inspire greater cooperation among all stakeholders and serve as a catalyst for practical solutions that will help build a greener, more inclusive and future-ready Gurugram.

I extend my best wishes for the success of this publication and hope it becomes an important reference for everyone working towards a sustainable future for our city.


(Inderjit Singh)

Dated: 30th July, 2026
Place: New Delhi

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Gurgaon First

E-mail: teamgurgaonfirst@gmail.com

Telephone : 0124-3637452

Website: www.gurgaonfirst.org

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Foreword

It gives me immense pleasure to present the Gurugram Sustainability Handbook 2026.

Over the past three decades, Gurugram has emerged as one of India's most dynamic economic centres, driving innovation, entrepreneurship and growth. At the same time, the city faces pressing sustainability challenges—rapid urbanisation, water scarcity, air pollution, waste management, biodiversity loss, mobility constraints and increasing climate risks.

Addressing these challenges requires informed citizens, responsive institutions and collaborative action across government, businesses, civil society and local communities.

This Handbook brings together key information, data, policies and initiatives across major sustainability sectors to provide a comprehensive reference for policymakers, businesses, researchers, educational institutions, resident welfare associations and citizens.

We hope it enhances awareness of sustainability issues, encourages evidence-based action and inspires greater collaboration towards building a resilient, inclusive and environmentally sustainable Gurugram.

I would like to sincerely thank the many organisations, researchers and institutions whose work has informed this publication. We are also grateful to the Raahgiri Foundation for its support in the production of this Handbook. A special word of appreciation goes to Aayush Dasgupta, an intern from O.P. Jindal Global University, whose dedication in researching various sectors and meticulously collating information made a significant contribution to the development of this handbook.

I hope this handbook serves not only as a repository of knowledge but also as a catalyst for collective action, inspiring individuals, institutions and communities to work together towards positive change.

Gurugram possesses an extraordinary pool of talent, innovation and civic spirit. If we can harness these strengths and engage our younger generation in shaping the city's future, we can together build a Gurugram that is sustainable, resilient and equitable for generations to come.



Shubhra Puri
Founder & Director
Gurgaon First



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Connect with us...

Email
contact@hexaclimate.com
Phone
+91-74777-83111

Location
8th & 9th Floor, Vatika Business Park, Sohna Road,
Gurugram, Haryana-122018

www.hexaclimate.com



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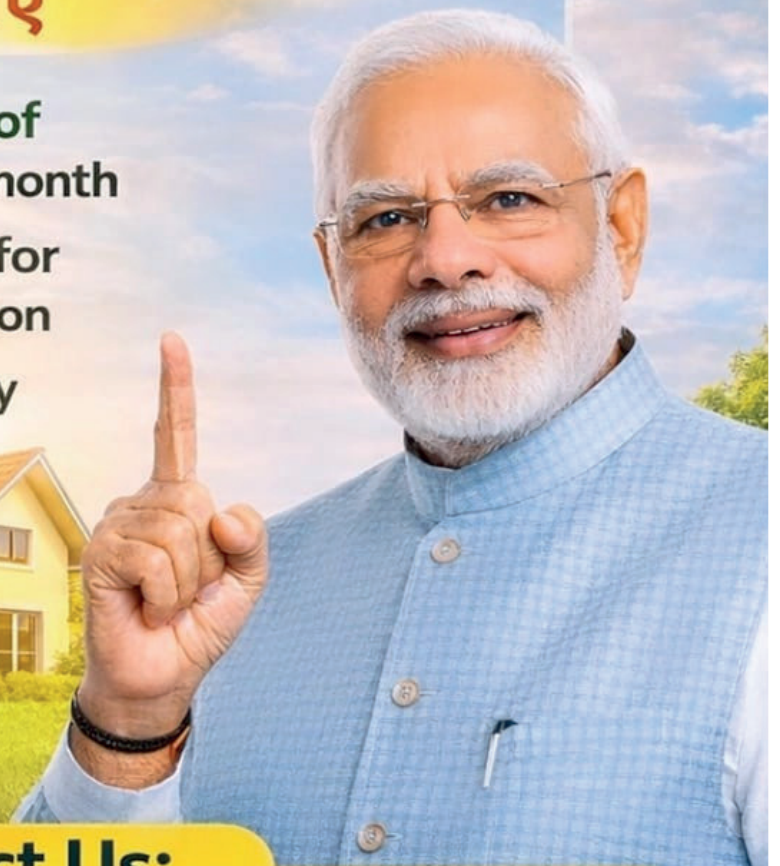


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Near Vaish college chownk tosham road Bhiwani 127021

1

Introduction



Gurugram Railway Station. Source: swarajyamag.com

From Gurgaon to Gurugram

By 2030, around 60 percent of the world's population is expected to live in urban areas, placing cities at the centre of the global sustainability agenda. In India, where urbanisation is accelerating rapidly, cities will determine whether the country achieves its economic, environmental and social development goals. As engines of growth and centres of innovation, they generate wealth and opportunity, but they also concentrate some of the nation's most pressing challenges, including resource depletion, environmental degradation, infrastructure deficits and governance complexities.

Few Indian cities have transformed as rapidly or as profoundly as Gurugram—once known as Gurgaon. Within three decades, an agrarian landscape on the southern edge of Delhi has evolved into one of India's most important engines of economic growth, a global hub for information technology, financial services, corporate headquarters and premium real estate. The change from Gurgaon to Gurugram in 2016 is more than a change in nomenclature; it reflects a city that has been continuously reshaped—economically, spatially and institutionally—over a remarkably short period.

Unlike most metropolitan centres, Gurugram also represents a distinct model of urbanisation, where private capital, market forces and regulatory liberalisation have collectively shaped the city's spatial and economic evolution. This model has generated extraordinary economic value. Successive waves of investment, supported by strategic connectivity through NH-48, the Delhi Metro, the Dwarka Expressway and proximity to the Indira Gandhi International Airport, have transformed Gurugram into one of India's fastest-growing metropolitan economies.

However, urban infrastructure, ecological assets and governance institutions have not kept pace with economic development. As a result, the city increasingly exhibits the characteristics of what urban planners describe as an infrastructure deficit within an economic surplus: exceptional private wealth coexisting with stressed public systems, declining ecological resilience and fragmented institutional capacity.

The consequences are visible across sectors. Gurugram experiences severe urban flooding during the monsoon while simultaneously facing chronic groundwater depletion and seasonal water scarcity. Rapid motorisation has outpaced investment in public transport, resulting in persistent congestion and high emissions. Waste generation continues to grow faster than scientific processing capacity. The gradual degradation of the Aravalli ecosystem, wetlands and green spaces has weakened the very ecological infrastructure upon which the city's long-term environmental security depends. These are often perceived as independent sectoral problems. In reality, they are manifestations of a far more systemic challenge.

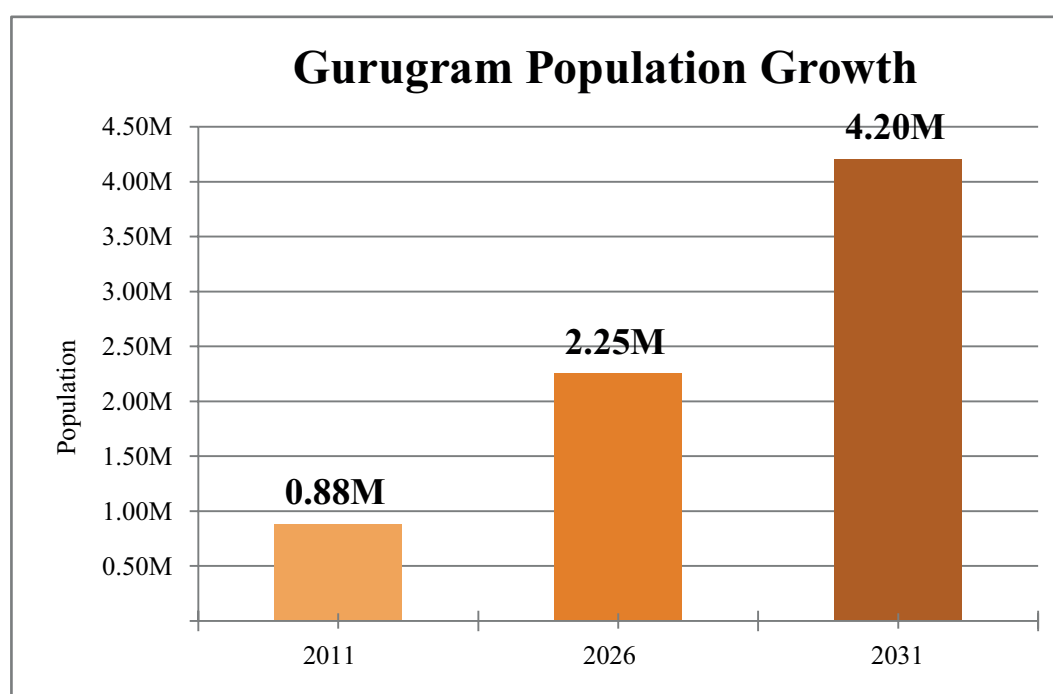
Besides, water, waste, energy, transport, ecological systems, public health, land use and governance together constitute an interconnected urban system. For example, mixed municipal waste generates leachate that contaminates groundwater aquifers, increasing dependence on imported water supplies. The disappearance of wetlands and natural drainage corridors intensifies urban flooding, disrupting transport networks and damaging public infrastructure. Similarly, inadequate public transport encourages private vehicle ownership, increasing congestion, air pollution, fuel consumption and energy demand. These examples illustrate the interconnected nature of urban systems, where failures in one sector inevitably create cascading impacts across many others.



Climate change further intensifies these existing vulnerabilities. Rising temperatures, increasingly erratic rainfall, prolonged heatwaves and extreme precipitation events are placing additional stress on ageing infrastructure, water resources, energy systems and public health. Cities that fail to integrate climate resilience into urban planning are likely to face growing economic and environmental costs.

Gurugram now stands at a defining moment in its urban journey. The choices made over the next decade—whether to continue responding to individual crises or to embrace an integrated model of sustainable urban development—will determine whether the city remains economically competitive, environmentally resilient and socially liveable.

Increasingly, sustainability is no longer solely an environmental concern but an economic imperative. Reliable infrastructure, clean air, water security, efficient mobility and high-quality public spaces have become critical determinants of investment, talent attraction and the long-term competitiveness of global cities.



Source: Census of India, 2011; GMDA Master Plan projections, 2026-2031.

1.1 Framework of the Report

This report adopts a broader understanding of sustainability than conventional service-delivery indicators. It aligns with the principles of United Nations Sustainable Development Goal 11 (Sustainable Cities and Communities), which emphasises cities to be inclusive, resilient, resource-efficient and environmentally secure. Further, the report recognises that urban resilience depends on strengthening both grey infrastructure, such as roads, water supply, drainage and electricity, and green infrastructure, including forests, wetlands, lakes and natural drainage systems.

The chapters that follow analyse the city's critical infrastructure sectors—**water, waste, energy and mobility**—identifying structural gaps between demand and capacity, assessing future pressures and evaluating opportunities for more resilient and resource-efficient service delivery. Together, these sectors form the backbone of a liveable, competitive and climate-resilient city, making their sustainable management essential to Gurugram's long-term development.

The chapter on Gurugram's **Forest Cover & the Aravallis**, examines the ecosystem's role in groundwater recharge, flood regulation, heat control, and ecological resilience, alongside the pressures of urbanisation, mining and encroachment that have placed it under increasing threat.

Building on this, the Handbook examines Gurugram **Inclusivity**, recognising that sustainable cities are measured not only by economic growth but also by equitable access to mobility, housing, public spaces, and essential urban services.

The **Governance** chapter argues that the challenges across these sectors stem from a common institutional constraint. Multiple agencies with overlapping mandates and fragmented responsibilities have limited coordinated implementation and accountability. Without governance reform, improvements are unlikely to be sustained or scaled across the metropolitan region.

The Handbook also highlights **Success Stories** that demonstrate practical pathways towards sustainable urban transformation. These case studies show that solutions already exist within the city and offer a foundation for recommendations that follow.

The **Conclusion** chapter brings together the sector-specific and cross-cutting findings into a coherent set of prioritised, actionable interventions.



2

Water



Chakkarpur-Wazirabad Storm Water Drain, Gurugram. Source: www.iamgurgaon.org

Securing Water for a Highly Urbanising City

Gurugram has been notoriously known as “Gurujam”¹ because of recurring monsoon flooding, yet it is simultaneously one of India’s most water-stressed urban districts. This contradiction is rooted in the transformation of Gurugram’s natural landscape. Once characterised by wetlands, ponds, seasonal water bodies and natural drainage systems, the city has progressively lost much of its capacity to absorb and retain rainwater as urbanisation has accelerated. At the same time, rising demand has increased dependence on imported canal water and groundwater. The challenge ahead is therefore not simply to find more water, but to restore the systems that allow the city to capture, recharge, reuse and retain it.

2.1 From a Water-Abundant Landscape to a Water-Stressed City

Until the 1960s, Gurugram functioned largely as a wetland landscape, characterised by an extensive network of rivers, wetlands, ponds and seasonal water bodies that formed an integral part of its natural hydrological system. The Sahibi River carried monsoon runoff from the Aravalli hills into the Najafgarh Jheel basin, creating a vast wetland ecosystem that stored floodwaters, moderated peak flows and naturally recharged groundwater aquifers. These interconnected water bodies served as the city’s ecological infrastructure, supporting agriculture, biodiversity and local livelihoods.²

Over subsequent decades, flood-control interventions undertaken to protect Delhi, together with real estate development and encroachment upon natural drains, led to the disappearance or degradation of many wetlands, ponds and streams. The loss of this natural water-retention network significantly reduced Gurugram’s capacity to capture rainwater, recharge groundwater and mitigate flooding.

2.2 Demand is Growing Faster than Supply

Water demand has risen sharply alongside Gurugram’s economic transformation. Expanding residential townships, commercial districts, office complexes, industries and construction activity have significantly increased water consumption.

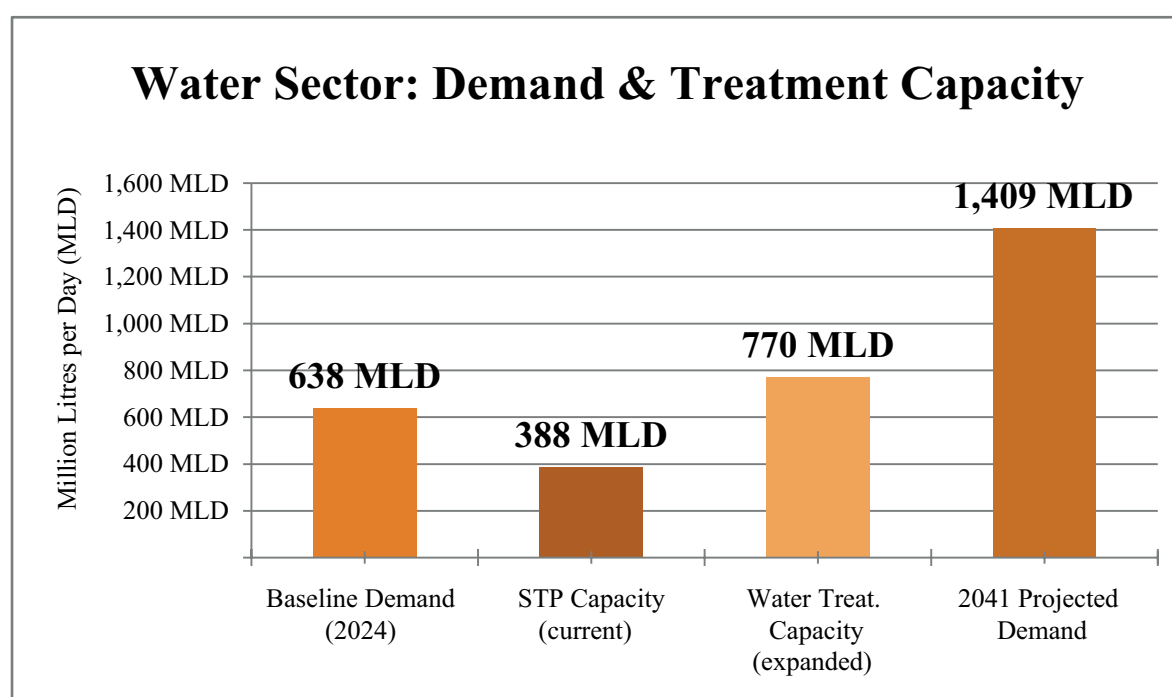
In 2024, the city’s estimated water demand stood at approximately 638 million litres per day (MLD), compared with around 570 MLD of canal-based water supply. The resulting gap is supplemented by groundwater extraction, adding to pressure on the city’s already stressed aquifers. Looking ahead, GMDA and IIT Roorkee project that water demand could reach 1,409–1,481 MLD by 2041, when Gurugram’s population is expected to exceed 6.6 million.³

For the supply, Gurugram relies on three principal sources of water:

1. Canal water imported from the Yamuna River through the Gurgaon Water Supply Canal and NCR Canal.
2. Groundwater extracted through thousands of public and private borewells.
3. Treated wastewater, which is increasingly reused for horticulture, construction and industrial purposes.

Raw water is diverted from the Western Yamuna Canal near Kakroi village into the Gurgaon Water Supply Canal before reaching the Basai Water Treatment Plant. Additional supplies are received through the National Capital Region Canal, which feeds the Chandu Budhera Water Treatment Plant.⁴





Source: IIT Roorkee / GMDA Water Master Plan 2031; GMDA press statements, 2026.

2.3 Governance of the Water Sector

The governance of water in Gurugram is shared across multiple agencies. The Gurugram Metropolitan Development Authority (GMDA) oversees the city's bulk water supply, master distribution network and trunk sewerage infrastructure. The Municipal Corporation of Gurugram (MCG) manages local distribution networks, local sewerage and stormwater drainage within its jurisdiction. The Public Health Engineering Department (PHED) continues to operate water infrastructure outside municipal limits, while the Haryana Irrigation and Water Resources Department manages canals supplying raw water from the Yamuna. Groundwater regulation falls under the Central Ground Water Authority, while the Haryana State Pollution Control Board monitors water quality and pollution control. The multiplicity of agencies requires strong coordination, particularly as infrastructure planning increasingly spans municipal boundaries. Despite clearly set institutional responsibilities, fragmented planning and coordination continue to affect the efficiency of water service delivery.

2.4 State of the Water Treatment Infrastructure

Gurugram's bulk potable-water supply is centred on two major water treatment plants at Basai and Chandu Budhera. Together, they currently provide around 670 MLD of treatment capacity. A new 100-MLD unit at Chandu Budhera is expected to raise the city's combined treatment capacity to 770 MLD.⁵

The raw water reaching Basai and Chandu Budhera has to travel a long distance before it ever reaches a tap. It originates at the Hathnikund Barrage on the Yamuna near Yamunanagar, which splits the river between the Western Yamuna Canal serving Haryana and Delhi and the Eastern Yamuna Canal serving Uttar Pradesh; from the Western Yamuna Canal, the Gurgaon Water Supply (GWS) Canal draws water at Kakroi in Sonipat and carries it close to 75 km to Basai. This channel is now being rebuilt: the state government has committed Rs. 1,993 crore to convert roughly 70 km of the GWS Canal into a fully underground pipeline, aiming to raise its carrying capacity from around 175 cusecs to 1,000 cusecs and to eliminate both transmission losses and water theft along the route.⁶

However, infrastructure expansion has not kept pace with urban growth. Ageing canals, transmission losses, pipeline leakages and continued dependence on groundwater and private water tankers continue to affect the reliability of water supply.⁷

2.5 Groundwater: Gurugram's Invisible Reserve Under Stress

Groundwater has become Gurugram's most heavily exploited water source. Over the past decade, groundwater levels have reportedly fallen by an average of around 1.5 -2 metres annually⁸, with the water table now lying nearly 39 metres below ground level across much of the district. Extensive construction, dependence on private borewells, inadequate recharge and widespread concretisation have severely disrupted the natural replenishment of aquifers.

Historically, Gurugram's lakes, *johads* (traditional water bodies) and wetlands captured monsoon runoff and recharged groundwater. A recent assessment of 644 identified water bodies found that 153 have become virtually irrecoverable while around 20 percent face significant pollution risk⁹. Meanwhile, 446 show potential for restoration. Their degradation and encroachment has caused rainfall to be rapidly conveyed through storm drains instead of infiltrating the ground. This has accelerated aquifer depletion and increased dependence on an already over-extracted resource.

2.6 Wastewater and Urban Drainage

Gurugram generates an estimated 450-460 MLD of sewage every day, against a combined treatment capacity that has reached 433 MLD across its seven sewage treatment plants (STPs). However, gaps in sewer connectivity mean that a significant volume of untreated wastewater bypasses the treatment system and enters local drains that ultimately flow into the Yamuna River. Although treated wastewater is increasingly being reused for industrial, horticultural and construction purposes, the remaining treated effluent is discharged into drainage channels.

Stormwater management presents an equally critical challenge. Despite receiving 600–700 mm of annual rainfall, Gurugram continues to experience severe waterlogging in monsoons. Construction over natural drains and recharge areas, together with encroachment on water bodies, widespread concretisation and inadequate maintenance of stormwater drains, has significantly reduced the city's capacity to absorb and convey rainfall. Rainwater that once infiltrated naturally is now rapidly channelled into storm drains, increasing flood risk while contributing little to groundwater recharge.

The widespread flooding witnessed in 2016 and in subsequent monsoon seasons exposed these structural deficiencies. Although several drainage improvement projects have since been undertaken, many flood-prone locations continue to experience recurrent inundation during heavy rainfall, underscoring the need for a more integrated approach to urban water management.

STPs in Gurugram

Existing STPs: 50 MLD STP, 68 MLD STP and 100 MLD STP at Dhanwapur. 50 MLD STP and 120 MLD STP at Behrampur. 20 MLD STP at Jahajgarh. 25 MLD STP at Manesar.

Proposed STPs: 100 MLD STP at Dhanwapur. 100 MLD STP at Behrampur. 100 MLD STP at Sector 107. 40 MLD STP at Naurangpur Village.

STPs being upgraded: 100 MLD STP at Dhanwapur. 120 MLD STP at Behrampur.

Source: Gurugram Metropolitan Development Authority

2.7 Rainwater Harvesting

Rainwater harvesting (RWH) is one of the most effective measures for addressing Gurugram's growing water crisis. With the city heavily dependent on rapidly depleting groundwater aquifers and facing increasingly erratic monsoon rainfall, capturing and recharging rainwater is critical. Recognising its importance, Haryana has made RWH mandatory for many residential, commercial and institutional buildings under its building regulations.

Despite these provisions, the effectiveness of rainwater harvesting in Gurugram remains limited. Many recharge pits are either non-functional or poorly maintained due to siltation, clogged recharge wells, inadequate maintenance and weak enforcement. At the city level, RWH infrastructure is implemented by multiple agencies—including GMDA, MCG, HSVP and private developers—depending on land ownership. Absence of regular inspections and performance audits has reduced the effectiveness of many existing systems.

Improving rainwater harvesting now requires a shift from installation to functionality. Existing systems must be restored, regularly inspected and maintained, while new developments, roads, parks and public spaces should integrate well-designed recharge structures. Better inter-agency coordination, stronger compliance mechanisms and periodic audits will be essential to maximise groundwater recharge, strengthen water security and build resilience to climate change.

2.8 Ongoing Government Projects and Civil Society Initiatives

Investments are being made in supply augmentation, waste water usage and revival of ponds. GMDA have initiated several projects to strengthen the city's long-term water security, including:

1. Modernisation of the Gurgaon Water Supply Canal into a closed pipeline system.
2. Expansion of the Chandu Budhera Water Treatment Plant by 100 MLD.
3. Construction of the 20.5-km Basai master pipeline.
4. Sector-level decentralised sewage treatment plants.
5. Rehabilitation of lakes and village ponds.
6. Expansion of treated wastewater reuse.
7. Proposed augmentation of Yamuna supplies through the Ganga-Yamuna Link Canal.

Collectively, these initiatives signal a gradual shift from supply augmentation towards a more integrated water management. In parallel, GMDA has made significant investments in strengthening the city's stormwater drainage infrastructure. It has developed three major master drainage corridors and is expanding this network by constructing new master drains and drainage systems. However, several drainage projects remain behind schedule. Annual desilting of drains before each monsoon season is also undertaken.

Alongside government-led investments, several civil society organisations have played an important role. Gurukul has been instrumental in restoring water bodies (Maujabad pond in Pataudi and Khentawas Pond in Farukkabad), promoting rainwater harvesting, groundwater recharge, water audits and citizen awareness. Under its 'Catch the Rain' campaign, Gurukul, in collaboration with the District Administration, inspected 152 rainwater harvesting structures across residential societies and institutions to improve their functionality. IAmGurgaon has undertaken the restoration of several ponds and wetlands, including the Sikanderpur Pond and Wazirabad Lake with support from GMDA and CSR funds thus helping revive urban biodiversity, improve groundwater recharge and create valuable public green spaces.

2.9 The Way Forward

Gurugram's long-term water security cannot rely solely on importing more water from distant rivers. While augmenting external supplies is necessary, future resilience depends on restoring the city's natural water cycle by protecting recharge zones, wetlands and drainage corridors as critical infrastructure. It will also depend not only on managing demand, but also improving water-use efficiency and expanding reuse as on creating new sources of supply. Protecting natural drains and water bodies from encroachment can help build flood resilience and groundwater recharge.

Priority actions include modernising canal infrastructure to reduce transmission losses; universal implementation of rainwater harvesting; restoration of ponds, wetlands and natural drainage channels; protection of groundwater recharge zones; decentralised wastewater treatment and large-scale reuse of treated wastewater; scientific regulation of groundwater abstraction; and regular maintenance and upgrading of the stormwater drainage network. Rainwater harvesting must be adopted at the city, community and household levels. Besides, water security cannot be delivered by the government alone. Resident Welfare Associations, developers, industries, educational institutions and citizens all have a role in reducing water consumption, harvesting rainwater, recycling greywater and protecting local water bodies.

Going forward, Gurugram's challenge is no longer simply to provide more water, but to transition from a linear system of extraction, consumption and discharge to a circular urban water system in which water is conserved, reused and returned to the local hydrological cycle.

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3

Waste



Bandhwari Landfill, Gurugram–Faridabad Road. Source: Wikimedia Commons

Building a Decentralised, Segregation-Driven Waste Management System

Waste management has emerged as one of the defining urban challenges facing rapidly growing Indian cities. Rising population, increasing consumption, changing lifestyles, and inadequate waste treatment infrastructure have placed unprecedented pressure on municipal systems. Persistent challenges, including open dumping and waste burning, inadequate waste treatment and disposal infrastructure remain significant impediments to scientific waste management.

Recognising that the principal challenge lay not in the absence of regulations but in their weak implementation, the Government of India notified the Solid Waste Management (SWM) Rules, 2026, replacing the SWM Rules, 2016. Rather than introducing an entirely new framework, the revised Rules seek to close the implementation gap left by the 2016 regulations by strengthening enforcement, clarifying institutional responsibilities, mandating digital monitoring, and embedding the principles of the circular economy and the 'Polluter Pays' approach.

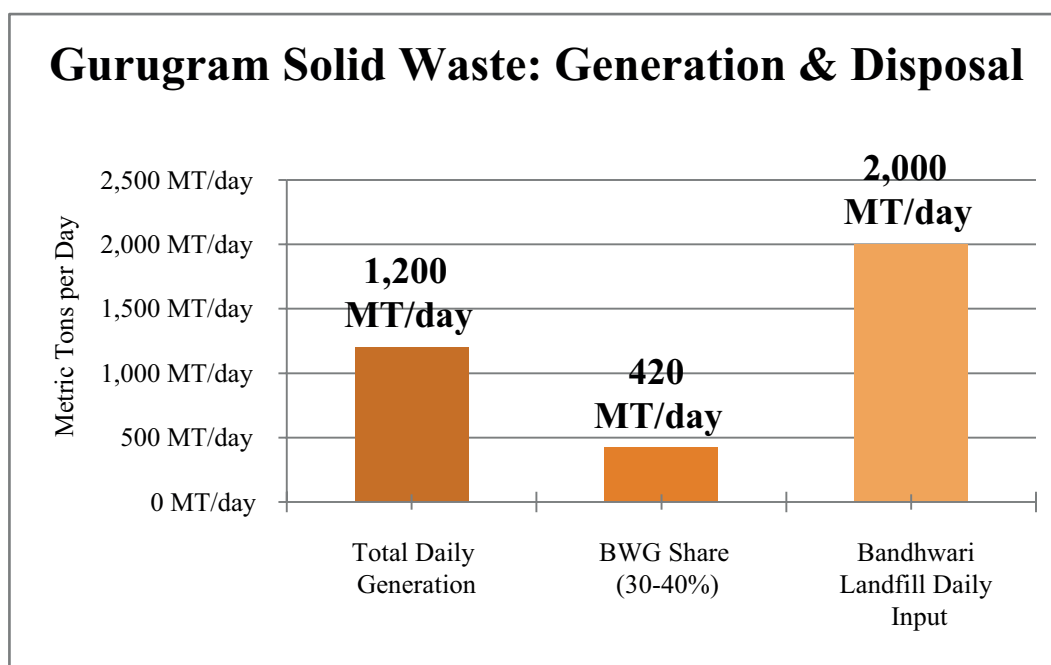
For rapidly urbanising cities such as Gurugram, the city has expanded collection and processing infrastructure and initiated remediation of legacy waste at the Bandhwari landfill. However, low levels of source segregation, continued dependence on landfill disposal and the need to strengthen decentralised waste processing remain key features of its current waste management system.

3.1 Waste Basics

As per Municipal Corporation of Gurugram (MCG), Gurugram generates an estimated 1,200–1,500 tonnes of municipal solid waste every day¹, with waste volumes increasing by nearly 5 percent annually. Residential areas account for approximately 60–70 percent of municipal waste generation. Organic waste constitutes the largest share of this stream, making decentralised composting and bio-methanation particularly attractive treatment options. The other waste streams are commercial and industrial establishments.

MCG has achieved 100 percent door-to-door waste collection across its jurisdiction. Mechanised road sweeping has been introduced on major roads to improve cleanliness and reduce roadside litter and dust. However, inconsistent source segregation and low recycling rates mean that a large proportion of the city's waste continues to be transported to the Bandhwari landfill on the Gurugram–Faridabad Road which uptill recently also received waste from Faridabad. The Municipal Corporation of Faridabad has stopped sending fresh municipal waste to Bandhwari and has diverted it to disposal sites at Pratapgarh and Mujheri. Despite ongoing remediation and legacy waste clearance efforts, the landfill still contains over 1.5 million tonnes of mixed waste, underscoring the city's continued dependence on landfill disposal rather than scientific waste processing.

On Swachh Survekshan 2024–25, Gurugram ranked 41st nationally among cities with a population of 3–10 lakh and seventh in Haryana, reflecting a marked improvement over the previous survey, although changes in the assessment categories limit direct year-on-year comparison. Its ranking in 2023-24 was 140th. While there may be progress on several assessment parameters, persistent issues such as low source segregation, recurring landfill fires, illegal dumping and waste burning indicate that significant on-ground challenges remain.



Source: MCG Solid Waste Management Cell; Bandhwari Landfill operations data.

3.2 Types of Waste and their Disposal

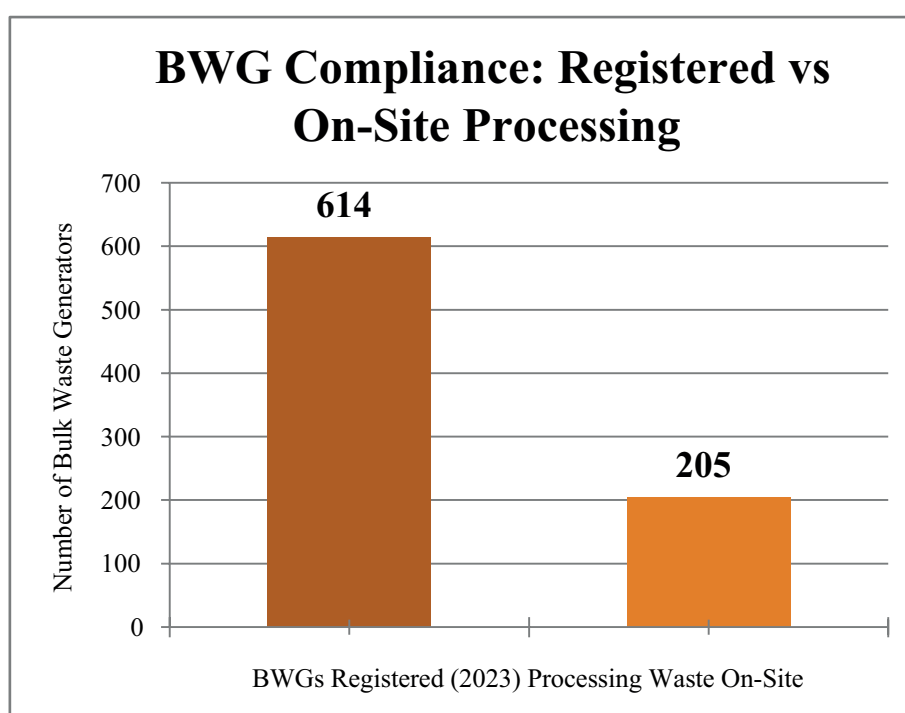
- 1. Municipal Solid Waste (MSW):** MSW is the everyday waste from households, markets and commercial establishments, the most common and voluminous category. According to MCG data, this waste stream is composed of approximately 40 percent wet/organic waste, 50 percent dry waste, and 10 percent inert material. This waste is collected through door-to-door collection and transported in trucks to the landfill site. Bulk Waste Generators (BWGs) are required to manage the waste they generate through on-site processing or other authorised waste management systems, in accordance with the Solid Waste Management Rules.
- 2. Construction & Demolition Waste (C&D):** C&D waste is generated during construction, renovation and demolition activities and is regulated under the Construction and Demolition Waste Management Rules, 2016. Gurugram generates an estimated 1,500 tonnes of C&D waste each day. Despite regulatory provisions requiring waste to be transported to authorised processing facilities, illegal dumping of C&D waste on roadsides, green belts, vacant plots and near water bodies remains common, attracting penalties under the Rules. The city's existing C&D waste processing facility at Basai has a design capacity of only 300 tonnes per day, well below the quantity generated. MCG has proposed a new 400-tonne-per-day processing facility.
- 3. E-Waste:** When electronic equipment such as mobile phones and laptops can no longer be used, it becomes e-waste, significant for Gurugram. The city generates an estimated 70,000 tonnes of e-waste every year.² E-waste is hazardous, as metals used in its manufacture can become toxic if disposed of improperly. It is governed by the E-Waste (Management) Rules, 2022, which assign producers collection targets rising from 60 percent in 2023-24 to 80 percent from 2027-28.³
- 4. Hazardous Waste:** Hazardous waste from industries, healthcare facilities and households is managed under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. Gurugram has no dedicated treatment, storage and disposal facility (TSDF); waste from industrial units is transported to Haryana's common TSDF at Village Pali, Faridabad.⁴

Biomedical waste is regulated separately, requiring facilities to route waste through an authorised Common Bio-Medical Waste Treatment Facility (CBWTF) within 75 km.⁵ Gurugram's CBWTF, run by Vulcan Waste Management at Bhondsi since 2003-04, serves over 1,300 hospitals and clinics across Gurugram and Rewari.⁶

5. **Wastewater:** Wastewater is discussed in greater detail in the Water chapter; a brief overview is provided here for continuity. The Gurugram Metropolitan Development Authority (GMDA) currently operates seven sewage treatment plants (STPs) with a combined treatment capacity of 433 MLD, while an additional 340 MLD SaTP has been proposed to meet future demand. Despite this growing treatment capacity, the reuse of treated wastewater remains limited.

3.3 Entities in waste management

1. The MCG is the apex body for waste management. It is responsible for collection, transportation, processing, and disposal of municipal solid waste. It has divided Gurugram into four zones spanning approximately 232 sq km across 36 wards⁷, and is responsible for collection, transportation, processing and disposal of municipal solid waste, largely through waste contractors and its own road-sweeping staff.
2. Other organisations, including Haryana State Industrial and Infrastructure Development Corporation (HSIIDC), also manage waste in parts of the city such as Udyog Vihar, creating a multiplicity of agencies with uneven service delivery.
3. The Solid Waste Management (SWM) Rules, 2016 define Bulk Waste Generators (BWGs) as entities generating more than 100 kg of waste per day. The SWM Rules, 2026 significantly expand this definition to also include establishments with a built-up area of over 20,000 m² or water consumption exceeding 40,000 litres per day. As a result, a much larger number of residential complexes, offices, hotels and institutions in Gurugram now fall within the BWG category and are required to segregate waste at source and process wet waste on-site wherever feasible.
4. Under the earlier definition, Gurugram had around 2,200 identified BWGs, including RWAs, hotels, hospitals and marketplaces.⁸ Of these, only 614 had registered with MCG by 2023, and just 205 reported on-site wet waste processing, indicating low compliance. As of 2024, around 74 percent of identified BWGs had still not registered on MCG's Waste Management Portal, underscoring the implementation gap. With the expanded coverage under the SWM Rules, 2026, strengthening compliance through registration, source segregation, on-site processing, monitoring and enforcement will become even more critical to reducing the city's dependence on landfill disposal and expanding decentralised waste management.
5. The informal sector plays a significant role in Gurugram's waste economy, though it remains largely outside MCG's formal contracting structure. A substantial share of waste from BWGs and households is handled by the informal sector. Nationally, an estimated 2.2 million people are engaged in waste picking⁹, within a wider recycling economy of kabadiwalas and scrap dealers numbering close to 4 million.¹⁰ This network handles a disproportionate share of dry waste recovery, nationally, including processing of over 90 percent of e-waste.¹¹



Source: MCG Bulk Waste Generator registry, 2023.

3.4 The Bandhwari Landfill

Mixed waste continues to enter Gurugram’s collection system and is ultimately transported to the Bandhwari landfill. Although legacy waste at the landfill has been reduced from nearly 30 lakh tonnes to around 15 lakh tonnes over the past two years¹², the site remains heavily burdened by accumulated mixed waste. Inadequate source segregation and the mixing of waste during collection reduce opportunities for recycling and composting, reduce treatment efficiency, and erode public confidence in segregation efforts.

Bandhwari has also become increasingly vulnerable to fires as decomposing legacy waste releases methane. MCG and Fire Department records indicate more than 70 fire incidents between March and June 2024 alone, followed by another series of major fires in April 2025 that blanketed neighbouring areas with thick smoke and toxic fumes. The Supreme Court subsequently observed that the recurring fires posed “severe environmental and health implications.” Plastic waste, which accounts for nearly one-quarter of the incoming waste stream, has been identified as a major contributor to the intensity and persistence of these fires. Earlier, a waste-to-energy plant was proposed at Bandhwari. The project proposal has now been shifted to Manesar, where it is slated to generate both biogas and electricity. However, the move has attracted sustained criticism from environmental groups and local residents over concerns about its potential environmental impacts.

3.5 Environment and Public Health Implications

Open dumping and waste burning affect local air quality, while poorly managed landfill operations risk groundwater contamination. Plastic and construction debris frequently clog stormwater drains, worsening monsoon flooding. Legacy waste at Bandhwari remains one of the city’s most significant environmental liabilities. The waste management challenge therefore intersects directly with Gurugram’s broader public health, climate resilience and environmental sustainability objectives.

3.6 Emerging Models for Decentralised Waste Management

1. IAmGurgaon, in partnership with MCG, has established a network of community dry waste collection centres called “Samadhaan Hubs” at Block D near Khushboo Chowk (Sector 26A), Badshahpur Forest Corridor (Sector 69), Aravalli Creek (Sector 56) along Golf Course Road, Sushant Lok 2, Prachin Hanuman Aur Shani Dev Mandir (off Sunset Boulevard). Between 2022 and June 2024, these centres collected over 174,800 kg of dry waste, with plastics channelled to partner organisations such as Avacayam for upcycling into bags, mats and planters made by artisans with disabilities. Another such collection centre is also located at Sustainable Oasis in Leisure Valley Park (Sector 29).
2. Saahas has promoted source segregation through initiatives such as “Alag Karo—Har Din Teen Bin” and established EcoGram, an integrated decentralised waste management facility comprising a 2 TPD bio-methanation plant, a 1 TPD composting unit and a 5 TPD Material Recovery Facility (MRF) on land allotted by MCG.
3. Raahgiri Foundation, in partnership with Nagarro and MCG, is establishing a 42 TPD Material Recovery Facility (MRF) in Sector 109 to strengthen decentralised dry waste processing and reduce the quantity of waste transported to the Bandhwari landfill.
4. Over the past decade, several Bulk Waste Generators (BWGs) have adopted decentralised waste management practices. Hotels such as The Oberoi, The Leela and The Westin; hospitals including Medanta, Artemis and Fortis; and over 40 residential communities such as Ridgewood Estate, Hamilton Court, Nirvana Country and Heritage City have implemented source segregation and on-site composting systems.
5. Independent waste management companies such as Green Bandhu and Balancing Bits have implemented decentralised composting, biomethanation and waste processing systems across residential colonies, institutions and commercial establishments.
6. Corporate social responsibility programmes supported by organisations including Feedback Infrastructure, Coca-Cola, Tetra Pak and the DLF Foundation have strengthened decentralised waste management through awareness campaigns, source segregation, recycling and community infrastructure.

Collectively, these initiatives demonstrate that Gurugram already possesses the technical expertise, institutional partnerships and community-led models needed for effective waste management. The challenge now is to replicate and scale these proven approaches across the city through stronger enforcement, institutional support and sustained citizen participation.

3.7 Policy Reform and New Projects

While the Solid Waste Management Rules, 2016 established the framework for scientific waste management, the SWM Rules, 2026 seek to address their principal shortcoming, weak implementation.¹³ The revised Rules place greater emphasis on enforcement through mandatory registration of Bulk Waste Generators (BWGs), digital monitoring, clearer institutional responsibilities and stronger penalties based on the ‘Polluter Pays’ principle.

Meanwhile, the Haryana Government and the Municipal Corporation of Gurugram (MCG) have initiated several reforms, including expanded BWG regulation, greater emphasis on decentralised waste processing, improved monitoring systems and citizen awareness initiatives.

In April 2026, MCG floated a Rs 606.66-crore, five-year tender to overhaul Gurugram's door-to-door waste management system. Divided into two city wide clusters, the project covers door-to-door collection, waste segregation and transportation to Bandhwari, with the aim of establishing a more structured and technology-driven system for municipal waste management. The tender was subsequently put on hold over differences on service rates and was reissued in June at a revised estimated cost of Rs 647.78 crore. The repeated delays highlight the difficulty of establishing a stable, city wide waste collection system following the termination of the previous concessionaire in 2024.¹⁴

While these reforms represent an important shift towards a more accountable and resource-efficient waste management system, their success will ultimately depend on consistent enforcement, institutional capacity, and effective coordination across the multiple agencies.

3.8 The Way Forward

While collection coverage has expanded considerably, segregation at source, treatment infrastructure, enforcement, and institutional coordination have not kept pace with rapid urbanisation, leaving the city heavily dependent on landfill disposal. Greater use of GPS and digital monitoring for waste collection and service delivery can help better waste collection and service delivery. Compliance by Bulk Waste Generators (BWGs) should be strengthened through a combination of incentives and enforcement. BWGs that successfully segregate and process waste on-site could be recognised through financial or regulatory incentives, while persistent non-compliance should attract stricter penalties and regular inspections.

The informal waste sector should be formally integrated into the waste value chain through recognition, capacity building and access to social protection, enabling higher recycling rates while improving livelihoods.

The next phase of reform must shift from a "collect-and-dump" model to a circular economy in which waste is systematically reduced, segregated, recovered, recycled, and reused. This will require stronger enforcement, expanded treatment infrastructure, greater accountability among institutions and Bulk Waste Generators, and sustained citizen participation. Ultimately, Gurugram's success should be measured not by how much waste it collects, but by how much it prevents from reaching landfills.

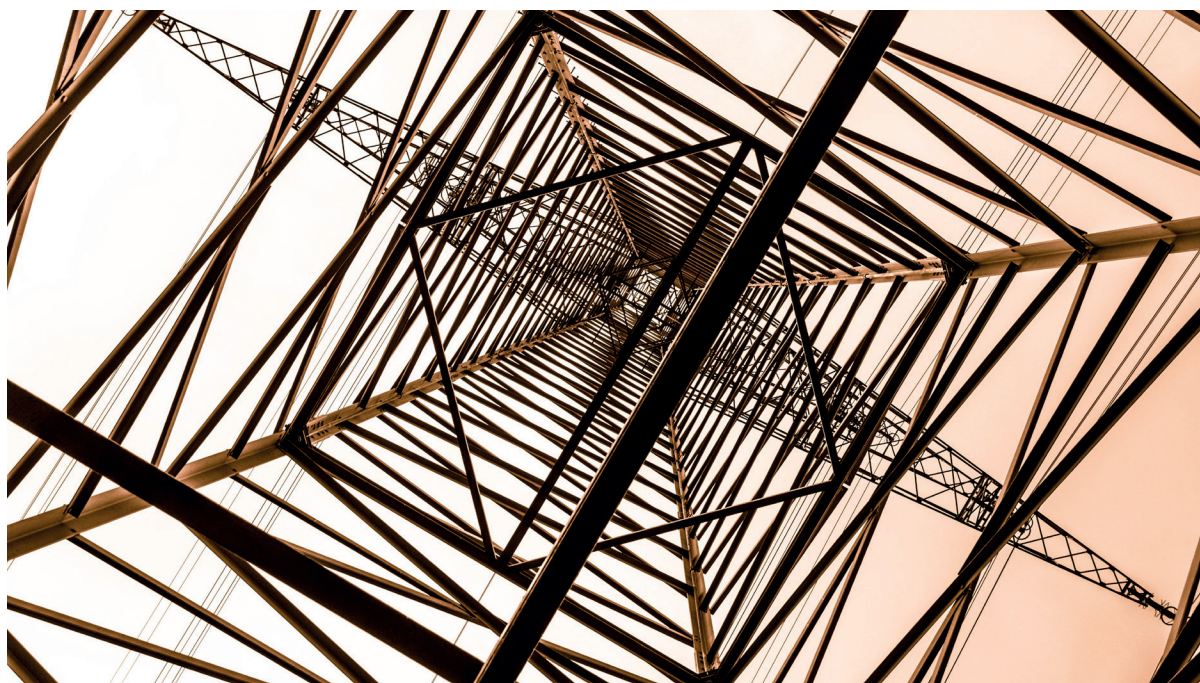
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4

Energy



Transmission Tower. Source: www.Pixabay.com

Towards a Reliable and Clean Energy Future

The summer of 2026 underscored the importance of reliable electricity in Gurugram. A transformer failure at the 220-kV Sector 72 substation on 22 May triggered widespread power outages, disrupting electricity supply for over six hours and suspending Rapid Metro services.¹ The incident, followed by further outages during the peak summer months,² highlighted the growing strain on the city's electricity distribution network.

Electricity has been central to Gurugram's emergence as one of India's leading business hubs. From high-rise commercial districts to residential townships and metro systems, virtually every aspect of the city's economy depends on a reliable and resilient power supply. Rapid development, rising incomes and increasing dependence on air conditioning have driven peak electricity demand to a record 2,550 MW in 2026, more than double the level recorded in 2012.³ With climate change expected to intensify cooling demand further, ensuring reliable 24×7 electricity has become central to the city's economic competitiveness and quality of life.

Haryana has significantly expanded electricity generation and Gurugram remains one of DHBVN's best-performing distribution circles. But recent outages demonstrate that the challenge is no longer simply supplying sufficient power. The critical issue is the resilience of the distribution network that delivers electricity to homes, businesses, transport systems and other essential services. The challenge lies in building a distribution system that is reliable, resilient, energy-efficient as well as accelerating the integration of rooftop solar and other distributed clean-energy resources.

Gurugram Electricity at a Glance

Peak Demand (Summer 2026): 2,550 MW, up from around 1,650 MW in the summer of 2015 and 1275 MW in 2012.

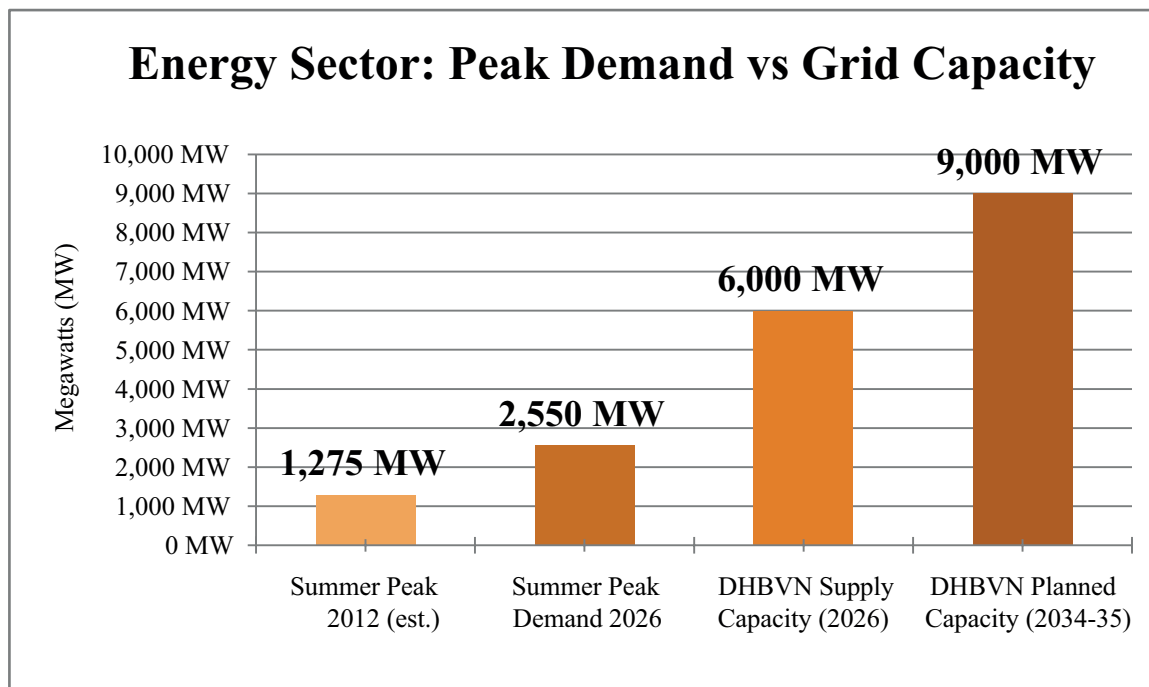
AT&C Losses: Among DHBVN's lowest circle-wide, no published percentage in the source chapter

Rooftop Solar Potential: ~600 MW estimated citywide potential; current deployment remains well below this

DG Capacity: 10,500+ generator sets citywide, ~2,000 MW combined installed capacity, ~80 percent serving commercial/industrial consumers.

4.1 Rising Electricity Demand

Electricity demand in Gurugram has grown steadily alongside the city's economic transformation. Power demand rose from just 225–350 MW between 2000 and 2005 to 950–1,000 MW by 2010, and touched around 1,700 MW by the summer of 2019.⁴ Peak demand, driven largely by residential cooling loads during the summer months, has increased from around 1,650 MW in the summer of 2015 to 2,550 MW during the summer of 2026. The city's electricity demand has been growing at an average annual rate of 10–15 percent, placing increasing pressure on the power infrastructure. This has necessitated continuous investment in transmission and distribution infrastructure.



Source: DHBVN records; Gurugram Smart Grid Project documentation, 2026.

4.2 Electricity Supply and Distribution

Electricity supplied to Gurugram is procured from power stations in Hisar, Panipat and Yamunanagar.⁵ It is transmitted through the interstate network, whose responsibility is held by the Haryana Vidyut Prasaran Nigam Limited (HVPNL), before being distributed within the city by Dakshin Haryana Bijli Vitran Nigam (DHBVN) through an extensive network of substations, feeders and distribution transformers.

Gurugram accounts for nearly one-third of the total electricity load served by DHBVN and contributes more than 42 percent of its revenues, reflecting the city's importance within Haryana's electricity sector. It is also one of DHBVN's best-performing distribution circles, characterised by relatively low Aggregate Technical and Commercial (AT&C) losses (under 10 percent), near-universal consumer metering and bill collection efficiency approaching 100 percent. However, rising peak demand and the growth of high-density residential, commercial and industrial developments have placed increasing pressure on the distribution network. Although the network has expanded significantly over the past decade, localised outages, transformer overloading and voltage fluctuations continue to occur during periods of peak summer demand.

Rooftop solar installations have increased steadily in recent years but continue to meet only a small share of the city's electricity demand. Under the PM Surya Ghar Muft Bijli Yojana, Haryana's Solar Policy and DHBVN's net-metering framework, consumers are increasingly being encouraged to adopt distributed solar generation. Currently, DHBVN is responsible for processing rooftop solar applications, net-metering approvals and grid integration, Haryana Renewable Energy Development Agency (HAREDA) serves as the State Nodal Agency for renewable energy, formulating policy and coordinating implementation.

The city nevertheless remains overwhelmingly dependent on grid-based electricity, underscoring the need to strengthen distribution infrastructure, improve grid resilience and accelerate the adoption of distributed renewable energy.

4.3 Modernisation of the Distribution Infrastructure

While Haryana possesses adequate generation capacity, strengthening Gurugram's distribution network remains an equally important priority. And it is this fact that underlines the reliance of many societies upon diesel generators.

However, over the past decade, DHBVN has undertaken one of India's largest urban electricity modernisation programmes to strengthen Gurugram's distribution network. The Rs. 1,608-crore Gurugram Smart Grid Project, launched in 2017, was designed to deliver 24x7 reliable power supply while progressively reducing the city's dependence on diesel generators.⁶

The programme includes underground cabling, substation augmentation, Ring Main Units (RMUs), smart metering, SCADA-enabled monitoring and network automation to improve redundancy as well as protecting grid equipment from the extreme weather conditions of summer in an underground system.⁷

While most components of the project have been implemented, some works—particularly the completion of underground cabling in certain areas—remain pending due to implementation and contractual challenges.⁸ Timely completion of these works will be critical to realising the full benefits of the smart grid and ensuring a seamless transition to a modern electricity distribution system.

As DHBVNL modernises Gurugram's electricity network, it must also strengthen grid resilience. Experts say that the transmission and distribution system should be designed to meet the N-1 contingency criterion, meaning that the failure of any single transformer, transmission line or substation should not interrupt power supply. This requires adequate backup capacity at critical substations, ring-fed distribution networks, Advanced Distribution Management Systems (ADMS), online transformer monitoring and strategic battery energy storage.

Besides, DHBVNL engineers should receive regular training in digital technologies and cybersecurity, while critical spares and modern fault detection systems for underground cables should be maintained to ensure rapid restoration and minimise outages. Strengthening preventive maintenance and asset management is also a must.

4.4 Diesel Generators: Gurugram's Parallel Power System

Frequent power interruptions have led residential societies, commercial establishments and industries to create a parallel electricity system based on diesel generators. Data obtained through RTI responses indicate that Gurugram has over 10,500 diesel generator sets with a combined installed capacity of nearly 2,000 MW, almost 80 percent of which serves commercial and industrial consumers.

While diesel generators provide essential backup during outages, they impose significant economic, environmental and public health costs. Electricity generated through diesel typically costs Rs.30-35 per unit, compared with around Rs.8 per unit from the grid, increasing operating costs for businesses and maintenance charges for residential communities. Dependence on imported diesel also exposes consumers to fuel price volatility and broader energy security risks.

The environmental costs are equally significant. Diesel generators emit particulate matter, nitrogen oxides and carbon dioxide directly into residential neighbourhoods and commercial districts, worsening air quality in one of India's most polluted urban regions. Unlike emissions from distant power plants, these pollutants are released where people live and work, increasing exposure to harmful air pollution.

The widespread use of diesel generators reflects more than a reliance on backup power; it highlights the need for a more reliable and resilient electricity distribution system that does not have to pollute the air quality. In that sense, solar energy may provide the solution to this conundrum.

4.5 Solar Rooftops: Gurugram's Untapped Opportunity

Despite its heavy dependence on diesel backup, Gurugram has the potential to become one of India's leading urban solar cities. The city receives high solar irradiation, has extensive rooftop space across residential societies, commercial buildings and industries, and benefits from supportive policies under the PM Surya Ghar Muft Bijli Yojana, Haryana's Solar Policy and net-metering regulations. According to DHBVN, around 6,300 rooftop solar systems, with capacities ranging from 2 kW to 10 kW, have already been installed in Gurugram.

As the host city of the International Solar Alliance (ISA), Gurugram should lead by example in accelerating rooftop solar adoption. With its extensive commercial, institutional and residential building stock, the city has the potential to become a national model for solarisation and a leading solar city. Studies estimate that Gurugram could generate nearly 600 MW through rooftop solar alone, meeting a significant share of its daytime electricity demand. Haryana's net-metering framework allows consumers to export surplus electricity to the grid, while rooftop solar implementation has now shifted from HAREDA to DHBVN, which is responsible for consumer outreach, approvals, net metering, grid connectivity and implementation of the PM Surya Ghar Muft Bijli Yojana.

Expanding rooftop solar—particularly when combined with Battery Energy Storage Systems (BESS)—can reduce dependence on diesel generators, lower electricity costs, reduce transmission losses and emissions, and help meet peak summer demand. For commercial and industrial consumers, replacing diesel generator (DG) sets with solar-plus-storage can reduce the cost of backup power from around Rs 30–35 per unit to Rs 6–8 per unit, while insulating consumers from volatile fossil fuel prices.

Despite supportive policies, rooftop solar adoption continues to be constrained by high upfront costs, structural limitations in older buildings, limited awareness, financing barriers and procedural delays in getting approvals and net metering. Addressing these barriers will require greater engagement with RWAs and developers as well as residential, industrial and commercial consumers.

Several landmark projects of rooftop solar in Gurugram include installations at The TERI Retreat, the HAREDA Office Building, Hero MotoCorp's corporate office, the Power Grid Corporation of India campus, the Om Shanti Retreat Centre, and the Wellington Estate RWA.

4.6 The Way Forward

Unlike many of Gurugram's environmental challenges, the pathway towards a more sustainable electricity system is relatively clear. Priorities should include completing the Smart Grid programme, strengthening network redundancy, accelerating rooftop solar deployment, integrating battery energy storage, expanding smart metering and promoting energy-efficient buildings and appliances.

Reducing Gurugram's electricity stress will require as much attention to managing demand as expanding supply. LED lighting, efficient cooling and smart building systems can help flatten peak demand, while smart-grid technologies, better network planning, skilled manpower and rapid fault restoration can make the distribution system more resilient.

Over time, Gurugram should progressively reduce its dependence on diesel generators by creating an electricity system that is cleaner, more resilient and increasingly decentralised. Strictly enforce rooftop solar mandates for large commercial buildings, institutional campuses and group housing societies, while streamlining the net-metering process is needed. The objective should be a grid that is not only bigger, but smarter, cleaner and more dependable.

Reliable electricity is no longer merely a utility service, it is critical infrastructure underpinning investment, productivity, public health and urban competitiveness. Gurugram's future competitiveness will depend not only on having adequate electricity generation but on delivering reliable, affordable and low-carbon power to every consumer.

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5

Mobility



Gurugram's Rapid Metro running past DLF Cyber City. Source: www.gmrl.org.in

From Moving Vehicles to Moving People

Despite decades of investment in highways, roads and flyovers, commuting in Gurugram remains slow, unpredictable and stressful. As the city's economy and population continue to grow, the challenge is no longer simply one of moving vehicles, but of moving people efficiently, safely and sustainably.

Every day, hundreds of thousands of journeys are made across Gurugram, connecting homes, workplaces, schools, industrial areas and commercial centres. The efficiency of these journeys increasingly determines the city's economic productivity, environmental sustainability and quality of life. Mobility is therefore no longer merely a transport issue; it has become a strategic determinant of Gurugram's future competitiveness.

However, while infrastructure expansion has improved connectivity, the same cannot be said for mobility. Transport investments have focused primarily on facilitating vehicle movement rather than improving people's access to jobs, education and services. Public transport has expanded more slowly than the city itself, while walking and cycling have received comparatively little attention despite accounting for a significant proportion of daily trips.

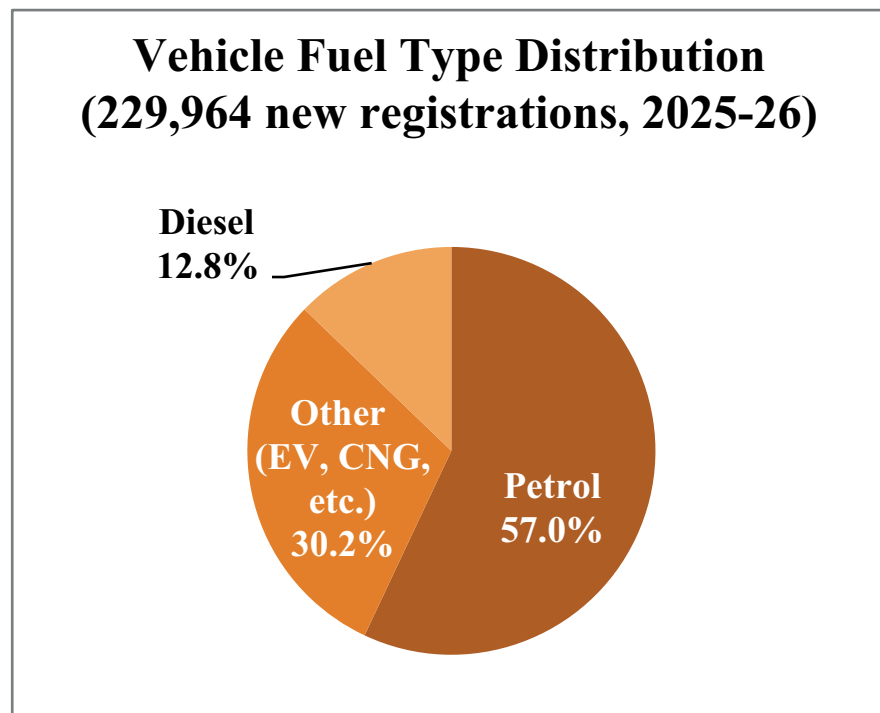
5.1 Road Network

Gurugram has an extensive road network of approximately 953 km¹, comprising national highways, expressways, arterial roads and local streets. Over the past two decades, the city has witnessed substantial investments in transport infrastructure, including the Dwarka Expressway, Southern Peripheral Road (SPR), Kundli-Manesar-Palwal (KMP) Expressway, Delhi-Jaipur Highway (NH-48) upgrades, the Golf Course Road and Golf Course Extension Road corridors, elevated corridors, grade separators, flyovers and underpasses.

Several new road projects, including the proposed Gurugram Ring Road and elevated corridors along key arterial routes, are also planned to improve connectivity and decongest traffic. Together, these investments have significantly enhanced regional connectivity, reduced bottlenecks on major corridors and supported the city's outward expansion.

Domination of private vehicles: While these investments have expanded road capacity and improved connectivity, they have also supported a mobility pattern that remains heavily dependent on private vehicles. Gurugram's vehicle mix spans two-wheelers, passenger cars, three-wheelers, buses and commercial and heavy goods vehicles. Gurugram's high levels of car ownership and daily commuting continue to shape both traffic conditions and transport-related emissions.

Fuel Choices and the Mobility Transition: As seen in the box below, petrol continues to dominate Gurugram's new car market. Of the 229,964 new vehicle registrations in 2025–26, 57 percent were petrol-powered, while diesel accounted for 12.8 percent. The remaining 30.2 percent comprised EVs, CNG and other fuel types. The data indicate that the transition towards cleaner mobility remains at an early stage, with conventional petrol vehicles continuing to account for the majority of new registrations.



Source: Regional Transport Office, Gurugram, vehicle registration data, 2025-26.

5.2 Public Transport Network

Bus: In 2018, Gurugram launched its own city bus service, Gurugaman, marking the city's first dedicated urban bus network. The service currently operates around 154 buses and carries approximately 85,000 passengers daily². Recognising the need for a stronger public transport system, the city has initiated a major expansion programme that includes the induction of electric buses and construction of new depots, terminals and bus stops. The first batch of 100 electric buses has begun arriving, while proposals have also been submitted to the Government of India for an additional 500 electric buses to meet the city's growing mobility needs. Route rationalisation and network planning are also being undertaken to improve coverage, strengthen last-mile connectivity and better integrate buses with the Metro network.

Metro: Gurugram is currently served by the Delhi Metro Yellow Line. Recognising that economic activity has steadily shifted towards Golf Course Extension Road, Southern Peripheral Road, New Gurugram and the Dwarka Expressway corridor, the Government of Haryana has approved the construction of a 28.5-km Gurugram Metro corridor comprising 27 elevated stations at an estimated cost of over Rs.5,500 crore.³ Once completed, the project will significantly improve connectivity to emerging residential and commercial districts that currently remain heavily dependent on road-based transport. Construction has commenced on the project, which will connect Millennium City Centre with Cyber City via Old Gurugram, with a spur towards the Dwarka Expressway.

Rapid Metro: The Rapid Metro, developed by DLF Ltd and IL&FS and commissioned in phases between 2013 and 2017, was India's first fully privately developed metro system. In 2019, after the private concessionaire withdrew, ownership was transferred to the Haryana Mass Rapid Transport Corporation (HMRTC), while operations and maintenance were entrusted to the Delhi Metro Rail Corporation (DMRC). The network was designed to complement, rather than duplicate, the Delhi Metro Yellow Line by providing last-mile connectivity between Sikanderpur Metro Station, DLF Cyber City and the residential neighbourhoods of DLF Phases II to V.⁴

5.3 Mobility Challenges

The Comprehensive Mobility Management Plan (CMMP): Developed by GMDA in 2020, it outlines the mobility challenges and provides a long-term roadmap for creating an integrated transport system as well as a shift from car-centric transport system from 2021 to 2041.⁵ Its vision is focussed towards improving accessibility through metro expansion, a stronger bus network, better last-mile connectivity, intelligent traffic management adaptive traffic signalling, transit-oriented development, and high-quality pedestrian and cycling infrastructure. The Plan outlines that Gurugram's next phase of development must move beyond building more roads towards building a mobility system that enables people to move more efficiently, safely and sustainably.

Based on CMMP, there are six structural challenges that continue to constrain sustainable mobility in Gurugram:

A Car-Centric Development Model: With approximately 323 cars per 1,000 residents, the city has one of the highest rates of private vehicle ownership in India, while more than 50,000 new vehicles are added annually.⁶ Rising incomes, dispersed urban development and inadequate public transport have reinforced this dependence. Unlike older Indian cities that evolved around compact neighbourhoods and established public transport corridors, Gurugram has expanded through low-density residential and commercial developments spread across multiple growth corridors. As employment centres have shifted from Cyber City to Golf Course Extension Road, Southern Peripheral Road, New Gurugram, the Dwarka Expressway and Manesar, commuting distances have increased, making private vehicles the preferred mode of travel for many residents. Consequently, demand for road space continues to outpace the city's capacity to provide it, contributing to chronic congestion.

Congestion Has Become an Economic Challenge: While highways, underpasses and high-speed corridors enhance regional connectivity, they do not necessarily alleviate urban congestion if bottlenecks persist on arterial, sub-arterial and neighbourhood roads. Traffic routinely affects NH-48, Golf Course Road, Sohna Road and several major intersections⁷ increasing travel times for commuters and freight alike. Longer journeys reduce labour productivity and diminish the overall efficiency of the city's economy. Stop-start traffic also contributes to higher emissions of particulate matter and greenhouse gases. The causes of congestion extend well beyond inadequate road capacity. The CMMP identifies excessive dependence on private vehicles, poor lane discipline, inefficient junction design, inadequate parking management, roadside encroachments and the limited attractiveness of public transport as the principal factors contributing to recurring bottlenecks across the city. Simply widening roads is therefore unlikely to provide a lasting solution.

Public Transport Has Not Kept Pace with Urban Growth: Although Gurugram is served by Metro, Rapid Metro and city bus services, public transport coverage remains uneven for a city of its size and economic significance. Until the metro is expanded, reliance upon private vehicles shall continue. The bus system faces similar constraints. Many newer sectors remain inadequately served, service frequencies are often low, and buses operate in mixed traffic without dedicated lanes, reducing reliability during peak hours. As per CMPP, there are 18 buses per lakh of population (as opposed to the accepted norm of 60 buses per lakh of population), accounting for only 7.3 percent of public transport trips. As a result, even commuters who use Metro services frequently depend on private vehicles, taxis or auto-rickshaws to complete the first and last stages of their journey.

Untapped Potential of Walking and Cycling: Perhaps the most striking finding of the Comprehensive Mobility Management Plan (CMMP) is that nearly one-third of all trips in Gurugram are made on foot. Yet, only about 28 percent of the city's roads have footpaths, many of which are discontinuous, poorly maintained or encroached upon, while safe pedestrian crossings remain limited. Cycling faces similar constraints. Although many daily trips are less than 7 km, the city lacks a continuous network of protected cycle tracks. This represents one of Gurugram's greatest untapped mobility opportunities. The CMMP proposes more than 1,000 km of pedestrian infrastructure, nearly 800 km of cycle tracks and a public bicycle-sharing system to improve last-mile connectivity. Compared with major road projects, investments in walking and cycling require relatively modest capital while delivering multiple benefits, including reduced congestion and emissions, improved public health and safer streets. As cities such as Copenhagen and Amsterdam have demonstrated, well-designed infrastructure can encourage a significant shift towards active mobility. Gurugram has a similar opportunity by recognising pedestrians and cyclists as integral—not residual—users of its streets.

Disconnect between Land Use planning and Mobility Needs: Many of Gurugram's mobility challenges stem not from its roads but from its pattern of urban development. Over the past two decades, residential areas, offices and commercial centres have expanded across multiple growth corridors, often ahead of public transport. As homes, workplaces and services are spread far apart, commuting distances have increased, reinforcing dependence on private vehicles and making public transport more difficult and costly to provide. Future growth should therefore follow the principles of Transit-Oriented Development (TOD), with higher-density, mixed-use development concentrated around Metro stations and major public transport corridors. Locating housing, jobs and services close to transit reduces travel distances, increases public transport use and creates neighbourhoods that are more walkable and cycle-friendly. Integrating land-use and transport planning is therefore essential if Gurugram is to achieve sustainable mobility rather than simply build more roads. The city should also accelerate its transition to zero-emission mobility by adopting a comprehensive electric vehicle strategy, including time-bound targets for electrifying buses, para-transit, commercial vehicles, two-wheelers and private cars, supported by charging infrastructure and the phased replacement of diesel auto-rickshaws with electric alternatives.

Poor Integration of different Modes of Transport: Lastly, efficient public transport is not defined solely by the availability of buses and metro services, but also by the ease, safety and affordability of accessing them. First- and last-mile connectivity remains one of the weakest links in Gurugram's mobility ecosystem. Inadequate pedestrian pathways and fragmented cycling infrastructure have resulted in an overdependence on intermediate public transport (IPT), such as auto-rickshaws and e-rickshaws, for short access trips to and from metro stations and bus stops. This has led to unorganised IPT operations around metro stations and other intermodal hubs, creating congestion, safety concerns and increasing the overall cost and inconvenience of using public transport.

5.4 Positive Initiatives

Despite its mobility challenges, Gurugram has emerged as a testing ground for several innovative initiatives aimed at creating a safer, cleaner and more sustainable transport system.

Government agencies such as GMDA, MCG, Gurugram Traffic Police, civil society organisations such as Raahgiri Foundation, private sector as well as road safety officers and citizens have increasingly collaborated to improve road safety, strengthen public transport, promote electric mobility and reclaim streets for pedestrians and cyclists. While many of these initiatives are still evolving, they provide a strong foundation for building a more integrated and people-centric mobility system.

SAFER STREETS

Vision Zero Gurugram: Raahgiri Foundation's Gurugram Vision Zero initiative, launched in 2022, seeks to eliminate road fatalities and serious injuries through safer street design, speed management, targeted enforcement and community engagement. Rather than treating road deaths as inevitable, the approach recognises them as preventable and focuses on redesigning the transport system to make streets safer for pedestrians, cyclists and motorists alike. The initiative includes GMDA, MCG, Gurugram Traffic Police, NHAI, civil society organisations and road safety experts.⁸

Street Redesign: Raahgiri Foundation has worked on redesigning streets and intersections to prioritise pedestrians, cyclists and other vulnerable road users. Its Gurugram projects include MG Road, Sector 58–67, Sector 56, Sector 44 and South City 1, as well as the Sanath Road project. Interventions include wider footpaths, safer crossings, cycle infrastructure, traffic management and better use of public space.

Sadar Bazaar Pedestrianisation: Raahgiri Foundation worked with MCG and other stakeholders on the pedestrianisation of a 600-metre stretch of Sadar Bazaar, using tactical urbanism to create a safer, more inclusive public space. The intervention incorporated pedestrian space, cycling facilities, greenery, waste segregation and community participation, with the objective of reducing congestion and emissions.

Sanath Road: Sanath Road in Sector 18, Gurugram—a 2.4-km stretch connecting Atlas Chowk on NH-48 with Old Delhi Road—has been transformed into Haryana's first "Complete Street." Developed by GMDA and MCG in collaboration with Raahgiri Foundation and private partners, the project introduced wider pedestrian footpaths, dedicated cycling infrastructure and safer crossings, creating a more people-centric street.

Black Spot Improvement Programme: Under Gurugram Vision Zero, this initiative has contributed to identifying and addressing accident-prone locations through crash-data analysis, on-ground safety assessments and intersection redesign.

Safe School Zones: Under the Gurugram Vision Zero programme, Raahgiri Foundation has worked with MCG and other agencies to create safer environments around schools through traffic-calming measures, improved signage and safer pedestrian crossings, with a focus on protecting children and encouraging safer street design. The first such zone in Haryana was launched at the government primary school in Kadipur in March 2026.⁹

Women-Friendly Mobility: Through safety audits, crowdsourced data and digital mapping, Safetipin has worked with government agencies to identify poorly lit streets, unsafe pedestrian environments and gaps in last-mile connectivity, helping make public spaces and urban mobility safer for women.

Raahgiri Day: A "streets for people" initiative that encourages walking, cycling and community participation while demonstrating the potential of people-centric urban streets.

CLEANER MOBILITY

Electric Mobility and EV Charging Infrastructure: Some of the initiatives include mandatory electric vehicle (EV) charging provisions in new buildings, expansion of EV charging infrastructure by GMDA and private operators, induction of 100 electric buses into the Gurugaman fleet under the PM e-Bus Sewa Scheme, with phased deployment beginning in 2026, rollout of public charging stations by MCG and Convergence Energy Services Limited, addition of 336 charging stations and charging points across the city in 2026¹⁰ by DHBVN, and establishment of a dedicated charging depot for the electric bus fleet.¹¹

SMARTER MOBILITY

Last-mile Connectivity: Efforts are being made to grow electric three-wheelers and provide cleaner and more affordable first- and last-mile connectivity.

Integrated Traffic Management System: There has been deployment of adaptive traffic signals, CCTV surveillance and intelligent traffic management technologies to improve traffic flow and enforcement.

5.5 Future Priorities

The first priority should be to fully implement the CMMP's vision of "moving people rather than vehicles." This requires accelerating completion of the new Metro corridor, expanding the Gurugaman bus network, strengthening feeder services and integrating the Metro, buses, auto-rickshaws, e-rickshaws and shared mobility through common ticketing, coordinated schedules and seamless interchanges. Ultimately, public transport must become a convenient, reliable and attractive alternative to private vehicles rather than a mode of last resort.

Beyond strengthening public transport, Gurugram must reclaim its streets for pedestrians and cyclists. Every new road project should incorporate continuous footpaths, protected cycle tracks, universal accessibility features, safe crossings and shaded streets. At the same time, Intelligent Traffic Management Systems, adaptive traffic signals, digital parking management and stricter enforcement of lane discipline can improve traffic flow without continually widening roads. As the city transitions towards cleaner mobility, it should also accelerate the deployment of electric buses, EV charging infrastructure and cleaner intermediate public transport to reduce both congestion and transport-related emissions.

Equally important is ensuring that the transport system is safe and inclusive for all users. Women-friendly mobility should be an integral part of Gurugram's transport strategy. Well-lit streets, active public spaces, safe pedestrian infrastructure, reliable public transport and secure last-mile connectivity can significantly improve women's confidence in walking and using public transport. Integrating gender-sensitive planning into transport policies will not only enhance safety but also promote greater social inclusion and workforce participation.

Similarly, creating safe routes to schools should be a key priority. Continuous footpaths, protected pedestrian crossings, traffic-calming measures, lower speed limits in school zones, dedicated cycling infrastructure and better traffic management around educational institutions can substantially reduce road accidents while encouraging active mobility among children.

Finally, achieving these objectives will depend on effective institutional coordination. Mobility planning is currently shared across multiple agencies, including GMDA, MCG, HSVP, NHAI, Haryana Roadways, Haryana Mass Rapid Transport Corporation and the Traffic Police. Stronger coordination, supported by a dedicated Non-Motorised Transport (NMT) Cell within GMDA, would help ensure that investments in walking, cycling and public transport receive sustained attention alongside road infrastructure.

5.6 The Way Forward

Gurugram's future competitiveness will depend not on the number of kilometres of roads it constructs, but on how efficiently it enables people to move. The world's most successful cities have demonstrated that prosperity is not created by continually building wider roads, but by providing residents with attractive alternatives to private vehicles. Gurugram has already laid the foundations through significant investments in transport infrastructure. The next phase of Gurugram's development must focus less on expanding road capacity and more on creating an integrated, people-centred mobility system that is efficient, inclusive and environmentally sustainable.

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6

Forest Cover & the Aravallis



Aravalli Range. Source: www.aravallibachao.org

Protecting Gurugram's Natural Infrastructure

The Aravalli Range forms Gurugram's ecological backbone, supporting much of the district's remaining forest cover and providing critical ecosystem services that sustain the city's environment. As rapid urbanisation accelerates, both the Aravalli landscape and the city's green cover are coming under increasing pressure. Protecting and restoring these natural assets is essential for Gurugram's long-term climate resilience, water security and quality of life.

6.1 A Declining Forest Cover

Forests are a concurrent subject under the Indian Constitution, with their protection governed by both central and state legislation. National laws such as the Forest (Conservation) Act, 1980 and the Wildlife (Protection) Act, 1972 provide the overarching legal framework, while Haryana has enacted complementary legislation, including the Haryana Forest (Conservation and Regulation) Act, 1995 and the Haryana Forest (Prevention of Encroachment) Rules, 2012, to regulate land diversion, curb encroachments and strengthen forest conservation.¹ Despite this robust legal framework, increasing developmental pressures have continued to erode the state's forest resources.

Haryana has the lowest forest cover in India, with forests occupying just 3.63 percent of its geographical area compared to the national average of 21.67 percent. Of the state's 44,212 square km geographical area, only 1,603 square km is under forests.² Although the Haryana Forest Policy (2006) set a target of increasing forest cover to 20 percent³, the state continues to witness one of the highest rates of diversion of forest land for non-forest purposes, placing additional pressure on ecologically sensitive landscapes, particularly the Aravalli Range.

Gurugram reflects this broader trend. The district's forests, concentrated largely in the Aravalli foothills, have steadily declined, with forest cover shrinking by 2.47 square km between 2019 and 2021.⁴ The quality of the remaining forests is also a concern, as very dense forests account for only about 3 percent of the total forest cover, while the majority comprises moderately dense and open forests. Rapid urbanisation has further accelerated the loss of natural vegetation. Between 2011 and 2023, Gurugram's green cover is estimated to have declined from 10.8 percent to 6.7 percent, with over 10,000 acres of natural vegetation converted for urban development.⁵

Reversing this decline requires shifting the focus from compensatory plantation to the protection of existing natural assets. Conserving remaining forests, safeguarding mature trees and restoring degraded green spaces must become central to Gurugram's urban development strategy. At the same time, afforestation efforts should prioritise native species and be driven through coordinated action by the Forest Department, GMDA, Municipal Corporation of Gurugram, Resident Welfare Associations, educational institutions and corporate CSR programmes. Initiatives such as GMDA's proposed 10-acre urban forest in Sector 109 represent positive steps, but they must form part of a larger, city-wide urban forestry strategy aimed at significantly enhancing Gurugram's green cover and ecological resilience.

6.2 The Aravalli Range: Gurugram's Vital Green Shield

The Aravalli Range is the world's oldest fold mountain and one of India's oldest geological formations. It extends approximately 670 kilometres from Delhi through Haryana and Rajasthan to Gujarat. Formed over two billion years ago, the range has shaped the region's geography, hydrology and biodiversity for millennia. While its geological significance is exceptional, its greatest value today lies in the ecosystem services it provides to one of India's fastest urbanising regions.

The Aravalli range extends across the Haryana districts of Gurugram, Faridabad, Nuh, Mahendragarh and Rewari⁶, where it supports a significant share of the state's already limited forest cover. The Aravalli Range functions as a critical natural infrastructure acting as a climate regulator, barrier against desertification, a water security and biodiversity zone as well as a pollution shield.

The Aravali Biodiversity Park illustrates the potential of restoring this ecological infrastructure within the city itself. The 350-acre, MCG-owned site was once degraded by mining and quarrying. Its restoration was initiated and led by IAmGurgaon through collaboration with citizens, schools, corporates and government agencies. Following the initial restoration, Hero MotoCorp (formerly Hero Honda) became involved in supporting the park's further development.

The Aravalli Range – Gurugram's Natural Infrastructure

Climate Regulator: The Aravalli Range acts as Gurugram's natural air conditioner, moderating temperatures, reducing the urban heat island effect and improving the city's microclimate.

Barrier Against Desertification: The range prevents the eastward spread of the Thar Desert, stabilises soils and influences regional wind, rainfall and surface runoff patterns.

Water Security: The hills recharge groundwater, sustain aquifers, regulate monsoon runoff and form the watershed for rivers such as the Sahibi, which supports Gurugram's drainage system.

Biodiversity Corridor: The Aravalli Range connects fragmented habitats and supports rich biodiversity, including leopards, striped hyenas, nilgai, jackals, over 300 bird species and diverse native flora.

Natural Pollution Shield: Forests reduce soil erosion, trap dust and air pollutants, stabilise slopes and improve environmental quality, making the Aravalli Range indispensable for the health and resilience of the National Capital Region.

6.3 The Aravalli Under Pressure

Over the past two decades, the Aravalli ecosystem has come under unprecedented pressure from infrastructure expansion, mining and encroachments. This has resulted in the loss of forest cover and wildlife habitats, disruption of natural drainage systems, reduced groundwater recharge and a growing urban heat island effect. Satellite studies indicate that human settlements within the Aravalli landscape increased from 4.5 percent of the area in 1975 to over 13 percent by 2019.⁷

The judiciary, particularly the Supreme Court, has played a crucial role in safeguarding the Aravalli Range by repeatedly acting against illegal mining, encroachments and environmentally harmful policy changes. In 2022, the Court struck down amendments that could have opened protected Aravalli and Shivalik forests to mining and real estate development.⁸ However, in November 2025, it accepted a technical definition that recognised only hill formations rising at least 100 metres above the surrounding terrain as part of the Aravalli range, a decision that drew widespread criticism from scientists and environmentalists for potentially excluding large parts of the range from legal protection.⁹ Responding to public concern and legal representations, the Court stayed the implementation of the order in December 2025 and constituted an expert committee to review the scientific, ecological and legal basis for defining the Aravalli Range.¹⁰ The stay continues to remain in force.

Over the past decade, environmental organisations, citizen groups, researchers and legal activists have led sustained campaigns to protect the Aravalli Range through public awareness, scientific research and strategic litigation. Organisations such as the Aravalli Bachao Citizens Movement (ABCM)¹¹, Save

Aravalli Trust¹² and People for Aravallis in NCR have played a significant role in mobilising public support and strengthening efforts to conserve this vital ecological lifeline.

6.4 The Way Forward

Protecting the Aravalli Range: The Aravalli range must be declared a Natural Conservation Zone by aligning its protection with the Regional Plan 2021, Haryana Sub-Regional Plan 2021 and Gurugram Development Plan 2031. Its boundaries should be scientifically demarcated and permanently secured, ecologically significant uncultivable wastelands recognised as forest land, village commons and Panchayat lands protected, and the Mangar Bani sacred grove and its surrounding buffer accorded the highest level of legal protection to preserve the region's ecological integrity.

Protecting Gurugram's Green Cover: Existing trees, urban forests, green belts, biodiversity parks and village commons should be treated as critical natural infrastructure and safeguarded from diversion for non-forest uses. Tree felling must remain a measure of last resort, supported by robust compensatory afforestation, independent monitoring of plantation survival and restoration using native species. Urban forestry should be integrated into city planning through minimum tree canopy targets, connected green corridors linking parks with the Aravalli Range, and a GIS-based tree inventory to ensure transparent monitoring and informed decision-making.

The long-term future of the Aravalli Range and Gurugram's green cover will depend on coordinated action by governments, businesses, communities and citizens. This requires eliminating illegal mining and encroachments, restoring degraded forests and wildlife corridors and embedding ecological conservation into urban planning. Strengthening community stewardship through citizen participation, awareness campaigns and collaborative monitoring is also crucial.

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7

Inclusivity



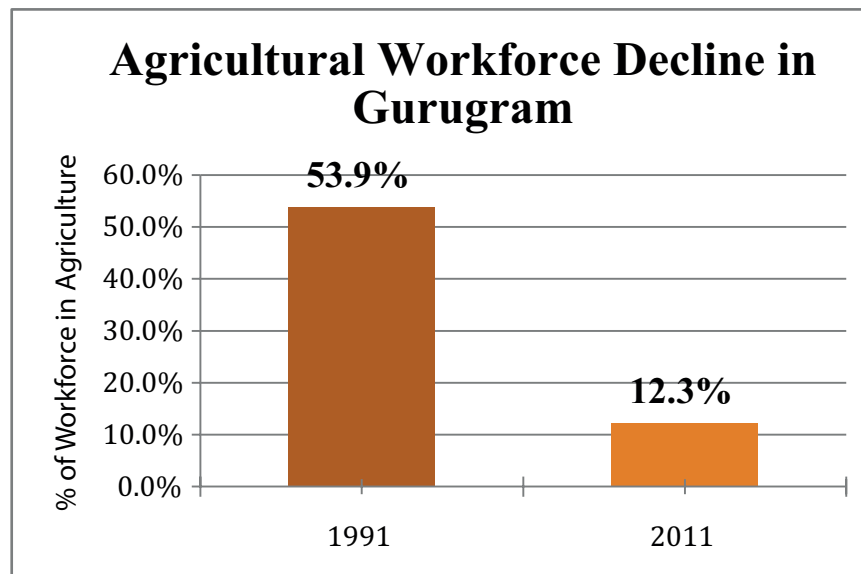
Students of Happy School, DLF -1, Gurugram. Source: Happy School

How Inclusive is Gurugram?

The World Bank defines an inclusive city as one that enables all residents, irrespective of income, gender, age or social background, to access opportunities, essential services and a decent quality of life. Inclusivity extends beyond economic growth; it reflects whether the benefits of urbanisation are shared equitably across society. An inclusive city provides affordable housing, quality healthcare, education, safe mobility, public spaces and livelihoods while ensuring that vulnerable populations are not excluded from the urban development process.

Measured against these parameters, Gurugram presents a paradox. It is among India's wealthiest urban economies and contributes significantly to Haryana's revenues, yet a substantial proportion of the workforce that sustains its economy—including domestic workers, security guards, drivers, construction workers, sanitation workers, delivery personnel, retail and hospitality staff, and factory workers—struggles to access affordable housing and other essential urban services.

Gurugram's transformation has been driven less by the gradual evolution of a local economy than by rapid in-migration. The share of the population engaged in agriculture fell from 53.9 percent in 1991 to just 12.3 percent in 2011, reflecting the city's emergence as a migrant-led urban economy rather than the organic transition of a traditional agrarian society. While this influx has fuelled economic growth, it has also created a workforce whose housing needs have not been adequately addressed. For many low- and middle-income workers, housing within the city's formal residential developments remains financially out of reach. Consequently, they reside in urban villages, informal settlements and peripheral towns, often commuting long distances to their workplaces. This spatial mismatch between jobs and affordable housing has increased commuting costs, traffic congestion and environmental impacts, while reinforcing social and economic segregation.



Source: Census of India, 1991 and 2011.

7.1 A City Built on Two Economies

Gurugram's economy functions through two parallel but interdependent labour markets.

The first comprises highly skilled professionals employed in information technology, finance, consulting and multinational corporations. These residents occupy premium housing and drive demand for high-end retail, commercial real estate and lifestyle infrastructure.

The second economy consists of the workers who enable the functioning of the first, construction workers who build the city's infrastructure, domestic workers who support households, drivers, security personnel, delivery executives, sanitation workers and employees in Udyog Vihar and Manesar's industrial units.

Urban villages such as Wazirabad, Nathupur, Sikanderpur, Badshahpur and Chakkarpur provide rental accommodation for workers in domestic work, housekeeping, security, construction and transport, while settlements around Udyog Vihar and IMT Manesar house workers employed in garment, automobile, auto-component, pharmaceutical and other industrial activities.¹ Gurugram has more than 30 such urban villages. Around 40 percent of Gurugram's population lived in these urban villages.² Economically Weaker Section (EWS) housing within many residential projects², remain insufficient to accommodate this section of the large workforce.

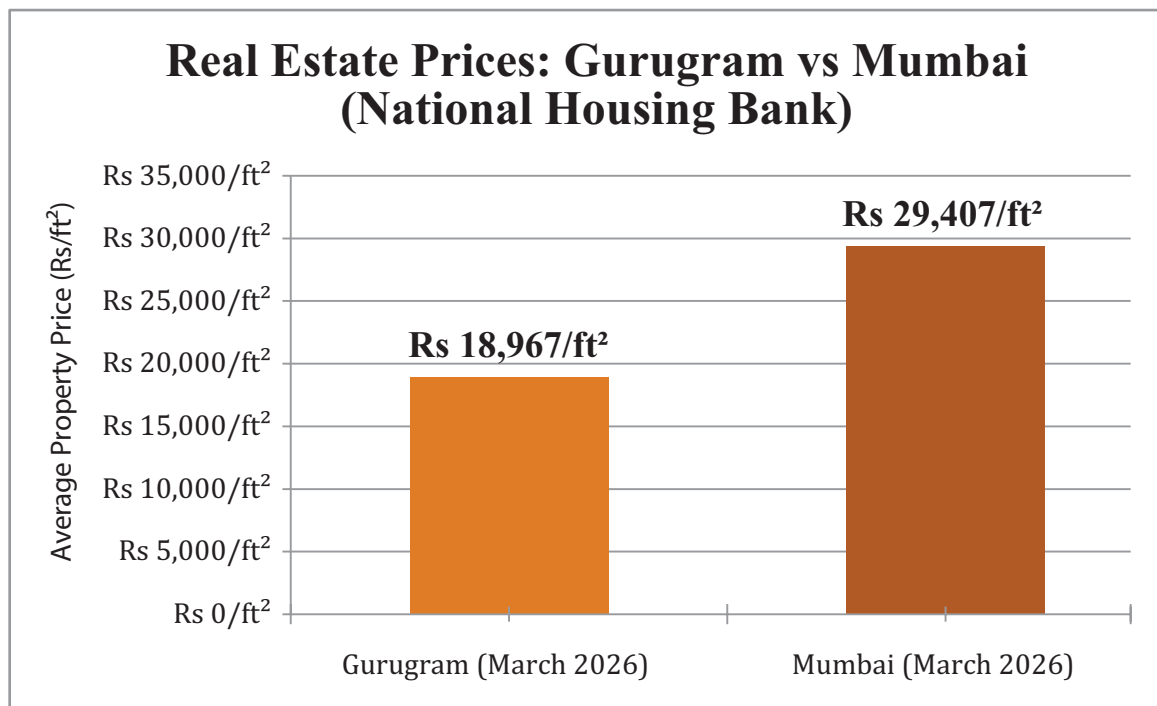
Haryana's new EWS housing policy seeks to expand access to affordable housing by mandating developers to reserve 20 percent of residential plots in plotted colonies and 15 percent of flats in group-housing projects for Economically Weaker Sections (EWS). The policy also places the Housing for All Department at the centre of beneficiary identification and allotment, with provisions for EWS units to be used under rental housing schemes.³

Ironically, while the city's growth depends on both groups, its urban development has largely been designed around the aspirations of the first.

7.2 Housing: The Greatest Test of Inclusivity

Perhaps nowhere is this imbalance more evident than in housing. Gurugram's development has been led by private real estate, resulting in one of India's most expensive residential markets.⁴ Luxury apartments, integrated townships and gated communities dominate the city's new growth corridors, while affordable housing remains limited relative to demand. Gurugram has emerged as one of India's most expensive real estate markets, second only to Mumbai, as illustrated in the box below.⁵ As a result, home ownership within the formal housing market remains beyond the reach of a large section of the city's low-income workforce.

The COVID-19 pandemic exposed this structural dependence. When mobility restrictions were imposed, thousands of workers found themselves unable to reach workplaces, while many residential societies struggled to function without essential service workers.⁶ Many migrant workers were in fact forced to return to their native villages. It underscored the risks of a development model in which those who keep the city running are unable to live close to where they work. The pandemic highlighted an uncomfortable reality, that Gurugram's economy depends heavily on workers who remain largely excluded from its formal urban fabric.



Source: National Housing Bank Residex, March 2026.

7.3 Migrants: Builders of the City, Yet Marginal to It

Migration has been central to Gurugram's growth story.

Unlike older industrial cities, Gurugram's expansion has been driven simultaneously by highly skilled professionals and low-income migrant labour. The former power the knowledge economy centred around Cyber City and corporate offices, while the latter build and maintain the city's physical infrastructure and service economy.⁶

Yet migrant workers often remain among the most vulnerable residents. Limited access to affordable housing, inadequate social security, informal employment and dependence on rental accommodation in congested urban villages leave many exposed to economic shocks.

Recent enforcement actions targeting undocumented migrants⁷ also drew attention to another dimension of urban inclusion. Public discourse frequently associates low-income settlements with illegality and insecurity, overlooking the critical role that migrant workers play in sustaining the city's economy.

7.4 Education and Healthcare: Civil Society Bridging the Gap

Despite its reputation for world-class private schools and hospitals, Gurugram also hosts a vibrant ecosystem of charitable and community institutions that provide essential services to economically weaker sections. Several NGOs, trusts and philanthropic organisations have stepped in where public systems remain inadequate.

Examples include:

- Lok Kalyan Hospital, Chakkarpur, which provides affordable healthcare through a charitable trust and serves thousands of low-income families⁸.
- Charitable health camps organised by organisations such as the Rotary Club, Lions Club, Indian Medical Association⁹
- Pratham, which works extensively on improving foundational learning among disadvantaged children¹⁰.
- CRY (Child Rights and You)¹¹ and Salaam Baalak Trust¹², which have supported vulnerable children and migrant communities through education and welfare programmes.
- Schools run by organisations such as the Deepalaya¹³, Lotus Petal Foundation¹⁴, and various charitable institutions provide educational opportunities to children who would otherwise remain outside the formal education system.

Corporate Social Responsibility (CSR) initiatives by many companies headquartered in Gurugram have further strengthened interventions in education, skilling, health and livelihoods, although their scale remains modest compared to the city's rapidly growing population¹⁵.

While the civil society plays an important role in enhancing urban inclusion, their efforts cannot substitute for systemic public investment in affordable social infrastructure. Civil society initiatives are often designed to complement public services, not replace the state's responsibility for ensuring universal and equitable access.

7.5 The Social Dimension of Sustainability

Urban sustainability is often measured through indicators such as water supply, waste management, energy use and public transport. Equally important, however, is social sustainability—the extent to which different sections of society are able to participate in and benefit from a city's growth and access its opportunities and essential services.

No large metropolitan city is free from socio-economic disparities. As cities grow, differences in income, housing and neighbourhoods are inevitable. The challenge is to ensure that these differences do not translate into unequal access to affordable housing, healthcare, education, public transport and other essential urban services. Growth becomes sustainable only when the benefits of development are broadly shared and the basic needs of all sections of society are addressed.

This is particularly important in a city such as Gurugram, where a large workforce sustains the city's homes, offices, industries and everyday services. A city cannot be considered truly sustainable if the people who build its homes, clean its streets, operate its industries and support its households remain excluded from its opportunities and essential services. Also, when income groups increasingly occupy separate physical and social spaces with limited interaction, social cohesion can weaken, public spaces can become less shared, and building consensus around city-wide environmental and governance priorities becomes more difficult. Social inclusion is therefore not an outcome of sustainable urban development alone; it is one of its foundations.

7.6 The Way Forward

Improving inclusivity will require more than expanding welfare programmes. It demands embedding equity within urban planning itself.

Future development must prioritise affordable housing near employment centres, strengthen public schools and healthcare facilities, improve rental housing standards, enhance public transport connectivity for low-income workers and create accessible public spaces that serve all residents.

At the same time, Gurugram's extensive network of resident welfare associations, corporate CSR programmes, non-governmental organisations and charitable trusts should be viewed as valuable partners in delivering social infrastructure. Stronger collaboration between government, civil society and the private sector can significantly improve access to education, healthcare, skilling and community services.

Above all, Gurugram's success should not be measured solely by the number of multinational headquarters, luxury housing projects or rising property values. A truly global city is one where prosperity is accompanied by opportunity, dignity and access for all sections of society. The long-term sustainability and resilience of Gurugram will depend not only on how efficiently it grows, but also on how inclusively it grows.

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8

Governance



The Municipal Corporation of Gurugram (MCG) office in Sector 34. Source: Hindustan Times

A Complex Institutional Landscape

No city can become sustainable or inclusive without effective governance. While Gurugram's challenges are often discussed in terms of water scarcity, waste management, mobility, air pollution, housing and public safety, they share a common underlying cause: fragmented urban governance. Many of the city's most pressing challenges are not the result of a lack of technical solutions or financial resources, but of institutional fragmentation, overlapping mandates, weak accountability and inadequate local capacity. Unless these governance deficits are addressed, investments in individual sectors are unlikely to achieve their intended outcomes.

As Haryana's economic engine, Gurugram contributes a disproportionately large share of the state's revenues. In the 2025–27 liquor-zone auctions, it accounted for 27 percent of the state's total auction revenue—the highest share among Haryana's districts.¹ In 2024-25, Gurugram accounted for around 32 percent of Haryana's total municipal income.² Yet the city's governance architecture has not evolved at the same pace as its economy or population. Gurugram's local institutions have not been adequately empowered with the authority, financial resources or administrative capacity needed to govern a city of its scale and complexity. Strengthening urban governance is therefore not merely an institutional reform—it is the single most important enabler of Gurugram's future sustainability, competitiveness and quality of life.

8.1 Building the Third Tier of Governance

The 74th Constitutional Amendment (1992), which came into effect on June 1, 1993, granted constitutional status to Urban Local Bodies (ULBs) as institutions of self-government. It established municipalities as the third tier of government, alongside the Union and State governments, and sought to decentralise governance by empowering ULBs with greater authority, responsibilities and democratic accountability. The amendment assigned municipalities a clear set of functions under the Twelfth Schedule of the Constitution, including urban planning, water supply, sanitation, solid waste management, roads, building regulations, public health and environmental protection. It also envisaged greater citizen participation, local planning and enhanced financial autonomy, enabling ULBs to function as effective institutions of urban governance.

8.2 Gurugram's Governance Framework

Gurugram's principal urban local body is the Municipal Corporation of Gurugram (MCG), formed in 2008. As the apex civic authority, the MCG anchors the governance structure through its specific powers and functions. However, it also continues to share many key functions with or be controlled by state-level agencies such as the Gurugram Metropolitan Development Authority (GMDA), Haryana Shahari Vikas Pradhikaran (HSVP), Public Works Department (PWD), and Public Health Engineering Department (PHED).

The Deputy Commissioner (DC) office plays a significant coordinating and administrative role in Gurugram, but is not intended to be the primary authority for urban governance. The Deputy Commissioner is the chief administrative officer of the district, responsible for revenue administration, law and order, disaster management, elections, implementation of government schemes, and coordination among government departments.

A City Magistrate, appointed by the Deputy Commissioner, oversees various administrative functions involving civic agencies. Since, the Gurugram district has an urban-rural character, in the peripheral rural areas, Block Development and Panchayat Officers supervise Gram Panchayats.³

At the ward level, councillors are elected for a five-year term to represent residents and address local civic issues such as sanitation, roads, street lighting, parks and drainage. Gurugram currently comprises 36 municipal wards. The councillors also oversee the functioning of the Municipal Corporation through various statutory committees, including the Finance and Contract Committee, while the Corporation is headed by the Mayor.

At the community level, Residents' Welfare Associations (RWAs) have emerged as important stakeholders, representing residents' interests, maintaining common infrastructure within private colonies, and serving as an interface between residents and public authorities. There are over 400 RWAs registered in Gurugram, either as plotted colonies registered under the Haryana Registration and Regulation of Societies Act, 2012 or as apartment complexes registered under the Haryana Apartment Ownership (HAO) Act, 1983. However, like many Indian cities, Gurugram lacks a formal institutional mechanism to systematically integrate RWAs into urban planning.

Above this framework, the district is represented in the Lok Sabha by Gurugram's Member of Parliament (MP), whose role includes articulating the district's interests in Parliament and facilitating central government support for regional development.⁴ The MP chairs the District Development Coordination and Monitoring Committee (DISHA), which reviews and monitors the implementation of major centrally sponsored schemes in the district.

At the state level, Gurugram district comprises four Legislative Assembly constituencies, Gurugram, Badshahpur, Pataudi, and Sohna, represented by elected Members of the Legislative Assembly (MLAs), who play a role in shaping state policies and development priorities affecting the district.

Together, these layers of governance – national, state, district, municipal, and community – are intended to provide a comprehensive framework for planning and service delivery. Understanding how these institutions interact and where their jurisdictions overlap is therefore essential to understanding Gurugram's governance challenges.

8.3 Gurugram's civic bodies

1. Municipal Corporation of Gurugram:

As the apex urban local body, MCG is responsible for a broad range of municipal functions, including urban planning, building approvals, engineering and public works, sanitation and sewerage, solid waste management, roads and bridges, street lighting, public health, parks, urban forestry, public amenities, disaster management, and the collection of property tax and licensing fees. These functions are administered by the Municipal Commissioner, the chief executive officer of the Corporation, who is assisted by Additional and Joint Commissioners.

The MCG comprises both an executive and an elected wing. While the executive is headed by the Municipal Commissioner, the elected wing consists of councillors chosen every five years from the city's 36 municipal wards. The first MCG elections were held in 2011, establishing a formal third tier of urban governance for Gurugram in line with the objectives of the 74th Constitutional Amendment. The councillors (elected for a period of five years) constitute the Municipal Council headed by the

Mayor.⁵ Whereas the Mayor was earlier chosen through an indirect election, the office is now filled through direct elections by the citizens of Gurugram, strengthening democratic accountability at the local level.⁶

2. Gurugram Metropolitan Development Authority (GMDA):

Established through the Haryana Gurugram Metropolitan Development Authority Act, 2017⁷, the GMDA provides integrated planning, coordination, and execution of infrastructure and public services across the rapidly expanding Gurugram metropolitan region. Chaired by the Chief Minister of Haryana, the Authority serves as the apex metropolitan planning and coordinating agency, bringing together multiple state departments and local bodies in urban development. GMDA is responsible for the planning, development, operation, maintenance, and regulation of key metropolitan infrastructure, including major arterial roads, trunk water supply and sewerage networks, master stormwater drainage systems, public transport, traffic management, and city-wide mobility initiatives. It also oversees the operation of the Integrated Command and Control Centre (ICCC), which supports traffic management, public safety, surveillance, and smart city services. In addition, the Authority prepares long-term infrastructure plans, coordinates implementation across agencies, and monitors the delivery of essential urban services to ensure more integrated metropolitan development.

3. Haryana Shehri Vikas Pradhikaran (HSVP):

Formerly known as the Haryana Urban Development Authority (HUDA) and renamed HSVP in 2017⁸, this state agency was established in 1977 as Haryana's primary vehicle for planned urban development. HSVP is responsible for acquiring land, preparing layout plans, and developing residential, commercial, and institutional sectors, including water supply, sewerage, roads, drainage, and street lighting, before formally transferring completed sectors to local bodies such as the MCG. Much of Gurugram's sector-based layout originated as HSVP (or HUDA) developments, and a considerable number of these sectors continue to sit only partially transferred, with HSVP retaining ownership of plots, internal roads, and civic infrastructure well after urbanisation. Newer sectors along the Southern Peripheral Road and Dwarka Expressway, such as Sectors 58 to 115, illustrate this lag: several rolled out faster than GMDA's piped water network could extend to them, leaving residents reliant on private borewells. HSVP's own land acquisition delays have stalled road links connecting these sectors to the expressway.⁹

4. Dakshin Haryana Bijli Vitran Nigam (DHBVN):

Incorporated in 1999 following the unbundling of the Haryana State Electricity Board¹⁰, and headquartered in Hisar, DHBVN is the state-owned utility responsible for the distribution and retail supply of electricity across the twelve districts of southern Haryana, including the Gurugram-I and Gurugram-II circles. It owns and maintains the transformers, feeders, and substations that carry power across the city, independently of MCG, GMDA, and HSVP.

5. Haryana State Industrial and Infrastructure Development Corporation (HSIIDC):

Established in 1967 as the Haryana State Industrial Development Corporation¹¹ and renamed HSIIDC in 2005, this wholly state-owned corporation was set up to accelerate industrialisation by developing industrial estates, technology parks, and special economic zones. Within its designated industrial areas, including Gurugram's Udyog Vihar, HSIIDC lays out internal roads, water supply, electrification, and effluent disposal systems before allotting plots to industrial units, effectively functioning as a parallel civic authority within these enclaves. HSIIDC's most significant footprint is IMT Manesar, a 4,000-acre

industrial township some 23 kilometres from the city along the Delhi–Jaipur highway. It houses over 2,100 industrial plots, making it one of the largest concentrations of manufacturing employment in the Gurugram region.¹²

6. Public Works Department (PWD):

Operating through its Buildings and Roads (B&R) branch and headquartered in Chandigarh¹³, PWD is Haryana's premier agency for planning, designing, and maintaining government infrastructure. Its mandate spans two broad categories: infrastructure development, covering roads, bridges, flyovers, and footpaths, and the built environment, covering government buildings such as hospitals, schools, colleges, and courts, organised into dedicated Road, Building, Bridge, and National Highway sections.

7. Public Health Engineering Department (PHED):

PHED is the state agency responsible for planning, developing, and maintaining drinking water supply and sewerage and stormwater drainage infrastructure across Haryana¹⁴, particularly in rural areas and in urban local bodies where these services have not yet been transferred to municipal agencies. In Gurugram, PHED continues to operate and maintain one of the sewage treatment plants at Dhanwapur even as MCG and GMDA have taken over master sewage pipeline networks. Besides, the two major canal-fed treatment plants located at Chandu Budhera and Basai were originally developed by PHED. This forms the backbone of Gurugram's piped water supply since the city first began drawing canal water in 1990.

8.4 Overlapping Jurisdictions and Fragmented Governance:

Although the roles of Gurugram's key civic agencies are defined in legislation, their mandates frequently overlap in practice, creating blurred accountability and coordination challenges. Key examples include:

- 1. Road infrastructure:** Responsibility for roads is divided among multiple agencies, including GMDA, MCG, HSVP, HSIIDC, and the Public Works Department (PWD). While MCG generally maintains local roads and GMDA manages arterial roads, the distinction is often unclear.¹⁵ PWD also retains ownership of several major roads such as Old Delhi-Gurugram road, even where MCG carries out its day-to-day maintenance. In 2022, colour-coded signboards were introduced across the city to help residents identify which agency was responsible for maintaining different road stretches.¹⁶
- 2. Stormwater drainage:** MCG is typically responsible for local drains, while GMDA manages the city's master drainage network. However, the two systems are physically interconnected, requiring continuous coordination. During the 2023 monsoon, both agencies simultaneously deployed pumps, desilting teams, and emergency crews. MCG undertook dewatering at several locations, while GMDA teams cleaned road gullies and removed silt and obstructions from drainage inlets.¹⁷
- 3. Water supply and sewerage:** MCG oversees local distribution networks in transferred sectors, whereas GMDA manages trunk water supply and sewerage infrastructure. Delays in one system frequently affect the functioning of the other. As mentioned, while GMDA maintains the pipeline networks, the operations of treatment plants are divided between HSVP, MCG and PHED.¹⁸ This often requires close inter-agency coordination and can contribute to overlapping responsibilities and accountability challenges.

4. **Public transport:** Even a single urban service involves multiple agencies. Gurugram Metropolitan City Bus Limited (GMCBL) is jointly owned by GMDA (50 percent), MCG (40 percent), and HSIIDC (10 percent), requiring coordination across three separate authorities for planning, financing, and operations.¹⁹
5. **HSVP-developed sectors:** Gurugram's older residential sectors were developed by HSVP, with maintenance responsibilities gradually transferred to MCG from 2016 onwards. However, the transition has not always been seamless. Subsequent transfers of residential pockets, markets and institutional areas have continued, while questions over the ownership and maintenance of vacant plots and other assets have persisted. In some cases, unclear jurisdiction and unresolved financial responsibilities between HSVP and MCG have complicated maintenance and service delivery.²⁰
6. **Solid waste management:** Waste management responsibilities are divided across agencies. MCG manages waste collection and disposal in most of the city, particularly Old Gurugram and transferred sectors. HSVP-administered sectors often depend on a combination of private contractors, RWAs, and HSVP staff, while HSIIDC independently manages waste and wastewater services within industrial estates such as Udyog Vihar.²¹
7. **Power infrastructure:** Electricity distribution is managed independently by Dakshin Haryana Bijli Vitran Nigam (DHBVN). Consequently, infrastructure projects undertaken by MCG, GMDA, HSVP, or PWD frequently require coordination with DHBVN for the relocation or protection of underground and overhead power infrastructure.

Collectively, multiplicity of agencies and their overlapping jurisdictions have produced a fragmented governance model resulting in ambiguity over ownership and accountability. This delays project implementation, complicates grievance redressal, weakens institutional accountability, and constrain the Municipal Corporation of Gurugram's ability to function as the city's primary urban government.

8.5 Priority Governance Reforms

Addressing Gurugram's governance challenges requires institutional reforms that enhance accountability, improve service delivery and enable integrated planning. A coherent governance framework should be built around these three strategic priorities:

Strengthening the Municipal Corporation of Gurugram: The Municipal Corporation should be vested with full authority over all municipal functions assigned under the Twelfth Schedule. Planning, regulation, service delivery and maintenance should rest with a single accountable institution, rather than being divided among multiple state agencies and parastatals.

The Corporation must also have financial autonomy. Although the Municipal Corporation has emerged as one of India's strongest municipal bodies in terms of internally generated revenues²², its expenditure and taxation powers remain constrained by state-level approvals. Greater fiscal autonomy is essential if municipal responsibilities are to be matched with the resources and authority needed to discharge them effectively.

Besides, the Corporation requires a professional municipal cadre with expertise in urban planning, engineering, finance, environmental management, digital governance, and public service delivery. Greater control over recruitment, training, and human resource management would significantly strengthen institutional capability and reduce dependence on contractual staffing.²³

Empowering the Mayor and Councillors: Democratic leadership at the city level must be strengthened. The direct election of the Mayor marked an important institutional reform, but meaningful decentralisation requires corresponding executive and financial authority. Decision-making powers should increasingly rest with elected representatives, enabling the political leadership to drive the city's long-term development agenda. Empower ward-level governance. Councillors should be given greater autonomy to approve and execute local development works, while Ward Committees should be operationalised as effective platforms for citizen participation, neighbourhood planning, and community oversight.

Enhancing Inter-agency Coordination: Even with greater municipal autonomy, Gurugram will continue to require agencies such as GMDA, HSVP, HSIIDC, DHBVN, and the PWD. The priority, therefore, is to establish clear jurisdictional boundaries, formal coordination mechanisms, shared data systems, and unified accountability frameworks that minimise duplication and enable integrated planning across the metropolitan region.

8.6 The Way Forward

Gurugram's institutional complexity is largely a product of the city's incremental evolution rather than deliberate planning. As the city expanded, new agencies were created to address specific functions and challenges. However, following the 74th Constitutional Amendment, many of these functions were not consolidated under the Municipal Corporation, and the state largely retained control through specialised agencies. As a result, Gurugram's governance architecture has become increasingly fragmented, weakening accountability and coordinated decision-making. The city does not require more institutions, but better alignment, clearer accountability and stronger coordination among the existing ones.

Ultimately, governance reform is not merely an institutional exercise—it is the foundation upon which Gurugram's sustainability, resilience, inclusivity and long-term economic competitiveness will depend.

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9

Success Stories



Wazirabad Lake, Gurugram, after its ecological restoration. Source: Down To Earth

Demonstrating What Works

Throughout this report, we have examined Gurugram's sustainability challenges across water, waste management, mobility, energy and urban ecology. Yet alongside these challenges, the city has also produced several examples that demonstrate practical, scalable and locally relevant solutions. Led by government agencies, Resident Welfare Associations, civil society organisations and private enterprises, these initiatives show that many of Gurugram's most pressing environmental problems already have proven solutions.

The following case studies illustrate how wastewater can become a resource, degraded ponds can be restored into ecological assets, waste can be diverted from landfills, neglected public spaces can be reclaimed, solar energy can reduce dependence on diesel generators, and streets can be redesigned around people rather than vehicles. While each initiative addresses a different challenge, together they demonstrate a common principle: sustainable urban development is achieved not through a single intervention, but through collaboration, innovation and long-term stewardship. These initiatives shared four common characteristics: they were decentralised, collaborative, built on multi-stakeholder partnerships, and rooted in principles of sustainability.

9.1 Badshahpur Forest Corridor: Transforming Waste into Green Infrastructure

The 5.6-kilometre Badshahpur Forest Corridor demonstrates how collaborative action can transform degraded urban land into valuable ecological infrastructure. Once used for waste dumping, encroachments and open defecation, the site was restored through a partnership between the organisation IAmGurgaon, GMDA, MCG and corporate partners. Around 33,000 native saplings were planted to create a self-sustaining forest habitat, while bioswales, water channels and recharge areas were developed to improve rainwater percolation and groundwater recharge. More than 250 truckloads of construction and demolition waste were repurposed into fencing, seating and landscape features, reducing project costs and promoting circular resource use.¹ Today, the corridor is used by an estimated 25,000–40,000 people daily and serves as a public green space, wildlife habitat, carbon sink and groundwater recharge zone, demonstrating how ecological restoration can enhance both environmental sustainability and urban liveability.

9.2 Ridgewood Estate: Segregation at Source

Ridgewood Estate in DLF Phase IV demonstrates how decentralised waste management can substantially reduce dependence on municipal landfills. Generating around 500 kilograms of waste every day², the residential community has implemented systematic waste segregation at source, supported by on-site composting in partnership with a local waste management company Balancing Bits. Wet waste is converted into compost for landscaping,³ while recyclable materials are recovered in a clean and uncontaminated condition, improving both recycling efficiency and the safety of waste workers.⁴ By processing most of its waste within the community, Ridgewood diverts approximately 18 tonnes of waste annually⁵ from landfill disposal. The initiative illustrates how segregation at source and decentralised processing form the foundation of a circular urban waste management system. It also demonstrates that with the right awareness and support, citizens can drive meaningful behavioural change.

9.3 Chakkarpur–Wazirabad Bundh: Reclaiming Urban Commons

Originally developed as part of Gurugram's traditional bundh system for rainwater harvesting, groundwater recharge and flood control, the Chakkarpur–Wazirabad Bundh had deteriorated due to encroachments, illegal dumping and sewage pollution. Through a citizen-led initiative by IAmGurgaon, along with the Haryana Forest Department, the MCG and other stakeholders, the 5.2 km bundh was restored. The project removed decades of accumulated waste, diverted sewage for treatment, reused over 6,000 m³ of C&D waste, and created a rainwater management system with recharge chambers, trenches and percolation pits to enhance groundwater recharge. More than 39,000 native trees and shrubs were planted, transforming the area into a biodiverse ecological corridor and public space for walking and cycling. Today, the restored bundh attracts an estimated 25,000–30,000 visitors daily, demonstrating how the revival of traditional water infrastructure can strengthen environmental resilience, biodiversity and groundwater recharge.

9.4 Sanath Road: Reimagining Streets for People

Once known locally as “Anath Road” due to years of neglect, poor drainage, waste accumulation and severe congestion, Sanath Road and the adjoining Gully 7 and HIPA Road in Sector 18 have been transformed into one of Gurugram's leading examples of people-centric street design. Implemented by the Raahgiri Foundation in partnership with MCG, GMDA and other city agencies, with support from Nagarro, Maruti Suzuki and landscape architects Beyond Built⁵, the project introduced wide shaded footpaths, cycle tracks, improved street lighting, ramps and raised crossings, upgraded drainage, underground utilities, dedicated vending zones and bioswales for rainwater management.⁵ The result is a vibrant public space that prioritises pedestrians and cyclists while improving mobility, universal accessibility, safety, air quality and climate resilience. The project demonstrates that well-designed streets can function not only as transport corridors but also as inclusive public spaces that promote social interaction, support local livelihoods and encourage sustainable mobility.

9.5 Wazirabad Lake: Restoring Nature's Water Infrastructure

Located along Golf Course Road in Sector 52, Wazirabad Lake had gradually deteriorated due to sewage inflows, waste dumping and rapid urbanisation. Acting on directions from the National Green Tribunal, GMDA initiated restoration in 2022⁶, implemented by the NGO Sustainable Environment and Ecological Development Society, by demarcating the lake boundary, removing accumulated waste and restoring water levels.⁷ Today, the revived lake functions not only as an attractive public space with walking tracks, but also as an important groundwater recharge zone and biodiversity habitat.⁸ The transformation demonstrates that restoring lakes is not merely an environmental exercise but an investment in water security, climate resilience and the quality of urban life.

9.6 Daulatabad Pond: Restoring Water Security through Ecological Infrastructure

In Daulatabad village near Sector 103, a neglected pond that had become heavily polluted and seasonal has been transformed into a model of ecological restoration. Supported by CSR funding from the Power Grid Corporation of India and implemented by GuruJal⁹, the project restored the pond's storage capacity through desilting and embankment strengthening¹⁰ before installing a 350 KLD constructed wetland-based wastewater treatment system.¹¹ Unlike conventional treatment plants, constructed wetlands use vegetation and naturally occurring microorganisms to treat wastewater at relatively low operating cost while creating green landscapes. The restored pond now improves groundwater

recharge, revives surrounding public spaces and demonstrates how nature-based infrastructure can complement conventional engineering solutions in strengthening water resilience.

9.7 Wellington Estate: Rooftop Solar in Action

Wellington Estate in DLF Phase V has emerged as one of India's leading examples of residential rooftop solar adoption. Beginning with a 200 kWp installation in 2017 and expanding to 350 kWp through a second phase¹², the society now generates around 70 percent of the electricity required for its common areas through solar rooftop.¹³ Residents have reported a reduction in average monthly electricity bills from approximately Rs. 8,000 to Rs. 5,000. The savings arise from a reduction in the pro-rata common area electricity charges borne by each apartment and lower tariffs for household electricity consumption, as reduced grid electricity procurement enables billing under lower DHBVN slab rates. Collectively, the society saves nearly Rs. 33 lakh annually. By replacing a substantial share of grid electricity and reducing reliance on diesel generators, Wellington Estate demonstrates how distributed rooftop solar can lower household energy costs, reduce emissions and strengthen energy resilience in high-density residential communities.

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10

Conclusion



A Complex Transition

Gurugram stands at a critical juncture in its urban development. The city's remarkable economic growth has transformed it into one of India's leading centres of investment and innovation, but it has also created sustainability challenges that can no longer be addressed in isolation.

Water resources are under mounting stress, waste generation continues to outpace processing capacity, energy systems must transition towards cleaner and more resilient sources, transport remains increasingly car-dependent, and the Aravalli ecosystem continues to face persistent ecological pressures. At the same time, there are concerns around affordable housing, equitable access to basic services and social inclusion. A number of government, private sector and citizen-led initiatives are making a difference; however, they remain insufficient in scale to keep pace with Gurugram's rapid growth.

The sustainability challenges examined in this report are closely interconnected and cannot be addressed through isolated sectoral interventions. Water security depends not only on protecting lakes, ponds and groundwater recharge zones, but also on conserving the Aravalli ecosystem and expanding wastewater reuse. Similarly, air quality is influenced by transport choices, energy systems and industrial emissions, while flood resilience depends upon integrated urban planning, natural drainage corridors and effective governance. These interdependencies underline the need for a coordinated, cross-sectoral approach to urban development.

Running through all these challenges is a common thread: the need for stronger, more integrated urban governance. While each chapter in this Handbook has examined a different dimension of urban sustainability, they all point to the same conclusion: Gurugram's future will depend less on the availability of technical solutions than on the quality of its governance and the ability of institutions to work together.

The MCG must evolve into a more empowered urban local body. All municipal functions should be transferred to it, and its finances strengthened. The GMDA should focus on metropolitan-level planning, regional infrastructure and inter-agency coordination, while day-to-day municipal services should rest with the MCG. The authority of the Mayor should be strengthened and councillors empowered. Ultimately, Gurugram's future will be determined as much by governance reform as by infrastructure investment.

10.1 Key Principles for Managing the Transition

Strengthening urban governance is a necessary step, but Gurugram's transition to a more sustainable, resilient and inclusive city will also require new approaches to planning, service delivery and collaboration. It can adopt several proven approaches that have delivered positive outcomes. Three cross-cutting principles that can guide this transition:

Decentralised Service Delivery: Many urban services can be delivered more efficiently at the local level rather than through entirely centralised systems. Decentralised wastewater treatment, rainwater harvesting, waste processing and water recycling can reduce pressure on citywide infrastructure and resources. These systems lower the demand for fresh water, minimise waste transported to distant facilities, and help prevent pollution of drains and water bodies. They also make neighbourhoods more self-reliant, improve service reliability, enable faster maintenance and encourage greater community ownership of urban resources.

Multi-Stakeholder Partnerships and Collaborations: Sustainable urban development is ultimately the responsibility of government institutions. However, experience in Gurugram has shown that the most effective and enduring solutions often emerge when government departments work in partnership with citizen groups, NGOs, resident welfare associations, academic institutions and the private sector, including through CSR initiatives.

Such collaborations have created islands of excellence in areas ranging from environmental restoration and waste management to water conservation and public spaces. The city should integrate non-government stakeholders into planning, implementation and monitoring processes, enabling innovation, leveraging additional resources and strengthening community ownership while keeping government at the centre of service delivery.

Institutional Coordination: While implementation should increasingly be decentralised, strategic direction, regulation and accountability must remain with higher levels of government. Equally important is improved coordination among GMDA, MCG, HSVP, state departments and regulatory agencies to ensure that sectoral interventions reinforce rather than duplicate one another.

10.2 Towards a Sustainable Gurugram

Gurugram's sustainability challenge is no longer primarily one of resources or technology. The city possesses the financial strength, institutional capacity and technical knowledge needed to become one of India's most sustainable urban regions. The real challenge lies in aligning these strengths through better governance, stronger collaboration and long-term planning.

We have seen that many of the solutions already exist. Successful initiatives in water restoration, decentralised waste management, rooftop solar, sustainable mobility and citizen-led environmental action demonstrate that transformation is both possible and practical. The next phase of development must focus on scaling these successful initiatives from isolated projects into integrated, city-wide systems. Achieving this transformation requires a multi-tiered approach in which government, businesses, communities and individuals each play distinct but complementary roles.

Positive action is needed at every level. Local governments must lead city-wide planning, strengthen institutional coordination and provide the infrastructure as well as policy and regulatory framework needed for sustainable urban development. Communities can complement these efforts by implementing decentralised solutions such as rainwater harvesting, waste segregation, composting, water recycling and neighbourhood greening. Individuals, too, play a vital role by adopting sustainable lifestyles—conserving water and energy, segregating waste at source, choosing public transport, cycling or walking where possible, and actively contributing to cleaner and greener neighbourhoods.

Together, these collective efforts can create a city that is more resilient, resource-efficient and liveable. The table below outlines some of the practical actions that each stakeholder can take to contribute towards a more sustainable Gurugram.

Cities are ultimately judged not by the speed of their growth, but by the quality of life they create for present and future generations. The next phase of Gurugram's transformation must be measured not only by the office towers it builds or the investments it attracts, but by the resilience of its water systems, the health of its ecosystems, the efficiency of its transport networks, the strength of its institutions and the inclusiveness of its neighbourhoods.

Building a sustainable city will require ecological stewardship, integrated urban planning, stronger institutions and effective collaboration between government, businesses, civil society and citizens. The vision is clear; the challenge now lies in translating it into sustained action through committed leadership, coordinated implementation and long-term political will.

A Shared Responsibility: Solutions at Every Level

City Level: Enforce city-wide rainwater harvesting; decentralised waste management; dry waste recycling; develop cycle tracks and pedestrian-friendly walkways; large-scale tree plantation; promote solar rooftops and energy efficiency; expand public transport and EV infrastructure; citywide waste segregation at source.

Community Level: RWA-led air and water monitoring; community composting, rainwater harvesting systems; greywater recycling for gardening and flushing; RWA-led solar projects; community solar street lighting; local biodiversity and eco-awareness groups; tree plantation in common areas and parks; eco-friendly events and green markets.

Individual Level: Take bucket baths to save water; use energy-efficient appliances; reuse RO reject water for plants; recycle household greywater; switch to rooftop solar panels; use public transport, cycle, or walk; segregate waste at source; plant and nurture native trees nearby.

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Mapping Sustainability: A Geospatial Approach to SDG Monitoring in Gurugram

Traditionally, urban sustainability has relied on periodic government surveys and administrative data. Today, advances in satellite imagery, remote sensing and artificial intelligence enable cities to monitor environmental indicators in near real time. The **Centre of Excellence in Sustainable Development (CoESD)** at **Great Lakes Institute of Management** has developed a hyper-local sustainability index that combines satellite-derived data on economic activity (night-time lights), soil moisture, greenhouse gases and other indicators. By generating quarterly village-level metrics, the initiative shows how geospatial analytics can support evidence-based SDG monitoring. The data and the indices can be accessed at <https://datalab.greatlakes.edu.in/>.

The index rates villages, sub-districts and districts using data extracted from Google Earth Engine based on the 2011 Census boundaries. Currently covering 391 of India's 641 districts, it provides separate quarterly ratings for each indicator rather than a single composite score. Every village and sub-district is placed on an eight-tier scale from **F to AAA** using fixed national percentile bands (AAA = top 5 percent, AA = 85th–95th percentile and F = bottom 5 percent).

This raises two key questions: How does Gurugram compare with other districts on selected sustainability indicators? Which areas within the district perform better than others? At the national level, two useful indicators are prosperity, proxied by night-time lights, and soil moisture. Consider India's night-time image as seen from space.



How India looks from space, day and night — the brightly lit areas at night trace the country's economic activity.

The brightly lit areas on the map represent centres of economic activity. These clusters correspond to major urban centres —the NCR, Mumbai, Bengaluru, Ahmedabad, Pune and Kolkata, while darker areas indicate low or moderate economic activity. By converting the intensity and spread of night-time illumination into numerical values, the Night Lights index generates hyper-local measures of economic activity across months, quarters, seasons and years. Areas with the highest night-light values are rated AAA, while those with little or no economic activity receive an F rating. These ratings are updated every quarter.

A similar exercise was carried out for soil moisture, which measures how much water is stored in the ground at a given time. In natural ecosystems, higher soil moisture generally indicates healthier growing conditions and lower drought stress, while low values signal water scarcity. However, higher values are not always beneficial. In built-up or paved areas with little vegetation, soil moisture may appear high simply because there is little vegetation to absorb and transpire water, not because the land contains abundant usable water.

How does Gurugram compare with the rest of India? Using CoESD's sub-district ratings for 2021–2024, the district's five sub-districts tell two very different stories depending on the indicator.

Sub-district	Nightlight Rating (national)	Soil Moisture Rating (national)
Gurgaon	AAA (nearly every quarter, 2021-2024)	B–BBB (never above BBB)
Manesar	AAA (every quarter)	B–BB
Sohna	AAA (all but one quarter)	B–BB
Farrukhnagar	AA→AAA (upgraded early, held since)	B–BBB
Pataudi	A–AA (consistently the lowest of the five)	B–BB

At the sub-district level, Gurugram tells two contrasting stories. On **Night Lights**, four of its five sub-districts—Gurgaon, Manesar, Sohna and Farrukhnagar—maintained the highest national rating (AAA) for almost the entire 2021–2024 period, with only Pataudi slightly lower at A/AA. This reflects sustained top-tier economic performance. In contrast, **Soil Moisture** ratings remained between C and BBB, with none of the sub-districts reaching AA or AAA nationally. Since soil moisture is driven largely by climate and rainfall rather than governance or development, this should not be viewed as a planning failure. Together, the rankings show Gurugram's national profile is exceptional on economic activity but average on an indicator shaped primarily by natural conditions.

The second tier of analysis examines village-level patterns using three indicators—Night Lights, Soil Moisture and GHG emissions. All four maps compare villages within Gurugram on the same eight-tier scale, from **F** (lowest) to **AAA** (highest). For Night Lights and Soil Moisture, higher ratings indicate greater economic activity and higher retained soil moisture. For the two GHG composites, the scale is reversed, with **AAA** representing the cleanest air and **F** the most polluted villages.

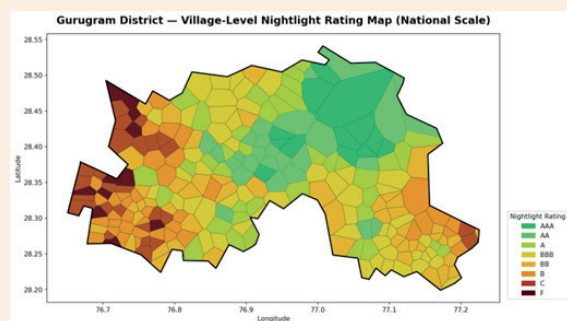


Fig 1. Night Lights (NL) — economic activity

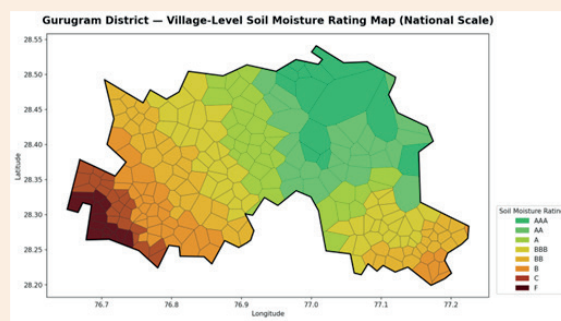


Fig 2. Soil Moisture

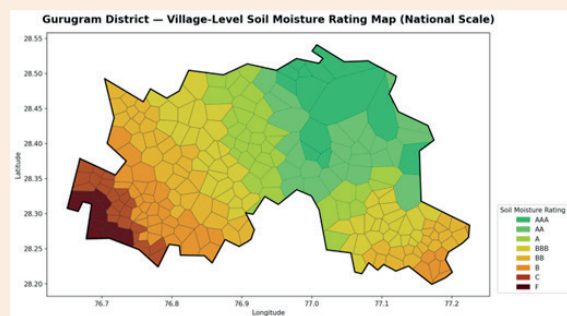


Fig 3. GHG Composite 1 (NO₂ + CO)

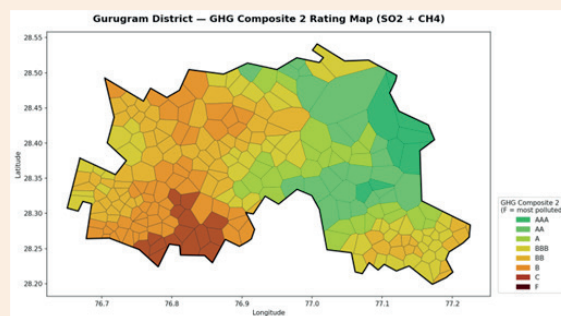


Fig 4. GHG Composite 2 (SO₂ + CH₄)

The four maps together tell a coherent story. Night Lights and Soil Moisture move together closely—the same bright, prosperous villages in the northeast also show the highest soil moisture, making prosperity and “wetness” appear positively related. At first glance, this suggests that economic growth and environmental health are rising together. However, GHG Composite 1 (NO₂ + CO, the traffic- and combustion-linked gases) immediately challenges that conclusion. It is almost the mirror image of the Night Lights map, with the brightest villages—Nangli Umarpur, Ghasula, Medawas, Ulhawas, Adampur and Gurugram town—ranking AAA on Night Lights but F on GHG Composite 1. The maps therefore reveal a clear trade-off: the villages performing best economically are also experiencing the poorest air quality.

The soil moisture findings also require careful interpretation. Higher values may simply reflect reduced vegetation and lower evapotranspiration in urbanised areas rather than a genuine abundance of usable water, and should not be viewed as an environmental benefit that offsets deteriorating air quality. GHG Composite 2 (SO₂+CH₄) presents a different pattern. Its cleanest and most polluted villages are dispersed rather than concentrated in the urban core, indicating different emission sources, likely brick kilns, waste management etc. While GHG Composite 1 reflects urbanisation, GHG Composite 2 does not.

The policy implication is clear. A single pollution index for Gurugram would mask these distinct patterns, implying one problem and one solution, when different pollution sources require separate policy responses. The marked variation across villages and sub-districts also underscores the need for place-based planning rather than district-wide averages. By generating high-frequency, spatially disaggregated data, the index demonstrates how satellite imagery can complement conventional statistics and support more targeted, evidence-based urban governance.

Taken together, the maps argue against any single verdict on Gurugram’s sustainability. Economic growth is real and geographically concentrated, but so is its air-quality cost. At the same time, a second, quieter set of emissions lies outside this growth story and is unlikely to respond to traffic-focused interventions.

The SDG message is equally clear. A single sustainability score would obscure more than it reveals. Growth, air quality and pollution sources must be monitored separately as villages performing well on one indicator often perform poorly on another. Hyper-local satellite data make these trade-offs visible, transforming the SDGs from broad national aspirations into actionable local evidence.

A final word of caution: these maps are derived from satellite observations and modelled climate data rather than ground-based sensors. Measures such as NO₂ and CO represent the atmospheric column rather than street-level exposure, while village boundaries are approximated mathematically from centre points rather than official cadastral records. Results near district boundaries should therefore be interpreted with care. Even so, the consistency across these independent variables provides a compelling picture of how growth, pollution and environmental pressures interact across Gurugram’s villages—and where that relationship warrants further investigation.

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