FOUNDATIONAL POLICY PAPER

Strategic Framework for Enhancing Urban Green Spaces in Haryana (2026–2047)

Submitted by

SDGCAC

SUSTAINABLE DEVELOPMENT GOALS
COORDINATION AND ACCELERATION CENTRE

OUTPUT- 2 : SDG Localization for Resilient Growth Centers

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Strategic Framework for Enhancing Urban Green Spaces in Haryana (2026–2047)

Towards Greener, Healthier, and Climate-Resilient Cities in Haryana

Executive Summary

Haryana stands at an ecological inflection point. With a forest cover of just 3.65% of its geographic area — the lowest of any Indian state and barely one-ninth of the National Forest Policy target of 33% — the state confronts a convergence of environmental issues: declining forest cover, critical groundwater depletion, severe air pollution, and intensifying urban heat islands[1]. Gurugram, the state's economic engine, offers its residents a mere 3.14 m² of per capita green space — 65% below the World Health Organization's minimum standard of 9 m² [2]. Eight Haryana cities rank among the world's fifty most polluted, and residents of Gurugram lose an estimated 11.2 years of life expectancy to particulate matter pollution alone[3].

This policy paper presents a Strategic Framework for Urban Green Space (UGS) Enhancement spanning 2026 to 2047, aligned with the Haryana Vision 2047 objective of building a $1 trillion economy[4]. The framework argues that achieving economic transformation without ecological resilience is neither sustainable nor feasible. Urban greening is not a peripheral amenity but a foundational infrastructure investment that directly reduces healthcare costs, increases property values, mitigates flood risk, recharges groundwater, improves air quality, and generates employment.

The paper draws on verified data from the India State of Forest Report (ISFR) 2023, Central Ground Water Board (CGWB) assessments, National Green Tribunal (NGT) directives, and the World Health Organization (WHO), and benchmarks Haryana's position against leading global models — Singapore's LUSH program, Medellín's Green Corridors, and Telangana's Haritaharam — as well as national innovations such as Karnataka's 5:50:500 rule.

Five strategic pillars are proposed: (1) Legal and Regulatory Mandates, (2) Financial Architecture, (3) Nature-Based Solutions, (4) Social Governance and Community Participation, and (5) Digital Monitoring and Accountability. A tiered Key Performance Indicator (KPI) framework provides quantified baselines and targets for 2030, 2036, and 2047, calibrated to different municipal capacities. The paper concludes with a call for immediate departmental consultation and an expert conclave at the Swarna Jayanti Haryana Institute for Fiscal Management (SJHIFM).

[1] ISFR 2023, Forest Survey of India, https://fsi.nic.in/uploads/isfr2023/isfr_book_eng-vol-1_2023.pdf

[2] GIS-Based Analysis, Central University of Haryana, https://journals2.ums.ac.id/fg/article/download/4759/1870/25822

[3] EPIC India / AQLI 2023, https://epic.uchicago.in/indians-lose-5-years-life-to-air-pollution-delhi-worst-at-12-years-chicago-university-study/

[4] Haryana Vision 2047, https://sjhifm.finhry.gov.in/vision-2030/

Comprehensive Ecological Baseline and Spatial Analytics

Macro-Level Forest Deficit

According to the India State of Forest Report 2023 (ISFR 2023), published by the Forest Survey of India on December 21, 2024, the state's total forest cover stands at 1,614.26 km² — a mere 3.65% of its geographic area of 44,212 km². This places Haryana at the bottom of all Indian states, below even Rajasthan (4.84%), a predominantly desert state. The national average stands at 21.76%, and the National Forest Policy mandates 33% for every state[5].

Forest Category	Area (km²)	% of Geographic Area
Very Dense Forest (canopy ≥70%)	27.17	0.06%
Moderately Dense Forest (canopy 40–70%)	441.18	1.00%
Open Forest (canopy 10–40%)	1,145.91	2.59%
Total Forest Cover	**1,614.26**	**3.65%**
Scrub	174.38	0.39%
Tree Cover (outside forests)	~383	~0.87%
Combined Forest + Tree Cover	**~1,997**	**~4.51%**

The composition is particularly alarming: Very Dense Forest constitutes a negligible 0.06% of the state's area, with only 27.17 km² qualifying. The overwhelming majority of forest cover (71%) falls in the lowest-quality Open Forest category. Between ISFR 2021 and ISFR 2023, while total forest cover registered a marginal increase of 11.26 km², this masked a structural deterioration — dense and moderately dense forests declined, while lower-quality open forests and scrubland expanded[6].

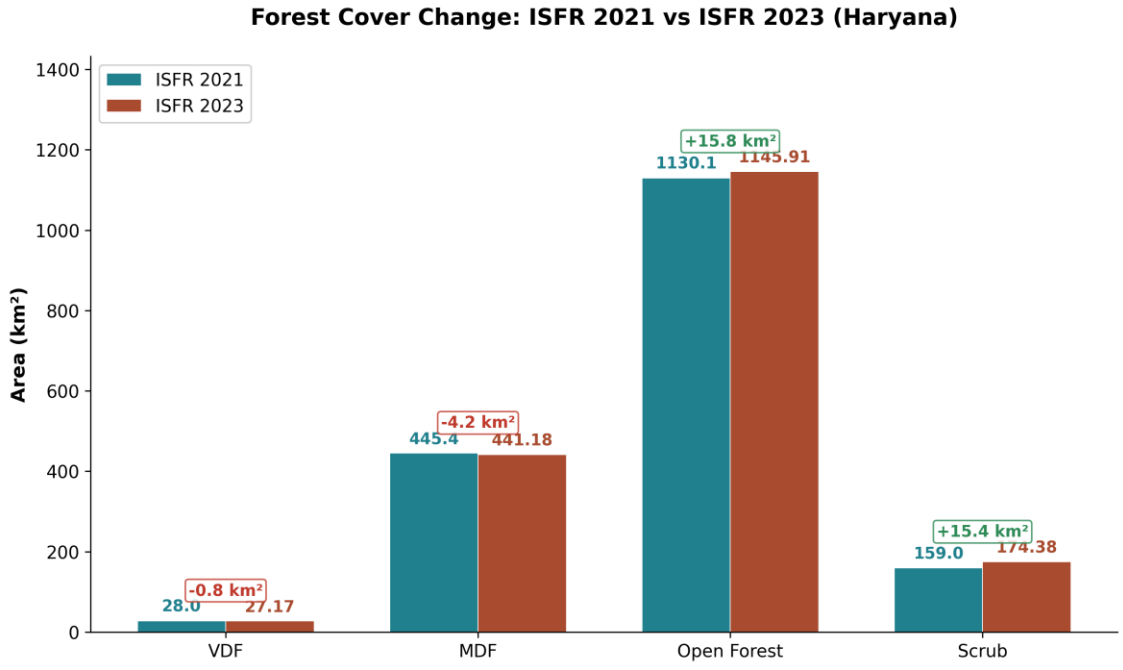


Figure 1: Forest Cover Change — ISFR 2021 vs ISFR 2023 (Haryana)

[5]PIB Press Release, December 2024, https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2086742

[6]The Print, December 2024, https://theprint.in/india/haryana-saw-rise-in-total-forest-tree-cover-between-2021-and-2023-but-dense-forests-declined/2416417/

Most critically, 343.67 km² of forest cover outside Recorded Forest Areas (RFA) was lost between 2021 and 2023 — forests on land not formally notified as forest land are disappearing at a rate that undermines all afforestation gains[7].

District-Level Gaps

The distribution of green cover across Haryana's 23 districts is greatly unequal. Of 23 districts, 22 have less than 20% combined forest and tree cover. Only Panchkula, benefiting from its Shivalik foothill geography and Morni Hills, exceeds this threshold at 43.44%. The industrialised and urbanised districts that constitute the economic core — Gurugram, Faridabad, Rohtak, Karnal — are among the most ecologically depleted.

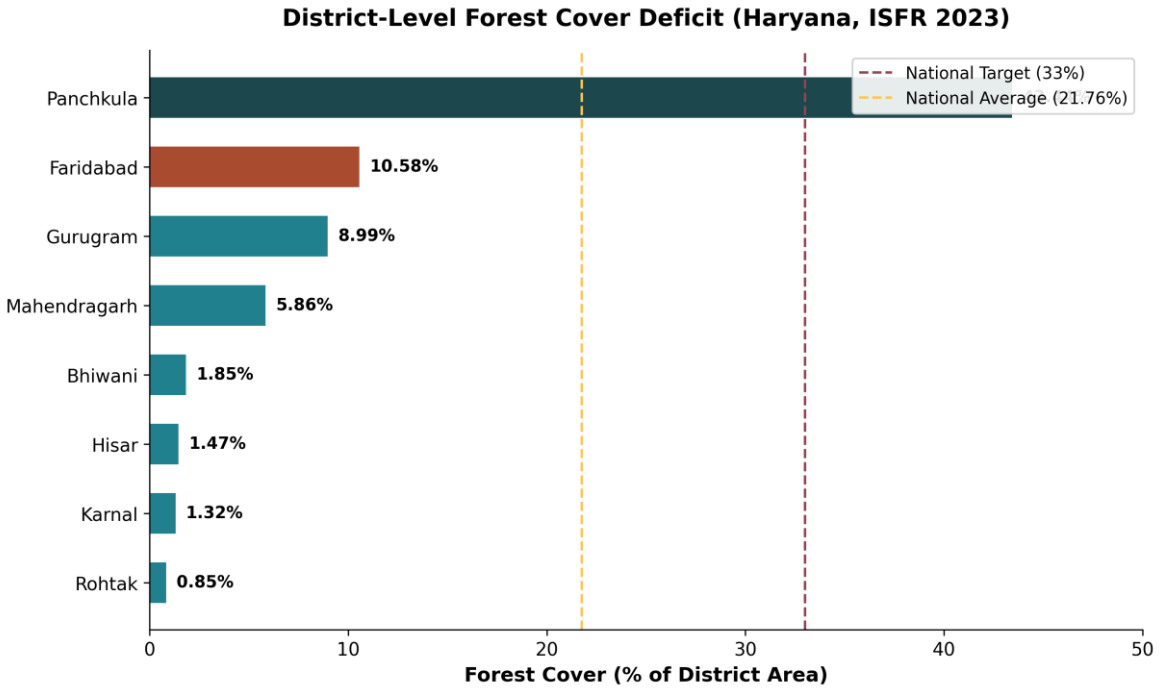


Figure 2: District-Level Forest Cover Deficit (Haryana, ISFR 2023)

District	Forest Cover (km²)	% of Area	VDF (km²)	Change vs 2021 (% pts)	Key Observation
Panchkula	390.12	43.44%	5.70	-1.43	Only district with VDF; Shivalik foothills
Faridabad	78.43	10.58%	0.00	-1.08	Aravalli degradation; most significant reduction of dense cover
Gurugram	113.11	8.99%	0.00	+0.15	Tree cover fell from 10.8% (2011) to 6.7% (2023); 1,200+ acres of Aravalli lost
Mahendragarh	111.31	5.86%	0.00	-1.72	Aravalli mining zone
Bhiwani	62.61	1.85%	0.00	-1.89	Aravalli mining destruction
Hisar	58.54	1.47%	0.00	-1.92	Agricultural monoculture zone
Karnal	32.95	1.32%	0.00	+0.04	Lowest tree cover district (1.8%)
Rohtak	14.54	0.85%	0.00	-4.28	Most significant decline of any district

Source: ISFR 2023 Volume II — Haryana Chapter, Forest Survey of India[8]

[7] ISFR 2023 Volume II, https://cdnbbsr.s3waas.gov.in/s3c5866e93cab1776890fe343c9e7063fb/uploads/2025/08/202508181373945329.pdf

Gurugram's trajectory is especially stark: tree cover declined from 10.8% in 2011 to 6.7% in 2023, with built-up area expanding from 50.6 km² (10% of district, 1990) to 210.4 km² (45.1%, 2018) — a 237% growth in impervious surfaces[9]. Over 1,200 acres of Aravalli forest patches have been lost to encroachments and construction[10].

Per Capita Green Space Deficit

Gurugram's per capita public open space stands at a critically low 3.14 m², with 6 of its 35 municipal wards reporting zero green space. The Gurugram Metropolitan Development Authority (GMDA) itself acknowledges this deficit against the WHO standard of 9 m² per capita[11].

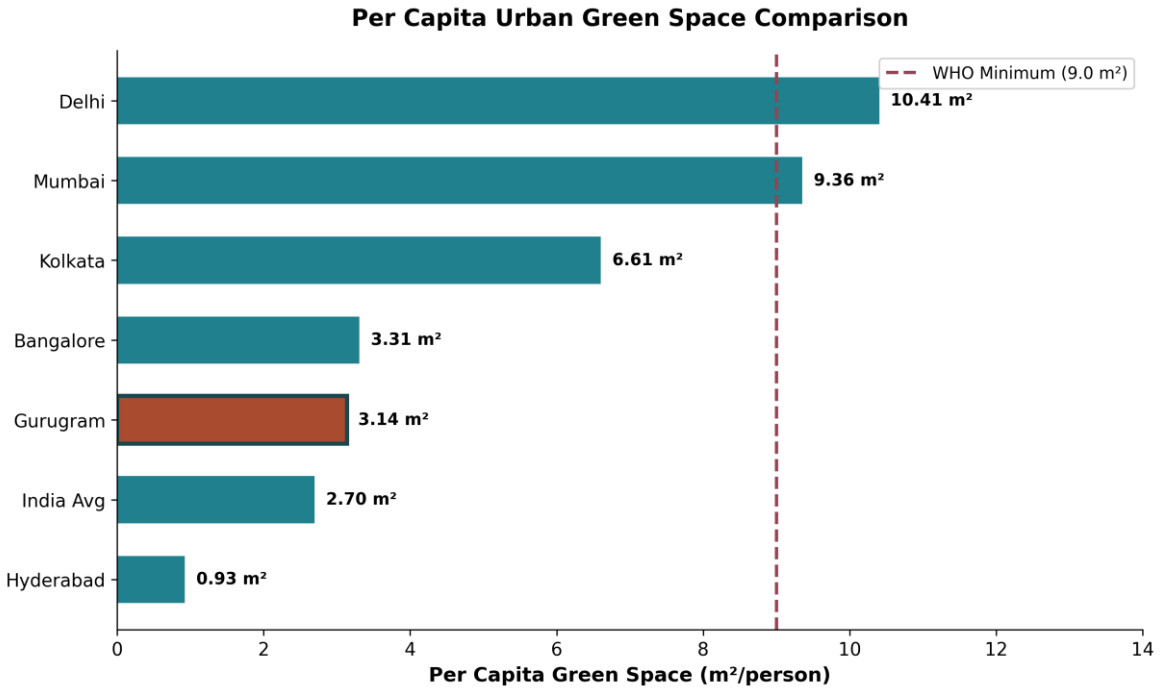


Figure 3: Per Capita Urban Green Space Comparison

India's national average urban per capita open space is approximately 2.7 m² — itself below the WHO minimum — underscoring a structural deficit across the country's urban landscape[12]. Over the past decade, India's urban green cover has decreased by 23%, with only 2.07% of urban land area covered by green spaces[13].

[9] ISPRS Archives, 2019, https://isprs-archives.copernicus.org/articles/XLII-5-W3/49/2019/

[10] Give Back to Gurugram, July 2025, https://www.givebacktogurugram.com/post/deforestation-in-gurugram-the-hidden-climate-emergency-no-one-is-talking-about

[11] GMDA Livability Parameters, https://www.gmda.gov.in/download.html?fid=GMDA_4d96aa80-9b03-4104-b859-06d9c8e91afa&code=opinion&key=attachment&identifier=1538558036260

[12] Shodhgangotri UGS Study, https://shodhgangotri.inflibnet.ac.in:8443/jspui/bitstream/20.500.14146/19271/1/MAHI.pdf

[13] IJFMR, 2024, https://www.ijfmr.com/papers/2024/5/29663.pdf

Hydrological Stress Multipliers

Haryana's groundwater crisis directly intersects with its green space deficit. The state extracts groundwater at 135.74% of sustainable levels, with annual extraction (11.8 BCM) exceeding annual extractable recharge (8.69 BCM) by over 3 BCM[14]. Of 143 administrative blocks, 88 (61.5%) are classified as "over-exploited"[15].

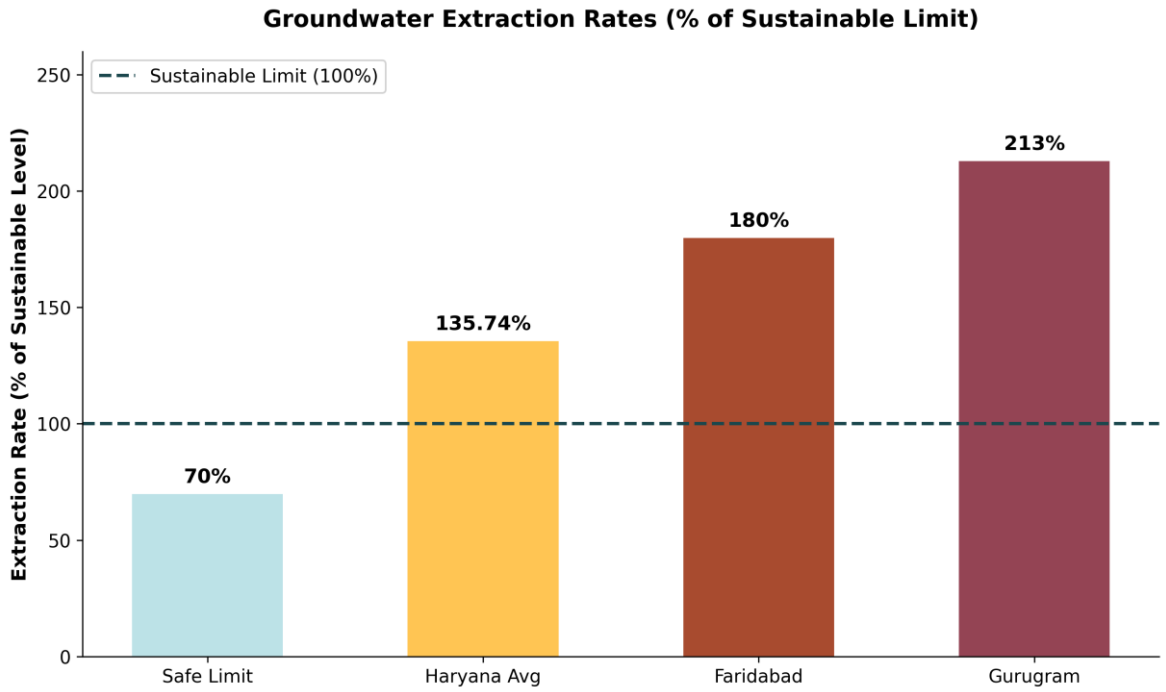


Figure 4: Groundwater Extraction Rates (% of Sustainable Limit)

The NCR districts are facing challenges:

- **Gurugram:** extraction at 213% of sustainable limit (43,262 ham extracted against 20,333 ham sustainable)
- **Faridabad:** extraction at approximately 180% of sustainable limit
- Average water table declined 9.47 metres over 25 years (1995–2020)

Source: CGWB 2023 via SANDRP[14]*; Haryana Water Resource Authority Annual Report 2022–24*[16]

Urban greening directly addresses this crisis. Permeable green surfaces facilitate groundwater recharge, reduce surface runoff, and lower evapotranspiration loss from exposed soil — making green infrastructure a water security intervention, not merely an aesthetic one.

Thermal Stress: Urban Heat Islands

Gurugram has been identified as, as identified in a 2025 peer-reviewed study, the most intense Urban Heat Island among all Delhi NCR satellite cities, with Land Surface Temperatures peaking at 42–44°C and a consistent warming trend documented from 2014 to 2022[17]. A Principal Component Analysis attributed

[14]SANDRP Groundwater Report 2024, https://sandrp.in/2025/02/18/groundwater-2024-top-ten-stories-on-how-depletion-continues-alarmingly/

[15]The Tribune, June 2024, https://www.tribuneindia.com/news/haryana/groundwater-crisis-in-state-88-of-143-blocks-over-exploited-630848/

[16]Haryana Water Resource Authority Annual Report 2022-24, https://hwra.org.in/AnnualReport/Annual%20Report%20For%20The%20Financial%20Year%202022-2023%20and%202023-2024.pdf

[17]Sharma, Yogeswaran & Singh, 2025, https://www.hrpub.org/download/20250630/CEA5-14841153.pdf

79.4% of variance to urbanisation variables — population density, built-up area expansion, water body loss, and tree cover decline.

Haryana's Tier-II cities face similar trajectories: Hisar is projected to warm 0.7–0.8°C above rural surroundings under 2°C global warming[18]. Deforestation in the Aravallis has opened 12 major breaches, allowing Thar Desert dust to penetrate into NCR, compounding both particulate pollution and thermal stress[19].

Air Quality Crisis

Eight Haryana cities rank among the world's fifty most polluted, and 15 of 24 monitored cities ranked among India's 100 most polluted in H1 2024[20].

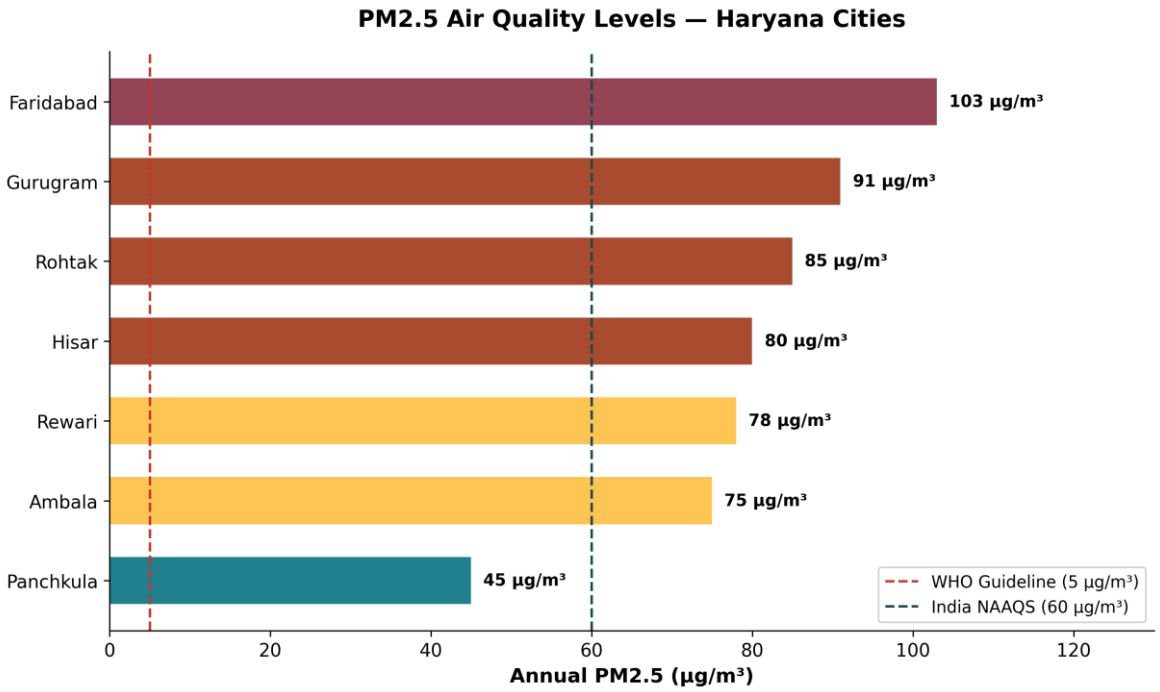


Figure 5: PM2.5 Air Quality Levels — Haryana Cities

City	Annual PM2.5 (µg/m³)	WHO Guideline Multiple	Life Expectancy Loss
Gurugram	91	18x	11.2 years
Faridabad	103 (H1 2024)	21x	10.8 years
India NAAQS	60	—	—
WHO Guideline	5	1x	—

Source: CREA NCAP Progress Report 2025[21]*; Airveda, April 2025*[22]*; EPIC India / AQLI 2023*[23]

[18]Down to Earth, February 2026, https://www.downtoearth.org.in/climate-change/urban-heat-in-india-set-to-intensify-as-some-cities-warm-faster-new-research-finds

[19]Down to Earth, December 2025, https://www.downtoearth.org.in/forests/uniform-definition-of-aravallis-accepted-by-supreme-court-will-be-catastrophic-for-indias-oldest-mountain-range

[20]Economic Times, September 2024, https://economictimes.com/news/india/haryana-has-15-cities-among-indias-100-most-polluted-gurgaon-faridabad-tops-the-list/articleshow/113094659.cms

[21]CREA NCAP Progress Report 2025, https://energyandcleanair.org/publication/tracing-the-hazy-air-2025-progress-report-on-national-clean-air-programme-ncap/

[22]Airveda, April 2025, https://www.airveda.com/blog/gurugram-AQI-trends

[23]EPIC India / AQLI 2023, https://epic.uchicago.in/indians-lose-5-years-life-to-air-pollution-delhi-worst-at-12-years-chicago-university-study/

Urban tree canopies are among the most cost-effective particulate matter filters. Research demonstrates that strategic urban forestry can reduce PM2.5 concentrations by 7–24% in localised areas, and the Medellín Green Corridors model achieved a measured reduction in respiratory morbidity from 160 to 95 per 1,000 population.

Statutory and Policy Review

Review of Existing Frameworks

Statute/Policy	Key Green Space Provisions	Gaps and Limitations
Haryana Municipal Bill, 2025	Urban forestry mandate for ecosystem services; unifies 87 municipalities under single statute	Lacks specific quantified green space mandates; no dedicated green budget provision; implementation rules pending
HDRUA Act & Rules	Rule 4: 45% of gross colony area for roads, open spaces, schools; 5% dedicated open space for eco-friendly colonies; Rule 5(b): mandatory turfing and plantation	Open space bundled with roads/schools — no separate green space minimum; 5-year developer maintenance period insufficient; no canopy cover mandate
Haryana Forest Policy 2006	Target of 20% forest and tree cover (interim 10% by 2010)	10% interim target not achieved by 2026; current 4.51% represents massive shortfall; no enforceable penalties for non-compliance
Forest Conservation Amendment Act 2023 (Central)	Restricts FCA to formally recorded/notified forests	Excludes "deemed forests" from protection — critical risk for Aravalli unclassified areas; exempts pre-1996 converted land
NGT Directives (October 2025)	Tree felling in non-forest areas requires DFO approval; 3-tree compensatory minimum per tree felled	Enforcement capacity requires strengthening — 16+ documented incidents in Panipat alone (2022–2026); penalty amounts may benefit from revision to current standards (Rs 80,000 in January 2026 heritage tree case)
HRERA Green Building Mandate (March 2025)	GRIHA/LEED/IGBC certification mandatory for Gurugram projects >20,000 m² or 750 units	Limited to Gurugram; threshold excludes smaller but numerous developments; no green space percentage mandate
CAMPA (est. April 2019)	Compensatory afforestation fund for diversion of forest land	Haryana utilisation rate 57.4% — below national average of 67.5%; Rs 110.83 cr approved (2024–25), only Rs 79 cr utilised
Punjab Land Preservation Act (PLPA) 1900	Heritage tree protection (maximum penalty: 1 month imprisonment, Rs 100 fine)	Penalties reflecting historical values; applies only in 10 of 22 districts; Rs 100 fine has limited deterrent effect given present-day values
State Environment Plan 2025 (September 2025)	Comprehensive environmental planning framework	Recently released; implementation mechanisms not yet operationalised

Sources: Punjab Newsline — Haryana Municipal Bill 2025[24]*; HDRUA Rules*[25]*; NGT Orders 2025*[26]*; CAMPA Annual Plan 2024–25*[27]

[24]Punjab Newsline — Haryana Municipal Bill 2025, https://www.punjabnewsline.com/news/haryana-cabinet-approved-haryana-municipal-bill-2025

[25]HDRUA Rules, https://tcpharyana.gov.in/

[26]NGT Orders 2025, https://greentribunal.gov.in/

[27]CAMPA Annual Plan 2024-25, https://campa.gov.in/

It is notable that neighbouring Punjab enacted the Punjab Protection of Trees Act 2025, which extends to all urban areas of the state and imposes fines of up to Rs 5,000 for a first offence and Rs 50,000 for repeat offences, along with environmental compensation for each tree. This provides a relevant legislative model for Haryana, which currently lacks a standalone urban tree preservation statute.

The Haryana Municipal Bill, 2025: Opportunities and Gaps

The Haryana Municipal Bill, 2025, approved by the Cabinet on December 8, 2025, represents the most significant legislative opportunity for urban greening in the state's history. By replacing the Haryana Municipal Act, 1973, and the Haryana Municipal Corporation Act, 1994, with a unified statute, it consolidates governance of all 87 municipalities. The Bill includes an explicit urban forestry mandate and provisions for ecosystem services management within municipal limits[28].

However, the Bill falls short of establishing quantified green space mandates comparable to global best practices. This policy paper recommends that the implementing rules under the Bill incorporate:

1. **Minimum 15% of municipal area** as designated green space (phased: 10% by 2030, 15% by 2036)
2. A **Green Budget provision** mandating 5–10% of municipal budgets toward urban forestry and green infrastructure
3. **Canopy cover targets** for municipal roads and public areas (30% by 2040)
4. **Heritage and Protected Tree registers** with penalties updated to 21st-century deterrence levels

Aravalli Protection

The Supreme Court of India's judgment dated November 20, 2025 (2025 INSC 1338), accepting a "uniform definition" of the Aravalli Hills based on elevation criteria (hills exceeding 100 metres), poses a significant concern for conservation of green cover. This definition could exclude up to 90% of the Aravalli range from protection, potentially opening 20,000–30,000 hectares to mining and construction. Though stayed on December 29, 2025, pending a high-powered committee review, the judgment specifically noted that Haryana lacks a formal definition of "Aravalli Hills" — a gap this framework urgently recommends addressing[29].

The mining freeze continues, but over 1,000 unauthorised mines have been documented in Haryana and Rajasthan's Aravalli zones, with only one conviction recorded from 582 registered cases. Mining in Charkhi Dadri and Bhiwani has been described, as described by conservation observers, as having "wiped out most of the two-billion-year-old ecological heritage" of the range[30].

[28] CMO Haryana Press Release, December 2025, https://www.punjabnewsline.com/news/haryana-cabinet-approved-haryana-municipal-bill-2025

[29] Down to Earth, December 2025, https://www.downtoearth.org.in/forests/uniform-definition-of-aravallis-accepted-by-supreme-court-will-be-catastrophic-for-indias-oldest-mountain-range

[30] Save Aravalli Hills, https://savearavalli.in/threats.html

Comparative Matrix: Global and National Paradigms

Haryana's urban greening strategy must be informed by proven models. The following comparative matrix benchmarks the most relevant global and national paradigms against Haryana's current position.

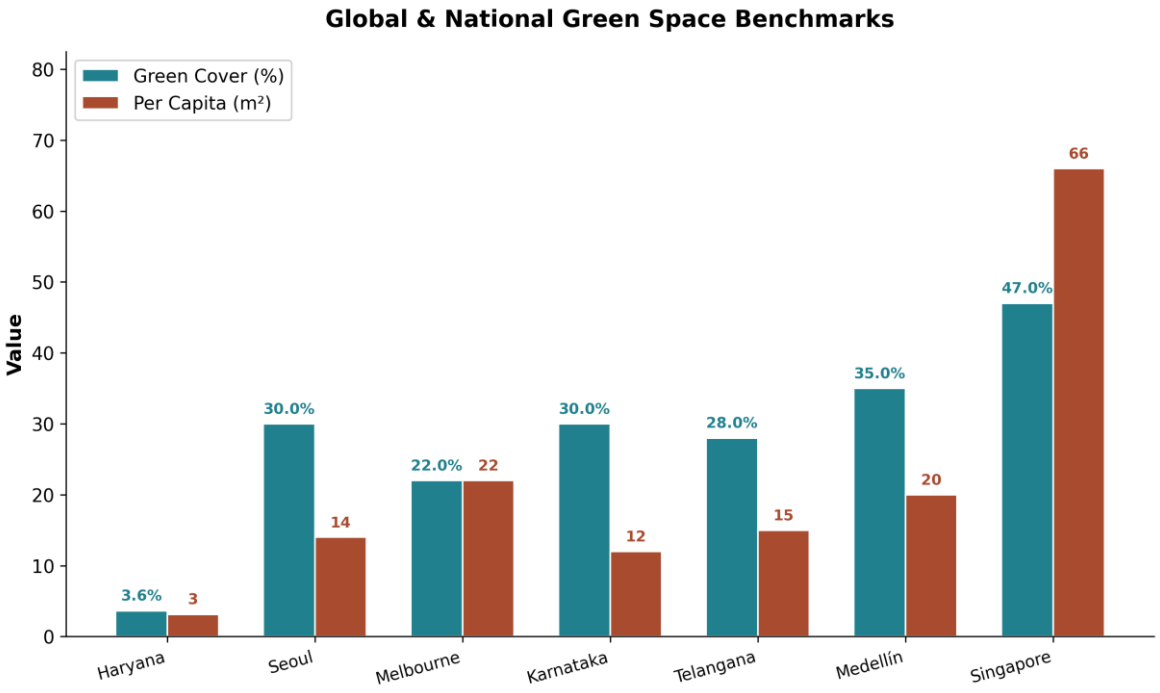


Figure 6: Global & National Green Space Benchmarks

Global Models

Model	Country	Key Mechanism	Quantified Results	Relevance to Haryana
Singapore LUSH	Singapore	Mandatory Green Plot Ratio (GnPR ≥ 4.0); 100% landscape replacement; Skyrise Greenery Incentive	>300 ha greenery added; 47% citywide green cover; SGD 10.2M disbursed	Direct model for mandatory green space in new developments; applicable to Gurugram-Faridabad
Medellín Green Corridors	Colombia	30 green corridors (65 ha); evapotranspiration, shading, albedo improvement	2°C temperature reduction; respiratory morbidity fell from 160 to 95 per 1,000	Directly applicable to Haryana's arterial roads and canal networks
Melbourne Urban Forest Strategy	Australia	Target: 22% → 40% canopy by 2040; 3,000 trees/year; Chief Heat Officer	>80,000 trees planted; Chief Heat Officer coordinates cross-departmental action	Species diversification principle critical for Haryana's monoculture risk
Seoul Cheonggyecheon Restoration	South Korea	USD $380M stream restoration; removed elevated highway; 5.8 km riparian corridor	Temperature dropped 3.3–5.9°C vs parallel roads; PM-10 down 35%; $1.98B economic investment catalysed	Model for Sahibi River and canal corridor restoration in Gurugram
China Sponge City Program	China	30 pilot cities; target: 80% urban areas retain 70% rainwater by 2030	RMB 100–150M/km² construction cost; Wuhan: 2B RMB, 104 projects	Applicable to Gurugram's chronic flooding; integrates green infrastructure with stormwater

EU Nature Restoration Law (Aug 2024)	EU	No net loss of urban green space by Dec 31, 2030; Urban Nature Plans for cities >20,000	National Restoration Plans due mid-2026; mandatory reporting	Regulatory template for "no net loss" principle applicable to Haryana Municipal Bill rules

Sources: NUS ESI Policy Brief — Singapore LUSH 2024[31]*; Ashden Award — Medellín Green Corridors*[32]*; City of Melbourne Urban Forest Strategy*[33]*; EU Biodiversity Strategy 2030*[34]

National Models

Model	State	Key Mechanism	Quantified Results	Adaptability for Haryana
Telangana Haritaharam / Green Budget	Telangana	10% Green Budget mandate; target 230 crore saplings	270.65 crore saplings planted (117.68% of target); Rs 10,822 crore invested; forest cover +6.85%	Most directly replicable model; Green Budget principle can be mandated through Haryana Municipal Bill rules
Karnataka 5:50:500 Rule	Karnataka	Codified in BBMP Bengaluru Urban Forest Manual 2025: no species >5% of total; ≥50 native species per ward; green space within 500m	Citywide canopy target 30–40%; 1 ha/1,000 people target	Species diversity principle addresses Haryana's eucalyptus monoculture risk; 500m accessibility standard directly applicable
Chandigarh	Chandigarh	Planned city with green space built into urban design; continuous monitoring	55 m²/capita green space; 46.18 km² green cover (+22% in 2 years); India's highest tree cover % among UTs	Demonstrates what planned greening achieves; benchmark for Panchkula and new townships
Tamil Nadu Urban Greening Policy (Feb 2026)	Tamil Nadu	First state-level Urban Greening Policy; 15% green cover mandate for all ULBs; 3-30-300 alignment; City Biodiversity Index	Recently launched — framework for measurement and targets established	Regulatory template directly applicable; Haryana can adopt similar state-level policy
UP Urban Green Policy 2025	Uttar Pradesh	Green Star ratings system (Green City → Green+++); 3-phase rollout: smart cities (2025-27), cities >1 lakh (2027-30), all ULBs (post-2030); Miyawaki forests, green belts, sponge parks	First comprehensive policy for India's most populous state; multi-level approach: city, neighbourhood, building; funded via AMRUT 2.0, NCAP, CSR	Peer state model with phased rollout directly replicable; Green Star ratings system adaptable for Haryana's 87 municipalities

Sources: Telangana Haritaharam Official Data[35]*; BBMP Bengaluru Urban Forest Manual 2025*[36]*; ISFR 2023 Volume II — Chandigarh Chapter, Forest Survey of India*[37]*; ET Government — UP Urban Green Policy 2025*[38]

[31] NUS ESI Policy Brief — Singapore LUSH 2024, https://esi.nus.edu.sg/

[32] Ashden Award — Medellín Green Corridors, https://ashden.org/

[33] City of Melbourne Urban Forest Strategy, https://www.melbourne.vic.gov.au/

[34] EU Biodiversity Strategy 2030, https://environment.ec.europa.eu/

[35] Telangana Haritaharam Official Data, https://haritaharam.telangana.gov.in/

[36] BBMP Bengaluru Urban Forest Manual 2025, https://site.bbmp.gov.in/

[37] ISFR 2023 Volume II — Chandigarh Chapter, Forest Survey of India, https://fsi.nic.in/uploads/isfr2023/isfr_book_eng-vol-2_2023.pdf

[38] UP Urban Green Policy 2025, ET Government, https://government.economictimes.indiatimes.com/news/policy/uttar-pradesh-cabinet-unveils-urban-green-policy-for-sustainable-climate-resilient-cities/121985542

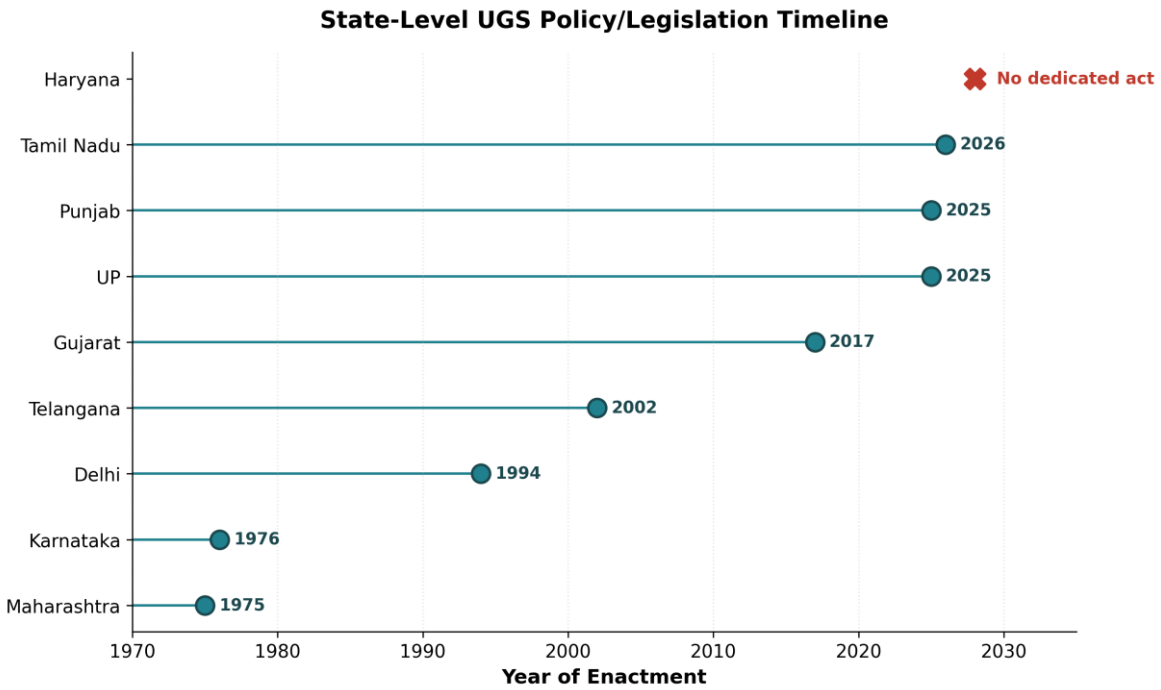


Figure 7: State-Level UGS Policy/Legislation Timeline

The timeline above illustrates Haryana's position as the only major state among its peers without a dedicated Urban Green Space legislation. The UP Urban Green Policy 2025, approved in June 2025, provides a particularly relevant peer model given the similarity of administrative structures and urbanisation challenges faced by North Indian states.

Nagar Van Yojana: Expanded Targets

The Central Government's Nagar Van Yojana (NVY), initially launched in 2020 with a target of 400 Nagar Vans and 200 Nagar Vatikas during 2020-25, has been expanded to a target of 1,000 Nagar Vans by 2027. In 2024, 111 Nagar Vans were sanctioned within the first 100 days of the new government term, and 75 additional projects were sanctioned in 2025 alone. The total estimated cost is Rs 895 crore from National CAMPA, with financial assistance of Rs 4 lakh per hectare (maximum Rs 2 crore for 50 ha)[39].

[39] Nagar Van Yojana — PIB Press Release 2025, https://www.pib.gov.in/PressReleasePage.aspx?PRID=2210100

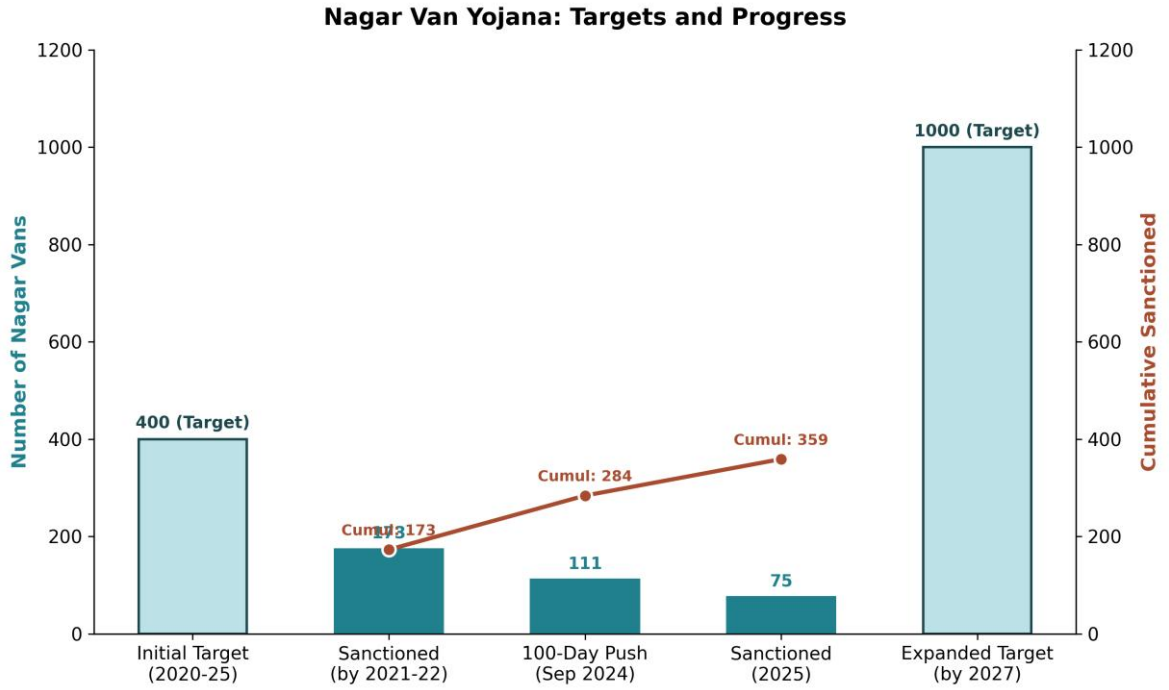


Figure 8: Nagar Van Yojana — Targets and Progress

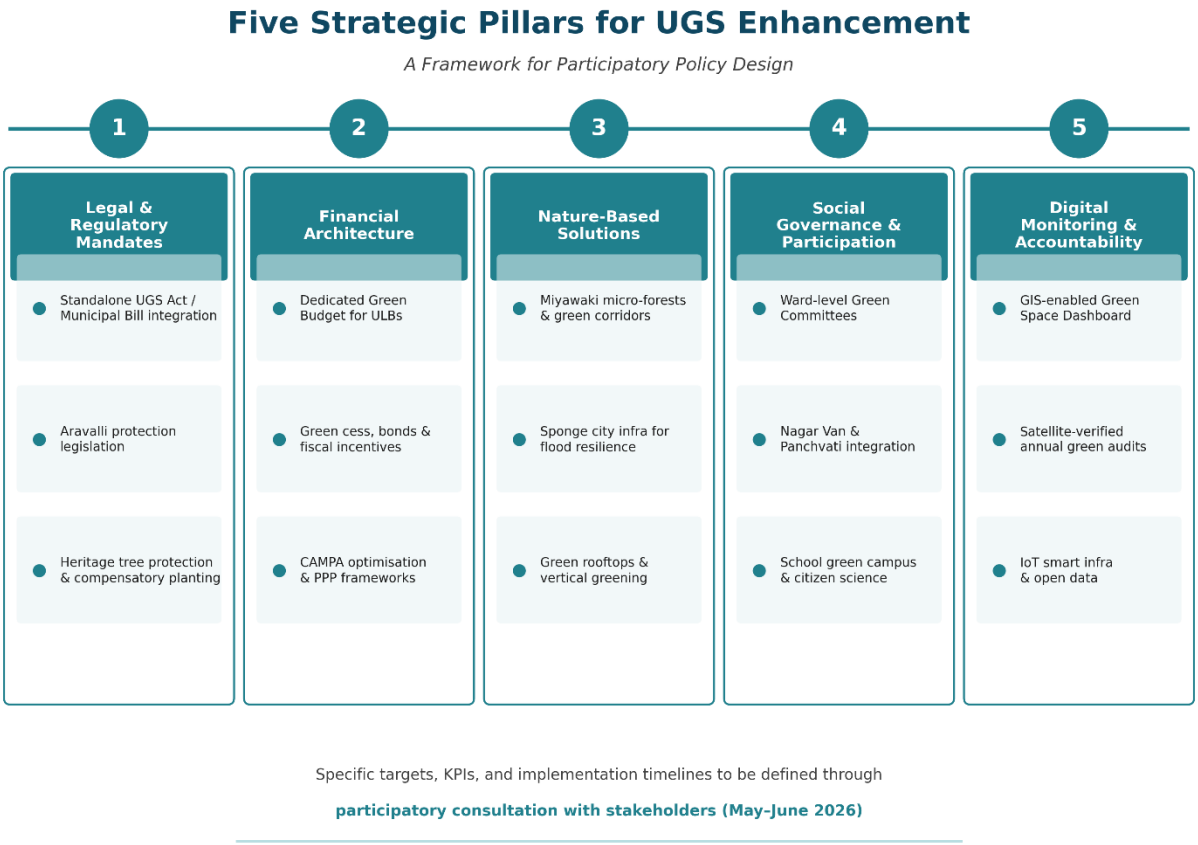
Synthesis: What Haryana Can Adopt

The comparative analysis yields five transferable principles:

1. **Mandatory Legal Mandates** (Singapore, EU): Voluntary greening has shown limited effectiveness globally. Enforceable Green Plot Ratios and "no net loss" provisions must be legislated.
2. **Dedicated Green Budgets** (Telangana): A fixed percentage of municipal and state budgets earmarked for greening is the single most impactful financial mechanism.
3. **Corridor-Based Design** (Medellín): Linear green corridors along roads, canals, and waterways deliver UHI mitigation at scale with relatively lower land acquisition costs.
4. **Species Diversity Standards** (Karnataka): The 5:50:500 rule prevents monoculture risk and ensures ecological resilience.
5. **Economic Framing** (Seoul): Green infrastructure investments generate measurable economic returns — the Cheonggyecheon project catalysed $1.98 billion in adjacent economic activity.

Strategic Pillars for UGS Enhancement (2026–2047)

The comparative analysis in the preceding sections — spanning global best practices (Singapore, Medellín, Seoul, EU) and national paradigms (Telangana, Karnataka, Tamil Nadu, Uttar Pradesh) — yields a clear strategic architecture. This policy paper proposes five interconnected pillars as the foundation for Haryana's urban greening transformation. These pillars are presented here as a framework for deliberation; specific targets, timelines, and implementation mechanisms will be defined through participatory consultation with all stakeholders.



Pillar 1: Legal and Regulatory Mandates

Urban greening cannot remain a discretionary activity. Global and national evidence consistently demonstrates that enforceable legal frameworks — mandatory green space ratios, "no net loss" provisions, and heritage tree protection — are prerequisites for meaningful progress. For Haryana, the legislative agenda includes the possibility of a standalone Urban Green Space Act (or comprehensive provisions within the Haryana Municipal Bill 2025 rules), dedicated Aravalli protection legislation addressing the definitional gap flagged by the Supreme Court (2025 INSC 1338), and strengthened compensatory planting norms with updated penalty structures. The precise scope, thresholds, and penalty levels of such legislation should emerge from inter-departmental consultation and expert input.

Pillar 2: Financial Architecture

Sustainable urban greening requires financial mechanisms that go beyond annual budgetary allocations. The Telangana model of dedicated Green Budgets, combined with innovative instruments such as green cess, green bonds, FAR incentives for green buildings, and optimised utilisation of CAMPA funds, offers a menu of options for Haryana. Private sector engagement through CSR and PPP frameworks — particularly relevant

given Gurugram's corporate concentration — can supplement public investment. The consultation process should determine which instruments are most appropriate for Haryana's fiscal context and the appropriate allocation levels.

Pillar 3: Nature-Based Solutions (NbS)

Nature-based interventions deliver multiple co-benefits — air filtration, flood mitigation, groundwater recharge, biodiversity conservation, and thermal comfort — at costs competitive with conventional grey infrastructure. For Haryana, the most promising approaches include Miyawaki micro-forests (already proven at Kherki Daula, Gurugram), linear green corridors along highways and canal networks (modelled on Medellín's experience), sponge city infrastructure to address chronic urban flooding, and green rooftop programmes. The consultation should help identify priority sites, appropriate species palettes, and the most effective delivery mechanisms.

Pillar 4: Social Governance and Community Participation

Long-term sustainability of urban greening depends on community ownership. Ward-level Green Committees, integration with existing Panchvati and Nagar Van schemes, school and college green campus programmes, and citizen science platforms can embed greening in local governance structures. The participatory consultation will be an opportunity to hear directly from civil society organisations, resident welfare associations, and community groups on the most effective models for Haryana's context.

Pillar 5: Digital Monitoring and Accountability

Transparency and evidence-based accountability are essential to prevent greenwashing and ensure that greening investments deliver real outcomes. A GIS-enabled Haryana Urban Green Space Dashboard (HUGSD), satellite-verified annual green audits, IoT-enabled smart green infrastructure, and open data portals can provide the monitoring architecture. ISRO's BHUVAN platform and NISAR satellite data (launched July 2025) offer the technological backbone for such a system.

These five pillars are mutually reinforcing — legal mandates create the obligation, financial architecture provides the resources, nature-based solutions deliver the interventions, social governance ensures community ownership, and digital monitoring guarantees accountability. The consultation process outlined in the next section will refine each pillar into an actionable implementation framework with quantified targets and clear timelines.

Alignment with Haryana Vision 2047

The $1 Trillion Economy and Ecological Infrastructure

The Haryana Vision 2047 document, launched on December 24, 2025, at Panchkula by Union Home Minister Amit Shah, sets an ambitious target of transforming Haryana from its current GSDP of approximately US$130 billion to a $1 trillion economy by 2047. Vision’s framework explicitly includes environmental sustainability one of the foundational themes. This policy framework argues that urban greening is not peripheral to the $1 trillion target but essential to achieving it. The economic case rests on five pillars:

1. Healthcare Cost Reduction

India lost $194 billion in income in 2024 due to heat stress, with 247 billion labour hours lost nationally. For Haryana, where Gurugram and Faridabad rank among India's three most polluted cities, the health burden is acute — residents lose 10.8–11.2 years of life expectancy to air pollution[40].

WHO meta-analyses demonstrate that a 0.1 increment in the Normalised Difference Vegetation Index (NDVI) — achievable through strategic urban greening — correlates with 8% lower asthma risk, 38% lower lung cancer incidence, 5% lower COPD mortality, and 7% reduction in depression from weekly 30-minute green space exposure. At scale, these health gains translate to billions of rupees in avoided healthcare expenditure and productivity gains.[41]

2. Property Value and Revenue Enhancement

A NIUA study in Pune found a Rs 4,297 per year rental premium for properties within 500 metres of quality green spaces.[42] Applied across Gurugram's residential stock (estimated 4+ lakh dwelling units), even modest property value uplift from greening generates substantial increases in property tax revenue — a critical self-financing mechanism for ULBs.

3. Climate Resilience and Avoided Losses

Gurugram's chronic flooding — caused in part by the loss of natural drainage systems and green infrastructure — imposes estimated losses of Rs 150-200 crore per major flood event (based on insured losses and business disruption). Green infrastructure delivering sponge-city functions can reduce urban flooding peak flows by 20–40%, with a benefit-cost ratio of 3:1 for urban greening in Indian cities.[43]

4. Green Jobs and Livelihoods

The Council on Energy, Environment and Water (CEEW) estimates 48 million full-time equivalent green jobs in India by 2047, with approximately 23 million from the Bioeconomy and Nature-based Solutions sector. The FAO estimates that $36 billion in forestry investment can generate approximately 10 million jobs.[44] This policy framework envisions significant green job creation in Haryana.

5. Carbon Markets and Global Competitiveness

With India's carbon market framework maturing, urban forests represent a tangible, verifiable carbon sequestration asset. At 33 MgC/ha/year for Miyawaki forests[45], 500 micro-forests across Haryana could sequester significant volumes of carbon, generating revenue through voluntary and compliance carbon markets while enhancing Haryana's ESG credentials for global investors.

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[40] EPIC India / AQLI 2023, https://epic.uchicago.in/indians-lose-5-years-life-to-air-pollution-delhi-worst-at-12-years-chicago-university-study/

[41] Tang M, Liu W, Li H, Li F. Greenness and chronic respiratory health issues: a systematic review and meta-analysis. *Front. Public Health* 11:1279322 (2023). https://doi.org/10.3389/fpubh.2023.1279322 | Shanahan DF et al. Health Benefits from Nature Experiences Depend on Dose. *Sci. Rep.* 6:28551 (2016). https://doi.org/10.1038/srep28551

[42] Nallathiga R, Appala A, Reddy S, Gunupudi G. Assessing the Importance of Natural Amenities in Terms of Property Value in Urban Areas: A Study of Baner-Pashan Suburban Area, Pune. *Urban India* 39(I), Jan–Jun 2019 (NIUA, New Delhi). https://www.niua.in/sites/default/files/2025-07/2019_1_Assessing%20the%20Importance.pdf

[43] BCR: Jones N et al. Prioritizing Heat Mitigation Actions in Indian Cities. World Bank Policy Research WP 10960, Oct 2024. https://documents1.worldbank.org/curated/en/099304410282418477/pdf/IDU14636d4df1ab37144601857917779c8690438.pdf | Peak flow: Song Y et al. Water Sci. Technol. (2025). https://doi.org/10.2166/wst.2025.188 | Flooding: Give Back to Gurugram Foundation, 2023. https://www.givebacktogurugram.com/post/monsoon-mayhem-urban-flooding-in-india-and-what-corporates-can-do-about-it

[44] Jain A, Jhunjhunwala G et al. Building a Green Economy for Viksit Bharat. CEEW, 2025. https://www.ceew.in/publications/how-can-viksit-bharat-drive-india-green-economy-by-2047 | Nair CTS, Rutt R. Creating forestry jobs to boost the economy and build a green future. *Unasylva* 60(233), 2009, FAO. https://www.fao.org/4/i1025e/i1025e02.htm

[45] Roy A, Lopus M, Surendran S et al. Assessing carbon sequestration in urban Miyawaki forests of south India. *Trees, Forests and People*, Art. 100925 (2025). https://www.sciencedirect.com/science/article/pii/S2666719325001517

Next Steps

This policy paper is a foundational document which presents the evidence base, identifies proven models, and proposes a strategic framework. The next phase is participatory: bringing together government departments, domain experts, civil society, and communities to refine these proposals into an actionable implementation plan. The following steps outline a practical pathway.

Step 1: Internal Circulation and Departmental Feedback (April 2026)

Circulate this policy paper to all relevant departments for written feedback:

- Department of Forests and Wildlife
- Department of Urban Local Bodies (ULB)
- Town and Country Planning Department
- Haryana State Pollution Control Board
- Haryana Water Resources Authority
- Gurugram Metropolitan Development Authority (GMDA)
- Finance Department
- Revenue Department
- Department of Future

Each department should identify: (a) points of convergence with ongoing programmes, (b) implementation constraints and data gaps, and (c) specific suggestions for refinement.

Step 2: Stakeholder Consultation Workshop at SJHIFM, Panchkula (May–June 2026)

SJHIFM, as the institution that prepared the Haryana Vision 2047 document, is the natural convening body. The workshop should bring together:

- State government officials from the departments listed above
- Urban ecological planners and landscape architects
- Representatives from peer states — Telangana (Haritaharam), Karnataka (5:50:500 Rule), Tamil Nadu (Urban Greening Policy), and Uttar Pradesh (Urban Green Policy 2025)
- Civil society organisations (Save Aravalli, Give Back to Gurugram, IAmGurgaon)
- Academic experts (Indian Institute of Forest Management, TERI, Centre for Science and Environment)
- Financial architects (green bond structuring, carbon market specialists)

The workshop agenda should cover: (a) validation of the five strategic pillars, (b) defining quantified KPIs and targets for each pillar, (c) prioritising interventions and sequencing, (d) identifying funding mechanisms and fiscal instruments, and (e) agreeing on institutional arrangements and monitoring architecture.

Step 3: Incorporate Feedback and Define KPIs (June–July 2026)

Based on consultation inputs, revise this framework to include:

- Quantified, time-bound KPIs for each pillar, differentiated by municipal tier (Municipal Corporations, Municipal Councils, Municipal Committees)
- A phased implementation roadmap (2026–2030, 2031–2036, 2037–2047)
- Estimated financial requirements and funding source mapping
- Institutional responsibilities and coordination mechanisms

Summary Timeline

Step	Action	Timeline
1	Internal circulation and departmental feedback	April 2026
2	Stakeholder Consultation Workshop at SJHIFM	May–June 2026
3	Incorporate feedback, define KPIs and roadmap	June–July 2026

Haryana's ecological deficit is not merely an environmental concern — it is an economic liability, a public health emergency, and a governance challenge of the first order. The state that aspires to a $1 trillion economy cannot afford to remain the most forest-depleted in India, nor can it consign its urban residents to air quality that significantly reduces life expectancy.

APPROACH NOTE

SDGCAC

SUSTAINABLE DEVELOPMENT GOALS
COORDINATION AND ACCELERATION CENTRE