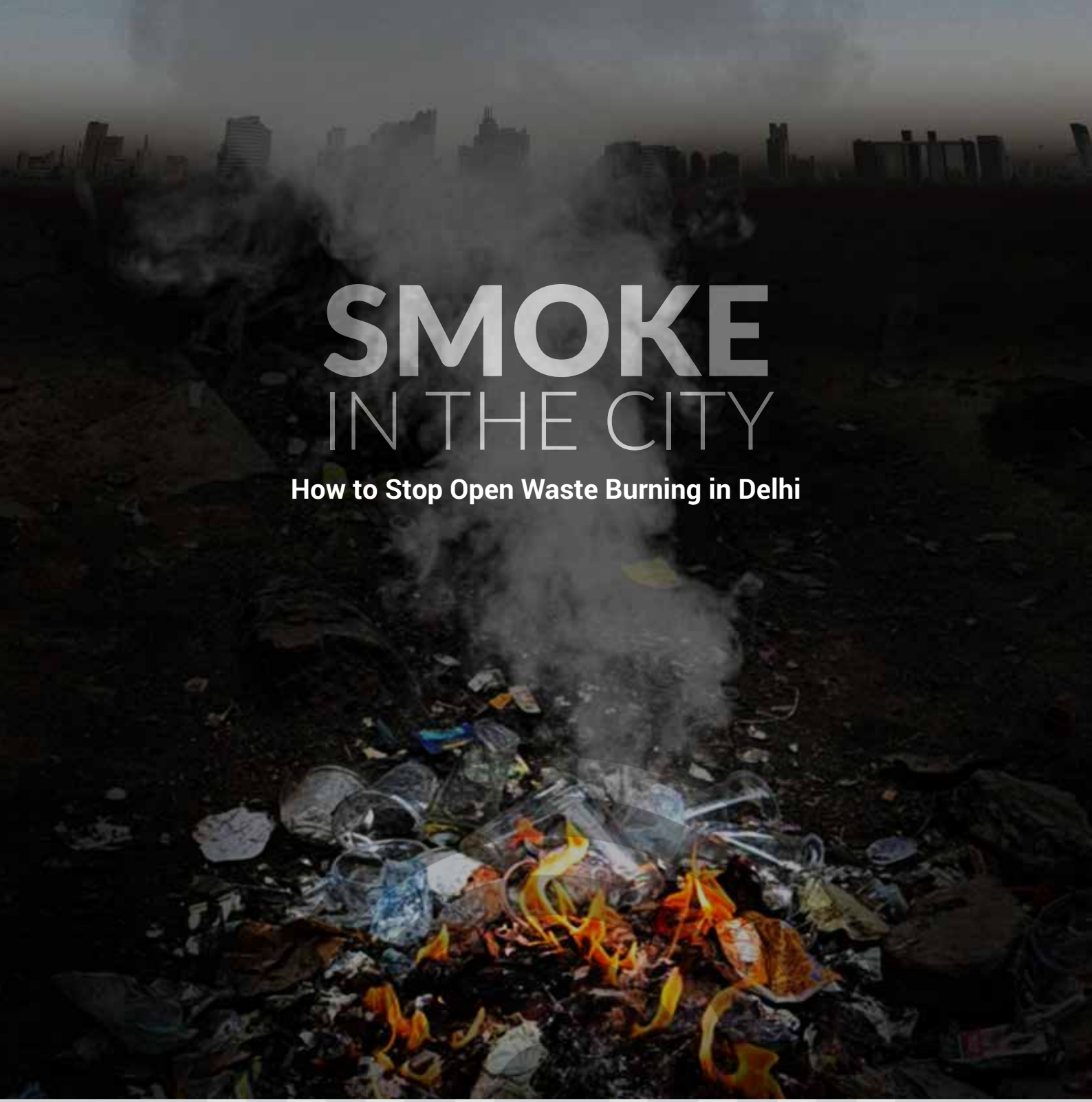


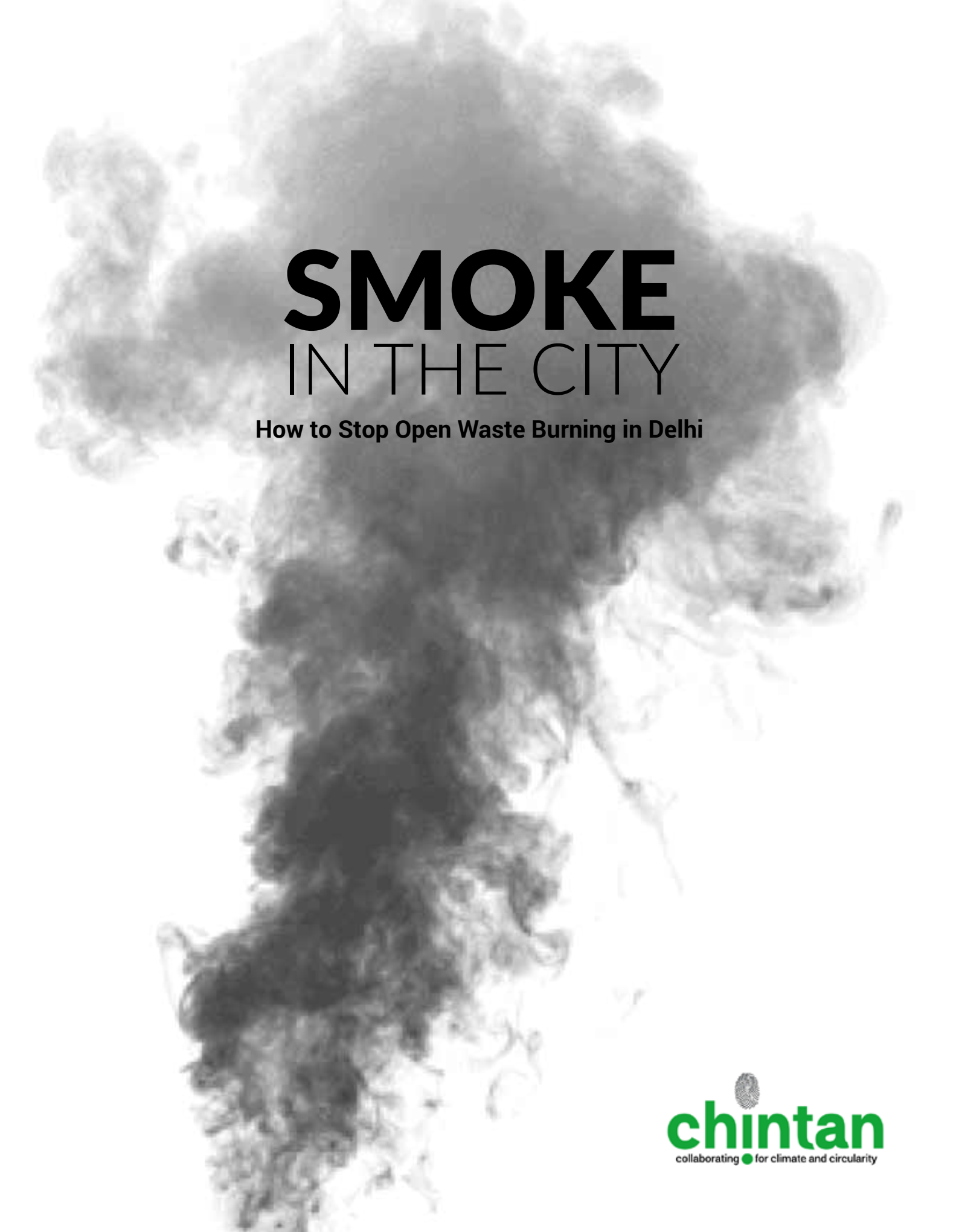
SMOKE IN THE CITY

How to Stop Open Waste Burning in Delhi

2026

chintan

collaborating for climate and circularity



SMOKE IN THE CITY

How to Stop Open Waste Burning in Delhi

chintan
collaborating for climate and circularity

Published by
Chintan Environmental Research and Action Group

About Chintan
Chintan is a non-profit Circular Society Do-Tank that improves the lives, livelihoods and leadership of the people who contribute the least to environmental pollution and climate change while combating the excessive and inequitable consumption that causes it.

Authors
Bharati Chaturvedi
Professor Srinivas Chary Vedala
Chirantana Kar
Bhavayta Mahajan
Manjusha Manchala

Reviewed by
Chetan Bhattacharji
Dr Anita

Design:
DamageControl

238 Sidhartha Enclave, New Delhi-110014
Email: info@chintan-india.org
Website: www.chintan-india.org

Contents

List of Acronyms iv

List of Graphs v

List of Figures v

List of Tables v

Foreword vi

Executive Summary 1

1 INTRODUCTION
Open Burning of Waste in Cities:
An Environmental and Public Health Emergency 7

2 STUDY METHODOLOGY
A Granular Field Survey of 128 Wards 13

3 FINDINGS
How Open Waste Burning Contaminates Delhi's Air 17

4 KEY LEARNINGS
What the Fires Tell Us 35

5 RECOMMENDATIONS
From Firefighting to Prevention:
A Ward-Level Roadmap with People at its Heart 39

6 CONCLUSION
Rethinking Waste: For a Breath of Clean Air 45

ANNEXURE A
Ward-wise Summary Table (All wards with mapped incidents) 47

ANNEXURE B
Questionnaire 53

LIST OF ACRONYMS

CAQM	Commission for Air Quality Management
D2D	Door to Door Waste Collection
DPCC	Delhi Pollution Control Committee
EPR	Extended Producer Responsibility
HIG	High Income Group
LIG	Low Income Group
MCD	Municipal Corporation of Delhi
MIG	Middle Income Group
MRF	Material Recovery Facilities
OBW	Open Burning of Waste
RWA	Residents Welfare Association
SUP	Single Use Plastic

LIST OF GRAPHS

Graph 1: Top 10 High-Concentration Wards for Open Waste Burning in Delhi 19
Graph 2: Typology of Open Burning of Waste 20
Graph 3: Approximate Size of Burning Area (diameter in feet) 21
Graph 4: Accelerant and Fuel Used to Ignite Fire 22
Graph 5: Smoke Intensity 23
Graph 6: Availability of Nearby Waste Collection Services 30
Graph 7: Who are indulging in open burning? 32

LIST OF FIGURES

Figure 1: Geo-tagged locations of Fire Incidents Across 128 Wards 18
Figure 2: Open Fires of Different Intensity 24
Figure 3: Small Footprint, Long Duration 25
Figure 4: Different Burning Materials 27
Figure 5: Reasons for Indulging in Open Burning 29

LIST OF TABLES

Table 1: Burning Duration of Fires 21
Table 2: Mode of Burning 22
Table 3: Material Composition of Burned Waste 26
Table 4: Purpose of Open Burning 28
Table 5: Location Type Without Waste Collection Service Within 500 Meters Radius 30
Table 6: Sensitive Receptors Near Burning Sites 31

FOREWORD

Every winter, Delhi looks up to satellite images, regional wind patterns, and distant fires to explain the air we breathe.
This report asks us to look down instead.

It directs attention to the street corner, the edges of markets, roadside mounds of leaves and packaging waste, and the small groups of people warming their hands over smoky piles. These are the fires we pass every day. They are hyperlocal, routine, not the cause and largely left out of broader conversations about air pollution. They rarely figure on the complaints the DPCC receives. Yet for millions of Delhi's residents they remain a constant and immediate source of toxic exposure.

What this study reveals is both uncomfortable and urgent.

Open burning of waste in Delhi is not an occasional act of non-compliance. It is an indication of a city where waste services do not reach everyone equally, where recovery systems for low-value materials remain very weak, and where the poorest residents must deal with cold nights and uncollected waste using the only tool available to them, fire. Air pollution becomes not merely an environmental issue but a daily survival trade-off.

Through meticulous ward-level fieldwork, this report shifts the focus from episodic crisis to everyday emissions. Waste is being burned everyday in Delhi. It is a constant source of air pollution, day after day, winter or summer.

Our report shows how small, recurring fires that often burn for long periods at the same locations create a continuous smoke load in the breathing zones of people waiting for buses, selling food, sorting recyclables, walking to school, or sleeping in the open. They also create a load for those living, working or studying nearby. The widespread presence of these fires reveals critical service gaps. It makes clear that failures in waste management have a direct impact on air quality, public health, and environmental justice.

The report is also a reminder that accountability for clean air does not rest solely with municipal systems. Under the Solid Waste Management Rules, 2026, Resident Welfare Associations and other bulk waste generators have a mandatory responsibility to manage their waste through decentralised systems. This includes processing wet waste on site and ensuring 4 way segregation. When waste is mixed and returned to the municipal system, it follows the same chain that ultimately produces garbage-vulnerable points and open burning. Compliance with these rules is, therefore, not a procedural requirement. It is essential to ensure clean air.

For too long, solutions to air pollution have been framed through distant geographies to address seasonal emergency responses. This report shows that preventing waste burning in our own neighbourhoods is one of the most immediate and actionable interventions to reduce air pollution. Clean air, in this context, is to be produced through reliable public services, accountable institutions, and responsible waste generators.

The findings also challenge us to rethink how we measure success. Extended Producer Responsibility cannot remain an exercise in online aggregated documentation while unmanaged branded-packaging burns in our neighbourhoods. Municipal contracts cannot continue to reward the transport of mixed waste while segregation and decentralization remains notional. Behaviour change campaigns cannot succeed if there are no viable alternatives. Clean air demands that incentives, infrastructure, and responsibilities align with realities on the ground.

At Chintan, we have always believed that environmental progress must be rooted in the labour and knowledge of those who sustain the city's material economy. An inclusive, decentralised waste system that recognises and strengthens their role offers one of the fastest pathways to reducing local air pollution. And we don't mean including only wastepickers and waste aggregators, but also repair workers who reduce waste - cobblers, clothes repairing tailors, those who repair beds, chairs and kitchen utensils.

This report is therefore more than an analysis of a neglected source of emissions. It is a call to action for municipalities, producers, RWAs, bulk generators, and all stakeholders in Delhi's air. It provides a practical, equitable, and immediately implementable roadmap. Every avoided small fire delivers a direct gain for public health, climate, and urban dignity.

If Delhi is serious about clean air, it must act where the smoke rises.

Bharati Chaturvedi
Founder and Director
Chintan Environmental Research and Action Group

Preventing waste burning in our own neighbourhoods is one of the most immediate and actionable interventions to reduce air pollution

EXECUTIVE SUMMARY

- Study conducted across 128 wards of Delhi over one month.
- 1,006 geotagged burning incidents recorded.
- 3/4th of the recorded fire incidents occurred within one kilometre of dense residential areas, transit stops, parks, schools, or health facilities.
- A hyper-local source of Particulate Matter exposure in the breathing zone.
- High impact on public health.
- Winter fires are for thermal comfort. Survival trade-off needs to be addressed. Social Protection is the solution for this source of Air Pollution.
- Waste management failure is leading to the fires.
- Rampant evidence of branded packaging and low-value plastics in burn piles proves failure of Extended Producer Responsibility
- It's solvable. Through Immediate ward-level interventions. Interlinked package of solutions will work.

Delhi's air pollution debate is often framed through seasonal spikes, regional transport of pollutants, and city-wide averages. This study brings the focus back to the street. It examines the everyday, hyper-local fires that burn at roadsides, near markets, outside homes, beside bus stops, and along dumping points. These fires are not large but they occur frequently. Because they burn within people's breathing zones, their public health impact is immediate and disproportionate. The study establishes, for the first time at ward scale, a ground-verified baseline of open waste burning across the National Capital Territory. It examines the issue through the lens of exposure, service delivery, and environmental justice.

Conducted across 128 wards over one month, with repeated visits and supported by preliminary trend mapping in 30 wards, the survey documented 1,006 geotagged burning incidents across residential, commercial, industrial, and public-space typologies. Historical records from municipal agencies were combined with field validation and local knowledge to identify high-probability locations. Each site was assessed not only for the act of burning but also for its service context and exposure context.

The findings show that open burning is not an occasional violation. It is a daily, distributed source of emissions embedded in how waste is stored, collected, and processed in the city.

From an air quality perspective, the most important insight is the hyper-local nature of these fires. Nearly three-quarters of the recorded incidents occurred within one kilometre of dense residential areas, transit stops, parks, schools, or health facilities. This means the emissions, including fine particulate matter, black carbon, and toxic combustion products from mixed waste, are released directly where people live, walk, wait, work, and sleep.

Most fires were small, typically one to two feet in diameter. Yet they lasted longer than thirty minutes and recurred at the same locations. This recurring pattern creates a continuous local smoke load that remains invisible in city-level inventories but is highly relevant for daily exposure. Medium to dense smoke was observed in a majority of cases. Several wards showed repeated high-intensity plumes that disrupted visibility and caused immediate irritation.

These are not distant pollution sources. They are neighbourhood-level emissions that affect those who already face the highest environmental and occupational risks. These groups include waste pickers, street vendors, sanitation workers, security guards, transport users, and residents of low and mixed-income settlements.

Waste Matters

The composition of the burn piles directly links solid waste management failures to air pollution. Horticultural waste was present in most fires, showing the absence of a separate, decentralised green waste system. Paper, packaging, and low-value plastics were found in substantial quantities. This indicates that mixed waste continues to accumulate in public spaces. Smaller but significant fractions of textiles, multi-layered materials, and e-waste, which are highly toxic when burnt, were also observed.

The spatial analysis makes the causal chain clear. In more than 70 per cent of the sites, no waste collection point or bin was available within 500 metres. Where community storage existed, it was often undersized, poorly placed, or cleared too infrequently, especially in market areas where waste generation peaks in the evening. These conditions create garbage-vulnerable points that are periodically burnt to reduce volume.

Open burning is not the failure of behaviour alone. It is the endpoint of an unreliable waste system.

Producer Irresponsibility

One of the most critical findings for air quality governance is the presence of branded packaging and low-value plastics in burn piles across markets, transport corridors, and dumping zones. These are precisely the locations where Extended Producer Responsibility (EPR) should be visible through material recovery systems. Instead, they serve as leakage points through which unrecovered packaging enters the open environment and is eventually burned.

Presence of branded packaging materials in burn piles denotes inefficient implementation of Extended Producer Responsibility (EPR)

This exposes a structural gap between reported compliance and on-ground recovery. As long as EPR is measured through aggregated documentation rather than geographically verifiable retrieval, the city will continue to inhale the emissions from uncollected plastic.

Clean air in Delhi is therefore directly linked to accountable material recovery.

Winter Warmth

A large share of observed fires was lit not only for waste clearance but also for warmth by people who work outdoors at night and in the early morning. These included security guards, vendors, transport workers, and unhoused residents. In the absence of safe heating options, fire becomes a survival technology.

This finding shifts the air pollution conversation from enforcement to welfare. For thousands of people, the choice is not between clean air and illegal burning. It is between exposure to the cold and immediate relief. The smoke that degrades Delhi's air is also the heat that enables night-time work. Addressing this dimension is both a public health and a social protection imperative.

An air pollution strategy for open burning must also provide safe and dignified alternatives for thermal comfort. Night shelters, heated rest points for outdoor workers, and regulated community warming facilities can eliminate a major share of winter fires while improving occupational health and safety.

Interlinked Actions

The study demonstrates that preventing open burning is one of the most immediate and locally actionable air quality interventions available to the city. Unlike regional sources, these emissions can be reduced through ward-level service reform.

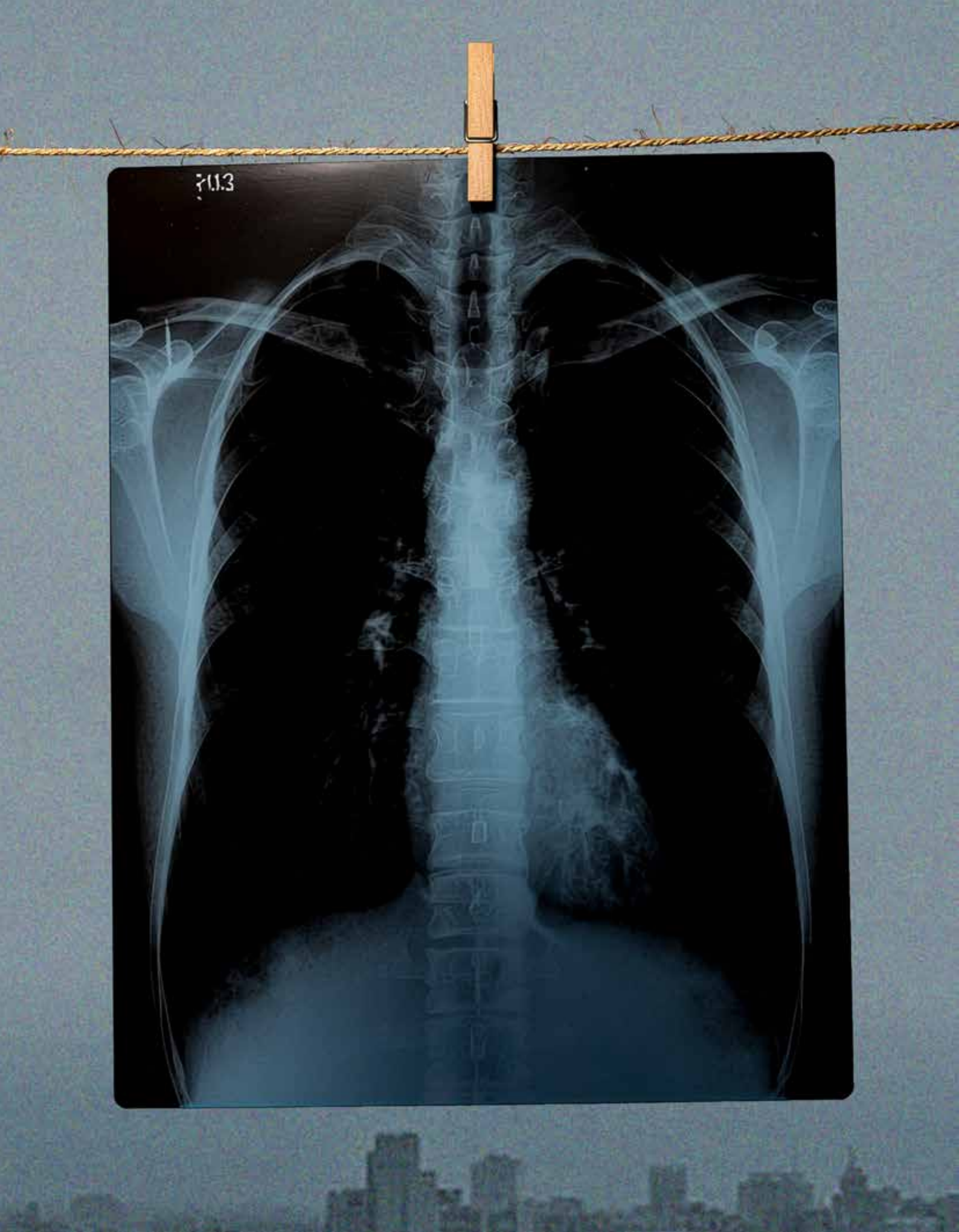
Three interlinked shifts are identified. First, universal, timed, and segregated doorstep collection must align with actual waste generation cycles, including late-evening commercial activity. Without reliable daily collection, garbage-vulnerable points will continue to form and be burnt. Second, decentralised systems are needed to remove combustible waste from the street. This requires dedicated horticultural waste collection, ward-level processing, functional material recovery facilities that integrate waste pickers, and decentralised composting by bulk generators and RWAs in line with the Solid Waste Management Rules, 2026. Third, the financial architecture of waste management must change. Contracts that reward tonnage transport perpetuate mixed waste and dependence on landfills. Payments should instead incentivise segregation, recovery, elimination of vulnerable points, and diversion from landfills.

Act at Ward

This study shows that open burning is a widespread everyday source of exposure linking air quality, waste governance, urban inequality, and producer accountability. Its solutions are local. They require ward-level planning, decentralised infrastructure, inclusive contracts, and geographically verifiable EPR.

Eliminating these fires would deliver immediate public health gains, reduce black carbon emissions, improve neighbourhood air quality, and strengthen the livelihoods of the workers who already sustain Delhi's recycling economy. Delhi's clean air transition depends not only on regional controls and seasonal measures but on ending these persistent local fires.

Shift to ward-level plans to identify garbage vulnerable points and hyper-local patterns and gaps in service



1 INTRODUCTION

Open Burning of Waste in Cities: An Environmental and Public Health Emergency

Open burning of waste remains one of the most visible and normalised environmental injustices across Indian cities. It is not merely a behavioural issue. It is a direct outcome of systemic gaps in urban service delivery. Irregular or absent door-to-door collection, weak source segregation, weak implementation of extended producer responsibility, continuous flow of single-use plastics, inadequate secondary storage, and limited processing capacity result in the continuous accumulation of mixed waste in streets, informal dumping points, markets, transport hubs, and vacant land plots. In the absence of reliable, dignified, and accessible waste management services, residents, street vendors, sanitation workers, and waste pickers are left with the most immediate and least-cost method of clearance: burning.

For communities living and working in conditions of precarity, winter intensifies this practice. Small waste fires provide warmth for people who have no access to safe heating, secure shelter, or basic energy services. What is routinely framed as a public nuisance is therefore deeply linked to questions of inequality, service exclusion, and the invisibilities of informal livelihoods in city planning.

The burden of air pollution from open waste burning is significant and grossly underestimated. National and city-level emission inventories indicate that open burning of municipal solid waste accounts for 5-12% of PM2.5 emissions in urban India, with the share disproportionately high in dense settlements and peri-urban areas where formal waste services are weakest.

Unlike industrial or vehicular emissions, which are often spatially regulated, waste burning occurs at the hyper-local and neighbourhood scale. It exposes the most socially and economically vulnerable section of the population to highly toxic emissions daily. The emissions from burning mixed waste are particularly hazardous because they include dioxins, furans, heavy metals, polycyclic aromatic hydrocarbons, and fine particulate matter. These arise from the combustion of plastics, multi-layered packaging, textiles, and other low-value discards. This creates a hyper-localised public health crisis layered on top of an already severe regional air pollution problem. Those who contribute the least to waste generation and climate emissions bear the highest exposure.

Unless cities urgently scale up investments in decentralised waste processing, material recovery, source segregation, inclusive service delivery and strengthen the EPR regime, open waste burning will become one of the largest uncontrolled sources of urban air pollution. Addressing this requires moving beyond sporadic enforcement to structural reforms that treat waste as both a public health emergency and an issue of environmental justice.

About Delhi

Like other major Indian cities, Delhi experiences a severe air quality crisis, with open waste burning remaining one of its most persistent and normalised sources of local pollution.

The National Capital Territory of India, with a population exceeding 20 million, ranks among the largest and most densely populated urban regions in the world. As the nation's political centre and a major economic hub, it has consistently ranked among the most polluted capital cities worldwide. Each winter, hazardous PM2.5 levels trigger predictable public health emergencies, including the use of air purifying equipment in offices and homes, school closures, mobility restrictions, and advisories to remain indoors. These measures are inaccessible to the majority who work outdoors, reside in informal settlements or are economically disadvantaged.

Delhi's air pollution is caused by multiple sources, including transport, industry, construction dust, regional biomass burning, and secondary aerosol formation. Nevertheless, neighbourhood-level emissions play a decisive role in shaping daily exposure. Among these, open waste burning remains one of the least addressed sources, despite its widespread visibility.

Source-apportionment studies by IIT Kanpur, TERI, and IIT Delhi show that biomass and waste burning contribute about 7–20% of Delhi's annual PM2.5 load. The share rises sharply in winter due to temperature inversion coupled with weak wind speed, reaching 40–50% on some days at the neighbourhood scale. These fires, especially from mixed waste like low-value plastics and multilayered packaging, release highly toxic pollutants including fine particulates, black carbon, dioxins, and furans.

Unfortunately, open burning in Delhi is not an isolated infraction. It is a daily response to a fragmented and exclusionary waste management system. Delhi Fire Services recorded 4,933 garbage-burning incidents in 2024 up to 12 December. These figures account only for larger, reported fires. Numerous small roadside and night-time fires remain unrecorded.

This persistence endures despite explicit prohibitions under the Solid Waste Management Rules (2016 and 2026) and repeated directives from the Commission for Air Quality Management, which has consistently identified waste and biomass burning as major local sources of winter pollution. The gap between regulation and reality indicates a deeper failure: the absence of reliable, inclusive waste services and a limited understanding of the conditions that make burning the most accessible option.

Unlike seasonal and distant stubble burning, open waste burning is continuous and hyper-local. It occurs near homes, workplaces, schools, markets, drains, recycling sites and transport nodes. This leads to the highest exposure among waste pickers, sanitation workers, street vendors, children, construction workers and residents of low-income settlements. These communities already face multiple risks. While waste pickers and sanitation workers are most consistently exposed due to their work, others are also affected. For instance, shopkeepers in market areas face greater risk than occasional shoppers because prolonged daily exposure in the same micro-environment results in a higher cumulative health burden.

Children are another highly vulnerable group in these locations. Their developing respiratory systems and lower immunity make them far more susceptible to the harmful effects of particulate matter, toxic fumes, and bio aerosols. Even short periods of exposure can have disproportionate health impacts on them.

The continued occurrence of these fires in the national capital, despite judicial oversight, national initiatives, and an extensive regulatory framework and EPR regime, raises fundamental questions about urban service delivery and accountability. While public discourse frequently emphasises regional sources, the smoke from Delhi's streets, dhalaos (three-walled concrete garbage collection structures in Delhi used for storing neighbourhood waste before disposal), markets, and landfill peripheries reflects significant service gaps and an urban planning that fails to address the material realities of waste.

Filling the Knowledge Gap for Delhi

In Delhi, open waste burning is visible yet poorly understood. The city has several citizen-reporting platforms like the Green Delhi App, MCD 311, and CPCB's Sameer App that allow people to report garbage fires and air quality concerns. However, the number of complaints captured through these systems represents only a small fraction of those that occur on the ground. The countless small fires in congested neighbourhoods, market places, and around industrial zones rarely enter official records. These are the fires that people live and work next to every day.

More importantly, the data they generate is limited to geo-tagged locations and incident counts. It offers little insight into why burning occurs, who resorts to it, what types of waste are being burnt, or the service gaps and survival needs that make it the most immediate option.

In the absence of this understanding, the response to open burning continues to rely largely on bans, penalties, and short-term enforcement drives that do little to change the conditions that make burning the quickest and often the only available option.

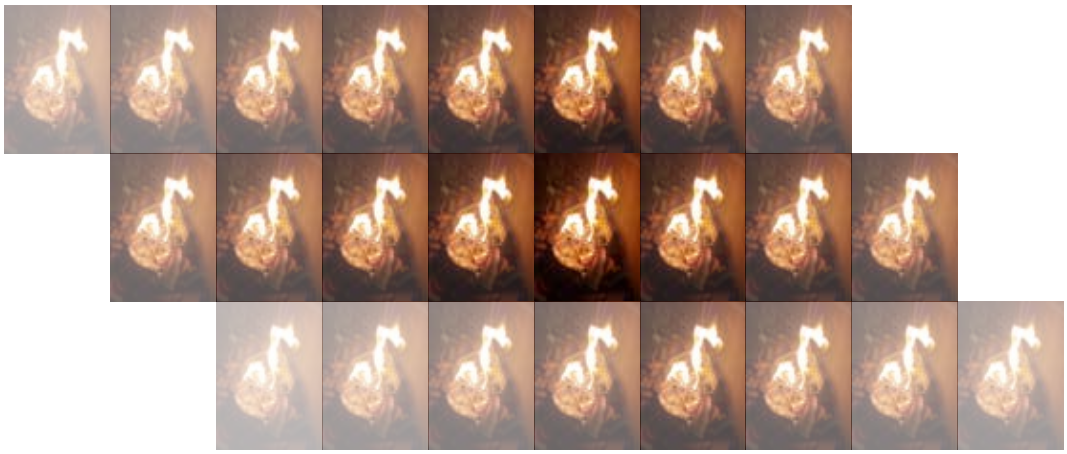
To date, no comprehensive, field-based study in Delhi has systematically examined the drivers of open waste burning alongside spatial patterns, waste types, service availability, seasonal variations, and the communities most exposed to toxic emissions. This evidence gap has constrained the design of targeted, preventive, and inclusive solutions. The present study, undertaken by Chintan, seeks to address this critical knowledge gap by generating field-verified insights that move the discourse beyond incident reporting and prohibition.

Specifically, the study seeks to:

- Examine whether open waste burning follows a seasonal pattern, including its use during harsh winters.
- Identify the main waste types burned, such as mixed municipal waste, plastics, leaf litter, cardboard, and other combustibles.
- Document common accelerants used, like kerosene, diesel, scrap wood, twigs, and similar materials.
- Map burning sites against availability of waste services such as bins, door-to-door collection, and secondary storage points.
- Assess exposure risks, particularly near schools, health facilities, bus stops, old-age homes, and dense residential areas.

By situating burning within the context of service delivery and seasonal vulnerability, the study aims to shift the focus from punitive action to systemic prevention. The findings presented in the following sections are intended to support the development of a realistic and inclusive roadmap for Delhi. This roadmap replaces reactive firefighting with service improvements, protects those most exposed, and addresses the root causes of the practice.

The countless small fires in congested neighbourhoods, market places, and around industrial zones rarely enter official records. These are the fires that people live and work next to every day.




GPS Map Camera
Google
New Delhi, Delhi, India
M6q3+j2q, Maurice Nagar, Roop Nagar, New Delhi, Delhi 110007, India
Lat 28.689069° Long 77.202462°
Saturday, 03/01/2026 06:19 PM GMT +05:30


GPS Map Camera
Google
New Delhi, Delhi, India
B160, Malka Ganj, New Delhi, Delhi 110007, India
Lat 28.676926° Long 77.211009°
Sunday, 04/01/2026 11:03 PM GMT +05:30


GPS Map Camera
Google
Delhi, Delhi, India
P7ch+jq2, 33 Feet Rd, Phase 7, Block B, Shiv Vihar, Karawal Nagar, Delhi, Delhi 110090, India
Lat 28.721573° Long 77.279357°
Sunday, 04/01/2026 10:26 PM GMT +05:30


GPS Map Camera
Google
Delhi, Delhi, India
M678+j72, Tis Hazari, Delhi, Delhi 110006, India
Lat 28.66408° Long 77.215702°
Monday, 05/01/2026 11:25 PM GMT +05:30


GPS Map Cam
New Delhi,Delhi,India
Ring Road, Kashmere Gate, New Delhi, Delhi 110006, India
Lat 28.661720, Long 77.238746
Saturday, 03/01/2026 11:41 PM GMT+05:30
Note : Captured by GPS Map Camera


GPS Map Camera
Google
New Delhi, Delhi, India
Shop No 1 Hanuman Mandir Chai Wala Near Hanuman Mandir Chai Wale Ke Pass Chandni Chowk, Charkhe Walan, Old Delhi, New Delhi, Delhi 110006, India
Lat 28.653515° Long 77.234874°
Saturday, 03/01/2026 10:19 PM GMT +05:30


GPS Map Camera
Google
New Delhi, Delhi, India
Main Road, M44x+vrh, Rama Rd, Block C, Najafgarh Road Industrial Area, New Delhi, Delhi 110015, India
Lat 28.657138° Long 77.149703°
Friday, 02/01/2026 05:41 PM GMT +05:30


GPS Map Cam
New Delhi,Delhi,India
Ring Road, Kashmere Gate, New Delhi, Delhi 110006, India
Lat 28.661802, Long 77.238902
Saturday, 03/01/2026 11:41 PM GMT+05:30
Note : Captured by GPS Map Camera


GPS Map Camera
Google
New Delhi, Delhi, India
H7p5+7vj Save, Ring Rd, Adjoining Isbt, Block A, Isbt Sarai Kale Khan, Sarai Kale Khan, New Delhi, Delhi 110013, India
Lat 28.586091° Long 77.259366°
Sunday, 04/01/2026 10:00 PM GMT +05:30

2 STUDY METHODOLOGY
A Granular Field Survey of 128 Wards

The study adopts a ward-level, field-based approach to establish a ground-verified baseline of open waste burning in Delhi. A systematic sampling framework was designed to cover 1,006 open burning sites across multiple land uses. Initial mapping drew on MCD and DPCC records, media reports, and locally validated insights from residents and youth groups across all 12 zones. Wards that had a mix of residential, commercial, and industrial areas were preferred. As a result, 128 wards were demarcated for the field survey.

Before scaling up the survey, a pilot was conducted in 30 wards to identify recurring trends, high-probability time windows, common site typologies, and operational challenges in documentation. This pilot phase helped refine the survey tools, standardise observation formats, and validate the sampling logic. The insights generated during this stage informed the design and execution of the full-scale field survey.

The full survey was conducted over a one-month period across the 128 wards, with repeated visits to capture temporal variations. A detailed survey instrument was developed and coded as a mobile app for real-time data transmission and validation. Field testing of the questionnaire was conducted in a few select wards with the support of trained enumerators, who administered the instrument on the ground and interacted with residents to understand the patterns of open burning during both daytime and night-time hours. The ward-level survey was spread across a range of locations including residential areas across income categories, markets, industrial zones and public spaces like parks, bus stops and vacant plots. The end result was a robust dataset.

Field evidence was gathered through systematic documentation at identified burning sites, including capturing live images of the burning locations and the specific types of waste being burnt. Brief interviews were conducted with people involved in or present at the activity to understand reasons for burning, and these responses were recorded as

qualitative evidence. All visual and interview-based evidence was compiled and uploaded to a central dashboard for analysis.

Area and Coverage

The study was conducted across the National Capital Territory of Delhi, covering all 128 municipal wards listed in Annexure A. The spatial coverage was designed to capture the diversity of urban form, land use, and service delivery conditions across the city.

Typologies of Areas

The wide spatial coverage enabled the study to examine open burning practices across different socio-economic and infrastructure contexts. Field observations included the following typologies:

- Residential areas across income categories, High-Income Group, Middle-Income Group, and Low-Income Group.
- Commercial and market areas.
- Industrial clusters.
- Informal dumping hotspots.
- Peri-urban fringes.
- Landfill-adjacent settlements and activity zones.

Field Deployment and Incident Documentation

Ground survey teams conducted systematic field surveys during high-probability time windows, particularly the early morning and evening hours when burning incidents are most likely to occur.

For each identified burning incident, the survey teams:

- Recorded GPS coordinates
- Identified the site typology
- Captured photographic evidence

Analytical lenses

Two analytical lenses applied at every site.

The Service context: Availability and proximity of basic waste management services, including door-to-door collection, community bins, secondary waste collection points, decentralised waste management practices, and effective implementation of regulations, particularly on single-use plastic.

Exposure context: The presence of receptors likely to be affected by smoke, such as nearby residential areas, schools and educational institutions, health facilities, bus stops and high pedestrian movement zones, and parks and public spaces.

Standardised Reporting Protocol and Quality Assurance

To ensure consistency and comparability across survey teams, a standardised reporting format was used. This enabled uniform coding of site characteristics, service availability, waste types, and exposure indicators.

Quality assurance was maintained through supervisory review of field entries, verification of geo-coordinates and site classification, and assessment of photographic evidence to minimise errors and inconsistencies.

Database Development, Spatial Analysis, and Hotspot Mapping

All field observations were consolidated into a centralised geo-referenced database for analysis. The dataset was used to generate hotspot maps at both locality and ward levels, identify service gaps linked to burning locations, map sensitive receptors and high-exposure zones, and develop priority intervention areas for planning and enforcement.

This ward-level spatial analysis provides actionable, location-specific information for the Municipal Corporation of Delhi (MCD) and the Delhi Pollution Control Committee (DPCC) to target enforcement more effectively and align it with service improvements in areas where burning is most prevalent.

Specific Activities Undertaken

The key activities carried out as part of the study include:

- Systematic identification and geo-tagging of open burning incidents through field surveys.
- Documentation of on-ground conditions, including the types of waste being burnt and the availability of waste management services in the surrounding area.
- Mapping of sensitive receptors such as schools, hospitals, and other high-exposure locations within a 1-km radius.
- Photographic documentation for each recorded incident.
- Generation of ward-wise and city-level hotspot maps and prioritised site lists.
- Preparation of structured ward-level datasets that can be integrated with existing or future monitoring systems of the MCD.

3 FINDINGS
How Open Waste Burning Contaminates Delhi's Air

This section presents the key findings from the field-based assessment of open waste burning across the National Capital Territory of Delhi. Moving beyond complaint-based data and secondary estimates, the analysis is based on 1,006 geo-tagged observations collected through systematic ground surveys. The findings provide a location-specific understanding of where burning is occurring, the urban contexts in which it is concentrated, and the scale at which the practice persists.

The spatial analysis reveals that open burning is not randomly distributed across the city. Instead, it is clustered in specific wards where particular land-use patterns, waste flows, service gaps, and socio-economic conditions intersect. Identifying these concentrations is critical for shifting the response from city-wide generic enforcement to targeted, area-based interventions.

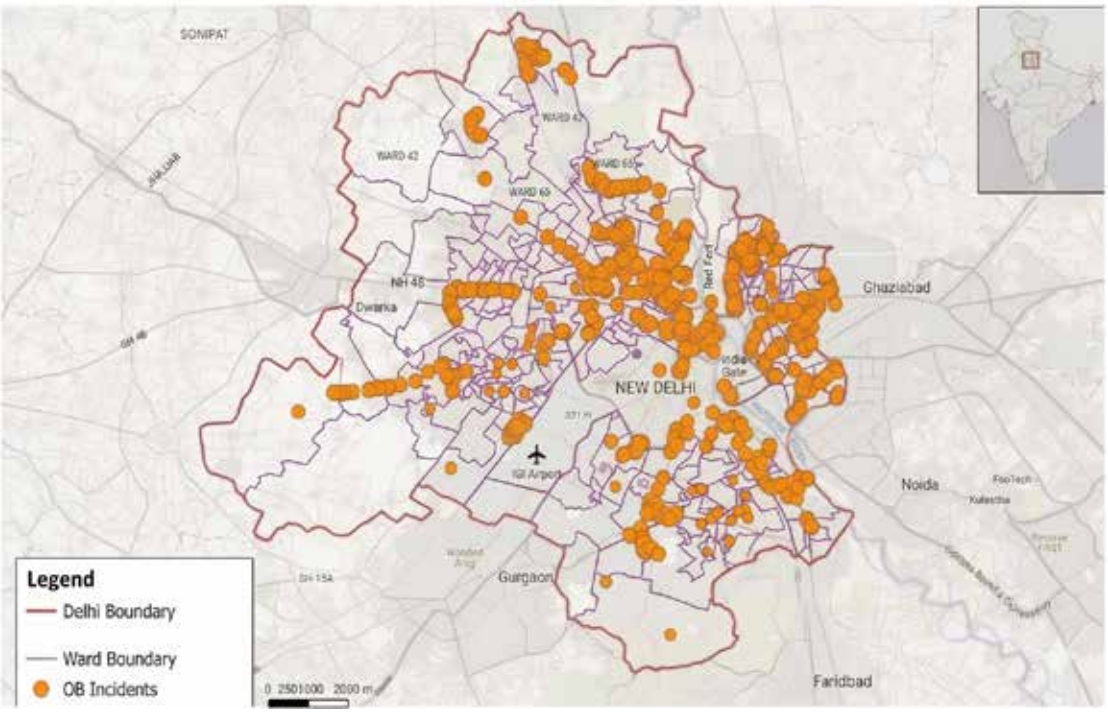
Key Findings at a Glance:

- Ward-wise Concentration of Open Burning
- Distribution of Open Waste Burning by Land-use Type
- Nature of Burning Events: Scale, Duration, Method, and Smoke Intensity
- Material Composition of Burnt Waste
- Stated Purpose of Open Burning
- Waste Management Service Gaps Near Burning Sites
- Exposure Risk: Proximity of Burning Sites to Sensitive Receptors
- Actors Involved in Burning

Ward-wise Concentration of Open Burning

The survey recorded 1,006 geotagged burning incidents across all 128 municipal wards, confirming that open burning is a city-wide issue. However, the intensity of occurrence varies significantly across wards.

Figure 1: Geo-tagged locations of Fire Incidents Across 128 Wards

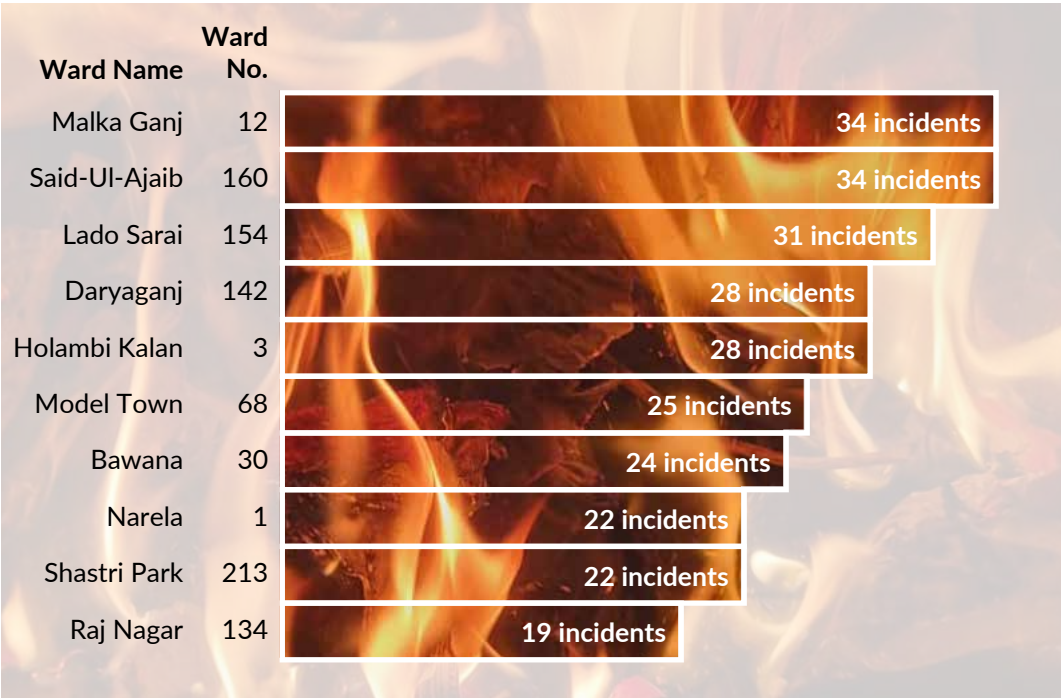


Graph 1 presents the top ten wards by number of observed incidents. These areas comprise a mix of industrial clusters, peri-urban fringes, high-density settlements, and logistics and transport corridors. All of them generate large volumes of mixed, low-value waste and often experience uneven waste service delivery.

Malka Ganj (North Delhi) and Said-ul-Ajaib (South Delhi) recorded the highest incidents with 34 each, followed by Lado Sarai with 31. These reflect high-activity, service-edge environments where waste accumulates at lanes, roadside corners and market edges, making burning a convenient method for clearance. Daryaganj (Central Delhi) and Holambi Kalan (North-west Delhi) recorded 28 incidents each, highlighting the prevalence of burning across both inner-city areas and peri-urban areas.

Industrial and peri-urban growth centres such as Bawana and Narela also feature prominently in the list. This highlights the strong correlation between bulk waste generation, informal dumping, and burning practices. The presence of localities such as Shastri Park, Raj Nagar, and Model Town further indicates that the issue cuts across different urban typologies, including resettlement areas and dense mixed-use neighbourhoods.

Graph 1: Top 10 High-Concentration Wards for Open Waste Burning in Delhi



The concentration of incidents in these locations suggests that open burning is closely linked to structural factors such as the availability and frequency of waste collection services (D2D and primary collection), the presence of informal dump points, the handling of packaging and industrial discards, and the absence of decentralised processing facilities. These wards therefore represent priority zones for integrated action combining service improvements, material recovery, decentralised waste processing, and targeted enforcement.

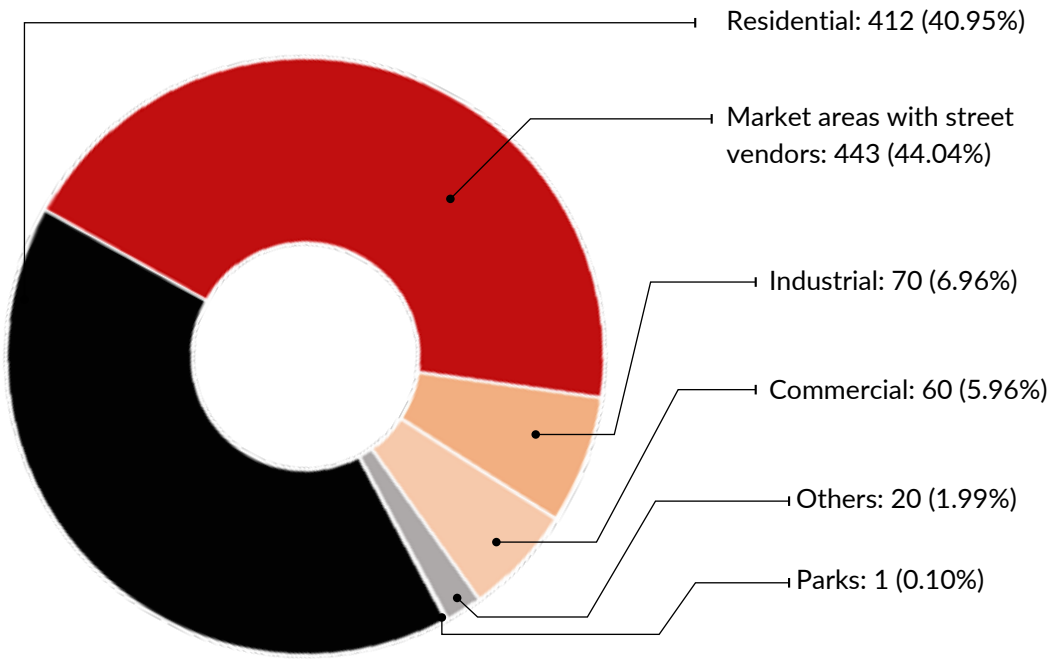
The spatial pattern that emerges from the ground-truth data provides a clear starting point for a focused, ward-level response. It enables municipal agencies to move from reactive firefighting to preventive planning grounded in evidence.

Distribution of Open Waste Burning by Land-use Type

The field data shows that open waste burning is closely linked to specific urban land-use conditions rather than being randomly distributed. Incidents are most frequently observed at ward boundaries, peri-urban edges, sites of informal dumping, and in high-activity public spaces such as roadsides, market areas, and street-vending zones. These are typically areas where waste generation is high, but collection, storage, and removal systems are either weak, irregular, or absent.

The analysis of 1,006 documented sites (Graph 2) indicates that market and street-vending areas account for the largest share of incidents (44%), followed closely by residential areas (41%). Incidents in parks and other locations are minimal.

Graph 2: Typology of Open Burning of Waste



The high incidence in market and street-vending zones reflects a clear service gap. These areas generate substantial volumes of mixed waste daily, particularly packaging materials, food waste, and low-value combustibles. In many locations, waste continues to accumulate after business hours due to the absence of late-evening or night-time collection. As a result, burning becomes a routine way to clear waste at the end of the day, often continuing into the night.

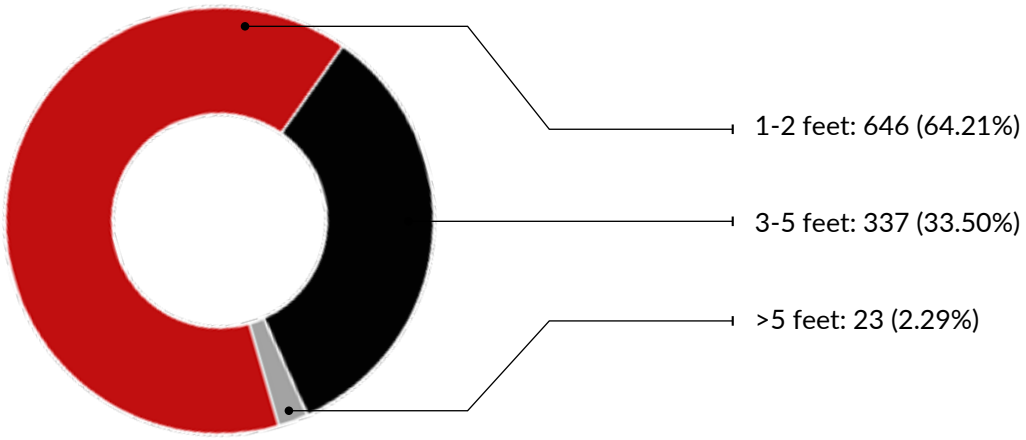
Residential areas account for 412 documented incidents (41%). This demonstrates that open burning is not confined to informal settlements. The practice cuts across income categories, though its prevalence varies significantly. Middle-income neighbourhoods account for 51% of residential incidents, followed by low-income settlements, including slums, at 37%, while high-income areas represent 8%. This distribution challenges the common perception that burning is primarily an issue of informal settlements. It instead points to broader systemic gaps in local waste management services, particularly for mixed and low-value waste streams.

Overall, the location typology highlights a strong relationship between waste accumulation points, gaps in collection services (D2D and primary), and the occurrence of burning. Market clusters, dense mixed-use neighbourhoods, and peri-urban growth areas emerge as priority zones for targeted interventions that combine improved waste services, decentralised processing of specific waste streams, effective implementation of EPR and SUP ban, and context-sensitive enforcement.

Nature of Burning Events: Scale, Duration, Method, and Smoke Intensity

The field observations show that most burning events are small in physical scale but high in frequency and duration, resulting in a continuous localised smoke burden. Nearly 64% of all documented fires measured approximately 1–2 feet in diameter (Graph 3). These fires typically involved small quantities of readily available combustible material, such as paper, plastic, cloth, packaging waste, or pieces of wood, and were often used by small groups of people at a time.

Graph 3: Approximate Size of Burning Area (diameter in feet)



Although limited in size, these fires were not short-lived. A large majority (82%) lasted for more than 30 minutes (Table 1), leading to sustained emissions in the immediate surroundings. Many of these prolonged burning events were observed during late evening and night-time hours, particularly after 9 PM, when temperatures fall and municipal activity in public spaces reduces. The extended duration of these fires indicates that the practice is not incidental but routine in certain locations.

Table 1: Burning Duration of Fires

Duration (In Minutes)	Incidents	Share (As Percent)
> 30 minutes	824	81.90
15-30 minutes	122	12.10
5-15 minutes	52	5.20
< 5 minutes	8	0.80

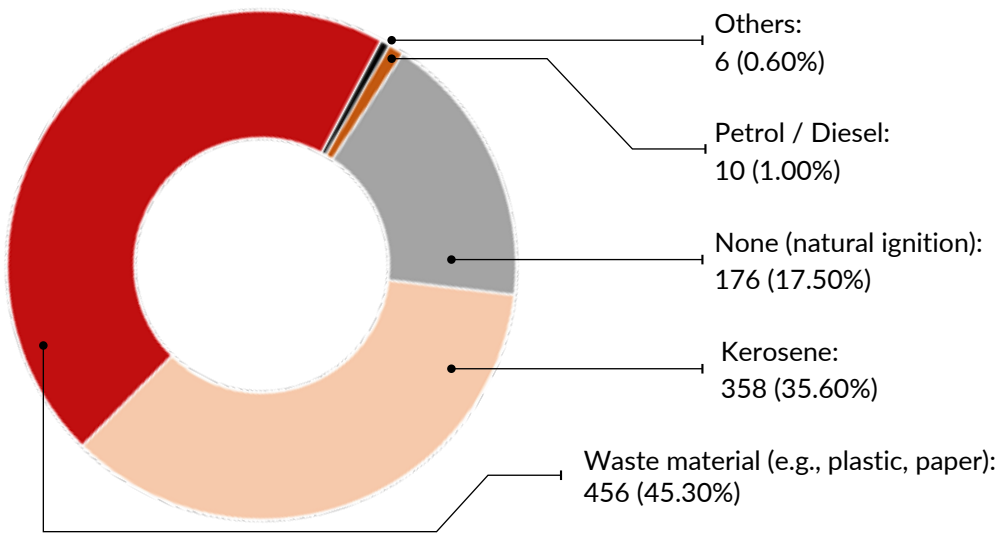
Regarding the burning method, 76% of incidents occurred in open areas, typically along roadsides, at informal dumping points, or on vacant land (Table 2). In these locations, the residual ash and partially burnt material remained on site, turning them into recurring burning hotspots as well as garbage-vulnerable points where fresh waste continues to accumulate and is repeatedly set on fire. About 23% of fires were lit in small containers or metal drums, usually by small groups in commercial or semi-public spaces, reflecting an attempt to confine the fire to a limited and more controlled area.

Table 2: Mode of Burning

Mode of Burning	Incidents	Share (As Percent)
Open area	764	75.90
Inside iron container / drum	232	23.10
Others	5	0.50
In a pit	5	0.50

The materials used to ignite fires further illustrate the reliance on readily available, low-cost options. In nearly 45% of the cases, waste material itself served as the ignition source, while kerosene was used in about 36% of incidents, particularly where slightly larger or longer-lasting fires were required (Graph 4). Very few cases involved petrol or diesel. A notable proportion of fires were lit without additional accelerants, using only dry waste and natural ignition.

Graph 4: Accelerant and Fuel Used to Ignite Fire



Smoke intensity was assessed as a field-based visual proxy for immediate exposure and visibility impacts, since real-time monitoring of particulate concentration was not feasible at each site. A standardised observation protocol was used by all survey teams to classify smoke into four categories: low, medium, high, and severe. This classification was based on visible plume density, horizontal spread, and the degree to which the smoke interfered with normal activity in the surrounding area. This approach does not estimate pollutant concentrations and does not capture colourless gases such as carbon monoxide. Rather, it provides a comparable indicator of on-ground human exposure conditions, particularly from particulate-rich emissions that visibly affect breathing space and movement.

For the purpose of consistency across wards, the following operational definitions were used:

Low: Smoke visible only at the source, dissipating within a few metres. It has no noticeable impact on passers-by or traffic movement.

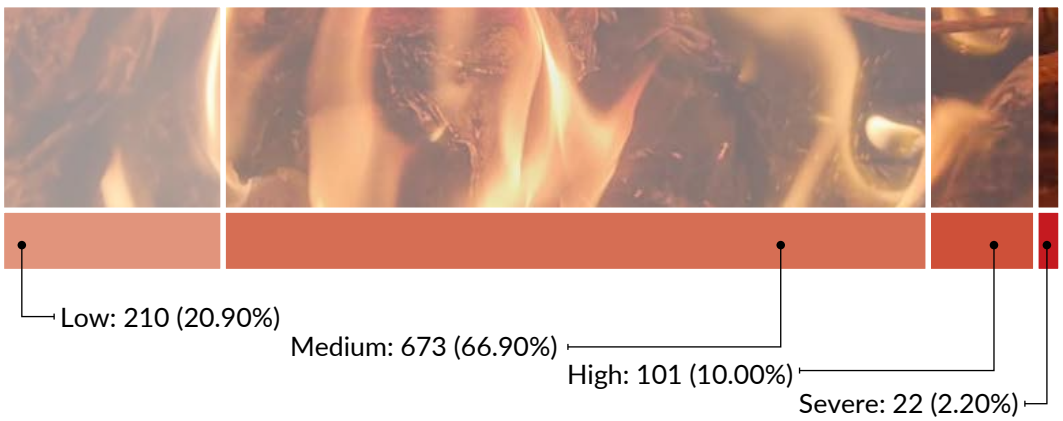
Medium: Clearly visible smoke plume extending across the immediate site (typically up to the width of the road or public space), causing mild discomfort such as odour or brief disturbance to visibility.

High: Dense smoke plume spreading beyond the immediate burning point, partially obscuring background features like shops, vehicles, or buildings, and causing people nearby to alter their movement or avoid the area.

Severe: Very thick and persistent smoke resulting in substantial visibility reduction across the site and causing strong irritation to eyes and throat with clear disruption to normal activities.

Using this standardised scale, about two-thirds of the incidents fell in the medium category (Graph 5), indicating routine but localised exposure. In roughly 12% of the cases, smoke was classified as high or severe. These conditions were repeatedly observed in locations such as parts of Bawana, Narela (Holambi Kalan ward), Malkaganj, Civil Lines, Kamla Nagar, Chandni Chowk, and Bhalswa (Swaroop Nagar), marking them as recurring high-exposure micro-sites.

Graph 5: Smoke Intensity



Field interactions conducted at various sites through short and informal conversations with residents, street vendors, security personnel, waste workers, and shopkeepers indicated a consistent pattern. Most respondents were aware that open burning is officially prohibited, yet continued the practice because it was the fastest available way to clear accumulated waste. During winter it also served as a readily accessible source of warmth in the absence of safer options. These interactions were not designed as a structured perception survey. However, the responses were recorded as part of the site documentation to provide contextual understanding of observed behaviour. The recurrence of similar explanations across multiple wards and land-use types provides qualitative validation for interpreting burning as a service and survival-linked practice rather than an isolated or uninformed act.

Figure 2: Open Fires of Different Intensity

Figure 3: Small Footprint, Long Duration

Small Scale	Open Mode	Long Duration
64.2% are in 1-2 feet diameter	**75.9%** in Open Areas (Ground)	**81.9%** burn for more than 30 minutes

This interpretation is also supported by the observed co-location of burning sites with clear service gaps, such as the absence of doorstep collection, overflowing community bins, or uncollected horticultural waste, and by the high share of incidents in areas with prolonged outdoor economic activity during early morning and late evening hours.

Overall, the findings show that the impact of open burning in Delhi is driven less by the size of individual fires and more by their frequency, duration, location, and cumulative smoke load. These characteristics create persistent microenvironments of exposure in public and residential spaces and point to the need for interventions that address waste accumulation, provide viable alternatives for specific waste streams, and reduce the conditions that enable repeated burning.

Field observations show that most open burning incidents are hyper-local, typically carried out for routine waste clearance or to provide warmth. Interactions with residents, waste workers, street vendors, and other local stakeholders through interviews and focused group discussions consistently confirmed that these fires are a regular occurrence in the same locations.

This qualitative validation explains why the cumulative smoke burden remains high despite the limited size of individual fires. It is the frequency and repetition of burning, combined with its proximity to everyday human activity, that significantly increases exposure and neighbourhood-level health risk.

Material Composition of Burnt Waste

The composition of waste observed at burning sites points to two dominant streams: horticultural waste and dry mixed combustibles. Each is linked to distinct service, regulatory and management gaps and with differing pollution implications.

As shown in Table 3, horticultural waste was present in 77.4% of all observed incidents, making it the most common material burnt. This includes leaves, twigs, and sweepings generated from parks, roadside plantations, institutional premises, and residential areas. The high proportion indicates that open burning is frequently used as a routine method for clearing green waste in areas where decentralised composting, mulching, or dedicated collection systems are either unavailable or irregular.

Table 3: Material Composition of Burned Waste

Dominant Waste Type	Incidents	Share (% to the total 1006 incidents)
Horticultural waste	779	77.40
Paper/packaging waste	364	36.20
Low-Value Plastics/rubber waste	312	31.00
Cloth/textile waste	56	5.60
Others	44	4.40
E-waste	10	1.00

At the same time, a substantial share of incidents involved paper and packaging waste (36.2%) and plastic (MLP) or rubber materials (31.0%). The presence of these materials alongside green waste shows that burning is not limited to leaf litter management. Instead, it often involves mixed low-value combustible waste and SUP, reflecting gaps in regulatory enforcement, source segregation, inadequate storage infrastructure, weak EPR regime and the accumulation of uncollected waste in public spaces. When such mixed waste is burnt, it significantly increases the emission of toxic pollutants compared to the burning of horticultural waste alone.

Cloth and textile waste (5.6%), e-waste (1%), and other materials (4.4%) together represent a smaller but distinct set of burning sites where these fractions form the dominant waste component in the pile.

The 'other materials' category included small quantities of thermocol, foam packaging, treated wood scraps, rubber footwear remnants, synthetic ropes, tarpaulin fragments, and other mixed combustible materials that could not be distinctly classified during field observation. Although individually limited in proportion, several of these materials are synthetic or chemically treated and may release hazardous emissions when burnt.

Figure 4: Different Burning Materials

Although their overall share is limited compared to horticultural and mixed dry waste, their significance from a public health perspective is high because of the toxic emissions generated during combustion. Even at lower prevalence, the burning of synthetic and blended textiles and electronic waste releases hazardous pollutants, making these sites disproportionately harmful relative to their frequency.

In most locations, horticultural waste is rarely burnt in isolation. It is typically mixed with other materials such as plastics, paper, cloth, and occasionally wires. This reflects the ground reality of waste handling at the neighbourhood level, where different streams get aggregated before burning.

Table 3 should therefore be interpreted as indicating the prominence of a particular waste fraction in the burning pile, not its exclusive presence. Horticultural waste appears more frequently as the dominant component primarily because of its higher volume and visibility during visual assessment in the field. Its bulk often masks the presence of lesser quantities of other materials, even though mixed burning is the norm.

The waste composition therefore highlights a strong link between burning practices and upstream system performance. Areas with frequent burning typically coincide with the absence of decentralised solutions for horticultural waste, weak or inconsistent source segregation, inadequate container capacity or design for dry waste, informal dumping of mixed waste, and weak implementation of the Extended Producer Responsibility regime and Single-Use Plastic ban.

These findings underline the need to move from post-incident control measures to preventive service interventions. Strengthening segregation at source, ensuring separate and regular collection of green and dry waste, introducing decentralised shredding and processing for horticultural waste, and improving containerisation and anti-dumping measures are critical to reducing the material that currently feeds these fires.

Stated Purpose of Open Burning

The field observations provide critical insight into why burning continues despite legal prohibitions. The stated purpose of open burning reflects the multiple, overlapping reasons for which fires are lit at a single site. Table 4 should therefore be interpreted as indicating the presence of one or more reported purposes at each incident, rather than mutually exclusive categories. The dominant purpose, reported in 61.3% of the observed incidents, was protection from the cold and the need for thermal comfort during winter. These fires were typically used by security guards, street vendors, transport workers, and others who spend long hours in the open with little access to enclosed or heated spaces. In this context, burning serves as a coping mechanism in the absence of safe, affordable alternatives for warmth.

Table 4: Purpose of Open Burning

Purpose (Multi-select)	Incidents	Share (%)
Protection/ thermal comfort during winter	617	61.3
Disposal of accumulated waste	377	37.4
Space clearing	147	14.6
Stubble/agricultural residue	11	1.1
Others	24	2.3

The second major reason, reported in 37.4% of incidents, was the disposal of accumulated waste, followed by space clearing and localised cleaning of areas (14.6%). These responses indicate that burning is often used as a practical substitute for formal waste management services where waste collection is irregular, storage infrastructure is inadequate, or mixed waste accumulates in public spaces. In such locations, burning becomes the quickest available method for restoring usable space and managing visible waste.

A very small proportion of incidents (1.1%) involved the burning of agricultural residue. This confirms that within Delhi the practice is overwhelmingly urban in character and closely linked to local service conditions rather than rural spillover.

Taken together, these findings show that open burning in Delhi is driven by two intersecting realities: the need for warmth among those who work and live outdoors during winter, and the absence of reliable, context-appropriate waste services in certain locations.

However, the cumulative impact of these hyperlocal, routine fires is significant. Repeated burning at the neighbourhood level leads to continuous localised emissions of particulate matter and toxic pollutants, increasing exposure for people who live and work nearby. This contributes to greater respiratory stress, intensifies winter smog, and weakens the city's overall air quality gains.

Figure 5: Reasons for Indulging in Open Burning

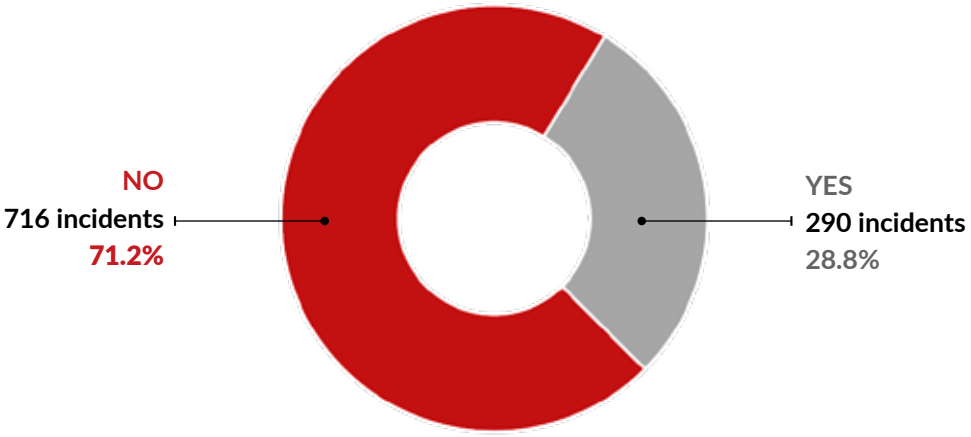
Understanding the stated purpose of burning is therefore central to designing effective solutions. Measures that focus only on prohibition and penalties will have a limited impact unless they are accompanied by safe and accessible alternatives for winter warmth in high-exposure occupations and locations, reliable well-designed waste collection, including Door-to-Door (D2D) and across the value chain, and storage systems that prevent the accumulation of combustible waste, decentralised processing, and effective implementation of Extended Producer Responsibility (EPR) and Single-Use Plastic (SUP) ban.

What is required is a shift towards worker-centred planning, universal and reliable waste services, decentralised systems for managing local waste streams, and safe alternatives for winter warmth, so that the responsibility for clean air does not fall on those who currently bear the highest exposure and the least protection.

Waste Management Service Gaps Near Burning Sites

The field analysis shows a strong, consistent relationship between open burning and the absence of basic waste collection and storage services in the immediate vicinity. As presented in Graph 6, 71.2% of all recorded incidents occurred at locations where no bin or waste collection point was available within a 500-metre radius. This pattern is observed across all land-use categories, indicating that burning is closely associated with service coverage rather than with any single type of urban area.

Graph 6: Availability of Nearby Waste Collection Services



A more disaggregated view (Table 5) highlights the extent of the service deficit. The lack of nearby waste infrastructure was most pronounced in industrial areas, where 92.4% of burning sites had no bin or collection facility within 500 metres, informal dumping grounds (85.7%), and roadside locations, which accounted for the largest number of incidents and where 78.8% of sites lacked any visible waste service.

Table 5: Location Type Without Waste Collection Service Within 500 Meters Radius

Location Type	Total Incidents of Burning	Absence of Service	Bins Unavailable (% of Location)
Industrial	66	61	92.4
Others (Waste dumping grounds)	7	6	85.7
Roadside Burning	392	309	78.8
Market (Street vending zone)	182	128	70.3
Residential	311	188	60.5
Parks	6	3	50.0
Commercial	42	21	50.0

In market and street-vending areas, which generate significant volumes of packaging and mixed waste, 70.3% of burning locations lacked a nearby waste collection point. This indicates a mismatch between waste generation patterns and service design. Even in residential areas, 60.5% of burning sites were located beyond the reach of a functional bin or collection facility.

In the absence of accessible storage and regular collection, waste accumulates on roadsides, at plot edges, and in open spaces. These become repeated dumping and burning points, particularly in high-activity areas where space needs to be quickly cleared for daily use. Burning, in such contexts, serves as an immediate, locally available method for managing visible waste.

The findings indicate that open burning is not merely an enforcement issue but a service delivery issue. Locations with inadequate containment and collection systems are significantly more likely to experience repeated burning. This underscores the need for expanding bin and secondary storage coverage in high-generation areas, aligning collection frequency with actual waste generation patterns (especially in markets and industrial zones), addressing informal dumping through improved service design and monitoring, and improving the door-to-door collection system.

Strengthening these upstream service elements is essential to prevent the accumulation of combustible waste and to reduce the conditions that currently make burning routine.

Exposure Risk: Proximity of Burning Sites to Sensitive Receptors

The spatial analysis shows that open waste burning in Delhi is not confined to isolated or low-activity areas. Instead, it occurs predominantly in locations where people live, work, commute, and gather. Of the 1,006 observed incidents, 730 (72.6%) occurred within a 1-kilometre radius of at least one sensitive receptor, indicating that most burning events occur in high-exposure environments.

As presented in Table 6, the most frequent points of proximity are public transit stops (36.7%) and dense residential housing (36.1%). These are spaces characterised by continuous human presence and daily use, meaning exposure is not occasional but routine. Commuters waiting at bus stops, pedestrians along busy corridors, and households in closely built neighbourhoods are therefore subjected to recurring smoke emissions as part of their everyday environment.

Table 6: Sensitive Receptors Near Burning Sites

Sensitive Receptor Nearby	Incidents	Percentage to the total incidents
Public transit stops	369	36.70
Dense residential housing	363	36.10
Park/Recreation area	151	15.00
School	61	6.10
Hospital/Health center	43	4.30
None selected	276	27.40

The proximity analysis of sensitive receptors reflects the multiple exposure contexts that may exist around a single burning site. Table 6 should therefore be interpreted as indicating the presence of one or more sensitive receptors within a 1-kilometre radius of each incident, rather than mutually exclusive categories.

Parks and recreational areas (15%) also feature prominently in the proximity analysis. Burning in and around these locations affects shared public spaces that are intended for physical activity, social interaction, and children's play, thereby undermining their health and environmental value. The presence of burning near these areas increases exposure among groups more vulnerable to air pollution, including children and the elderly.

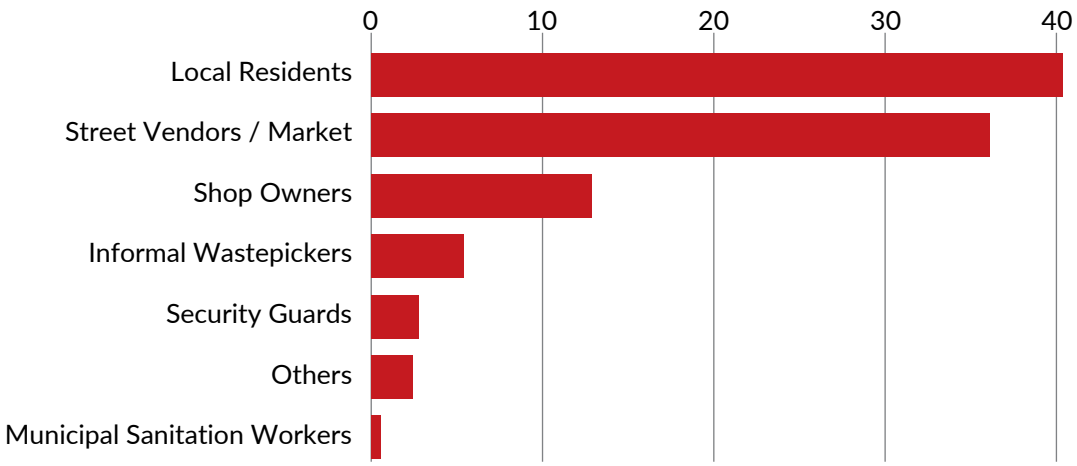
Although the proportion of incidents near schools (6.1%) and hospitals or health centres (4.3%) is smaller in numerical terms, these receptors are particularly sensitive. Even limited but repeated exposure in such locations has disproportionate implications for respiratory health, recovery environments, and overall well-being. These sites therefore warrant priority preventive action. The exposure patterns emerging from the ground data point to a critical shift in understanding: open burning in Delhi is not a peripheral activity, but one embedded in everyday public spaces. Its impacts extend far beyond those who light the fires, affecting a much wider population that uses the surrounding spaces.

From a planning and public health perspective, this finding underscores the need to treat open burning as a neighbourhood-level exposure issue. Interventions must prioritise high-footfall corridors, dense residential areas, transport nodes, and public-use spaces, where even small and frequent fires translate into continuous human exposure.

Actors Involved in Burning

The field observations indicate that open waste burning in Delhi cannot be attributed to a single group. Instead, it cuts across households, livelihoods, and public-space activities, reflecting the way waste is generated, handled, and left unmanaged in different parts of the city.

Graph 7: Who are indulging in open burning?



Residents account for the largest share of observed burning (40%), particularly in low and middle-income neighbourhoods. This suggests that the practice has become embedded in routine methods of clearing accumulated waste in areas where D2D collection and segregation is weak, storage infrastructure is limited, and collection services do not always align with the volume and timing of waste generation.

Street vendors and market operators represent a nearly equal share (35%). These locations generate significant quantities of packaging material and mixed dry waste daily, often after formal collection rounds have concluded. In the absence of late-evening clearance, burning becomes a quick way to restore usable space for the next business cycle. The high proportion in these areas reinforces the earlier finding that market and vending zones are among the most consistent burning hotspots.

Shop owners (12%), informal waste pickers (5%), and security guards (2%) account for a smaller but important share of incidents. In these cases, burning is typically associated with the need to manage residual low-value waste, maintain immediate surroundings, or cope with long working hours in open spaces during winter. Their presence in the activity profile points to the absence of inclusive service design that recognises the specific waste streams and working conditions of different occupational groups.

Taken together, the distribution shows that open burning cannot be explained as individual behaviour alone but is shaped by everyday urban service conditions of waste collection and management. Its prevalence across income groups and occupations suggests that awareness of prohibitions is not the key constraint. Rather, burning persists due to gaps in service delivery and the lack of practical, locally viable alternatives at the point of waste generation.

This has a clear programmatic implication: Behaviour change and awareness campaigns alone are unlikely to shift practices on their own. They must be paired with stronger, more reliable solid waste systems so that burning is no longer the default option for waste disposal or volume reduction.

This finding is critical for policy and programme design. Targeted interventions must therefore move beyond generic awareness campaigns and instead focus on:

- Service scheduling that matches the operating hours of markets and commercial areas
- Accessible storage and collection systems (including D2D) for residential neighbourhoods
- Solutions for low-value and residual waste (EPR and beyond) that currently have no defined recovery pathway

Recognising the diversity of actors involved enables location-specific, livelihood-sensitive responses, which are essential for achieving sustained reductions in open burning.

4 KEY LEARNINGS
What the Fires Tell Us

The field evidence makes it clear that open burning in Delhi is not a series of isolated violations. It is a visible signal of two deeper urban failures: the denial of basic well-being infrastructure to those who keep the city running, and the breakdown of an inclusive waste management, service delivery and materials recovery system. These fires are not the cause of the crisis; they are its symptom. The following cross-cutting insights emerge from the field evidence:

Burning for Waste Clearance: A System Failure from Doorstep Collection to Extended Producer Responsibility

After the need for thermal protection by the poor, the second major driver of burning is the accumulation of mixed waste in public spaces, community lanes, market edges, roadside corners, transport corridors, and peri-urban growth belts, where waste services do not keep pace with waste generation.

The strongest predictor of burning is not income level, awareness, or land use. It is whether waste is collected from homes, on time, segregated properly, stored and given a recovery pathway.

The field data establish a clear chain of failure:

- Sub-optimal doorstep collection: Irregular and poorly timed collection allows waste to spill into public space, creating garbage-vulnerable points that are repeatedly burnt for clearance.
- Inadequate community storage design and clearance frequency: Where bins exist but are not cleared in sync with waste generation, especially in markets and high-footfall corridors, they become overflow points that trigger burning.

- Weak source segregation: Mixing wet waste with dry recyclables degrades material value and leaves a combustible residue.
- Failure of the Extended Producer Responsibility (EPR) system for low-value plastics and packaging: The study finds that a significant share of burn piles contains materials that should have been recovered through producer-financed systems. Their presence in municipal waste points to systemic gaps, including lack of assured offtake, absence of price support, exclusion of informal aggregators, and weak enforcement in high-leakage commercial zones.
- Leakage of low-value waste into public realm: In effect, materials with negative market value are being pushed into the public realm and burning becomes the easiest method of removal.

Burning for Warmth: A Question of Survival, Dignity, and Worker Rights

For many of the people encountered at burning sites — security guards, street vendors, transport workers, sanitation workers, and others who spend long hours outdoors — the fire is a survival tool. In winter, the city offers them no heated rest spaces, no accessible shelters near workplaces, and no safe, non-polluting thermal alternatives. In this context, the small waste fire becomes an informal welfare system.

This reveals a critical urban planning blind spot: the city's air-quality response has not recognised the thermal vulnerability of outdoor workers as an urban public-health issue. Clean air cannot be achieved by criminalising the coping mechanisms of people who have no access to basic protection from the cold.

The continued reliance on waste fires for warmth indicates that:

- The urban economy depends on a large workforce that operates without basic support infrastructure, and
- Environmental regulation is being implemented without parallel investments in workers' well-being.

Ending this form of burning therefore requires replacing survival fires with dignified thermal alternatives, co-designed with worker groups and located where they work.

Environmental Injustice: Those Who Contribute Least Are Most Exposed

Nearly three-fourths of burning sites are located in everyday activity spaces, near homes, transport nodes, vending zones, and public areas. Exposure is therefore continuous and concentrated among the socially and economically vulnerable population, the very same people who are responsible for sustaining the city's material economy. Open burning is therefore a neighbourhood-level environmental justice issue that needs immediate intervention.

Needs System Design, Not Behaviour Change

The normalisation of burning reflects the absence of viable alternatives. Where services are reliable and recovery pathways exist, open burning declines. Where waste accumulates and materials have no value chain, burning becomes routine.

The study reframes the solution:

- From enforcement to prevention.
- From city-wide bans to ward-level service design.
- From awareness campaigns to material and livelihood systems that work.

These fires are telling us that clean air in Delhi will not come from penalties alone. It will come from a waste system that reaches the last mile, an EPR regime that works for low-value materials, and a city that recognises the dignity and thermal needs of its informal workforce.

Open burning is a visible signal of two deeper urban failures: the denial of basic well-being infrastructure to those who keep the city running, and the breakdown of an inclusive waste management, service delivery and materials recovery system

5 RECOMMENDATIONS

From Firefighting to Prevention: A Ward-Level Roadmap with People at its Heart

The field investigation across 128 wards and 1,006 geotagged sites makes one point unmistakably clear: open burning in Delhi is not random or inevitable. It follows a pattern. Fires occur where doorstep collection is unreliable, where community storage overflows, where horticultural waste has no local processing pathway, where low-value packaging has no recovery chain, and where workers exposed to winter nights have no access to safe warmth. The same locations repeatedly combine service gaps, high human exposure, and the presence of combustible mixed waste. Eliminating this practice therefore requires replacing coping mechanisms with systems that work reliably, locally, and with dignity.

The recommendations are organised around two structural drivers identified by the study: the use of fire as a substitute for waste services and material recovery and the use of fire for thermal comfort. **They are based on the provisions and spirit of the Solid Waste Rules, 2026**.

Stopping Waste Before It Reaches the Street: Service Reform and Decentralised Systems

- **Universal, timed and segregated doorstep collection**

The strongest predictor of burning is the absence of reliable collection. Daily, segregated doorstep collection aligned with actual waste-generation cycles, including before late-evening market closure, will prevent the formation of garbage-vulnerable points and remove the need for on-site burning as a clearance mechanism. Service design must reflect the rhythms of the city's informal and commercial economy, not just standard shifts.

- **Re-design community storage for high-load zones**

In vending areas, transport corridors and dense commercial streets, bulk waste storage is unavoidable. The study shows that poorly placed, undersized and infrequently cleared bins trigger burning. Twice-daily clearance, appropriate container design and clear ward-level accountability can eliminate this cycle. Community storage must be treated as an operational service node, not a passive dumping point. Infact, we suggest making ward level waste plans to identity needs, with a greater monitoring role for the councillors.

- **Decentralise and undertake contracted management of horticultural waste**

Given the prevalence of horticultural waste in most fires, Delhi requires a dedicated, decentralised system for its collection and processing. Horticultural waste management should be separately contracted to local and medium-scale operators, social enterprises and NGOs, with each cluster covering four to five wards and responsible for scheduled collection, shredding and composting.

This approach will:

- Prevent roadside accumulation and burning.
- Significantly reduce long-distance transport costs.
- Create decentralised green jobs, including for existing informal or semi-formal workers.
- Generate usable compost for local landscapes and urban agriculture.

- **Strengthen material recovery facilities as inclusive recovery infrastructure**

The presence of plastics and packaging in burn piles reflects the absence of assured recovery pathways for low-value materials. Functional, decentralised Material Recovery Facilities (MRFs), formally integrating waste pickers, ensuring fair remuneration and providing storage and aggregation space, are central to eliminating the combustible fraction from the waste stream. These facilities must be planned at ward or cluster level and linked directly to Extended Producer Responsibility-funded material flows so that low-value plastics and multi-layered packaging do not leak into public spaces.

- **Fix the incentives, pay for segregation, not for dumping mixed waste**

The present waste management contracts reward tonnage, not clean streets.

If operators are paid to lift mixed waste, segregation will remain cosmetic and the combustible fraction will continue to reach neighbourhoods and be burnt. Payments must shift toward what the city wants: collection of segregated waste, recovery of low-value plastics and safe handling of domestic hazardous waste.

High-value dry waste should move through decentralised MRFs that formally recognise and include waste pickers, not into concessionaire trucks.

Wet waste Contracts must include measurable outcomes like zero garbage-vulnerable points, elimination of repeat burning hotspots, and verifiable diversion from landfill. Until the money flow changes, the material flow will not change.

- **Mandate decentralised waste management by Resident Welfare Associations and bulk generators**

In line with the Solid Waste Management Rules, 2026, all Resident Welfare Associations (RWAs) and bulk waste generators must transition to decentralised waste management systems. This includes on-site composting of wet waste, segregation and channelisation of dry waste for recycling, and dedicated arrangements for low-value plastics, multi-layered packaging and horticultural waste. RWAs must be required to enter into formal service agreements for the safe handling of these specific waste streams and to bear the cost of their environmentally sound management.

This will:

- Prevent bulk waste from entering municipal street systems.
- Reduce pressure on public collection infrastructure.
- Create decentralised recovery value chains.
- Directly cut the volume of combustible waste reaching public spaces.

RWAs cannot externalise the environmental cost (especially air pollution) of their waste onto the city's streets and informal workers.

Make Producers and Brand Owners Truly Accountable

- **From invisible reporting to visible recovery**

The study's hotspot mapping shows precisely where branded packaging leaks into the environment and ends up in burn piles: markets, transport corridors, dhalaos (traditional three-walled concrete garbage collection structures in Delhi, used for storing neighbourhood waste before disposal), and other dumping zones. Yet Extended Producer Responsibility (EPR) continues to be measured largely through aggregated, city-level documentation that does not translate into on-the-ground recovery. These identified leakage zones must be routinely monitored and made the primary geography for EPR compliance and material retrieval. Clean air in Delhi is being compromised by this gap between reported compliance and lived reality.

- **Direct EPR investments to high-leakage geographies**

Producers and Producer Responsibility Organisations must be required to finance and operate collection, aggregation and buy-back systems in the specific wards and commercial clusters where their materials are found in open burning sites. Compliance should be linked to demonstrated, geo-referenced recovery rather than to offset certificates and distant processing claims.

- **Ensure fair compensation for the informal recycling workforce**

The recycling economy that currently prevents a far larger waste crisis is built on the labour of waste pickers, who receive the least value from the materials they recover. EPR funds must prioritize support fair pricing, occupational safety, adequate storage space, and the formal integration of these workers into MRF-based recovery systems. Without this, low-value plastics will continue to be discarded and burned.

- **Enforce brand accountability for non-recoverable materials**

A significant share of multi-layered, low-value packaging lacks a viable recycling pathway and is routinely found in burn piles. Producers placing such materials on the market must be required to finance their retrieval and phase in redesign toward recoverable formats. Clean-air action demands that brands take responsibility for the afterlife of their products.

Protect High-Exposure Public Spaces through Localised Prevention

- **Move from complaint-based response to ward-level prevention planning**

The geo-tagged dataset enables micro-planning. Each high-incident ward should have a prevention plan combining service redesign, recovery systems and worker-support infrastructure, shifting the approach from reactive enforcement to predictable prevention.

- **Declare high-exposure areas as zero-burn service priority zones**

Most burning occurs in densely populated residential neighbourhoods and around transport and livelihood areas. These must be treated as high-priority public health zones with guaranteed daily clearance, decentralised processing and routine monitoring.

- **Build a community-linked monitoring system**

Waste picker organisations, resident groups and market associations should be recognised as partners in identifying and preventing burning. A unified, ward-linked reporting and response platform can convert local knowledge into real-time action and accountability.

Use Technology as a Public-System Enabler

- Technology should be used to strengthen the responsiveness and accountability of municipal systems, rather than function as a stand-alone solution. In practical terms, this means integrating CCTV camera feeds at recurring problem locations with ward control rooms to enable quick verification and action, deploying simple geo-tagged mobile apps with standard reporting formats so field staff can upload time-stamped work records, and creating a ward-level dashboard that tracks incident locations, team deployment and task completion. This can be supported with periodic use of India's existing satellite imagery databases to validate hotspots and review performance independently. Such a setup keeps the focus on day-to-day operations, helps supervisors take faster decisions, and makes service delivery transparent and measurable.

Replace Survival Fires with Dignified Thermal Support

- **Recognise winter exposure as an urban labour and public health concern**

A majority of winter fires are not acts of disposal but acts of endurance. For security guards, street vendors, sanitation workers, loaders, drivers, and waste pickers, the fire is an improvised heating device that allows them to remain at work through long, cold nights.

Clean-air action cannot succeed if it ignores the thermal needs of those whose livelihoods depend on outdoor spaces. Providing safe, non-polluting warming infrastructure at work locations is therefore not a welfare measure but a core clean-air intervention.

- **Establishing clean, accessible, work-linked warming points**

Community warming facilities must be located at transport nodes, wholesale markets, vending clusters, industrial areas and landfill peripheries, precisely where burning is concentrated. When these are within walking distance, usable during working hours, and designed with basic services such as seating, drinking water and lighting, they become real alternatives to waste fires.

- **Co-management with worker organisations**

Worker collectives and informal-sector associations should be involved in the planning, operation and oversight of these facilities. This ensures dignity, usability and long-term sustainability while embedding clean-air action within a rights-based framework.

Strategic Transition

Open burning will not end through prohibition alone. It will end when waste is collected before it accumulates, when materials are recovered because producers are accountable for them, when green waste is processed locally, and when those who work at night have access to safe, warm housing. Clean air in Delhi will be secured not only by controlling emissions but by building an urban service system that reaches its most vulnerable residents and holds its most powerful market actors responsible.

6 CONCLUSION
Rethinking Waste: For a Breath of Clean Air

The study confirms that open burning in Delhi is not primarily an enforcement failure but a systemic gap in basic waste services, particularly source segregation, timely collection, EPR implementation and local waste processing. It is important to acknowledge that for marginalised populations, burning waste is often a coping mechanism born out of limited alternatives. However, these fires burn mixed municipal waste which releases fine particulate matter, black carbon, and harmful chemicals directly into the breathing zone of nearby residents, children in schools, patients in health facilities, and daily commuters. In a city already battling severe air pollution, especially during winter, every such fire adds to the toxic burden and undermines Delhi's efforts to improve air quality.

The pathway to eliminating open burning therefore lies not in punitive action alone, but in building a reliable, decentralised, and inclusive waste management system that prevents waste from accumulating in the first place.

This includes:

- Universal and consistent source segregation.
- Waste collection schedules aligned with actual generation patterns in markets, residential areas, and public spaces.
- Decentralised processing of horticultural waste and local organic streams.
- The expansion and effective operation of MRFs to ensure that dry waste, especially low-value plastics and packaging, has a defined recovery pathway and does not leak into the environment.
- Resident Welfare Associations, as bulk waste producers, to strictly follow the Solid Waste Management Rules, 2026.
- Strengthening of EPR and making the waste-producing brands accountable.

Equally important is the provision of safe and dignified alternatives for winter warmth for those who work through the night in exposed conditions, so that clean air does not come at the cost of human survival.

Addressing open burning in Delhi must therefore be framed as a public health, service delivery, and environmental justice priority. The ward-level, hotspot-focused approach demonstrated in this study provides a practical roadmap: when services reach the last mile, when waste is managed close to where it is generated, and when informal and occupational groups are treated as partners in the system, the need for burning diminishes.

Clean air in Delhi will not be achieved only through seasonal emergency measures. It will be achieved through everyday systems that work locally, equitably, and consistently for all.

Equally important is the provision of safe and dignified alternatives for winter warmth for those who work through the night in exposed conditions, so that clean air does not come at the cost of human survival

ANNEXURE A

Ward-wise Summary Table (All wards with mapped incidents)

This annex lists all wards with at least one mapped incident, along with planning-relevant indicators.

1. Number of burning incidents in each ward, and the share coming from key wards and localities.
2. Percentage of incidents where there are no bins or waste collection services nearby (to track service improvements).
3. Percentage of incidents that occur close to sensitive places such as homes, dense housing edges, schools, health facilities, parks, and bus or transit stops.
4. Number and percentage of "high-risk" incidents where both conditions occur together: no bins/collection nearby and at least one sensitive receptor nearby.
5. Percentage of incidents where paper or plastic is present in the waste, and where both paper and plastic are present together.
6. Percentage of incidents that last more than 30 minutes and how intense the smoke is across incidents.
7. How incidents are distributed over different time zones by site type (for example, roadside, markets, residential areas, and industrial areas).

CENTRAL DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Daryaganj	Residential	29	18	92.9%	75.0%	39.3%	0
Chandni Chowk	Commercial/ Market	12	7	58.3%	58.3%	58.3%	0
Karol Bagh	Residential	11	4	45.5%	72.7%	9.1%	0
Pahar Ganj	Commercial/ Market	16	5	42.9%	57.1%	42.9%	0
Jama Masjid	Market (SVZ)	7	5	57.1%	42.9%	42.9%	0
Chandani Mahal	Commercial/ Market	7	6	100.0%	71.4%	42.9%	0
Quraish Nagar	Residential	4	3	100.0%	75.0%	25.0%	0
Bazar Sita Ram	Market (SVZ)	3	3	33.3%	100.0%	33.3%	0
Sadar Bazar	Commercial/ Market	3	3	100.0%	66.7%	66.7%	0
Delhi Gate	Market (SVZ)	2	2	100.0%	100.0%	0.0%	0
Ballimaran	Market (SVZ)	3	1	100.0%	100.0%	100.0%	0
Kishan Ganj	Commercial/ Market	1	1	100.0%	100.0%	100.0%	0
TOTAL		**98**	**58**	**77.5%**	**76.6%**	**46.7%**	**0**

EAST DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Anand Vihar	Residential	21	14	38.1%	47.6%	28.6%	0
Gharoli	Residential	20	8	90.0%	95.0%	100.0%	0
Jhilmil	Residential	20	9	75.0%	50.0%	55.0%	0
New Ashok Nagar	Commercial	13	1	46.2%	100.0%	100.0%	0
Trilokpuri	Residential	10	2	80.0%	100.0%	90.0%	0
Vinod Nagar	Residential	9	3	22.2%	100.0%	100.0%	0
Preet Vihar	Market (SVZ)	8	6	25.0%	87.5%	62.5%	0
Vishwas Nagar	Residential	5	4	60.0%	60.0%	20.0%	0
Shakarpur	Market (SVZ)	4	4	25.0%	100.0%	50.0%	0
Lalita Park	Commercial	3	3	66.7%	100.0%	33.3%	0
Mayur Vihar Phase-Ii	Residential	3	1	66.7%	100.0%	100.0%	0
Kalyanpuri	Residential	3	2	66.7%	100.0%	100.0%	0
Geeta Colony	Market (SVZ)	2	2	50.0%	100.0%	0.0%	0
I.P. Extension	Residential	2	1	100.0%	100.0%	100.0%	0
Krishna Nagar	Residential	2	2	50.0%	0.0%	0.0%	0
TOTAL		**125**	**62**	**57.4%**	**82.7%**	**62.6%**	**0**
NEW DELHI / NDMC DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Raj Nagar	Residential	19	1	100.0%	100.0%	5.3%	0
TOTAL		**19**	**91**	**57.5%**	**85.8%**	**52.8%**	**0**
NORTH DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Malka Ganj	Market (SVZ)	34	27	58.8%	94.1%	47.1%	0
Model Town	Residential	25	12	28.0%	100.0%	36.0%	0
Kamla Nagar	Residential	21	15	61.9%	95.2%	42.9%	0
Mukherjee Nagar	Residential	21	15	52.4%	81.0%	23.8%	0
Timarpur	Market (SVZ)	15	5	93.3%	86.7%	40.0%	0
Civil Lines	Residential	12	8	66.7%	83.3%	58.3%	1
Burari	Residential	2	2	100.0%	50.0%	0.0%	0
Sant Nagar	Residential	1	1	100.0%	0.0%	100.0%	0
TOTAL		**131**	**85**	**70.1%**	**73.8%**	**43.5%**	**1**

NORTH EAST DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Shastri Park	Market (SVZ)	22	10	68.2%	81.8%	27.3%	1
Bhajanpura	Residential	14	14	42.9%	100.0%	42.9%	0
Yamuna Vihar	Residential	6	5	100.0%	100.0%	0.0%	0
Joharipur	Residential	6	4	100.0%	100.0%	0.0%	0
Kadipur	Residential	6	6	100.0%	83.3%	33.3%	0
Karawal Nagar-East	Residential	5	2	100.0%	100.0%	60.0%	0
Nehru Vihar	Residential	4	4	100.0%	100.0%	25.0%	0
Gokal Puri	Residential	3	2	100.0%	100.0%	100.0%	1
Braham Puri	Residential	2	2	100.0%	50.0%	50.0%	0
Mustafabad	Residential	2	2	100.0%	100.0%	50.0%	0
Seelampur	Market (SVZ)	2	2	50.0%	100.0%	50.0%	0
Sadatpur	Residential	2	2	100.0%	100.0%	50.0%	0
Brij Puri	Residential	1	1	100.0%	100.0%	100.0%	0
TOTAL		**75**	**56**	**89.3%**	**93.5%**	**45.3%**	**2**
NORTH WEST DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Holambi Kalan	Market (SVZ)	28	4	100.0%	42.9%	35.7%	0
Bawana	Commercial/ Market	24	5	100.0%	29.2%	66.7%	2
Narela	Market (SVZ)	22	2	100.0%	63.6%	45.5%	0
Keshav Puram	Industrial	19	6	89.5%	31.6%	26.3%	1
Sarup Nagar	Residential	13	8	100.0%	76.9%	38.5%	0
Ashok Vihar	Market (SVZ)	11	8	81.8%	72.7%	27.3%	0
Shakur Pur	Industrial	11	6	81.8%	36.4%	27.3%	0
Shalimar Bagh-A	Market (SVZ)	8	5	100.0%	75.0%	0.0%	0
Adarsh Nagar	Commercial/ Market	7	5	100.0%	85.7%	57.1%	0
Pitam Pura	Residential	7	2	85.7%	42.9%	0.0%	0
Dhirpur	Residential	7	4	100.0%	71.4%	71.4%	0
Sangam Park	Residential	5	4	80.0%	80.0%	60.0%	0
Rohini-F	Residential	4	2	100.0%	0.0%	0.0%	0
Bhalswa	Market (SVZ)	4	2	100.0%	100.0%	50.0%	0
Azadpur	Market (SVZ)	4	1	100.0%	75.0%	50.0%	0
Wazir Pur	Industrial	4	3	100.0%	100.0%	50.0%	0
Saraswati Vihar	Residential	3	2	66.7%	100.0%	66.7%	0

Alipur	Residential	2	2	100.0%	0.0%	0.0%	0
Kohat Enclave	Residential	1	1	0.0%	100.0%	100.0%	0
Pooth Khurd	Residential	1	1	100.0%	0.0%	100.0%	0
Rohini-E	Residential	4	1	0.0%	100.0%	0.0%	0
Rithala	Residential	1	1	100.0%	0.0%	100.0%	0
Rani Bagh	Market (SVZ)	1	1	0.0%	100.0%	100.0%	0
TOTAL		**191**	**76**	**82.0%**	**60.1%**	**46.6%**	**3**
SHAHDARA DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Sundar Nagri	Residential	7	2	57.1%	0.0%	42.9%	0
Shahdara	Residential	6	4	66.7%	16.7%	33.3%	0
Sri Ram Colony	Residential	6	5	100.0%	83.3%	33.3%	0
Dilshad Colony	Residential	6	3	20.0%	0.0%	20.0%	0
TOTAL		**25**	**14**	**61.0%**	**25.0%**	**53.6%**	**3**
SOUTH DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Said-Ul-Ajaib	Residential	34	24	32.4%	91.2%	8.8%	0
Lado Sarai	Residential	31	25	25.8%	87.1%	9.7%	0
Chhatarpur	Residential	9	8	22.2%	100.0%	11.1%	0
R.K. Puram	Residential	4	3	75.0%	25.0%	75.0%	0
Munirka	Others	3	3	100.0%	66.7%	100.0%	0
Hauz Khas	Residential	2	2	50.0%	100.0%	50.0%	0
Vasant Vihar	Residential	1	1	100.0%	0.0%	100.0%	0
Malviya Nagar	Residential	4	1	0.0%	100.0%	0.0%	0
Begumpur	Residential	1	1	100.0%	0.0%	100.0%	0
TOTAL		**89**	**90**	**57.2%**	**56.5%**	**46.8%**	**3**
SOUTH EAST DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Sarita Vihar	Residential	15	5	53.3%	100.0%	93.3%	0
Madanpur Khadar East	Residential	13	3	53.8%	100.0%	92.3%	0
Sidhartha Nagar	Residential	11	7	100.0%	81.8%	72.7%	0
Gautam Puri	Residential	8	7	100.0%	75.0%	25.0%	0
Madanpur Khadar West	Commercial/ Market	7	1	28.6%	100.0%	100.0%	0
Zakir Nagar	Market (SVZ)	5	3	33.3%	83.3%	33.3%	0
Kotla Mubarakpur	Residential	5	4	60.0%	40.0%	20.0%	0

Sri Niwas Puri	Residential	8	4	100.0%	100.0%	100.0%	0
Abul Fazal Enclave	Commercial	4	3	100.0%	100.0%	100.0%	0
Harkesh Nagar	Residential	3	1	66.7%	100.0%	100.0%	0
Amar Colony	Market (SVZ)	2	2	0.0%	50.0%	50.0%	0
Lajpat Nagar	Commercial	1	1	100.0%	100.0%	100.0%	0
TOTAL		**82**	**41**	**66.3%**	**85.8%**	**73.9%**	**0**
SOUTH WEST DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Isapur	Residential	15	2	20.0%	0.0%	50.0%	0
Najafgarh	Residential	9	3	44.4%	11.1%	55.6%	0
Palam	Residential	8	4	100.0%	100.0%	12.5%	0
Manglapuri	Residential	6	3	100.0%	100.0%	0.0%	0
Kakrola	Market (SVZ)	6	2	50.0%	0.0%	50.0%	0
Mohan Garden	Residential	4	3	100.0%	75.0%	50.0%	1
Matiala	Market (SVZ)	2	1	50.0%	0.0%	0.0%	0
Nangli Sakrawati	Residential	2	2	0.0%	0.0%	50.0%	0
Sadh Nagar	Residential	2	2	100.0%	100.0%	0.0%	0
Jharoda	Market (SVZ)	2	2	50.0%	50.0%	50.0%	0
Uttam Nagar	Residential	4	1	0.0%	0.0%	0.0%	0
Dichaon Kalan	Residential	1	1	0.0%	0.0%	0.0%	0
TOTAL		**61**	**26**	**51.2%**	**36.3%**	**26.5%**	**1**
WEST DISTRICT							
Ward	**Predominant Typology**	**Incidents**	**Localities**	**No-bins (%)**	**Receptor Nearby (%)**	**Paper/ Plastic (%)**	**E-waste (Count)**
Nangloi	Industrial	18	3	100.0%	77.8%	16.7%	1
Mundka	Industrial	16	1	100.0%	7.7%	46.2%	2
Hari Nagar Extension	Market (SVZ)	12	1	58.3%	100.0%	91.7%	0
Moti Nagar	Industrial	13	8	80.0%	80.0%	20.0%	0
Karam Pura	Industrial	8	8	75.0%	75.0%	62.5%	0
Jawalapuri	Commercial/ Market	7	5	100.0%	100.0%	42.9%	0
Ram Nagar	Residential	6	6	83.3%	100.0%	16.7%	0
Roshan Pura	Commercial/ Market	5	1	40.0%	20.0%	0.0%	0
Nilothi	Commercial/ Market	5	5	100.0%	100.0%	60.0%	0
Subhash Nagar	Residential	5	5	100.0%	40.0%	40.0%	0
Tilak Nagar	Market (SVZ)	3	3	100.0%	100.0%	33.3%	0

Punjabi Bagh	Residential	2	2	100.0%	100.0%	0.0%	0
Nangloi Jat	Residential	2	1	100.0%	100.0%	100.0%	0
Kunwar Singh Nagar	Industrial	2	2	100.0%	0.0%	50.0%	0
Rajouri Garden	Residential	2	2	50.0%	100.0%	100.0%	0
Raghubir Nagar	Others (specify in remarks)	3	1	100.0%	0.0%	100.0%	0
Ramesh Nagar	Residential	1	1	100.0%	100.0%	100.0%	0
TOTAL		**110**	**55**	**87.4%**	**70.6%**	**51.8%**	**3**
		1006	**654**	**69**	**67.89%**	**50.01%**	**16**

ANNEXURE B

Questionnaire

12/25/25, 4:56 PM Open Burning Kobo

Open Burning Survey Tool

Date of Observation

DD/MM/YYYY

Observer's Name

Ward/Locality Name

GPS Coordinates (Latitude & Longitude)

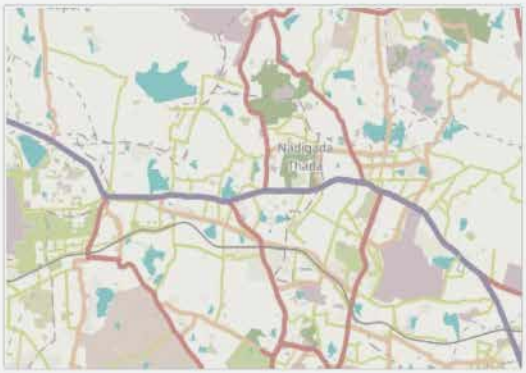
Tap to capture location using device GPS

latitude (x.y °)

longitude (x.y °)

altitude (m)

accuracy (m)



Photograph of the Site

Capture a clear photo showing the burning area

Click here to upload file. (< 5MB)

2.1. Type of Location

- ◯ Residential area
- ◯ Commercial area (shops, markets, etc.)
- ◯ Vegetable/fruit market
- ◯ Roadside/open area
- ◯ Industrial area
- ◯ Others (specify in remarks)

2.2. Approximate Size of Burning Area

- ◯ 1-2 ft diameter
- ◯ 3-4 ft diameter
- ◯ More than 5 ft diameter

3.1. Type of Waste Being Burnt (select all that apply)

- ☐ Horticultural waste (leaves, twigs, branches)
- ☐ Plastic and rubber waste
- ☐ Paper and packaging waste
- ☐ Cloth and textile waste
- ☐ Mixed/household waste
- ☐ E-waste (wire, circuit boards/PCBs)
- ☐ Others (specify in remarks)

3.2. Estimated Quantity of Waste Burnt

- ◯ Small
- ◯ Medium
- ◯ Large

4.1. Mode of Burning

- ◯ Open area
- ◯ Inside iron container/drum
- ◯ In a pit
- ◯ Others (specify in remarks)

4.2. Fuel or Accelerant Used to Ignite Fire

- ◯ None (natural ignition)
- ◯ Petrol/diesel
- ◯ Kerosene
- ◯ Waste material (e.g., plastic, paper)
- ◯ Others (specify in remarks)

4.3. Burning duration (minutes)

- ◯ Less than 5 minutes
- ◯ 5-15 minutes
- ◯ 15-30 minutes
- ◯ More than 30 minutes

4.4. Smoke Intensity / Visibility Impact (for severity tagging)

- ◯ Low
- ◯ Medium
- ◯ High
- ◯ Severe

4.5. Frequency of Burning at this Site

- ◯ Once a day
- ◯ Few times a week
- ◯ Occasionally (less than once a week)
- ◯ Rarely (first occurrence observed)

5.1. Purpose of Burning (select all that apply)

- ☐ Disposal of accumulated waste
- ☐ Protection/warmth during winter
- ☐ Space clearing or cleaning of area
- ☐ Stubble or agricultural residue burning
- ☐ Others (specify in remarks)

5.2. Who is carrying out the burning?

- ◯ Local residents
- ◯ Street vendors/market workers
- ◯ Municipal sanitation workers
- ◯ Shop owners
- ◯ Informal waste pickers
- ◯ Watchman
- ◯ Others (specify in remarks)

5.3. Were any Municipal Bins or Waste Collection Services Available Nearby?

- ◯ Yes
- ◯ No

5.4. Nearby Sensitive Receptors (select all that apply)

- ☐ School
- ☐ Hospital/Health center
- ☐ Park/Recreation area
- ☐ Public transit stops
- ☐ Dense residential housing
- ☐ None

6.1. Any Remarks/Observations by the Field Investigator

Add any additional observations, context, or clarifications

About Chintan Environmental Research and Action Group

Chintan, is a do-tank that works on the burning issues of circular economy, waste, air pollution, and climate change. Our interventions are at the intersection of environmental sustainability, social justice, gender equity, and climate resilience. We focus on the people most affected by these challenges.

Enjoy other publications from Chintan

If you want to volunteer at Chintan, contact:

Chintan Environmental Research and Action Group
238 Sidhartha Enclave, New Delhi-110014
Email: info@chintan-india.org
Website: www.chintan-india.org

chintan
collaborating for climate and circularity