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No. HSPCB/Aircell/2023/6523-44

Dated: 06.10.2023

To

All Deputy Commissioners of Haryana

Sub : Winter Action Plan 2023-24 for State of Haryana.

With reference to the subject cited above, please find enclosed herewith the Winter Action Plan 2023-24 for State of Haryana for information and compliance please.

DA/ As above.

**Sr. Env. Engineer (HQ)
for Chairman**

Copy for information and strict compliance to:

1. CEO, Gurugram Metro Development Authority.
2. CEO, Faridabad Metro Development Authority.
3. All Police Heads of Haryana.
4. Municipal Corporations / Municipal Committees of Haryana.
5. All Regional Officers of HSPCB.

DA/as above

Copy for information and necessary action to:

1. Additional Chief Secretary, Home Department, Government of Haryana.
2. Additional Chief Secretary to Government, Haryana, Food, Civil Supplies & Consumer Affairs Department.
3. Additional Chief Secretary, PWD (B & R) Department, Government of Haryana.
4. Additional Chief Secretary to Government, Haryana, Industries & Commerce Department.
5. Additional Chief Secretary to Government, Haryana, Town and Country Planning Department and Mines and Geology Department.
6. Director General of Police cum HoPF, Police Department, Government of Haryana
7. Commissioner & Secretary to Government, Haryana, Urban Local Bodies Department.
8. Managing Director, Haryana Power Generation Corporation Ltd.
9. Chief Administrator, Haryana Shehri Vikas Pradhikaran, Panchkula.

10. Managing Director, Uttar Haryana Bijli Vitran Nigam Ltd.
11. Managing Director, Dakshin Haryana Bijli Vitran Nigam Ltd.
12. Transport Commissioner, Haryana.

DA/as above

Copy for kind information to.

1. PS to Chairman, Commission of Air Quality Management in NCR and Adjoining Areas, New Delhi.
2. PS to Chief Secretary, Government of Haryana.
3. PS to Additional Chief Secretary, Environment and Climate Change Department, Government of Haryana.
4. Chief Environment Engineer-I, HSPCB.
5. Chief Environment Engineer-II, HSPCB
6. All Branch In-charges of Head office, HSPCB.
7. PS to Director General, Environment and Climate Change Department, Government of Haryana.
8. PS to Chairman, HSPCB.
9. PA to Member Secretary, HSPCB.

DA/as above

CC:-

A copy is forwarded to Sr. Environmental Engineer (IT) for uploading the above directions on the HSPCB website please.

DA/as above

Haryana Winter Action Plan (2023-24) for Control of Air Pollution

Prepared by

Haryana State Pollution Control Board (HSPCB)



Haryana State
Pollution
Control Board



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1. Introduction

Rising air pollution has become a major concern in the recent past, particularly in winter months. The health impacts of air pollution are well captured. A 2019 study estimated the exposure to high pollution levels has reduced the lifespan of Indians by 6-9 years, and caused premature deaths of 1.7 million Indians.¹ Studies also show that air pollution poses a major risk for people already affected by chronic obstructive pulmonary disease, lung cancer, heart disease, stroke and pneumonia. This is more so for the elderly and children. Therefore, air pollution is as much a public health problem, as it is an environmental problem.

As an immediate response, over the years, we have witnessed the closure of schools & educational institutions, and restriction of economic activities due to very high pollution levels.^{2,3} Almost all sectors - be it education, health, industries, construction sites, or transport services, have been affected by these restrictions. In the Delhi and NCR area, the construction ban created problems for the many daily wage labour employed in the sector.⁴ Post COVID, the interruptions in school learning due to air pollution pose a challenge, especially for those who only depend on school, with no private tuition, and probably no air purifiers at home. All air polluting industries needed to re-structure, and DG sets are also being tightly regulated. In other words, no one is left unaffected.

This is also a culturally active time of the year, with many festivities as well as a largely favourable weather for travel and leisure. Unfortunately, this coincidence further magnifies the threat of air pollution during winters.

¹ Health and economic impact of air pollution in the states of India: Global Burden of Disease Study 2019, [https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(20\)30298-9/fulltext](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30298-9/fulltext)

² "Delhi primary schools to be closed from tomorrow", Hindustan Times, November 4, 2022, <https://www.hindustantimes.com/education/news/delhi-primary-schools-to-be-closed-from-tomorrow-101667541830804.html>

³ "Delhi implements GRAP-4 guidelines amid rise in pollution; Here's a list of banned activities", Livemint.com, November 4, 2022, <https://www.livemint.com/news/india/delhi-implements-grap-4-amid-rise-in-pollution-here-s-list-of-ban-activities-11667531333738.html>

⁴ "Wage cut, job loss: A ban too many for construction workers in Delhi NCR", Times of India, November 4, 2022, <https://timesofindia.indiatimes.com/city/noida/wage-cut-job-loss-a-ban-too-many-for-construction-workers-in-delhi-ncr/articleshow/95288181.cms>

As a response to the emerging problem, the central government responded at two levels. First, it established the Commission for Air Quality Management (CAQM), as a high-powered statutory authority.⁵ The CAQM is India's first experiment with a multi-sectoral air-shed level regulatory body.

The second is the launch of the National Clean Air Programme, which funds and incentivizes non-attainment cities to take action. Eventually, resources from the 15th Finance Commission were also leveraged to improve air quality, in Million-Plus cities. Through this program, a city-level strategy was adopted, to abate local sources of pollution.

Now, with greater understanding, an airshed level approach is also beginning to take shape. It is in the context of the *very real consequences* of air pollution, that the Government of Haryana and HSPCB present this Winter Action Plan.

Existing source apportionment studies (TERI 2016, TERI 2019) for Delhi NCR region have found the main contributing sectors to PM 2.5 emissions to be transport, thermal power plants, medium and small industries, burning of agro-residue, burning of biomass and open waste burning. For PM10, the main contributing sectors have been found to be construction dust and road dust.

Based on the existing knowledge, Haryana has been taking a number of steps to prevent emissions from major sources - like vehicles, industries, dust, biomass and agro-residue burning etc. Deteriorating air quality in Delhi- NCR during the winter period triggers implementation of the Graded Response Action Plan (GRAP). GRAP refers to a set of progressive restrictions, which come into force, based on the 3-day air quality forecast.

In this context, Haryana's Winter Action Plan 2023-24 aims to:

- 1) To the extent possible, reduce the possibility of GRAP being triggered, and
- 2) Reduce the number of days with 'Poor' or worse air quality.

⁵ Commission for Air Quality Management in National Capital Region and Adjoining Areas Act, 2021, <https://caqm.nic.in/WriteReadData/LINKS/The%20Commission%20for%20Air%20Quality%20Management%20in%20NCR%20&%20Adjoining%20Areas%20Act.%20202176b7d650-cba2-4414-b357-520732cc119f.pdf>

The Winter Action Plan borrows from the success of the ongoing interventions and introduces certain new measures to control emissions.

2. State profile

2.1 Geographical and demographic landscape

Haryana is an Indian state, located in the north-western part of the country. It was carved out of the former state of East Punjab, on 1 Nov 1966. It is ranked 21st in terms of area, with less than 1.4% (44,212 sq. km) of India's land share. The state capital is Chandigarh, which it shares with the neighbouring state of Punjab. Haryana has 6 administrative divisions, 22 districts, 72 sub-divisions, 93 revenue tehsils, 50 sub-tehsils, 140 community development blocks, 154 cities and towns, 7,356 villages, and 6,222 villages panchayats.

Haryana is located between 27°39' to 30°35' N latitude and between 74°28' and 77°36' E longitude. The total geographical area of the state is 4.42 m ha, which is 1.4% of the geographical area of the country. The altitude of Haryana varies between 700 and 3600 ft (200 meters to 1200 meters) above sea level. Haryana has only 4% (compared with national 21.85%) area under forests. Haryana is a landlocked state, bordered by Punjab and Himachal Pradesh to the north, by Rajasthan to the west and south, while river Yamuna forms its eastern border with Uttar Pradesh. Haryana surrounds the country's capital territory of Delhi on three sides (north, west and south).

In summer, the average temperature is 37°C, with an average rainfall of 30mm. In winter, the average temperature is 25°C, with an average rainfall of 12mm. The climate is arid to semi-arid. Around 29% of the rainfall is received during the months from July to September as a result of the monsoon, and the remaining rainfall is received during the period from December to February, as a result of the western disturbances.

2.2 Presence in the Indo Gangetic Plain

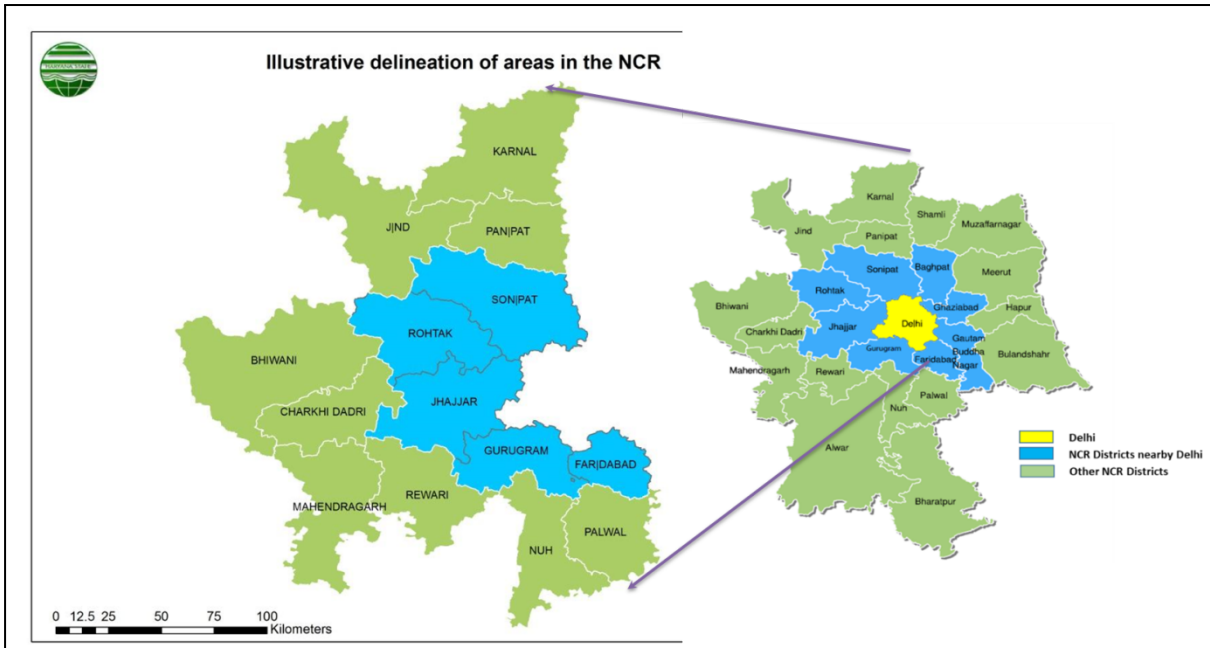
Haryana is located in the Indo-Gangetic plain, a contiguous airshed home to more than 40% of India's population. This airshed is actually part of the airshed extending all the way from Pakistan in the West to Bangladesh in the East.⁶

This means that all the pollution being measured within the state may not originate from *within* state boundaries, but may have reached there due to prevalent meteorological conditions. As part of a World Bank study (2020), nearly 30% of Haryana's PM levels are from outside Haryana, while nearly 15% is from outside India (exclusive of the 30% outside Haryana).

2.3 Presence in the National Capital Region

A large area of Haryana state is included in the economically important NCR of India for the purposes of planning and development. As many as 14 districts of Haryana are part of the NCR. This makes the state's air quality significantly dependent on the policies and directions of the Commission for Air Quality Management (CAQM) in Delhi and NCR, and their effective implementation within Haryana, as well as the neighbouring states of Delhi, Uttar Pradesh and Rajasthan.

⁶ "Urgent Action needed in South Asia to curb deadly air pollution", World Bank, <https://www.worldbank.org/en/news/press-release/2022/12/14/urgent-action-needed-in-south-asia-to-curb-deadly-air-pollution>



2.4 Air Quality in Haryana (2019-2022)

While devising the winter action plan, it is important to understand the base pollution and then set targets accordingly. As per the international best practices, such as the method used by the US Environmental Protection Agency (USEPA), an annual average of the previous three years is taken to define the base pollution level and, accordingly, targets for pollution reductions are set to guide action and prepare action plans. Trend analysis helps to understand the impact of action on long-term ambient concentration.

Air in urban areas has numerous pollutants (of these 12 are regulated under the National Ambient Air Quality Standards [NAAQS]). However, in Haryana, over the past few years, PM_{2.5} and PM₁₀ have emerged as the major pollutants. The trend of these concentrations, across the districts and years is shown below:

Figure 1: Trend of PM_{2.5} in Haryana (2019-2022); [NAAQS - 40 µg/m³]

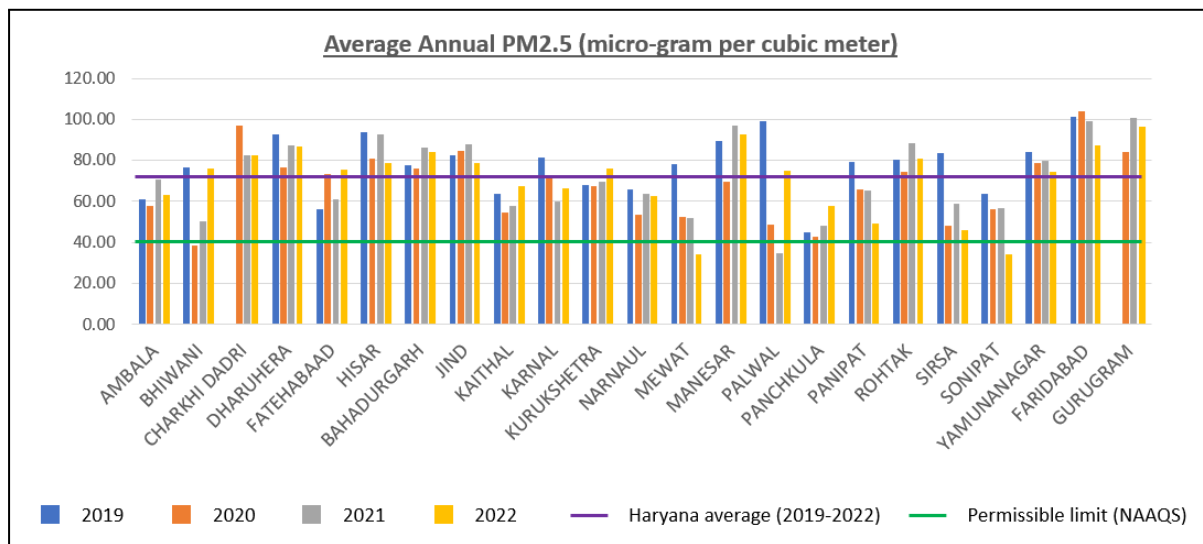
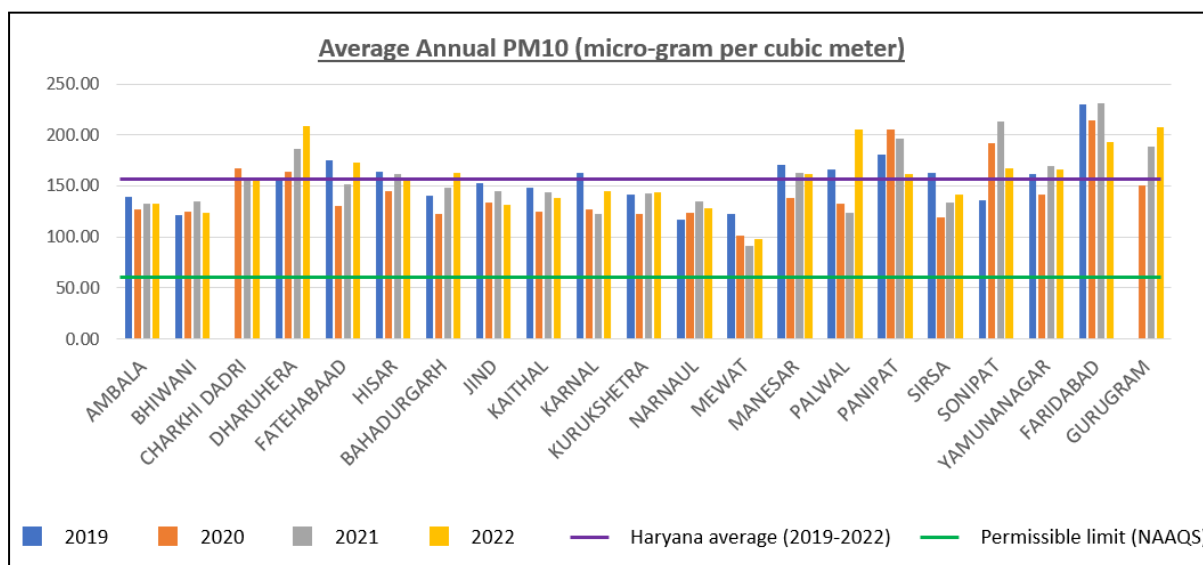


Figure 2: Trend of PM₁₀ in Haryana (2019-2022); [NAAQS - 60 µg/m³]



As can be seen from the above charts, the three-year annual average (2019-22) of PM_{2.5} level in Haryana (simplified calculation as simple average of all cities) has been 71 (~75% poorer than NAAQS standards) and PM₁₀ has been 153 (~150% poorer than NAAQS standards).

2.5 Seasonal variation of air quality in Haryana

With respect to PM_{2.5} levels, the winter average across all districts for 2022 was **74% more** than the summer average. With respect to PM₁₀ levels, the winter average across all districts for 2022 was **38% more** than the summer average.

Table 1: Comparison of seasonal average PM levels in Haryana across all districts (in µg/m³)

Pollutant	Winter 2021-22 average*	Summer 2022 average**	% change
PM 2.5	99	57	74%
PM 10***	191	138	38%

*From October 1, 2021 to January 31, 2022.

**From February 1, 2022 to September 30, 2022.

***Data was not available for Panchkula and Rohtak.

Therefore, temperature inversion during the winter months means that emissions in winter are more concentrated, as they are not dispersed into the atmosphere. Thus, even though the sources of pollution and the magnitude of their contributions might remain the same, concentrations would be higher during winters.

3. Regulatory framework

The Environment (Protection) Act, 1986 empowers the central government to notify emission norms for industries (such as cement, brick kilns, thermal power plants etc), and other industrial processes or operations.⁷ These standards are monitored for compliance by the Pollution Control Boards/Committees.

The Haryana State Pollution Control Board, is strictly following the various emission standards under the Environment Protection Act, 1986. In compliance with the Air (Prevention and Control of Pollution) Act, 1981, industrial emissions are regulated at the establishment phase and

⁷ Section 3, Environment (Protection) Act, 1986, https://www.indiacode.nic.in/bitstream/123456789/4316/1/ep_act_1986.pdf

operational phase through consent management, inspections and monitoring.⁸

The consent certificate is issued only if industrial establishments / processes fulfill general as well as specific conditions (related to process, or technology, or inputs) to mitigate the impact on the environment. In the cases where the consent certificate conditions and the directions issued by the Board under the Act are violated, the Act empowers the Board to close defaulting units and initiate criminal prosecution against them.

Further, various NGT directions have empowered the Board to levy Environmental Compensation (EC) from the defaulting units for the environmental damage caused.⁹

Vehicular emissions are monitored by the Ministry of Road Transport and Highways at the central level, and the Transport Department at the state level. The standards for vehicular emissions are laid down under the Motor Vehicles Act, 1986. Vehicles must comply with these standards for plying on the roads. This compliance is checked by the Pollution Under Check Centres, which issue Pollution Under Control Certificates to the vehicles.

The other sources of pollution including road dust, construction dust, agro-residue burning, and open-waste burning, which are more fugitive in nature, are generally regulated by the various directions from the CAQM. The CAQM is a unique body, in the sense that its jurisdiction is beyond the UT of Delhi, including 14 of the neighbouring districts of Haryana, and other districts from UP and Rajasthan.¹⁰ It is empowered with wide ranging powers to take policy decisions on air quality related matters.

The CAQM has taken several policy decisions across various sectors of air pollution, including industrial, vehicular, construction and agro-residue

⁸ Air (Prevention and Control of Pollution) Act, 1981,
https://www.indiacode.nic.in/bitstream/123456789/9462/1/air_act-1981.pdf

⁹ Methodology for calculating Environmental Compensation,
https://www.hspcb.org.in/content/Consent_Policy_Procedure/Order%20Dated%2022.12.2021.pdf

¹⁰ The CAQM Act, 2021,
<https://caqm.nic.in/WriteReadData/LINKS/The%20Commission%20for%20Air%20Quality%20Management%20in%20NCR%20&%20Adjoining%20Areas%20Act.%20202176b7d650-cba2-4414-b357-520732cc119f.pdf>

burning. Further, the CAQM's Policy to curb pollution in the NCR Region (2022) provides guidance on the steps to be taken to curb air pollution.¹¹

In addition to existing laws, the directions of the Hon'ble Supreme Court and the National Green Tribunal (NGT) are also part of the regulatory framework. The ban on plying of overage vehicles was imposed by the NGT.

In January 2019, the central government launched the National Clean Air Programme (NCAP), with an aim to improve air quality in 131 non-attainment cities (NACs). NACs are those cities which had PM levels in excess of the national standards. As of September 2023, Haryana has 1 non-attainment city, i.e. Faridabad.

4. Sector-wise activities for emission control

4.1 Greening

As per the National Forest Policy, 1988, one-third of the total land area of the country should be under forest or tree cover. As per the 2021 report of the Forest Survey of India, Haryana has about 3.6% of its land area under forests.¹²

Further, as Haryana lies in the semi-arid region, the prevalence of loose soil dust is more. Greening helps prevent erosion of topsoil from winds, especially in the summer season. This dust can get deposited on other surfaces (like roads), making it vulnerable to re-suspension.

4.1.1 Ongoing actions

For 2022-23, the state of Haryana achieved **82%** of its plantation target of 1.02 crore plants. The Chief Minister of Haryana, in his 2022-23 budget speech, announced the **conversion of 100 hotspots into green spots** within a year. After a detailed identification exercise, more than 60% of the identified hotspots have already been corrected, and converted to green

¹¹ Policy to curb pollution in the NCR Region, 2022, CAQM
https://caqm.nic.in/WriteReadData/LINKS/Policy%20to%20curb%20air%20polluution%20in%20NCR_8bc1dddf1-b34a-4506-b29f-34390650e053.pdf

¹² Forest Cover in India, <https://pib.gov.in/PressReleasePage.aspx?PRID=1842628>

spots by urban local bodies and other agencies.¹³ The conversion of other identified hotspots is under progress.

4.1.2 Planned actions

For 2023-24, the state has set a target of 88 lakh plants. Some of the agencies/ departments in a few districts have already achieved their targets.

Further, the state government is also leveraging the central government's Nagar Van Yojana, under which urban local bodies would receive assistance to establish Nagar Vans in 10-50 hectares of land and vaatikas in 1-10 hectares of land.

4.2 Road dust

4.2.1 Ongoing actions

One of the major reasons for road dust is disintegrating road surfaces, which can lead to potholes. In this context, in 2023-24, the state is focussing on:

- 1) Identifying major roads which are in need of repair, by leveraging government resources, as well as citizen-to-government communication. One of the resources for this is the SAMEER App, developed by CPCB.¹⁴
- 2) Completing the repair of the identified stretches or patches, ahead of the winter season.
- 3) Hiring of additional mechanised sweepers/sprinklers where required, and inter-agency leasing of idle mechanised sweepers or sprinklers.

4.2.1 Planned actions

Even though roads may be in good condition, dust from nearby sources often tends to get deposited on the road. This dust is susceptible to re-suspension, mainly due to vehicular movement. In this context, in 2023-24, the state will focus on:

¹³ Based on data from the urban local bodies, 63 hotspots were identified in the first phase.

¹⁴ SAMEER App, <https://play.google.com/store/apps/details?id=com.cpcb&hl=en&gl=US&pli=1>

- 1) Undertaking preventive maintenance of all sprinkling and sweeping machines, to ensure they are in working condition.
- 2) Efficiently operating the existing sprinkling and sweeping machines, to minimise re-suspension of road dust due to movement of vehicles.
- 3) Procuring new machines at the municipal authorities level, based on the gap to achieve the 50% road sweeping / sprinkling target by 31-12-2023 (as per CAQM Policy for NCR region, 2022).¹⁵
- 4) Ensuring that the road sweeping machines are effectively cleaning the road, through surprise inspections and test runs.

4.3 Construction and demolition activities

4.3.1 Ongoing actions

All active construction projects are mandated to comply with **CAQM Direction No. 69**.¹⁶ This direction mandates the use of Anti Smog Guns (ASGs) in construction sites, based on the following area slabs:

Table 2: Area slabs and Anti-Smog Guns (ASGs) as per CAQM Direction 11

S.No	Area slab	Minimum no. of ASGs
1	5,000 sqm to 10,000 sqm	1
2	10,000 sqm to 15,000 sqm	2
3	15,000 sqm to 20,000 sqm	3
5	Above 20,000 sqm	4

Since July 2023, district-level teams have increased the inspections of construction projects in their jurisdictions, to ensure that ASGs are actually deployed on the ground. This is an ongoing activity, and will be intensified in the upcoming weeks.

¹⁵ Page 90, CAQM Policy for NCR Region (2022), https://caqm.nic.in/WriteReadData/LINKS/Policy%20to%20curb%20air%20polluution%20in%20NCR_8bc1dddf1-b34a-4506-b29f-34390650e053.pdf

¹⁶ CAQM Direction No. 69, <https://caqm.nic.in/WriteReadData/LINKS/840f2c68-fb77-450e-a715-cea66d677538.pdf>

Further, all construction projects in urban areas in NCR have to comply with **CAQM Direction No. 11**.¹⁷ This direction mandates all current and upcoming projects, which are larger than 500 sqm in area in *urban areas* in NCR, to register on a Dust Self Assessment Portal (<https://dustapphspcb.com/>). Project proponents must upload a fortnightly self-audit, checking compliance with construction dust mitigation measures, which includes covering of the construction material and continuous wetting for dust suppression. Additionally, they have to provide a web-camera with web-link and low-cost sensors for PM2.5 and PM10, for remote monitoring by the regulatory agencies (CAQM, HSPCB etc).

The Deputy Commissioners, in collaboration with stakeholder departments, have been sensitizing all project proponents about **CAQM Direction No. 11**. This will be intensified in the coming weeks, so that it is easy to monitor the construction projects remotely.

4.3.2 Planned actions

In 2023-24, the state will focus on increased adoption of clean construction practices, remote monitoring through Dust Portal, and increased inspections. To achieve this, the district administration and the Regional Offices of the HSPCB will:

- 1) Sensitize project proponents on clean construction practices through workshops.
- 2) Get the project proponents registered on the Dust Portal, and ensure timely submission of fortnightly self-audits.
- 3) Ensure that project proponents provide a web-camera with working web link and low cost sensors on site for remote monitoring.
- 4) Increase the frequency of construction projects of all areas, to ensure deployment and usage of Anti Smog Guns.

4.4 Emissions from diesel generator sets

4.4.1 Ongoing actions

Many commercial, industrial and residential establishments keep generator

¹⁷ CAQM Direction No. 11, <https://caqm.nic.in/WriteReadData/LINKS/7f73f186-edle-4b55-a381-bd78e9b07cc3.pdf>

sets as a backup source for electricity supply. While proving to be a critical backup source, diesel generator (DG) sets are found to be the most polluting.

Throughout the year, in various review meetings, the distribution companies of the state have been asked to undertake all measures (such as upgrading power infrastructure) to provide 24 X 7 uninterrupted supply of power.^{18,19}

This would prevent the need to operate generator sets in the first place.

In the short term, in the context of generator sets, all establishments have to comply with **CAQM Direction No. 73**.²⁰ This direction mandates DG sets in industrial, residential, commercial, and office establishments to adhere to the following emission control system, based on their capacity (by 30.09.2023):

> Below 19 kW – No emission control system

> 19 to 125 kW – Dual fuel mode (Natural gas & diesel)

> 125 to 800 kW – Dual fuel mode Or RECD through certified vendors / agencies

Apart from above no additional emission control device required in case of gas based generator sets.

Further, there are no restrictions on new generator sets (upto 800 KW) which are compliant with November 2022 emissions standards.²¹ Note that the emission limits for new engines used in generator sets (upto 800 kW Gross Mechanical Power), are applicable on:

- 1) Diesel engines,
- 2) Engines based on dedicated alternate fuels,
- 3) Engines based on Bi-fuels run either on Gasoline or on any one of the alternate fuels,

¹⁸ UHBVN districts: Panchkula, Ambala, Yamunanagar, Kurukhsetra, Kaithal, Karnal, Panipat, Sonapat, Rohtak and Jhajjar, <https://uhbvn.eeslsmartmeter.in/about>

¹⁹ DHBVN districts: Faridabad, Palwal, Nuh, Gurugram, Mohindergarh, Rewari, Bhiwani, Charkhi Dadri, Hisar, Fatehabad, Sirsa and Jind, <https://dhbvn.org.in/web/portal/about-dhbvn#:~:text=The%20following%2012%20No.%2C%20Fatehabad%2C%20Sirsa%20and%20Jind.>

²⁰ CAQM Direction No. 73, <https://caqm.nic.in/WriteReadData/LINKS/73efc2ebf5-b9a7-4330-8e82-6eb3710f0343.pdf>

²¹ MoEFCC notification GSR 804(E) dated 03.11.2022, <https://egazette.gov.in/WriteReadData/2022/240031.pdf>

4) (Engines based on Dual Fuel run on Diesel and any of the alternate fuels, and

5) Portable Generator sets (PI engines below 19kW and up to 800 cc displacement) run on Gasoline fuel, dedicated alternate fuels and Bi-fuel run either on Gasoline or on any one of the alternate fuels

> Above 800 kW – any emission control mechanism, strictly subject to compliance of emission standards as indicated below:¹²

Table 3: Standards for stack emissions for 800 kW and above DG sets

S.No	Parameter	Standards
1	PM (at 15% O ₂)	50 mg / Nm ³
2	NOx (at 15% O ₂)	650 mg / Nm ³
3	CO (at 15% O ₂)	100 mg / Nm ³
4	Stack height	<p>Maximum of the following (in meters):</p> <p>a) Minimum 6 m <i>above</i> the building where DG set is installed, or</p> <p>b) 30 m</p> <p>For example, if the building height where such DG sets are installed is 20m, stack height for DG sets should be 30 m. from ground level; while if the building height itself is 27m, the minimum stack height for the DG sets should be 33m from the ground level.</p>

As per CAQM Direction No. 76 (<https://caqm.nic.in/WriteReadData/LINKS/Direction%20No-768acf87c5-a940-4f9c-94fe-75b90691030f.pdf>), the DG sets (of all capacities) which are being used for emergency services must comply with the above norms and standards and installation of emission control technologies, by December 31, 2023.

The list of emergency services listed in CAQM Direction No. 76 are:

- 1) Elevators / Escalators / Travelators etc. in various installations; Commercial entities / residential societies shall, however, ensure that operation of DG sets and supply therefrom is purely limited to operation of elevators / escalators / travelators etc. and not for any other activities of commercial entities / residential societies.
- 2) Medical Services (Hospital/Nursing Home/Health care facilities) including units involved in manufacturing of life saving medical equipment/devices, drugs and medicines. Railway Services / Railway Stations.
- 3) Railway Services / Railway Stations.
- 4) Metro Rail Corporation & MRTS Services, including trains and stations.
- 5) Airports and Inter-State Bus Terminals (ISBTs).
- 6) Sewage Treatment Plants.
- 7) Water pumping Stations.
- 8) Projects related to national security, defence & of national importance.
- 9) Telecommunications and IT/ data services.

4.4.2 Planned actions

As a part of ongoing efforts, the state will continue its efforts to ensure 24 X 7 uninterrupted power supply. Further, the state government will make efforts to expedite supply of gas connections to industries in all industrial areas. There will be continuous dialogue between different departments, gas agencies, and industries. Ensuring uninterrupted supply of gas and electricity to industries is a top priority for the state government, and will be reviewed more frequently, going forward.

In parallel, the state will take all measures to comply with CAQM Direction No 73. To achieve this, the state will avail CPCB's one time financial

assistance to government hospitals in the NCR region. The quantum of assistance is provided in the following table:

Table 4: Applicability criteria for availing financial assistance

#	Type of purchase	Eligibility conditions	Quantum of assistance
1	Dual fuel kit only	>PNG <i>infrastructure/network</i> is available.	100% cost of dual fuel kit
2	RECD or dual fuel kits	>PNG <i>infrastructure/network</i> is available. >DG set is at least 5 years old.	100% cost of RECD or dual fuel kit
2	New gas based generator set (capacity upto 250 kVA)	>PNG is available in the area. >DG set is older than 13 years old. > DG set has been operated for more than 44,000 hours.	40% of the generator cost

4.5 Emissions from agro-residue burning

4.5.1 Ongoing actions

During the period 2021 and 2022, the state was able to reduce its Active Fire Events by nearly 50% across all districts.

The measures taken by the State Government include:

- 1) Providing an incentive @ Rs. 1000/- per acre for in-situ / ex-situ management of paddy crop residue.
- 2) Providing an incentive @ Rs. 7000/- per acre for diversification of paddy area with alternative crops under Mera Pani Meri Virasat Scheme.
- 3) Providing an incentive @ Rs. 4000/- per acre for adoption of direct sowing of rice.

- 4) The New and Renewable Energy Department already identified & formed a cluster of villages, producing biomass in the vicinity of various industries in consultation with the Agriculture & Farmer Welfare Department.
- 5) Red Zone Panchayat to receive Rs. 1,00,000/- for achieving Zero Burning.
- 6) Yellow zone Panchayat to receive Rs. 50,000/- for achieving Zero Burning.
- 7) Transportation charges of Bales @ 500/- per acre limited to max of Rs. 15,000/- to Gaushalas.
- 8) Various IEC activities for farmer training through farmer vans, wall paintings etc.

Further, since March 2023, several review meetings have been held during the year under the chairmanship of Chairperson, CAQM to review the preparedness for the upcoming winter season.

4.5.2 Planned actions

Strategy to manage paddy straw / stubble (2023-24)

- Approximate area under paddy 3657220 acres
- Approx. straw generation 7314440 MT

Management strategies

- | | |
|----------------------|------------|
| o Use as Fodder | 2462882 MT |
| o In-situ Management | 3141892 MT |
| o Ex-situ Management | 1709666 MT |

- 1) An estimated quantity of 13.54 Lakh metric tons of paddy stubble is likely to be consumed in the major industries.
- 2) Deploying more than 80,000 Crop Residue Machines to manage more than 14 lakh hectares of paddy straw, with most of these machines going to small and marginal farmers.

- 3) Department has taken initiative to target 5 Lakhs acre paddy area through Pusa Bio Decomposer.
- 4) State government will provide Pusa bio decomposer kits to the farmers free of cost.
- 5) Increased use of IEC activities to make farmers aware about the existing schemes and incentives to avoid stubble burning.
- 6) Identifying and leveraging champions from each village and block as change agents, who have availed the benefits of the existing schemes.
- 7) Increasing the use of satellite based monitoring from HARSAC to identify active fire locations.
- 8) Deploying task forces at District, Block, and Panchayat level in advance of the harvesting season, to create a 'presence of the administration' in hotspots, and
- 9) After exhausting the above measures, levying Environmental Compensation on the defaulting farmers as per the following schedule:²²

Table 5: Environmental Compensation for stubble burning

S.No	Land area	Fine amount
1	Less than 2 acres	Rs 2,500
2	2-5 acres	Rs 5,000
3	More than 5 acres	Rs 15,000

4.6 Vehicular emissions

4.6.1 Ongoing actions

In 2022, the state notified two important policies - the Haryana Electric Vehicle (EV) Policy and the Vehicle Scrapping Policy.^{23,24}

²² The Commission for Air Quality Management in National Capital Region and Adjoining Areas (Imposition, Collection and Utilisation of Environmental Compensation for Stubble Burning) Rules, 2023, <https://caqm.nic.in/WriteReadData/LINKS/ecf84a3f-584b-442a-af60-65404b44c818.pdf>

²³ The Haryana Electric Vehicle Policy, 2022, <https://investharyana.in/content/pdfs/EV%20Policy%202022.pdf>

²⁴ The Haryana Vehicle Scrapping Policy, 2022, https://morth.nic.in/sites/default/files/HR_RVSE_10022-CS-%20transport-scrapping%208996-8999.pdf

As of September 2023, Haryana has more than 72,000 EVs. More than 47% of these EVs were registered in the past 12 months, after notification of the EV Policy. By ensuring speedy implementation of a web portal, Haryana has already supported the purchase of **more than 1,200 EVs**, by disbursing incentives of **more than Rs 34 crore**.²⁵ Notably, the demand for certain segments has already exceeded the 5-year limit. A proposal for increasing this limit is under consideration of the state government.

For the Vehicle Scrapping Policy to be successful, the state needs two key enabling infrastructures - Automated Testing Stations (ATS) and Registered Vehicle Scrapping Facilities (RVSFs). The state government is in the process of establishing these ATS on PPP mode. As of September 2023, Haryana has 5 RVSFs.

Once a vehicle is handed over to the RVSF, the earlier vehicle owner is given a Certificate of Deposit (CoD). So far, 1,250 certificates of deposit (CoD) have been issued. When the same person buys a new vehicle, and submits this CoD at the time of vehicle registration, the person shall receive a rebate on motor vehicle tax. The rebate shall be equal to lesser among: 10% of the motor vehicle tax, or 50% of the scrap value (mentioned in the CoD).

Further, all Regional Transport Offices (RTOs) in the NCR region are inspecting the calibration of the equipment at Pollution Under Control Certificate (PUCC) centres. Non-compliant PUCC centres have been challaned, or shut down, based on the degree of non-compliance.

Further, NCR districts in Haryana are implementing **CAQM Direction No. 70**.²⁶ This direction mandates the registration of only CNG/electric autos in NCR districts.

4.6.2 Planned actions

Under Stage I of the revised GRAP (AQI of Delhi ranging from 200-300), over-aged petrol/diesel vehicles found plying on the roads will have to be impounded, in compliance with the Hon'ble Supreme Court & NGT orders.²⁷ In this context, the state will:

²⁵ Based on data from VAHAN Dashboard and the Dept of Industries and Commerce for September 2023.

²⁶ CAQM Direction No. 70,

<https://caqm.nic.in/WriteReadData/LINKS/Direction%20No-7028ef4ee0-lfd1-4e9b-91d7-fedbd4d22508.pdf>

²⁷ Revised GRAP for 2023-24, <https://pib.gov.in/PressReleaselframePage.aspx?PRID=1943721>

- 1) Spread awareness about the motor vehicle tax rebate available under the Haryana Vehicle Scrapping Policy, to ensure that people get their end-of-life or close to end-of-life vehicles scrapped.
- 2) Spread awareness about the directions of the Hon'ble Supreme Court & NGT orders regarding ban on plying of end-of-life vehicles.

Further, efforts will be made to minimise traffic congestion in NCR areas. To achieve this, the state will:

- 1) Encourage government and private offices to have staggered office timings, to distribute the flow of traffic.
- 2) Review the working of traffic light systems, ahead of the winter season.
- 3) Ensure deployment of traffic police at points prone to congestion.
- 4) Deploy anti-smog guns on congestion points, especially at peak hours.

4.7 Industrial emissions

4.7.1 Ongoing actions

The HSPCB, through its Regional Offices, has held a series of sensitization and stock-taking meetings, to make all stakeholders aware of various CAQM Directions.. The state government and district administration are expediting the process of providing Piped Natural Gas connections, to allow operation of generator sets on dual fuel mode.

Although, industries are an integral part of Haryana's economy, they also contribute to air pollution within the state. In compliance with CAQM directions and CAQM Policy for NCR region (2022), the state is taking the following measures to abate industrial emissions:

- 1) *Clean fuel strategy:* As of today, all industries in industrial clusters in NCR are running on approved fuels. Most of such industries are operating on biomass fuels. Further, in March 2023, the state government notified a scheme to provide financial assistance of 30%

of the total cost of conversion of boilers to run on PNG/CNG, for MSMEs.²⁸

- 2) *Process upgradation*: More than 99% of brick kilns in the state have shifted to zig-zag technology. This has helped reduce the contribution of brick kilns to air pollution.
- 3) *Emissions monitoring*: The HSPCB monitors the emission stacks of all red category industries using Online Continuous Emissions Monitoring System (OCEMS). In cases of exceedance and delays, the industrial units are notified and asked to take corrective action.
- 4) *Inspections and monitoring*: The HSPCB has a roster of inspections for red, orange and green categories of industries. Through these inspections, the HSPCB monitors emissions from industrial units. Action is being taken on defaulting units as per procedure prescribed under the law.

4.7.2 Planned actions

The HSPCB through its Regional Offices will intensify the inspections and monitoring of industries. Further, the state government will increase its extension activities to ensure that financial incentives for clean fuel transition are known and availed by MSMEs.

4.8 Biomass burning

4.8.1 Ongoing actions

Household combustion emits more than half of all global black carbon emissions, a major component of fine particulate matter. A significant section of the population of the state, are dependent on cooking using: (i) easily available but polluting fuels (such as wood, animal dung and crop waste and coal), or (ii) inefficient stoves. Both result in harmful household air pollution.

The state government is implementing the PM Ujjwala Yojana, aiming to ensure access to clean cooking fuel to all eligible households.

²⁸ Notification of "Assistance in conversion of boiler to run on cleaner fuel". Dept of Industries and Commerce <https://cdnbbsr.s3waas.gov.in/s3f48c04ffab49ff0e5d1176244fd65c/uploads/2023/03/2023033153.pdf>

4.8.2 Planned actions

Apart from biomass burning for cooking, biomass burning for heating has also emerged as a problem, especially for the poor and vulnerable. In peak winter, the poor and vulnerable segments of society resort to burning of biomass, to keep themselves warm. In the winter season, this too contributes to the high pollutant concentrations in the air. To prevent this situation, the state will:

- 1) Ensure that all government shelters for the poor and vulnerable are well stocked with warm clothes and heating coils
- 2) Create awareness among civil society organisations to contribute clean, warm clothes for the poorer segments in society

Further, unauthorised burning of open waste will be monitored, and penalised by teams from the urban local bodies.

4.9 Burning of firecrackers

4.9.1 Ongoing actions

Ahead of the festive season, the state has implemented a total ban on manufacturing, sale, distribution of firecrackers, except for green crackers from November 1, 2023 to January 31, 2024. Green crackers have already been defined by CSIR-NEERI, as crackers which emit 20-30% less PM than conventional crackers.

4.9.2 Planned actions

By taking this decision in September (a month in advance of the ban), the state has proactively tried to reduce the 'sunk cost' in the firecracker supply chain, thereby protecting lives of its residents, and of those employed in the firecracker sector as well.

In 2023-24, inspection teams constituted under the Deputy Commissioners will shortly start inspections, to check establishment of the firecracker supply chain. Further, wide publicity will be given to the ban, to make the citizens aware.

4.10 Air quality monitoring

4.10.1 Ongoing actions

Air quality monitoring enables us to track changes in air quality over time, identify pollution hotspots and exposure patterns, and inform action plans. HSPCB monitors criteria pollutants regularly. Currently, there are 29 real-time monitoring stations and 32 manual monitoring stations in Haryana.

Source apportionment and emission inventory studies (in combination) help us understand local sources of air pollution and their relative contributions. So far, source apportionment studies for Faridabad, Gurugram, Sonipat, and Panipat are in progress. An interim report for Faridabad (being done by TERI) found construction and road dust to be the major contributors for high PM₁₀ levels. The status of the source apportionment studies in the state is captured below:

Table 6: Status of source apportionment studies in Haryana

S.No	City	Executing agency	Starting time	Status
1	Faridabad	TERI	March 2021	Nearing completion.
2	Gurugram, Sonipat, and Panipat	ARAI, Pune	March 2023	In progress
3	Rewari, Jhajjar, Charkhi Dadri, Rohtak and Jind	Not yet selected	Not yet started	Under tendering

4.10.2 Planned actions

The state is focused on expanding its ambient air quality monitoring network. Further, NGT directed CPCB to install 10 new real-time stations- 5 each in Charkhi Dadri and Mahendargarh districts. A proposal for

procurement of additional real-time monitoring stations is under consideration.

The expression of interest for conducting the source apportionment studies in another 05 NCR districts i.e. Rewari, Jhajjar, Charkhi Dadri, Rohtak and Jind, has been floated.

The HSPCB will continue to hold regular reviews of the ongoing studies, to ensure adherence to agreed upon timelines. Further, any actionable insights from these studies will be leveraged in the Winter Action Plan.

5. Stakeholder discussions ahead of winter for 2023-24

The HSPCB aims to undertake measures which, to the extent possible, **prevent** the AQI forecast to breach the thresholds for Stage I of the Graded Response Action Plan (GRAP). To achieve this, the pollution sources in the state have to be abated with greater intensity. This is because in winter, due to temperature inversion, pollutants tend to remain suspended in the atmosphere at lower heights.

To that extent, series of review meetings at district headquarters, have been held under the chairmanship of Chairperson, Haryana State Pollution Control Board (HSPCB), to review the enforcement of air pollution abatement actions across departments in all the 14 NCR districts of Haryana. In each of these meetings, total review of the contributing sectors was taken, which includes, construction and demolition activities, road dust, vehicular emissions, and emissions from DG sets, etc.

Table 7: List of recently held stakeholder discussions

S.No	Date	Venue	Districts reviewed
1	August 31, 2023	Mini Secretariat, Faridabad	Faridabad, Ballabgarh and Palwal
2	September 1, 2023	PWD Rest House, Gurugram	Gurugram, Nuh and Mewat
3	September 7, 2023	Mini Secretariat, Bhiwani	Bhiwani, Charkhi Dadr, and Jind
4	September 19, 2023	Mini Secretariat, Jhajjar	Jhajjar and Rohtak
5	September 20, 2023	Mini Secretariat, Panipat	Panipat, Sonipat and Karnal
6	September 26, 2023	Mini Secretariat, Mahendergarh	Mahendergarh
7	September 27, 2023	Mini Secretariat, Rewari	Rewari

6. Implementation of GRAP

Currently, Delhi's AQI is the reference point for implementation of GRAP. Acknowledging the presence of Haryana in the same airshed as Delhi, this Winter Action Plan aims to minimise Haryana's contribution to air pollution. However, the transboundary nature of air means that the state government has to be prepared for effective implementation of GRAP. It should be noted that many of the measures under GRAP are part of existing control measures that are being taken. These include measures related to mitigation of dust and vehicular emissions.

GRAP's objective is to balance protection of public health and maintaining livelihoods. This can only be achieved if GRAP restriction period is *minimal, but implemented effectively*. To ensure speedy and effective implementation of GRAP, the state government/HSPCB will:

- 1) Monitor the 3-day forecast of air quality from System of Air Quality and Weather Forecasting and Research (SAFAR)²⁹ on a daily basis.
- 2) Constitute district-level task forces with representation from all stakeholder departments to review the actions corresponding to the GRAP stages.
- 3) Streamline reporting and monitoring of on-ground actions by departments.
- 4) Review the implementation of GRAP at regular intervals

7. IEC activities

When it comes to air pollution, citizens are as much a part of the problem as they are of the solution. Keeping in mind both the preventive aspects and the greater health risks associated with pollution in winter, the state will launch a 360-degree IEC campaign. The campaign will urge citizens to:

- 1) Avoid unnecessary travel, and choose public transport wherever possible. Scrap personal vehicles which are nearing end-of-life.
- 2) Use non-polluting modes of travel, including CNG/electric vehicles - whether public or private.
- 3) Ensure good maintenance of personal vehicles, to minimise emissions.
- 4) Ensure regular updation of the PUC certificates of the existing private vehicles.
- 5) Avoid starting any new major construction/ demolition activity during the winter months.
- 6) Undertake firecracker free festivities, and use traditional non-polluting alternatives (such as Diyas).
- 7) Avoid throwing garbage in unauthorised areas, to prevent chances of open waste burning.
- 8) Provide electric heaters to security guards in residential societies and colonies, to help them keep warm.
- 9) Report air pollution activities through SAMEER App.

²⁹ SAFAR is an air quality forecasting system, developed by the Indian Institute of Tropical Meteorology (IITM). Using existing air quality data as well as meteorological information, SAFAR can provide air quality forecasts of 1-3 days for Delhi, Pune, Mumbai, and Ahmedabad.

- 10) Use indoor air purifiers, in case air quality deteriorates to poor in health facilities, schools, public offices etc,
- 11) Undertake personal precautions (such as wearing masks etc) when air quality deteriorates to poor, keeping in mind the existing medical condition of individuals.

8. Conclusion

The state government is committed to reducing air pollution and ensuring cleaner air for all its citizens. In this upcoming winter, the state government will continue to increase awareness, enforce existing laws and directions of the Hon'ble Supreme Court, National Green Tribunal and the CAQM. Regular high level reviews of on-ground actions will ensure that the Winter Action Plan 2023-24 is implemented in true letter and spirit.