

Air Pollution in Chennai City

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Abstract

Chennai is one of the metropolitan cities in India. It is a place where rapid development occurs in different fields, thus leading to population and vehicle growth. Air pollution is one of the major concerns in all metro cities of India. In this study, the monitoring of various pollution levels due to Suspended Particulate matter (SPM), Respirable Suspended Particulate Matter (RSPM), SO₂, NO₂ and CO are monitored in Chennai city. It is concluded that, the air quality in Chennai is within the permissible limits

Keywords; SPM, RSPM, SO₂, NO₂, CO, NAAQS, Ambient Air Quality, Air pollution, Pollutants..

I. INTRODUCTION

India might be the largest united states on the earth situated in the southern piece of Asia with New Delhi being its capital. New Delhi, Kolkata, Mumbai and Chennai are regarded because the most big metropolitan districts amongst 10 others. The improvement and improvement of those are remarkable. Chennai, capital of Tamil Nadu, is a piece of South India situated alongside the coastline of Bay of Bengal. It has a populace of around 1 crore and is unfold over various 1,189 km². In Chennai, the important thing regions like Nungambakkam, Parrys nook and Thiagaraya Nagar are picked due to this.

Checking Air Quality in town like Chennai in obligatory considering the human properly being as critical aim. Air is one of the five antique fashion additives – air, water, earth, hearth and land. Air around us is a combination of gases and residue particles. The piece of air includes a mix of about seventy eight.09% of nitrogen, 20.95% of oxygen, 0.93% of argon, 0.04% of carbon di oxide and extraordinarily restricted quantity of various gases. Air contamination happens even as unfavorable materials at the side of particulates and natural debris are introduced into the Earth's climate.

It may additionally purpose one-of-a-kind maladies, hypersensitivities or passing in humans and moreover impact awesome biological systems. The convergence of air contaminations relies upon no longer simply on the quantities which are radiated from sources yet furthermore the capacity of the air to either ingest or scatter those discharges.

Air contamination radiates from one-of-a-type assets, which contain function and anthropogenic sources. Normal wellsprings of air contamination incorporate volcanoes (sulfur, chlorine and particulates), Wildfire (smoke, carbon di oxide and carbon monoxide), and so on., Human assets include Vehicular emanation, Electricity age, Industrial Emissions, Landfill gases outflows and so forth., Most generally positioned pollution are Particulate difficulty, Sulfur oxide (SO_x), Nitrogen Oxide (NO_x), Carbon Monoxide (CO), Hydrogen Sulfide (H₂S), Volatile Organic Compounds (VOC), Ammonia (NH₃), Ozone (O₃), Radon and so forth.,

II. MATERIALS AND METHODS

2.1. Study Area

The following study areas are chosen.

- i. Nungambakkam
- ii. Parrys Corner

iii. Thiagaraya Nagar

2.2. Devices Used

Respirable Dust Sampler and Drager tube were the devices carried out for this examination. Respirable Dust Sampler become implemented for estimating Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM), Sulfur Dioxide (SO₂), Nitrogen Dioxide (NO₂). Though Drager tube have become used for estimating Carbon Monoxide (CO).

2.2.1 Respirable Dust Sampler

The sampler is in reference to Envirotech Respirable Dust Sampler (RDS), Model APM 460 NL. This relied on National Environmental Engineering Research Institute (NEERI), Council of Scientific and Industrial Research (CSIR), Govt. Of India. It is extensively implemented in India within the National Air Quality Monitoring Program (NAMP) of the U.S.A.. The upsides of APM 460 over the last samplers are quiet, Brushless blower diminishes hardware non-public time and assist exertion and Electro Magnetic Interface (EMI), Easy manipulate of impingers, No warming up of retaining arrangements due to warmth from the blower, Facility of taking the encroach plate straightforwardly to the lab for extra at ease journey of glass components. The precept segments of the Sampler include: Heavy responsibility blower to suck the air at a pace of 1.5 m³/min, Particle length classifier – Cyclone sport plan, Settling cup, Filter paper, Filter holder, Rotameter to test the movement.

2.2.2 Drager Tube

Carbon monoxide changed into anticipated utilizing the Drager tube. The cylinder includes layer: orange shaded pre-layer and a white demonstrating layer. The cylinder containing a synthetically dealt with silica gel is opened through severing elements of the offers. Utilizing a fundamental elastic suction equipment bulb an air check is drawn thru the cylinder. At the factor even as an air or a gasoline

check is sucked thru the cylinder, the meddling gases are to be held within the pre-layer. The transformation of iodine pentoxide beneath acidic conditions to iodine with the aid of response with carbon monoxide.

2.3 Methodology

The checking stations had been picked with the stop purpose that it have to be liberated from any obstruction from the surrounding residing stock. Testing became completed at a stature of 1.5 m with the channel similar to the floor. For an agent take a look at it ought no longer be set beneath a tree, almost a divider or one of a kind blocks that might save you unfastened wind current from the encompassing climate. The instance was covered towards weather tweaks.

Inspecting turn out to be for the maximum element at rooftop maximum factors of the agent places spherical 1.5 m over the endorsed stature which was liberated from any impediments to move of air. Length for gazing is accomplished for eight hours frequently and the person examples are taken to the studies facilities as a manner to gather the convergence of the only of a type contaminations.

III. RESULTS AND DISCUSSION

The Ambient Air Quality Monitoring changed into evaluated in Nungambakkam, Parrys Corner and Thiagaraya Nagar and the consequences are labeled as in Table 1, Table 2 and Table three in my view.

Table 1. Pollutant Concentration at nungambakkam.

Sl. No	Pollutants	Unit	Results	TNPSB Standards	Sampling procedure & Methods of Measurements
				Industrial, Residential, Rural & other areas.	
1	Particulate Matter (Size less than 10 µm) or	µg/m ³	120	100	IS 5182 (Part 23: 2006 (RA 2012).

	PM 10				
2	Suspended Particulate Matter (SPM)	$\mu\text{g}/\text{m}^3$	100.25	-	IS 5182 (Part23: 2006 (RA 2012)).
3	Sulphur dioxide (SO_2)	$\mu\text{g}/\text{m}^3$	7.8	80	IS 5182 (Part2: 2001 (RA 2012)).
4	Nitrogen dioxide (NO_2)	$\mu\text{g}/\text{m}^3$	30.05	80	IS 5182 (Part6: 2006 (RA 2012)).
5	Carbon Monoxide (CO)	mg/m^3	4.0	4.0	IS 5182 (Part10: 1999 (RA 2009)).

Table 2. Pollutant Concentration at parrys corner.

Sl. No	Pollutants	Unit	Results	TNPCB Standards	Sampling procedure & Methods of Measurements
				Industrial, Residential, Rural & other areas.	
1	Particulate Matter (Size less than 10 μm) or PM 10	$\mu\text{g}/\text{m}^3$	125.75	100	IS 5182 (Part23: 2006 (RA 2012)).
2	Suspended Particulate Matter (SPM)	$\mu\text{g}/\text{m}^3$	95.25	-	IS 5182 (Part23: 2006 (RA 2012)).
3	Sulphur dioxide (SO_2)	$\mu\text{g}/\text{m}^3$	8.75	80	IS 5182 (Part2: 2001 (RA 2012)).
4	Nitrogen dioxide (NO_2)	$\mu\text{g}/\text{m}^3$	30.0	80	IS 5182 (Part6: 2006 (RA 2012)).
5	Carbon Monoxide (CO)	mg/m^3	3.8	4.0	IS 5182 (Part10: 1999 (RA 2009)).

Table 3. Pollutant Concentration at Thiagaraya Nagar.

Sl. No	Pollutants	Unit	Results	TNPCB Standards	Sampling procedure & Methods of Measurements
				Industrial, Residential, Rural & other areas.	
1	Particulate Matter (Size less than 10 μm) or PM 10	$\mu\text{g}/\text{m}^3$	135.25	100	IS 5182 (Part23: 2006 (RA 2012)).
2	Suspended Particulate Matter (SPM)	$\mu\text{g}/\text{m}^3$	100.25	-	IS 5182 (Part23: 2006 (RA 2012)).
3	Sulphur dioxide (SO_2)	$\mu\text{g}/\text{m}^3$	11.65	80	IS 5182 (Part2: 2001 (RA 2012)).
4	Nitrogen dioxide (NO_2)	$\mu\text{g}/\text{m}^3$	28.75	80	IS 5182 (Part6: 2006 (RA 2012)).
5	Carbon Monoxide (CO)	mg/m^3	4.0	4.0	IS 5182 (Part10: 1999 (RA 2009)).

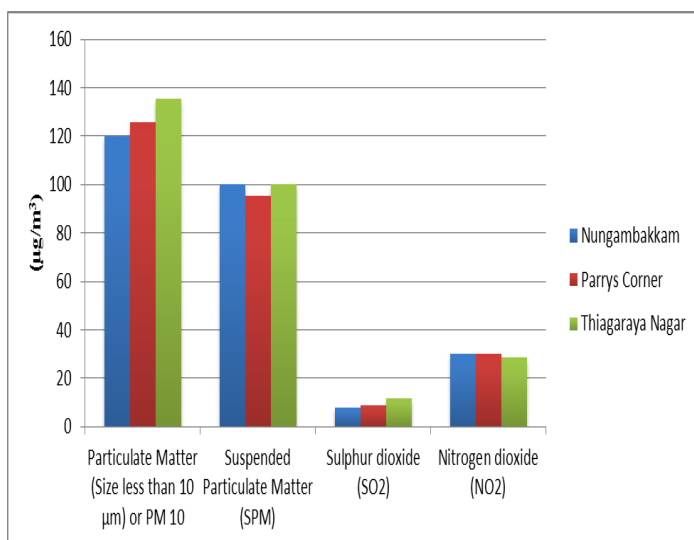


Figure 1: Graphical representation of the concentrations of PM10, SPM, SO_2 and NO_2

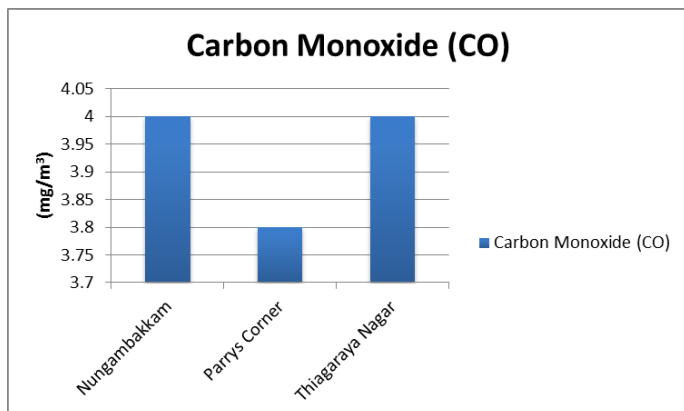


Figure: 2: Graphical representation of the concentrations of CO

In spite of the fact that the infection degrees at all of the spots are indoors great cutoff points while contrasted with surrounding air high-quality norms, the tiers of air poisons for Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM), Sulfur Dioxide(SO₂), Nitrogen Dioxide (NO₂) and Carbon Monoxide (CO) are immoderate at Thiagaraya Nagar when contrasted with Parrys corner and Nungambakkam. This is thinking about T. Nagar is the Shopping location for all things in Chennai. Nearly usually, the spot is probably intensely packed and moreover overflowed with vehicles. In destiny, the contamination tiers could be reduced by way of way of following mass transportation framework and Tree belongings. Tree belongings can be paid interest to up very to hold the contaminations. Right now, is seen that, Chennai is in the extra relaxed area even as contrasted with other metropolitan city groups in India.

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