EXPERIMENTAL ANALYSIS OF AIR POLLUTIONIN RURAL AND URBAN AREAS

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ABSTRACT

Particulate matter pollution is one of the major environmental concerns in India. Over the past 20 years there has been a considerable increase in the number of motor vehicles. The present study was conducted to assess journey time and roadside exposure to particulate matter along major roads of Salem, Namakkal in tamilnadu during February 2017.Measurements of particulate mass were carried out continuously outside the vehicle at 15 different locations in all three cities. Additionally, monitoring was undertaken at a background site throughout the period. The particulate matter (pm2.5) has analyzed by using pm 2.5 and test meter . It also measures humidity and temperature. The highest levels were found at the sites with traffic congestion reflecting, not only, the large contribution of automobile exhaust but also the resuspension of road dust. The majority of public transport vehicles in these cities are not air-conditioned and it is very likely that commuters are exposed to the similar high levels of pollution.

Keyword: *Pollution analysis, rural area*

1.INTRODUCTION

The World Health Organization estimates that air pollution contributes to approximately 800,000 deaths and4.6 million lost life years annually . Developing nations are particularly affected by air pollution as many as two thirds of the deaths and lost life years associated with air pollution on a global scale occur in Asia.To date, estimates of the health effects resulting from exposure to air pollution in Asia have relied largely on the extrapolation of results from research conducted outside Asia primarily in Europe and North America . India need to generate regular information on the ambient concentration levels of small particulates of diameter less than 10 micron and/or 2.5micron and take urgent steps to control emissions of these particles.Recent reports suggest that India has extremely high levels of environmental pollution especially air pollution. India is the home to 13 of 20 top cities in air pollution. It is because India's air has a lot of particulate matter 2.5 (World Health Organization).

2. LITRATURE REVIEW

- **Poojachauhan**: Environmental conservation became a major concern. Pollution is the major threat in most of regions in the world.
- India is also witnessing the environmental pollution due to rapid economic growth and insufficient implementation of environmental pollution control measures.

- Though the measurement of air quality is complicated, there are a few pollutants which regulators keep under supervision through regular monitoring.
- The most observed pollutants includes PM, NO2, SO2, CO2 etc. This paper aims to provide an overview of environmental pollution especially air pollution and concentration pollutants (PMs, SO2, NO2 etc.).

2.1Particulate Matter – Overview

- Can be liquid or solid particles.
- Usually defined in terms of PM_{10} and $PM_{2.5}$where the subscript refers to the diameter of the particle in microns ≤ 10 or 2.5.
- Reduces visibility in the atmosphere.
- Causes health problems related to the respiratory system and circulatory systems.

2.2Relative sizes of particles in air

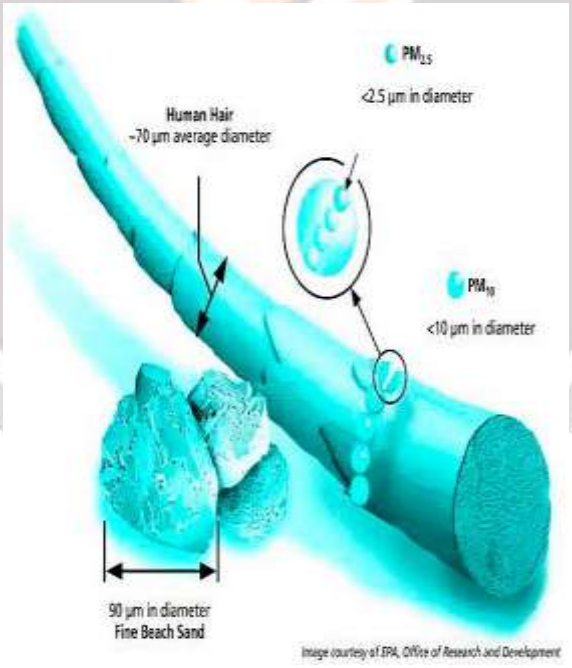

Fig.1 TEST METER

Fig.2 METER DESCRIPTION &FEATURES

- This electrical device measures indoor air quality pm2.5 dust particles concentration, humidity and temperature.
- Measures indoor air quality instantly with a real time manner.
- Shows pm2.5 concentration level in micro gm/cu.mtr.
- Pm 2.5 particle sensor used. Dust range from 12 to 35 pcs/cm3
- Accuracy of 75%over detection range.

2.3 Sources of PM

- wood burning stoves and fireplaces
- dust from construction, landfills, and agriculture, mining
- wildfires and brush/waste burning
- industrial sources
- windblown dust from open lands

2.4 Key to air quality levels

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health alert: everyone may experience more serious health effects
Hazardous	301 to 500	Health warnings of emergency conditions. The entire population is more likely to be affected.

2.5 Health Effects

- Aggravates conditions such as asthma, bronchitis, emphysema.
- Can trigger asthma attacks.
- Makes it difficult to breathe.
- Can cause premature death in elderly people or people with heart disease and respiratory diseases .
- Can cause future health problems in children (such as asthma, increased illness).

READINGS

PLACE: NAMAKKAL

S.NO	TIME	HUMIDITY	TEMPERATURE	PARTICULATE MATTER	VEHICLEGROWTH				
					2W	3W	4W	MIS	TOTAL
1	10	20	35	340	72	27	42	22	163
2	11	20	35	360	81	31	45	24	183
3	12	18	35	353	75	25	45	15	160
4	13	16	36	251	53	20	25	18	116
5	14	14	37	120	52	12	26	17	107
6	15	12	37	126	50	14	23	14	101
7	16	13	36	210	61	13	21	17	112
8	17	15	33	240	76	14	28	13	121
9	18	17	30	282	74	15	29	16	124
10	19	20	27	310	70	16	31	17	134

INFERENCE:

HOT, SUNNY DAY

Table 1 Readings

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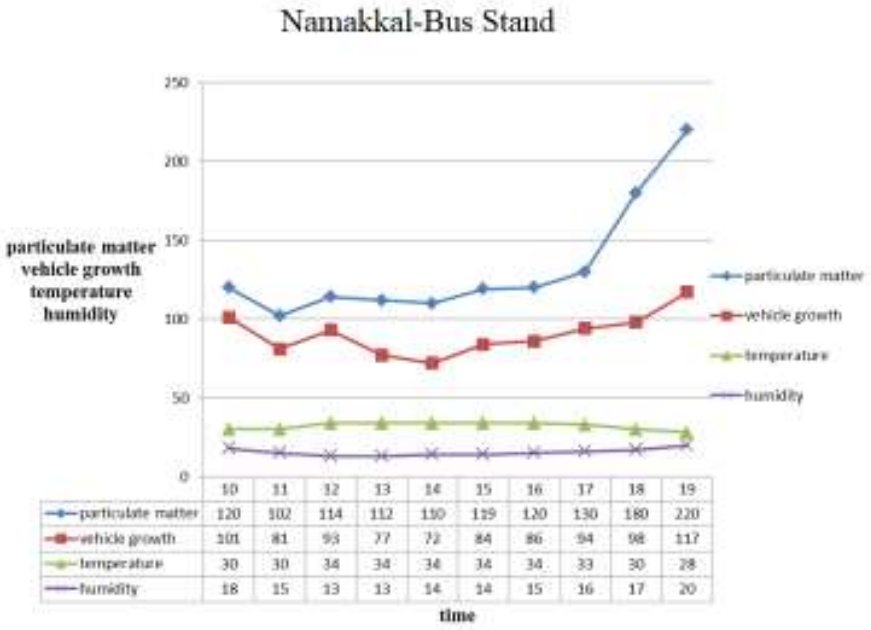
GRAPHS



	10	11	12	13	14	15	16	17	18	19
particulate matter	120	102	114	112	110	119	120	130	180	220
vehicle growth	101	81	93	77	72	84	86	94	98	117
temperature	30	30	34	34	34	34	34	33	30	28
humidity	18	15	13	13	14	14	15	16	17	20

Graph 1 Readings

3.CONCLUSION

- ✓ While recognizing that PM2.5 contamination was an issue, no Indian organization has evaluated demise and infection because of air contamination in India. The main controlling factor is particulate matter and vehicle movements.
- ➢ In Salem five roads surroundings is the worst place for accumulating dust by traffic congestion to compare with four places.
- ➢ In Erode PS park signal noted as harmful effect on particulate matter 2.5 when compare with other four places.
- ➢ In Namakkal particularly Rasipuram bus stand place increase particulate matter 2.5 when compare with other four places.
- ✓ In general the humidity increase or decrease based on the temperature
- ✓ Decrease or increase which influences the quantum of particulate matter decreases when humidity increases, and at the sometime rain without wind also shows decrease PM 2.5.

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