

A STUDY OF THE SUSPENDED PARTICULATE MATTER OVER GURGAON

Purba Chatterji, Sandip Viridi, Praven Bhargava, and H.N. Dutta

Perfact Solutions, B-372, Meera Bagh, New Delhi-110 063
purba80@yahoo.co.uk

V. B. Gupta

School of Future Studies and Planning
Devi Ahilaya University, Indore-452 001

Introduction

As per the statutory recommendations from Ministry of Environment and Forests, Government of India, New Delhi(Gazette Notification, 1994) and as part of several EIA projects over the past 5 years, we have made regular measurements of SPM over several spots in Gurgaon, which is the fastest developing city situated in the National Capital Region (NCR), India using high volume samplers. These samples give us a measure of SPM (Suspended Particulate Matter) and RSPM (Respirable Suspended Particulate Matter) in $\mu\text{g}/\text{m}^3$ of air and the samples are preserved for over a certain period and then destroyed, wasting mammoth amount of effort (time and energy) and the most valuable data about the physical-chemical compositions of the suspended particulate matter present in the atmosphere. Also, the suspended air-pollution is buried as a fine solid waste, a portion of which is bound to form air-pollution again due to erosion and many other natural phenomena. With these available routine measurements at our end, we present seasonal variations of SPM and RSPM over the selected locations in Gurgaon, one of the fastest growing commercial and industrial hubs of India.

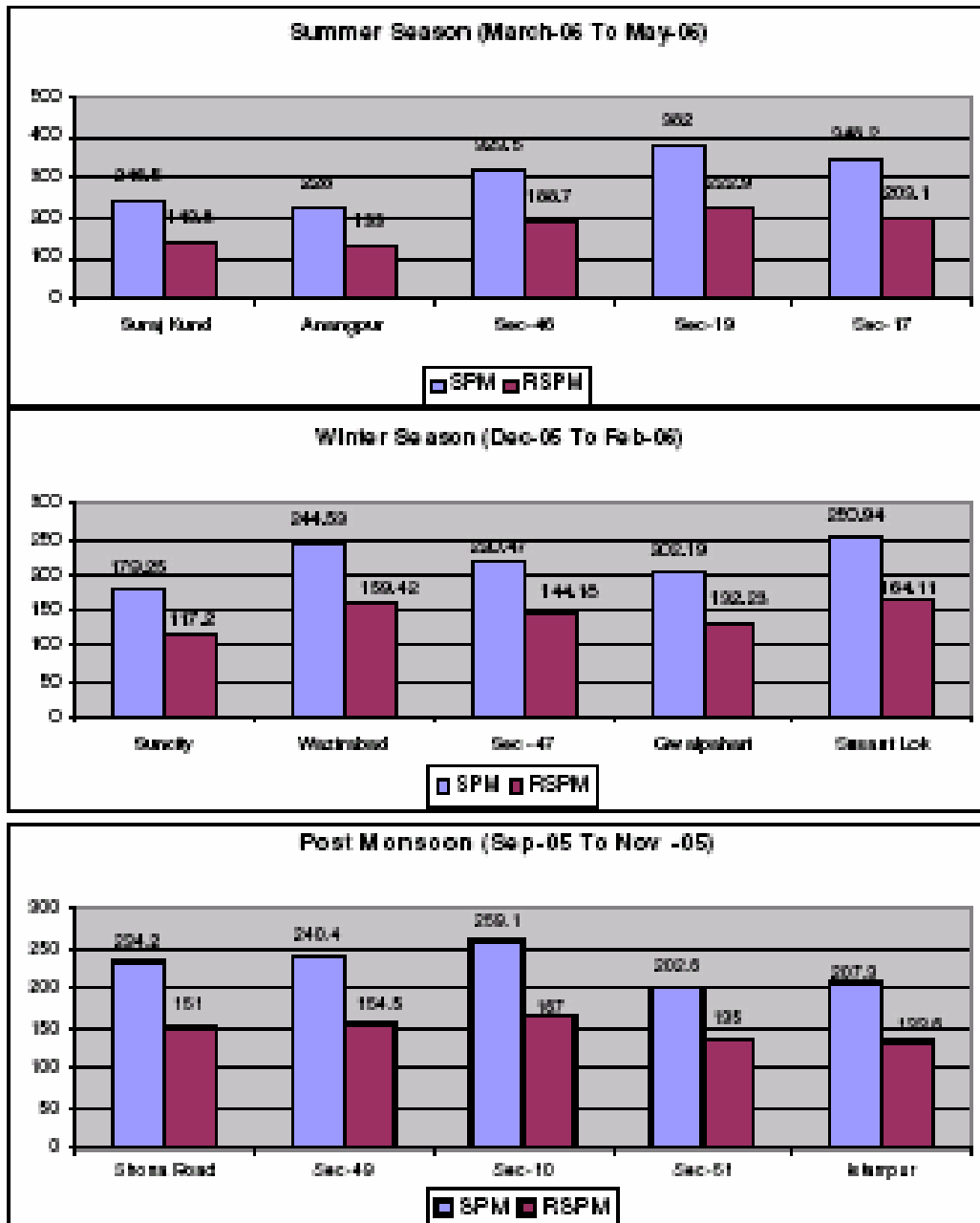
Observational Sites and Data

All the observational sites are located over upcoming project sites in Gurgaon and the period of SPM data collected at each site is for over one year. June, 2005 to May, 2006. The data is supplemented with the general traffic density and the weather conditions observed through AWS installed in Gurgaon. The data is collected for every 8 hours of period and thus 3 data sets are available on every day. It is important to note that during monsoon season, it is practically difficult to operate a high volumes sampler and the filter paper often becomes wet, leading to serious errors in the measurements.

Results

Fig. 1 presents seasonal variation of SPM and RSPM at 5 sites and as expected, the SPM and RSPM are maximum during pre-monsoon season followed by winter and the post monsoon seasons. It is important to note that over Gurgaon, it is the dust storms which push fine dust / sand particles from the Rajasthan desert towards northern and eastern part of India. Moreover, the local heating causes strong thermal convection, which mixes the pollution emitted by the vehicles on the roads and the smog emitted by industries. In this

connection, it is important to note that rise in population and growth in economic and industrial activities have led to increase in pollution in the NCR region of India. In the past 10 years, Gurgaon has become a major centre of commerce, IT industry and education. The growth of government departments and office complexes has also contributed to the spread of the city. Civic amenities have not kept pace. Unabated in migration has compounded the problem. Land use regulations have been flouted. The green cover has dwindled.



Discussion

According to a white paper on Pollution over Delhi [1], the 1991 census showed that Delhi had a population of 94.21 lakhs. The population is projected to touch 132 lakhs in 2010. This has led to a population pressure on satellite towns like Gurgaon, wherein both population and the industries have shifted in search of better amenities. Thus, although many areas in Delhi have saturated in terms of growth, Gurgaon is still growing up and thus the air pollution has acquired the same pollution level, which is observed over Delhi. The average population in the Gurgaon area is 10,437 per sq. km and it is increasing at a rapid rate. When Gurgaon started coming up, the Haryana government attracted massive investment from foreign companies and developers, both of whom saw great potential in land that was close enough to the capital, but not so close that it would be part of its crowded dinginess and rising real estate. Companies like Unitech, Ansals and DLF started cashing in with colonies and office buildings. The malls came soon after, and then there was no looking back. Today, many malls are seeing a decreasing economic trend, indicating. The number of industrial units in Delhi in 1951 was approximately 8,000. By 1991 this number had increased to more than 1,25,000. The vehicular population has increased phenomenally, from 2.35 lakhs in 1975 to 26.29 lakhs in 1996, and expected to touch 60 lakhs in 2011. Vehicular pollution contributes 67% of the total air pollution load (approximately 3,000 mt per day) in Delhi.

In future, as newer and newer fuels will be utilized, the characteristics of aerosols will be changing and it will be important for R&D institutions to not only characterize these pollutants on the basis of their physical characters but their optical and chemical properties shall be the most important factors in the global scenario. Under such a situation, environmental houses like Perfact Solution can contribute effectively in generating basic data sets for the development of national inventories of aerosols. It may be pointed out that we are a group of professionals carrying out EIA projects and it is mandatory for us to take onsite measurements, thus we can contribute in building the SPM and RSPM database in India.

References

1. Ministry of Environment and Forests Gazette Notification, S.O.60(E) issued on January 27, 1994 on Environmental Impact Assessment compliance.
2. White paper on pollution in Delhi with an action plan, Ministry of Environment and Forests, Government of India, <http://envfor.nic.in/divisions/cpoll/delpolln.html>