

Suspended Particulate Matter in Industrial and Outskirt Residential Areas of Jammu

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Particulate matter is a discrete mass of any material, except pure water that exists as liquid or solid in the atmosphere and of microscopic or sub-microscopic dimensions. A large number of studies have been made on SPM from time to time by CPCB. This study was carried out during 2001 to investigate the level of SPM (suspended particulate matter) in outskirts residential and industrial areas of Jammu. (Fig. 1)

For monitoring of SPM levels, these areas were divided into different sites:

- A. Outskirt Residential area was divided into five sites:
Site I: Nowabad Narwal Sunjwan Road, Site II: Karan Nagar,
Site III: Krishna Nagar, Site IV: Trikuta Nagar, Site V: Digiana.
 - B. Industrial area was divided into two sites:
Site VI: Gangayal Industrial Area, Site VII: Bari-Brahmana Industrial Area
- The area of study is shown in Figure 1.

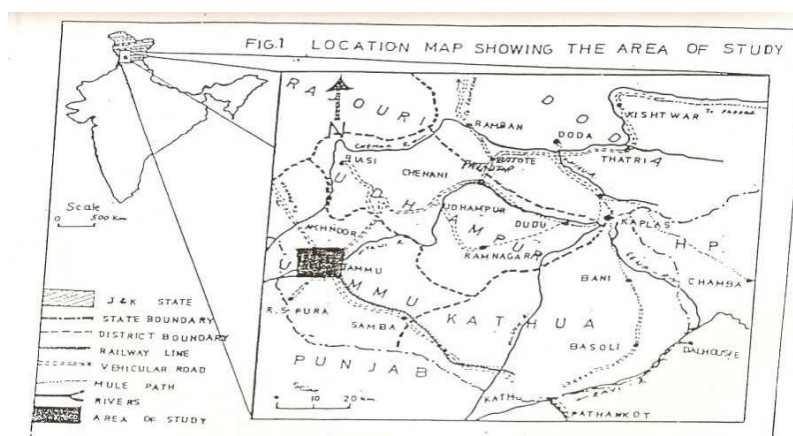


Figure 1. Location map showing the area of study

Sampling was done for 24 hours at each site with the help of balance, filter paper and High Volume air sampler and level of SPM was calculated by using following formula:

$$\text{SPM } (\mu\text{g}/\text{m}^3) = (\text{Fw}_2 - \text{Fw}_1) * 10^6 / \text{A.V.}$$

Where:

Fw1=Initial weight of filterpaper

Fw2=Final weight of filterpaper

AV (Air Volume Sampled)=Sampling rate * Net sampling time

Sampling rate = (initial flow rate of air + Final flow rate of air)/2

Net sampling time = (Final time totaliser reading – Initial time totaliser reading) * 60.

Tables 1 and 2 show the SPM level in the Outskirt Residential Area and Industrial Area of Jammu respectively

Table 1. SPM level in outskirt residential areas of Jammu

SITES	SPM ($\mu\text{g}/\text{m}^3$)
Site I. (Nowabad Narwal Sunjawan Road)	175.163
Site II. (Karan Nagar)	63.924
Site III. (Krishna Nagar)	125.155
Site IV. (Triakuta Nagar)	96.160
Site V. (Digiana)	169.545

Table 2. SPM level in industrial areas of Jammu

SITE	SPM ($\mu\text{g}/\text{m}^3$)
Site VI. (Gangyal Industrial Complex)	239.154
Site VII. (Bari-Brahmana Industrial Complex)	447.059

In Jammu City, the increase in number of vehicles and traffic flow rate on the roads had added SPM in air to a considerable extent. The analysis of the data of SPM level collected in present study revealed that the industrial areas of Jammu have more SPM level than that of Outskirts Residential Areas of Jammu.

The level of SPM was observed to range from 63.924 $\mu\text{g}/\text{m}^3$ to 175.163 $\mu\text{g}/\text{m}^3$ in the Outskirt Residential areas of Jammu whereas the SPM level in industrial areas of Jammu ranged from 239.154 $\mu\text{g}/\text{m}^3$ to 447.059 $\mu\text{g}/\text{m}^3$. The critical analysis of the data at Outskirt Residential Areas of Jammu revealed that at Site-II (Karan Nagar) and Site-IV (Triakuta Nagar), the level of SPM was below 100 $\mu\text{g}/\text{m}^3$. This was due to raining a day before and on the day of sampling. From this it can be concluded that the humid atmosphere

reduces the level of SPM. Prasad *et al* (1998) while studying SPM level of Indian cities observed that air pollutant level in southern cities exhibited declining trend as compared with that of northern cities due to presence of humid atmosphere in coastal areas.

This clearly indicates that traffic flow rate is one of the major contributing factors of SPM in air. The presence of high SPM (239.154-447.059 $\mu\text{g}/\text{m}^3$) in industrial area was due to emissions from the chimneys of factories and other industrial units. The value of SPM level in the Outskirt Residential Area of Jammu was observed to be less than 200 $\mu\text{g}/\text{m}^3$ prescribed limits of the SPM in residential area and similarly the SPM level in the industrial area was also observed to be less than 500 $\mu\text{g}/\text{m}^3$ the prescribed limits of SPM in Industrial Area as per Ambient Air Quality-status and statistics, 1995 (CPCB, 1995)