

A CASE STUDY:

Assessment of ambient air quality in Virudhunagar Town, Tamil Nadu

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The seasonal variations in spatial distribution of SO₂, NO_x, SPM, RPM, CO, HC emissions were investigated on three selected areas in Virudhunagar. The study areas consisted of residential area, sensitive area and industrial area. The objective of this study was to compare the ambient air quality in different selected areas of the town. The study identified the areas that were more affected due to air pollutants and the type of pollutants that concentrated in the selected areas. An effort has been made to study the air quality in Virudhunagar and the air quality can be described by Air Quality Index (AQI) based on four pollutants sampled at three locations in study area and the sampling was carried out using dust sampler at sampling sites. Results were compared with ambient air quality standard laid down by Ministry of Environment and forests Government of India. The data were discussed as to present the status of ambient air quality of the study session and Air Quality Index calculated by ORAQI.

The air quality in urban and semi-urban areas are deteriorating due to rapid urbanization and industrial development. Though, there has been undoubted economic growth as a result of these activities, they have caused severe environmental problems like water, air, land and noise pollution (Ahmed *et al.*, 2004). Road vehicles emit various pollutants and this continuous discharge of pollutants create a problem where nature no longer is able to disperse, absorb or dispose off unwanted residue in the natural sinks of the environment. This demands for making provision and efficient use of pollution control measures to minimize the adverse environmental impacts (Mohanty, 1998).

The Virudhunagar town is situated in the southern part of Tamil Nadu and this is the administrative head of Virudhunagar district. Total vehicular population on April, 2009 was 29,726 and witnessed a tremendous increase of registration of vehicles from 2005 to 2009.

Drainage construction, damaged roads are the other main sources of severe dust pollution in this area and these cause problems like nasal and throat infection, continuous cold and asthma. Keeping all these in consideration, a study was initiated to monitor air quality status of different sites in Virudhunagar town.

Virudhunagar town spreads over an area of about 6.600 sq.km as per 2001 survey and 50 km south from Madurai city. The total population of Virudhunagar is estimated as 72,081 as per 2001 census. The town basically a trade centre, having various small scale industries which are in the vicinity of the township (Fig. 1).

Monitoring was carried out at three locations in the town of Virudhunagar classified into three categories as Residential, Sensitive, Industrial. All these locations are prominent places in Virudhunagar town and the frequency of monitoring for SPM, RPM, SO₂, NO_x were 24/8 hourly. The details of monitoring locations are given in the Table 1.

Collection of sample and analysis:

Suspended particulate matter (SPM):

It consists of different solid and liquid particles that are suspended in the atmosphere and includes soil, soot, lead, asbestos and sulphuric acid droplets. Smaller particles are inhaled into the respiratory system and can cause health problems. Lead and asbestos particles are especially harmful (Naveen *et al.*, 2008).

Respirable particulate matter (RPM):

Particulates were mainly produced from coal combustion, diesel engines, construction and industrial activities.

Sulphur dioxide (SO₂):

Major sources are coal fired power plants and diesel powered motor vehicles. Ambient concentrations of SO₂ were usually highest in central city areas and around industrial areas

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