

# Assessment of noise quality in different residential areas of Meerut city of Uttar Pradesh, India

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**SUMMARY:** The present paper deals with the assessment of noise quality in residential areas of Meerut city. There was lack of proper town planning in some areas in Meerut city. This was due to poor town planning management in private residential colonies in and around Meerut city. There was no proper demarcation, such as residential, commercial and industrial area. Most of the colonies in the Meerut city are constructed in the vicinity of industries and commercial area. The present paper reveals that in Meerut city, the sound level in most of the colonies exceeded the permissible limit recommended for residential areas. The sound level recorded was higher as it can be compared with the limit recommended for commercial-cum-residential areas by CPCB. The main reason is the rapid industrialization and urbanization in and around Meerut city. In this paper an attempt has been made to portray the noise quality due to residential effects in Meerut city. Out of the twenty sites which were selected for the study, only five namely, Civil Lines, Ganga Nagar, Shastri Nagar, Defence Colony and Cantt. area were found to be within the recommended limit in morning and night time only.

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India has emerged as a fast developing nation resulting in an increase in the activity status of its people. Due to rapid industrialization and urbanization, the environmental quality is deteriorating day by day. The already existing pollution load of metropolitan cities has increased substantially. Noise pollution in recent year has emerged as one of the important components in the environmental monitoring studies owing to its acute and chronic effects (Rao and Rao, 1990). Studies undertaken in the past have established noise as a pollutant adversely affecting physiology and psychology of the exposed object (Balgopal *et al.*, 1978). During festival season, noise and air pollution are observed in residential areas (Tiwari *et al.*, 2001).

The people in residential areas feel discomfort against the unwanted, unpleasant or disagreeable sound. A restricted study is sufficient to evaluate the effect of traffic noise due to motor vehicles in any residential-cum-commercial zone (Lewis, 1973). Some studies have already been

carried out in different cities of India (Rao and Rao 1998; Shastri and Khan, 2003). But no effort has been made to investigate the noise pollution in Meerut city.

**Aim of study :**

The aim of the present noise pollution study in residential areas of Meerut city was :

- To predict the noise level at different residential locations in Meerut city.
- To evaluate the magnitude of the problem as perceived by the people of Meerut city.
- To know the sources of noise which are mostly present in the residential areas.
- To review the effect of noise pollution on the residents of Meerut city.

## EXPERIMENTAL METHODOLOGY

The noise pollution study was carried out by the digital sound level meter-2031 (Cygnnet made) at 20 selected sites of Meerut city. The

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monitoring sites were, Civil Lines, Ganga Nagar, Begum Bridge, Railway Road, Thapar Nagar, Kaiser Ganj, Pallavpuram, Shastri Nagar, Defence Colony, Suraj Kund, Jagriti Vihar, Ajanta Colony, Brahmmapuri, Somdutt Vihar, Shahpeer Gate, Lal Kurti, Cantt. Area, Kankar Khera, Soti Ganj and Sadar. The noise level was monitored for 30 minutes at each site during peak hours in morning, afternoon, evening and night-time. The equivalent continuous sound level was determined by using the observed sound, pressure levels. (Wooten, 1980). The standard deviation (S.D.) values were also calculated by using standard formula to compare the variations in morning hours sound level with night time sound level with standard limit recommended for day time and night time in residential areas. The average values of day time and night time sound levels were considered for calculating the standard deviation (S.D.).

## EXPERIMENTAL FINDINGS AND DISCUSSION

The sound levels which were recorded at different monitoring sites in residential areas of Meerut city with the help of digital sound level meter-2031 (Cygnet made) are depicted in Table 1. This table indicates that only five of the study sites have sound level within the standard limit as given by CPCB (Central Pollution Control Board).

Noise pollution is well recognized problem of the world but almost no attention has been paid to overcome this problem perhaps due to its long term effects. Sound level depicted in Table 1 in residential areas of Meerut city indicate that most of the study sites have sound level above the standards given by CPCB (Central Pollution Control Board) in day time (Seshagiri Rao and Ramalingeswara Rao, 2000). On some sites such as Railway Road, Thapar Nagar, Pallavpuram, Shastri Nagar, Ajanta Colony, Brahmmapuri, Somdutt Vihar and Shahpeer Gate, not much difference was observed in day time and night time sound levels. An equal sound level reported in these sites in day and night time may be due to round the clock road business.

Industrial operations, traffic noise and other vehicular noise in densely populated areas were main source of noise in the city (Rao and Rao, 1990). Some old colonies having narrow roads like in Nehru Nagar, Thapar Nagar, Kaiser Ganj, Ajanta Colony, Brahmmapuri and Lal Kurti, where the sounds produced in the form of noise and have not much space to disperse the sound and can cause hearing impairment among the residents of these areas (Chaudhary, 2002). Some sites such as Pallavpuram, Railway Road, Kankar Khera and Begum Bridge, located near the National Highways or State Highways were observed with high level of sound in the city.

**Table 1 : Noise level at various residential sites of Meerut city (U.P.)**

Sr. No.	Residential sites	Morning	Afternoon	Evening	Night	SD*
1.	Civil Lines	52.9	59.5	63.1	42.4	7.10
2.	Ganga Nagar	54.7	64.8	70.1	44.8	4.35
3.	Begum Bridge	77.8	79.9	81.7	67.9	4.95
4.	Railway Road	73.1	77.4	79.8	68.1	2.50
5.	Thapar Nagar	77.8	81.0	83.2	71.8	2.95
6.	Kaiser Ganj	67.4	74.7	76.7	79.1	6.35
7.	Pallavpuram	69.1	77.0	82.4	76.1	3.85
8.	Shastri Nagar	54.4	63.4	69.3	44.6	2.80
9.	Defence Colony	53.6	60.2	64.4	43.8	5.15
10.	Suraj Kund	61.3	73.6	85.7	73.3	6.01
11.	Jagriti Vihar	65.5	67.0	73.6	58.9	6.20
12.	Ajanta Colony	57.8	63.6	71.8	62.3	2.25
13.	Brahmapuri	64.7	70.8	78.7	60.8	1.05
14.	Somdutt Vihar	63.5	65.0	67.8	59.1	2.40
15.	Shahpeer Gate	66.3	78.6	88.7	69.3	2.01
16.	Lal Kurti	70.7	78.9	73.8	66.3	3.30
17.	Cantt. Area	51.8	58.4	60.3	41.5	7.15
18.	Kankarkhera	63.9	76.8	86.7	73.8	4.95
19.	Soti Ganj	58.2	76.4	84.9	75.9	8.40
20.	Sadar	62.7	72.8	79.1	67.3	4.30

All the values of noise level are in decibel (dB).

The standard recommended by CPCB for residential area was 55dB during day time and 45 dB during night time

The sites namely, Civil Lines, Defence colony, Cantt. area have much difference in sound level in day and night time, this indicating less polluted sites as compared to other sites (Kudesia, 2004). The sites namely, Shastri Nagar, Ganga Nagar, Jagriti Vihar and Somdutt Vihar are newly constructed colonies following town planning norms like broad roads, houses constructed with proper spacing, parks and commercial complexes are situated away from the houses, the sound level recorded at these places was high only in day time (Ritu Kudesia, 2005). The similar data were recorded in densely populated old colonies, like Brahmapuri and Lal Kurti. (Bakre, 1999).

The high noise levels are associated with higher population density, increased traffic movement, increased human activities and lack of greenery near residential areas (Rao and Rao, 1998). Higher noise levels cause health hazard and interference in communication. Continued exposure to high noise levels results in lack of concentration and annoyance.

#### Conclusion :

The noise pollution in metropolitan cities is a well recognized problem, which affects the noise quality in residential areas. Till now, no proper attention has been paid to overcome this problem in fast developing cities like Meerut. It has long term effects on the health of the people. The continuous exposure to high noise levels causes hearing and nervous problems, headache, anxiety, lack of concentration, annoyance and other health hazards. Some of the suggestions that could reduce noise levels have been mentioned below :

- Dense plantation of trees on road sides as well as in houses attenuates sound to the order of 10 dB per 100 m. width from the sound source.
- Proper traffic management and banning on use of horns in residential areas.
- Noise producing industries should be installed away from residential area.
- Educating people about the hazards of loud sound.
- Restriction on the use of pressure horn, and loudspeakers in residential area shall play an important role in mitigating sound.
- Proper maintenance of roads and vehicles.
- Reducing the amount of traffic in urban centres by building bypass roads.
- Proper demarcation in the city as residential, industrial and commercial area.

- Imposing a restriction on the usage of loudspeakers especially, during night time.
- Placement of barriers between the source and receiving body attenuates the sound energy to a greater extent.

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