

## Assessment of noise pollution in the city of Hardwar (Uttaranchal) India

D.R.Khanna, J.P.Singh\* and Shakun Singh

Department of Zoology and Environmental Sciences, Gurukul Kangri Vishwavidyalaya, Hardwar, 249404, India.

\*U.P.Pollution Control Board, Mathura (U.P.)

### Abstract

A study has been made to assess the noise pollution at six places of Hardwar city. Study was carried out for the period of three to five hours on 25th May-2002 for the parameters average, minimum and maximum noise in different categorized area. The results revealed that minimum and maximum pollution of noise varied between 56.1 to 83.6 dB(A) Leq.in the city. The present paper will be key for the awareness of public and authorities to take an action for control of noise pollution creators.

**KEYWORDS :** dB(A)Leq. ,Silence zone, noise pollution

### Introduction

Hardwar is a well known city for the people who believe in Hindu religion. Hardwar city is situated along the Ganga river at the boundary between the Indo-Gangetic plain (south) and the Himalayas foot hills from a holy river Ganga passed after hills. The Hardwar is a religious and pious city famous for its natural beautiful scenario where lacs of pilgrims take a sacred dip in Ganga river on Amavasya and Purnima, Ardha Kumbh and Maha Kumbh mela held after every six and twelve years. During Kumbh Mela population of pilgrims reaches up to more than 10 lacs. Besides this everyday bathing activities are also held at Har -Ki- Pauri ghats of river bank of Ganga. Number of vehicular movements are found in this city per day and during evening period Aarti conducted at Har Ki Pauri Ghats which enhanced to noise pollution. Main causes of noise pollution in this city are vehicular movements blowing horns by vehicles, during worships in temple and at ghats playing music equipments. Keeping all these things in mind,a noise pollution study was conducted at six places of the city in different categorized area in the month of 25th May-2002.

A number of studies on noise pollution have been performed at various cities in India (Tondon and Pandey,1998; Edison *et al.* 1999; Ingle *et al.* 2001 and Singhal S.P., 2000). A study was undertaken to monitor level of noise around Netaji Subhash Chandra Bose International Airport, Kolkata by CPCB (2001).

## Material and Methods

As materials no more items were required during sound monitoring , only sound pressure level meter was used to observe the data of noise level. Method of sampling was adopted as per CPCB guidelines and manual of the instrument. Sound pressure level was monitored during day time in "A" weightage using a sound pressure level meter make of Quest technology model no. 1900 (USA). It is highly sensitive instrument with computer aided programs. The data of noise level have been recorded in the form of minimum, maximum and average. Sound level monitoring was conducted at different places characterizing commercial, residential and silence zones.

## Sampling Stations

To assess the representative noise monitoring, six sampling stations were selected in different categorized area of the city. Category wise area were chosen as below

| S.No. | Category         | Area Circle | Monitoring Stations                |
|-------|------------------|-------------|------------------------------------|
| 1.    | Commercial Area  | A           | Ranipur More market                |
| 2.    | Residential Area | B           | Vivek Vihar Colony,Ranipur Mode    |
| 3.    | Silence Zone     | C           | Court of Coty Magistrate           |
| 4.    | Silence Zone     | D           | City hospital Emergency Ward       |
| 5.    | Silence Zone     | E           | Before Aarti Puja at Har-Ki- Pauri |
| 6.    | Silence Zone     | F           | During Aarti Puja at Har-Ki-Pauri  |

Sampling for noise level observation was conducted for at least 10 minutes at each sampling stations and approximately 10-12 observations of sound level were recorded at each sampling point. The values of minimum,maximum and average were noted from the noise level data which are given in Table-I.

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**Table:1: Results of Sound pressure level data at different sampling stations in the city of Haridwar**

| S.No. | Sampling Stations                        | Date of Sampling | Period of monitoring- (Hours) | Area        | Observation valuesdB(A)                                     | Values in dB(A) Leq. |         |         |
|-------|------------------------------------------|------------------|-------------------------------|-------------|-------------------------------------------------------------|----------------------|---------|---------|
|       |                                          |                  |                               |             |                                                             | Average              | Minimum | Maximum |
| A.    | Ranipur mode market                      | 25-5-2002        | 15:30-15:40                   | Commercial  | 74.9,73.9,75.8,77.0,74.4,72.8,75.5,71.9,75.3,74.7,74.4      | 74.61                | 71.9    | 77.0    |
| B.    | Vivek vihar colony (Ranipur mode)        | 25-5-2002        | 16:00-16:10                   | Residential | 62.2,61.9,62.9,63.8,63.4,59.0,61.0,67.5,64.5,62.9,69.8      | 63.55                | 59.0    | 69.8    |
| C.    | Court of City Magistrate                 | 25-5-2002        | 16:35-16:45                   | Silence     | 57.7,56.1,56.5,57.0,63.0,60.1,62.0,57.2,59.1,61.9,62.2,58.1 | 59.24                | 56.1    | 63.0    |
| D.    | Emergency ward cityhospital              | 25-5-2002        | 17:20-17:30                   | Silence     | 66.0,67.1,68.9,67.5,64.9,66.4,65.9,65.1,71.4,66.9,67.3,70.3 | 67.31                | 64.9    | 71.4    |
| E.    | BeforeAartiPujan at Har-Ki-Pauri ghats   | 25-5-2002        | 18:10-18:20                   | Silence     | 73.0,70.3,63.9,62.2,66.5,63.9,64.2,66.0,67.0,72.9,73.9      | 67.62                | 62.2    | 73.9    |
| F.    | During Aarti Pujan at Har-Ki-Pauri ghats | 25-5-2002        | 19:30-19:40                   | Silence     | 75.0,78.5,72.0,77.0,81.5,82.5,79.6,83.6,79.8,75.0           | 78.8                 | 72.0    | 83.6    |

TABLE-2 Ambient Air Quality Standards in respect of Noise.

| Sl. No. | Category of area | Limits in dB(A) Leq. |            |
|---------|------------------|----------------------|------------|
|         |                  | Day Time             | Night Time |
| 1       | Industrial area  | 75.0                 | 70.0       |
| 2       | Commercial area  | 65.0                 | 55.0       |
| 3       | Residential area | 55.0                 | 45.0       |
| 4       | Silence Zone     | 50.0                 | 40.0       |

**Note:**

- 1- Day time is reckoned in between 6.00 a.m.-10.00p.m.
- 2- Night time is reckoned in between 10.00p.m.-6.00 a.m.
- 3- Silence is defined as areas upto 100 meters around such premises as hospitals, educational institutions, courts and eminent temples.
- 4- Use of vehicular horns, loud speakers and bursting of crackers shall be banned in those zones (Notification 2000).

**Results and Discussion**

Results of sound pressure level data are given in Table-1 and standards of ambient air quality in respect of noise are mentioned in Table-2.

As it is evident from the table-1 that the values of sound pressure level varied between 71.9 dB (A) to 77.8 dB (A) and average sound value was obtained 74.61 dB (A) Leq. At sampling point-A. Since this comes within the commercial area where number of vehicular movements and other activities are held. Average value of noise at this place is beyond the standard prescribed for this area. It may be due to chauraha of Ranipur mode from where heavy traffic passes.

Sound pressure level values ranged from 59.0 dB (A) to 69.8 dB (A) Leq at sampling-B and at this point average value of noise level data were recorded 63.55 dB(A) which is more than the limits prescribed for the categorized area. This sampling point comes within residential area however averaged values of sound level is observed higher due to vehicular movements at Ranipur mode chauraha from where noise level remains generally higher.

The Values of sound pressure level varied between 56.1 dB (A) to 63.0 dB (A) Leq. and average value 59.24 dB (A)Leq. at monitoring station-C. This station is considered as silence area as per rules (2000). Average value at this point is higher than the limit prescribed for the silence zone. Which is due to movement of light vehicles and noise contamination of heavy traffic's horns blowing at main road of the city.

The minimum and maximum noise level at sampling point-D were observed as 46.9dB (A) Leq. and 71.4 dB(A) Leq. and average value was obtained 67.31 dB (A) Leq. Since this sampling point is

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made within the city Hospitals emergency ward which is situated at main road of the city. Hospitals are defined within silence zone and at this point average value of noise level also found more than the limits prescribed for silence zone. Higher value may be due to instantaneously movements of vehicles and blowing of horns, operating of generator sets during power failure as hospital needs regular power.

The value of minimum maximum and average noise level were obtained as 62.2, 73.9 and 67.62 dB (A) leq. at sampling point-E i.e. Har Ki Pauri. This sampling point comes within silence area as it is also defined as silence zone due to eminent temples which are situated here. The average value of noise level is higher than the limits prescribed for the silence zone (Table-2). Noise level monitoring was conducted at this point before Arti Pujan. However average value was obtained higher due to movements of light vehicles and blowing of horns. Light vehicle bring the pilgrims from roadways bus station and railway station.

Values of noise level at sampling station-F (Har- Ki- Pauri Ghat) ranged between 72.0 dB (A) 83.6 dB(A) and average sound pressure level observed was 78.8 dB (A) Leq. Since noise level monitoring was conducted at this sampling point during Arti Pujan period (19.30 hrs to 19.40 hrs) the average value of noise level was obtained too much higher than the other sampling stations which are much more than limits prescribed for silence zone (Table-2). Higher average value of noise level at this point may be due to playing Tom-Tom and music equipments during Arti Pujan and blowing of horns by light vehicles and movement of heavy traffic on Hardwar- Rishikesh road which increases the noise level. Babu (2003) reported noise (30.0 to 90.0 dB (A)) Leq. by traffic.

Higher noise can disturb our work, rest, sleep and communication. It can damage our hearing and evoke other psychological, physiological and probably pathological reaction. However because of complexity, variability and the interaction of noise with other environmental factors, the adverse health effects of noise do not lend themselves to a straight forward analysis. Hearing loss can be either temporary or permanent. Noise induced temporary threshold shift (NITTS) is a temporary loss of hearing activity experience after a relatively short exposure to excessive noise. Pre-exposive hearing is covered fairly rapidly after cessation of the noise. Noise induced permanent threshold shift (NIPTS) is an irreversible loss of hearing that is caused by prolonged noise exposure. Both kinds of loss, together with presbycusis, the permanent hearing impairment that is attributed to the natural aging process, can be experienced simultaneously ETI

(2000).

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