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ASSESSMENT OF NOISE POLLUTION LEVEL AT 5 COMMERCIAL AREAS OF ALLAHABAD CITY, INDIA

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ABSTRACT

The present study deals with the assessment of Noise pollution at 5 Commercial areas of Allahabad City. The Noise pollution recorded was more than 65 dB (A) during day time which is the prescribed standard level for Commercial Zone by CPCB at all Commercial areas. Noise descriptors such as L10,L90, Lnp were assessed to reveal the extent of noise pollution in the studied areas. The Lnp value for Bairhana was 121.6 dB (A), the Lnp value for Muthiganj was 123.41 dB (A), the Lnp value for Chowk was 126.99 dB (A), the Lnp value for Katrawas 121.61 dB (A) and the Lnp value for Civil lines was 116.76 dB (A). The reason behind the high level of noise pollution was the frequent occurrence of traffic jam. Study indicated that, the localities are highly affected by Noise pollution.

KEY WORDS
Noise Pollution
Commercial Areas
Traffic and Roads

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INTRODUCTION

Noise is an unacceptable level of sound that creates annoyance, hampers mental and physical peace and may induce severe damage to the health. Exposure to high level of noise may cause severe stress on the auditory and nervous system of the city dwellers, particularly the children (Alam *et al.*, 2006; Goswami *et al.*, 2010a, 2010b; Mohapatra *et al.*, 2010). In the 21st Century, human population is experiencing the manmade plague of environmental noise from which there is virtually no escape, no matter where we are - in our homes and yards, on our streets, in our cars, at theaters, restaurants, parks, arenas, and in other public places (Goines and Hagler, 2007).Urban traffic noise is one of the most pervasive types of noise pollution and generally considered more intrusive than other types of noise such as industrial noise, airport noise and community noise (Zanninet al., 2003; Filho *et al.*, 2004).Despite attempts to regulate it, noise pollution has become an unfortunate fact of life worldwide. In a way that is analogous to second-hand smoke, second-hand noise is an unwanted airborne pollutant produced by others; it is imposed on us without our consent, often against our wills, and at times, places, and volumes over which we have no control (USEPA, 1978). The present environmental pollution problems are universal in almost all the countries. Road traffic, jet planes, garbage trucks, construction equipment, manufacturing processes, and lawn movers are some of the major sources of this unwanted sound that are routinely transmitted in to the air (Birgitta&Lindvall, 1995).Various works have also been done on the relationship between the extent of reaction of people and exposure to traffic noise in different cities (Chakraborty et al., 1998; Zannin *et al.*, 2003; Gorai *et al.*, 2006). However, more recent research has concentrated on the relationship between noise and non-auditory effects (Stansfeld, 2003). Social survey data has shown that annoyance, sleep disturbance and cardiovascular problems are considered to be the most important environmental noise effects (Ouis, 2011; Langdon, 1976).Allahabad is among one of religious city and been a hub of education since long. In the present scenario, noise is becoming an increasingly source of discomfort and danger in the vicinity of Allahabad city. Therefore an attempt has been made to assess the noise levels in commercial of Allahabad city.

MATERIALS AND METHODS

The ambient noise monitoring was carried out in commercial areas of Allahabad city, Uttar Pradesh, India. Allahabad is in south-eastern part of Uttar Pradesh, India, at the confluence of the Ganges and Yamuna (Allahabad location guide and Location of city, 2012). According to Allahabad city population census 2011, Allahabad city has a population of 1,117, 094. Noise pollution is frequent in this town; noise mainly arises from the transportation system.

For the monitoring of noise level, 5 different commercial locations were selected

for the study with the help of a sound level meter and compared with the standard sound level described in environmental protection act, 1986 and standards of CPCB (Tripathy, 1999). The standards sound level meter, model no. TES1350A was used in this study measuring sound pressure between 20 to 20,000 Hz. The range and sensitivity of the instrument was 35-130 dB(A). The noise level was recorded at a minimum distance where cumulative noise was expected from different sources. Monitoring was carried on from 23rdFebruary to the 31stMarch 2015 (25 days) at a height of 1.5 m and 1 m away from the chest at 10 minutes intervals for 3 hours. Each site was monitored for 5 days. The measurement of noise level was taken during the evening (5pm to 8pm) at peak time.According to recommended noise standards, the maximum limit for noise level in Silence Zone during day is 65dB and in night is 55dB (Sharma and Joshi 2010).

RESULTS AND DISCUSSION

The sound levels recorded from 5 different commercial areas of Allahabad city were presented in Fig. 1. The noise levels were monitored and measured with the aid of TES 1350A sound meter. The level of Noise Pollution during present study of commercial areas was noticed to be higher when compared with the standards limits.

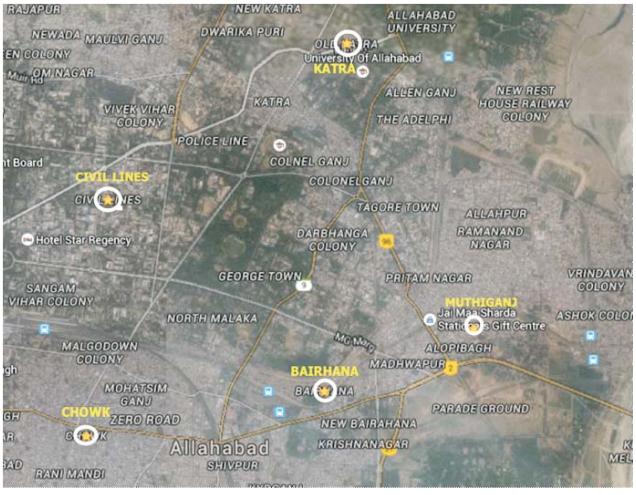

Figure 2: Map showing 5 commercial locations in which the Assessment of Noise pollution was conducted

It was observed that the parameters of each area were quite high and are above the standard limits raised by the CPCB. All five areas are highly affected by noise. The maximum L10 and Lnpwere recorded the highest at Chowk with 126.99 dB and the minimum L10 and Lnp were found at Civil lines at 103.08 dB.The reason for the high level of noise pollution at chowk was the frequent occurrence of traffic jam compared to the other four areas, Chowk has a narrow roads with a large number of vehicles and crowd passing through. Civil lines on the other hand has a gridiron plan roads which makes transportation much easier, it also has a proper traffic system therefore the overall noise level were much lesser. Similar results were also reported by Goswami and Swain (2013) demonstrated that even in a semi urban, medium sized city namely Baripada, environmental noise are higher than the limits set up by Central Pollution Control Board of India in all the investigated sites. The study reveals the fact that type of zone, geographic features, landscape and topography are factors on which noise emission and transmission depends. Chauhan (2008)reported that noise level in Haridwar and Dehradun city was higher than the prescribed limit of CPCB, India. Bodhe *et al.*, (2006) monitored the impact of noise on residential areas. Pathak *et al.*, (2008) reported that traffic noise became main reasons of headache, high BP and other stresses among the exposed individuals in adjoining working places in Varanasi City. Ganwar *et al.*, (2006) reported that noise level in Bareilly Metropolitan city was slightly higher than prescribed limit of the Central Pollution Control Board of India. Important factors affecting noise values are continuity of the city centre traffic, dimension of the roads, position of the roads and the road surface materials with city centre crossroad signal system (Tang and Tong, 2004). Traffic noise levels increase with increasing density of traffic related with the traffic composition, road slope, road width, road surface structure distance to crossroad (Williams and McCrae, 1995).

Table 1: Values of L10, L90 and Lnp for different commercial areas for weekdays between 4 pm to 7 pm Parameter measured in dB (A)

Commercial Areas	Parameters	Maximum	Minimum
Bairhana	L10(mean1)	100.76	92.11
	L90(mean1)	73.24	69.01
	Lnp(1)	121.6	106.54
Muthiganj	L10(mean2)	102.65	97.75
	L90(mean2)	73.24	69.76
	Lnp(2)	123.41	116.31
Katra	L10(mean3)	98.56	92.75
	L90(mean3)	66.43	63.23
	Lnp(3)	121.61	111.22
Chowk	L10(mean4)	103.61	99.55
	L90(mean4)	71.15	67.16
	Lnp(4)	126.99	119.46
Civil Lines	L10(mean5)	96.34	87.76
	L90(mean5)	66.08	64.16
	Lnp(5)	116.76	103.08

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