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Assessment of noise level status in institutional areas of Samba Town, J&K

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Abstract

Noise pollution has been well recognized as one of the major trepidations that impact the quality of life. It is more widespread and severe than ever before and it will continue to increase in magnitude and severity because of population growth, urbanization, industrialization, sustained growth in highway, rail and air traffic. The potential health effects of noise pollution are numerous, pervasive, persistent and medically and socially significant. The noise pollution control has become an important consideration in urban planning, in construction practices and in public administration. The present study has been conducted to assess the status of noise level in different institutions of Samba town in District Samba. The noise levels of Banks, Post offices, SSP office, DC office and Tehsil office located at different sites of study area were measured using Sound Level Meter (Data logger model:407764A). From the observed readings of SPL (Sound Pressure Level) Maximum SPL, Minimum SPL and Leq (Equivalent Noise Level) were calculated. The study revealed that indoor SPL values were observed to range from 50.1dB(A) to 89.9 dB(A) at Banks, 42.3dB(A) to 77.6dB(A) at SSP office, 42.1dB(A) to 76.4dB(A) at DC office, 40.0dB(A) to 66.4dB(A) at Tehsil office and 40.1dB(A) to 58.6dB(A) at Post offices. The outdoor SPL values exhibited varying ranges at different sites. The calculated Leq values except for some sites were also observed to be above the statutory permissible limits. The noise assessment study clearly revealed the alarming condition of noise pollution in Samba town and needs implementation of noise abatement strategies to mitigate the noise pollution.

Keywords: Environment, institutions, indoor noise, outdoor noise

Introduction

Noise pollution is undesired sound that is disruptive and dangerous and can cause harm to life, nature and property. It is often said noise differs from other forms of pollution in that, unlike atmospheric pollutants for example, once abated, noise leaves no residual accumulation in the environment or human body. Noise does leave behind its effects, however, and these can deteriorate after continued exposure to harmful sounds. So, it is not true, strictly speaking that "noise...leaves no visible evidence. There are three major sources of noise i.e. industrial noise, community noise and traffic noise (Nagi et al., 1999) [3]. The noise levels to which the urban population is exposed have been increasing at a substantial rate over the past few decades. Investigations in several countries in the past decades has indicated that noise has adverse effect on human health living in close proximity to busy highways (Ohrstorm and Rylander, 1990; Babisch *et al.*, 2001; Ljungberg and Neely, 2007) [4, 1, 2]. In the present study, attempt has been made to assess indoor as well as outdoor noise levels in various institutions which are located at different sites of Samba Town. Samba is situated on range of Shivalik Hills alongside the National Highway at a distance of 40km from Jammu.

Material & Methods

To assess the noise levels in various institutions of Samba town of Samba District, the noise levels of DC office, SSP office, Tehsil office, Banks and Post offices located at different sites of study area were measured. The noise levels were recorded thrice a day i. e, Morning period (0800-1000), Noon period (1200-1400) and Evening period (1800-2000). During each sampling of noise, 20 readings of SPL (Sound Pressure Level) were recorded at an interval of 30 seconds in a period of 10 minutes. At the end of 10 minutes, minimum and maximum SPL (Sound Pressure Level) were recorded with the help of Sound Level Meter

(Data logger model: 407764A). From the observed readings of SPL (Sound Pressure Level), following noise Indices were calculated:

1. Leq (Equivalent Noise Level)
2. Maximum Sound pressure level(SPL)
3. Minimum sound pressure Level (SPL). Leq (Equivalent Noise Level) was calculated by following formula:

$$L_{eq} = 10 \log(\sum_{i=1}^n f_i 10^{L_i/10}) \text{ dB (A)}$$

Where,

Fi=fraction of time for which the constant SPL persists.

I=time interval

n=number of observations

Li=Sound intensity

Finally, the data of Max SPL, Min SPL and Leq were compiled to calculate average levels. The average values were tabulated and also represented in form of histogram.

Results And Discussion

The critical analysis of the compiled values of indoor levels from (0800-2000 hrs) of different sites of institutional Area revealed that maximum noise level of 89.9dB (A) was recorded at Banks followed by 77.6 dB (A) and 76.4 dB (A) at SSP and DC office respectively. 66.4dB (A) was recorded at Tehsil office and 58.6 dB (A) at Post office. Also the maximum outdoor value of 108.0dB (A) was recorded at SSP office and minimum of 44.3 dB (A) at Tehsil office. Also the maximum indoor values of Leq (10 minutes) were recorded to be 70.24 dB (A) at SSP office followed by 68.08dB (A), 64.55dB (A), 52.42dB(A) and 51.57dB(A) at Banks, DC office, Tehsil office and post office respectively (Table-4).

Table 1: Indoor and Outdoor Noise Levels at different Institutions of Samba Town

SITES		Morning (0800-1000hrs) Noise Levels dB(A)		
		Max	Min	Leq
DC office	Indoor	70.1	50.1	65.19
	Outdoor	89.9	64.3	77.57
SSP office	Indoor	75.9	42.3	68.08
	Outdoor	108.0	61.5	95.91
Tehsil office	Indoor	52.3	40.1	48.14
	Outdoor	65.3	44.3	58.76
Post office	Indoor	58.4	50.0	52.41
	Outdoor	62.4	45.4	56.56
Bank	Indoor	75.1	51.1	65.72
	Outdoor	106.4	58.6	88.66

Table 2: Indoor and Outdoor Noise Levels at different Institutions of Samba Town

SITES		Noon (1200-1400hrs) Noise Levels dB(A)		
		Max	Min	Leq
DC office	Indoor	76.4	56.4	69.63
	Outdoor	99.9	64.6	88.25
SSP office	Indoor	77.6	60.1	72.48
	Outdoor	101.3	69.4	90.40
Tehsil office	Indoor	66.4	40.2	55.71
	Outdoor	94.4	50.1	78.68
Post office	Indoor	58.6	50.8	54.04
	Outdoor	60.4	51.2	55.81
Bank	Indoor	89.9	54.6	73.86
	Outdoor	102.3	62.4	88.76

Table 3: Indoor and Outdoor Noise Levels at different Institutions of Samba Town

SITES		Evening (1800-2000hrs) Noise Levels dB(A)		
		Max	Min	Leq
DC office	Indoor	66.4	42.1	58.85
	Outdoor	99.2	62.3	86.42
SSP office	Indoor	74.9	52.3	70.16
	Outdoor	78.4	48.9	72.13
Tehsil office	Indoor	62.3	42.2	53.41
	Outdoor	62.4	46.4	58.43
Post office	Indoor	54.3	40.1	48.26
	Outdoor	58.4	40.1	53.73
Bank	Indoor	76.6	50.1	64.46
	Outdoor	92.3	58.4	80.59

Table 4: Indoor and Outdoor Noise Levels at different Institutions of Samba Town

SITES		(0800-2000hrs) Noise Levels dB(A)		
		Max	Min	Leq
DC office	Indoor	76.4	42.1	64.55
	Outdoor	99.9	62.3	84.08
SSP office	Indoor	77.6	42.3	70.24
	Outdoor	108.0	48.9	86.14
Tehsil office	Indoor	66.4	40.0	52.42
	Outdoor	94.4	44.3	65.29
Post office	Indoor	58.6	40.1	51.57
	Outdoor	62.4	40.1	55.36
Bank	Indoor	89.9	50.1	68.08
	Outdoor	106.4	58.4	86.00

The analysis of average indoor and outdoor Leq during 0800-2000hrs of different institutions revealed that there is specific correlation between indoor and outdoor noise levels. Banks located near commercial areas exhibited higher values of noise levels as compared to the institutions located away from commercial area. The analysis of the data at all the sites revealed that maximum indoor noise levels were observed to be during Noon time (1200-1400hrs). The average indoor and outdoor noise levels in Institutions were recorded to be 61.37dB (A) and 75.37dB (A) respectively (Table 5). During the study, it was observed that both external and internal sources of noise were responsible for increase in noise pollution of institutions. Road traffic is a major source of noise in samba town. A modern Industrial complex established in Samba is also adding to this problem besides community noise, modern devices of recreation and crowded town. The result showed that the noise at various sites was composite in nature. Moreover, the average outdoor noise level of institutions irrespective of location were quite high than the prescribed values of CPCB. The observed values were even higher than those prescribed for Industrial Area. Noise pollution can cause negative impact on public health and welfare. (Ohrstorm and Rylander, 1990; Babisch *et al.*, 2001; Ljungberg and Neely, 2007) ^[4, 1, 2]. People staying in noisy area especially above 70dB (A) should take precautionary measures in order to avoid noise induced harmful effects. Thus, there is a need to aware and educate the citizens about the rising noise pollution. Disseminating a key message that control of noise at individual level mixed with a dose of punitive regulatory action can tackle the problem of noise pollution to a great extent.

Table 5: Average indoor and outdoor Leq (10 minutes) of institutions at Samba (0800-2000 hrs).

Indoor	61.37 dB(A)
Outdoor	75.37 dB(A)

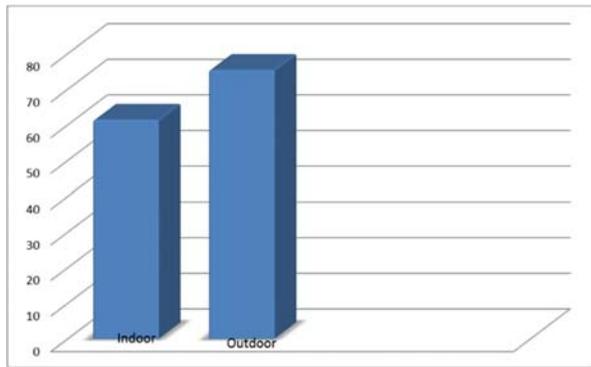


Fig 1: Average indoor and outdoor Leq (10 minutes) of institutions at Samba (0800-2000 hrs)

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