

**ASSESSMENT OF NOISE IN INDUSTRIAL AND COMMERCIAL ZONES OF AN URBAN SETTING****Faiza khalil***Assistant Professor, Lingayas Vidyapeeth, Faridabad, Haryana, India*

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**Abstract** - Urban zones with fast modernisations are influenced by noise related medical problems. This problem originating from the street activity noise, rail movement noise, air movement noise, mechanical noise, group commotion and different random sources influences people in everyday life. Sound Level meter (Larson & Davis) type1 integrating with free field microphone was utilized to make the noise monitoring at different areas on the roadway of concerned zones of Delhi. The primary objective is to monitor noise level in the Commercial and Industrial zones of Delhi. The main objective is to compare the noise levels with the limits prescribed by Central Pollution Control Board (CPCB). To find out noise levels which people encounter in their daily life, sampling was carried on the roadside from 08 hrs to 20 hrs a day in the month of January 2017 on the selected locations. The results indicate high noise levels, surpassing on many occasions to the prescribed levels.

**Key Words:** Industrial, commercial, decibels, noise levels, sound level meter

**1. INTRODUCTION**

The complex urban soundscape comprises of environmental noise from transit systems, the built environment, road traffic, construction, industry, population density etc. These sources are additive to any other sources of noise that individuals may be exposed to. Noise pollution is a significant environmental problem in many urban areas. Noise pollution has been stated as a serious health hazard (Bies and Hansen, 1996; Yilmaz and Ozer, 2005), with noise-related damage to humans ranging from annoyance to insanity and death (Mato and Mufuruki, 1999). The influences of noise on human health may be physical or psychological. Nelson (1987) reported that long term exposure to high occupational noise can result in permanent hearing loss. Additionally, commonly experienced noise effects may include annoyance, deterioration of sleep quality, and stress-related various type of heart disease (Anonymous, 1997; Morrell et al., 1997). According to World health organization (WHO) noise is Considered as third most hazardous type of pollution, right after air and water pollution (WHO, 2005).

Major cities like Mumbai, Delhi, Kolkata and Chennai are listed among the noisiest cities in India (Shastri et al., 1996). Many surveys addressing the noise pollution problems has been conducted for several cities of the world (Alberola et al., 2005; Bhosale et al., 2010) and have clearly shown the scale of discomfort that noise causes in people's lives (Vidyasagar and Rao, 2006).

Delhi (28.7041° N, 77.1025° E) capital territory of India, situated on the bank of river Yamuna, is a massive metropolitan city in the country's north. Delhi is amongst the

most populous cities of India having population 28 million (2017) and total area of 1484 km<sup>2</sup>. Traffic noise is a major environmental concern in Delhi. Various types of vehicle, automobile, cycle, rickshaw etc. create tremendous noise at various points of this city. Vehicular noise depends on the quality of the engine and exhaust system, traffic flow, interaction with road surface, tire and honking of horns. In this study noise monitoring is done at some pre-selected locations of Industrial, Commercial zones of Delhi. Data recorded is presented in the form of charts. Noise levels were exceeding the limits prescribed by Central pollution control board (CPCB) in all zones.

**1.1 Scope & Objectives**

Scope of this study is comparative assessment of noise levels at the selected road stretches of Industrial, Commercial, Residential and Institutional area of Delhi. The continuous monitoring of noise at various locations will give clear picture about the variation of the noise intensity. The noise parameters recorded at these areas will be compared by the standards prescribed by Central Pollution Control Board. The study will be valuable contribution in the area of noise management/abatement, especially at planning stage and redevelopment of urban areas. The study will be helpful in traffic planning, development of realistic objectives for noise management. It will be supportive tool for the identification of areas with high potential of reduction measures. It will also provide more effective use of local, regional and national planning procedures to control and reduce noise. Besides, it will be useful in monitoring the effectiveness of action plans and other planning procedures. Besides, the present study will provide an extended spatial database, spatial tools and computation force to quantify and visualize noise effects.

**1.2 Aim**

The aim of this study is comparative noise assessment in industrial and commercial zones of Delhi City. The specific objectives of this study are:

- i. Extensive field survey for sampling locations as per norms
- ii. Identification of sampling location for Industrial and Commercial area
- iii. Noise monitoring at selected locations

Comparative Assessment of noise with standards prescribed by Central pollution control board (CPCB).

**2. METHODOLOGY**

In order to assess noise pollution, major noisy area has been identified in respect of commercial, residential, Industrial

and silent zones. Accordingly, noise levels have been measured in each identified station. The study was conducted during the month of January 2017. Noise levels were measured using sound level meter. Ambient sound levels are being compared with the prescribed standards of CPCB (Central Pollution Control Board), India.

**Data Collection**

The desired data in terms of noise levels have been recorded and collected from different sites selected for noise monitoring in Institutional, commercial, residential and Industrial zone of Delhi. During monitoring of noise levels at various zones international guidelines will be followed. Monitoring was carried out with instrument at a height of 1.2 to 1.5m and 1m away from the chest. Noise monitoring is done for a period of 12 hours from 8 a.m. in the morning to 8 p.m. in the evening in the month of January 2017.

**Site selection**

Lajpat nagar is a residential and Commercial neighbourhood of the South Delhi. It is today most known for its Central market.

Okhla Industrial area is divided into 3 phase, where phase 2 is taken as study area. Okhla Industrial phase –II is an industrial suburb of New Delhi in South Delhi. Okhla Industrial Phase I and Phase II is one of the 28 notified industrial areas of Delhi, as per the Master plan of 2001.

Locations in each zone are selected as per the Table 1.

**Table -1:** Site selection

S.NO	ZONES	LOCATION	LATITUDE	LONGITUDE
1.	<b>COMMERCIAL LAJPAT NAGAR</b>	Central market	28.569229°N	77.241735°E
2.		Alankar cinema road	28.568859°N	77.240874°E
3.		Veer sawarkarmarg	28.569566°N	77.242296°E
4.	<b>INDUSTRIAL OKHLA INDUSTRIAL PHASE II</b>	Honda motors	28.536933°N	77.267864°E
5.		Brinco sales pvt ltd	28.538649°N	77.271308°E

**Noise monitoring instrument**

Noise monitoring is done with type1 integrating sound level meter shown in figure 2.6 with free field microphone. Larson & Davis Model 831IEC 61672-1:2002, ANSI S1.4, ANSI S1.43 Class 1 integrating sound level meter is used.



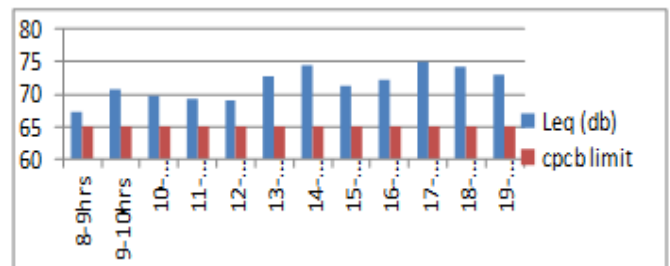
**Noise monitoring**

Noise monitoring is done in the month of January from Monday to Saturday. Monitoring is done for a period of 12 hours from 8 a.m. to 8 p.m.

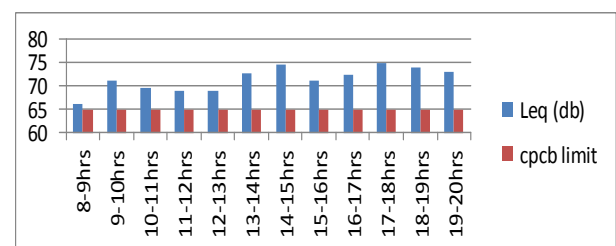
**3.RESULTS AND DISCUSSIONS**

The study is conducted on 5 different locations situated in different parts of Delhi. Comparative assessment of noise levels with the limits prescribed by Central pollution Control Board for different zones is presented graphically.

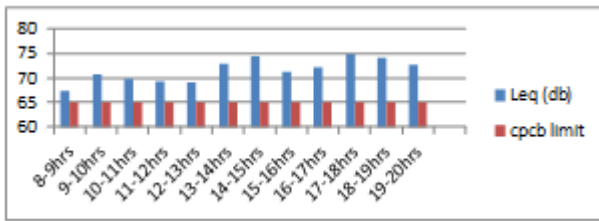
**3.1 Results of Commercial area Lajpatnagar**



**Chart 1:** Comparison of noise levels with standards prescribed by Central Pollution Control Board 28<sup>th</sup> January 2017



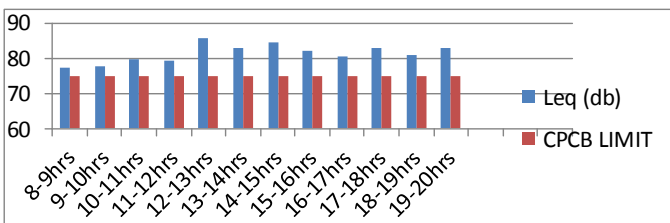
**Chart 2:** Comparison of noise levels with standards prescribed by Central Pollution Control Board 30<sup>th</sup> January 2017



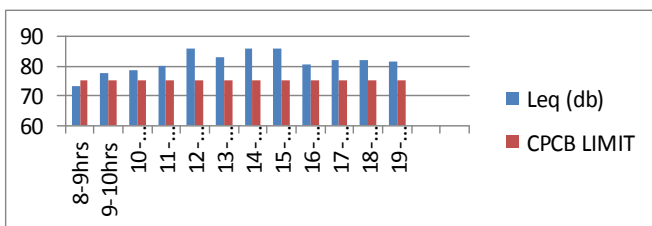
**Chart 3:** Comparison of noise levels with standards prescribed by Central Pollution Control Board 31<sup>st</sup> January 2017.

The observations show that noise levels are in the range of 63.5 to 87.1. Noise levels are higher after 10 a.m. in morning with highest noise levels recorded between 14-15 hrs and 17-19 hrs. The CPCB standards of noise in commercial area are 65 dB in day time and 55 dB in night time. Huge crowd, shouting of hawkers, shouting of sales men, are the main reason of noise in this area.

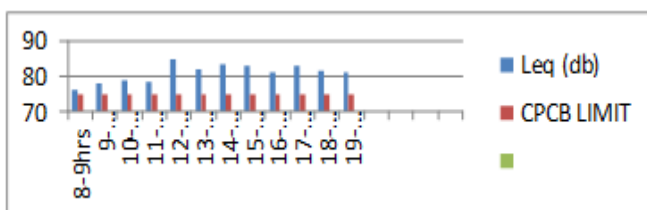
**3.2 Results of Industrial area**



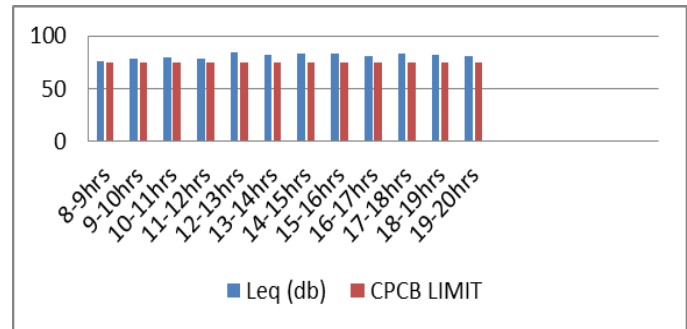
**Chart 4:** Comparison of noise levels with standards prescribed by Central Pollution Control Board 23<sup>rd</sup> January 2017



**Chart 5:** Comparison of noise levels with standards prescribed by Central Pollution Control Board 24<sup>th</sup> January 2017



**Chart 6:** Comparison of noise levels with standards prescribed by Central Pollution Control Board 25<sup>th</sup> January 2017



**Chart 7:** Comparison of noise levels with standards prescribed by Central Pollution Control Board 27<sup>th</sup> January 2017.

The observations show that the noise levels are in the range of 68 dBA (Lmin) to 94.5 dBA (Lmax).The Standards prescribed by Central Pollution Control Board for Industrial area are 75 dba in day time and 70 dba in night time .Lmin values are close to the Standards prescribed by CPCB. Honking of horns of vehicles is the main reason of noise.

**4. CONCLUSIONS**

This study elucidates the levels of noise pollution in different zones in Delhi city, capital of India. From the present study it is clear that the noise levels in all zones of Delhi city were higher than the prescribed limit by Central Pollution Control Board.

**CONCLUSIONS FOR COMMERCIAL AREA**

In commercial area hawkers, peddlers, customers, vendors all contribute towards increasing noise levels. Noise levels are in the range of 63.5 dB to 87.1 dB. Noise levels are higher after 10 a.m. in morning with highest noise levels recorded between 14-15 hrs and 17-19 hrs. The CPCB standards of noise in commercial area are 65 dB in day time and 55 dB in night time. Apart from noise due to commercial activities, there is traffic noise from vehicle horns, engines, and traffic volume. Lajpat Nagar is exposed to intracity road traffic noise every day; the most affected being the traders, pedestrians, commercial vehicle drivers and school children having their schools close to the main road.

**CONCLUSIONS FOR INDUSTRIAL AREA**

In Industrial area noise levels are in the range of 68 dBA (Lmin) to 94.5 dBA (Lmax). The Standards prescribed by Central Pollution Control Board for Industrial area are 75 dBA in day time and 70 dBA in night time .In Industrial area heavy vehicles like trucks carrying machines or other items contribute towards noise pollution. In some places industrial operations also contribute towards noise pollution.

**6.SCOPE FOR FUTURE WORK**

The main reason of noise pollution in the City are rapid urbanization and rapid increase of vehicular population,

congested traffic area, unplanned road network, construction of silence zone in the main area of the city, unplanned urban sprawl etc.

Necessary preventive measures must be taken by the authority to implement the Noise Pollution (Regulation and Control) Rules, 2000. At the same time plantations of greenery near the road will help in absorbing the noise. Prohibition of honking of horns near the silent zone, use of noise barriers, limitation of vehicle speeds, alteration of roadway surface texture, limitation of heavy duty vehicles, use of traffic controls that smooth vehicle flow, innovative tire design methods etc. should be adopted for controlling noise pollution.

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