The Elated Deviation of Noise Levels in Residential Zones of Urban Areas: Causes and Concerns

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ABSTRACT:
Noise pollution in residential areas poses a substantial threat to public health, wellbeing and overall quality of life. In urban dwellings, noise levels in residential areas have been exceeding the normal limits and these areas were no more immune to the noise. Not a single area showed the desired noise levels as well as not even a single reading of prescribed noise level was reported during the day time in all these areas. In the observed residential areas, there is not even a single slot of prescribed normal level was present in residential areas too**.** Due to the rapid urbanization, often unmatched by proper layout of roads, highways and buildings; industrial, residential and commercial areas lie in close proximity. This disturbs the peaceful environment of residential areas.

Key Words: Noise, Residential, Silence, Day Time

INTRODUCTION

Residential areas provide a protection from the hustle and bustle of urban life. However, the serenity of these communitiesis increasingly under threat from the insidious problem of noise pollution. Whether it's the incessant roar of traffic, the blaring of horns or the disruptive sounds of neighbors and nearby businesses, noise pollution in residential areas poses a significant challenge to the health, wellbeing and quality of life of residents. Noise evel in residential has been continuously exceeding the normal limits. Noise pollution is a serious threat to thequality of man's environment. Noise, is over-loud and disturbing sound which has the capacity to affect human health and behaviour. Sound level is measured in decibels (dB). It is a unit for expressing the relative intensity of sound on a scale from 0 to 130. Fast growing vehicular density in the towns and cities in the recent years, has resulted in considerable increase in traffic on roads causing alarming noise pollution. Under the Noise Pollution
(Regulation and Control) Rules, 2000, the Central Pollution ControlBoard (CPCB) provides noise norms for four different types of zones viz. Industrial, Commercial, Residential and Silence. Noise limit cannot be exceed beyond 55 decibels during the day and 45 decibels during the night hours in the Residential zones. According to standards set by the Bureau of Indian Standards (BIS), 125 decibels is the maximum limit for horns used in commercial vehicles, while 105 decibels is the maximum limit for two wheelers. In India, few studies on traffic noise level have been carried out. CSE (Centre for Science and Environment) researchers say: “India lacks monitoring capacity – and therefore, data - on noise is scarce. The lack of data and consequently, awareness, makes people to worry about this problem. Data gathered by Chandigarh Police revealed that the number of vehicles owned went up from 60.68% in 2004 to 96% in 2016. Though the number of vehicles increased, the population growth rate remained low at 4%. (Tribune News Service; Chandigarh, February 5, 2019)**.** For the last 10 years, the city added 4.68 lakh two-wheelers and cars.Chandigarh has topped the list of cities with the most number of vehicles perhead in India.This traffic congestion leads to increase in noise pollution in the city. Reporting and Controlling noise is a part of this endeavor. The objective of the study was to study the existing status of noise levels in thestudy areas by recording the noise intensity at various locations.

METHODOLOGY

Chandigarh Administration in exercise of powers conferred under sub rule (2) of rule (3) read with clause (b) of rule 2 of the Noise Pollution (Regulation & Control Rules) 2000 has categorize the area of the UT

Chandigarh into industrial commercial, residential or silence areas/zones. As per schedule of the above rules Ambient Air Quality Standards in respect of Noise in residential areas is as below.

Category of Area		Limit in dB (A)	
	Locations in Chandigarh	Day Time	Night Time
Residential Area	Residential area of Chandigarh comprising of the following Sectors except areas falling under the Educational Institutions, Hospitals and Leisure Valley. Sector 2 to 5, 6 (excluding, Golf Course), 7 to 11,15,16,18 to 33, 34-C and D,35 to 42, 43-A and B, 44, to 47 and portions of Sector 48 to 56 falling within the boundary of the Union Territory, Chandigarh boundary, Manimajra Town excluding Motor Market & Shopping Complex around Bus Stand and all villages in the Union Territory of Chandigarh	55	45

- Day time shall mean from 6.00 a.m. to 10.0 p.m.
- Night time shall mean from 10.00 p.m. to 6.00 a.m.
- Loud speaker or a public address system should not be used except after obtaining written permission from authority. A loud speaker or public address system shall not be used at night (between 10.00 p.m. to 6.00 a.m.) except in closed permission.

Sound level meter was used to record and measure the noise levels. The noise levels were recorded from roadside offices, organizations, and commercial business centers, which are at distances depending on location of the building from the center of the road, located at different places. Noise levels were measured systematically in different areas (sector-wise). At each spot, the measurements were taken at an interval of 2-hours during daytime (8 AM–8 PM). During the measurements in a particular slot, the average of 5-frequent readings noted at a pause of 5-minutes. The average is taken as the representative of the noise level of that slot.

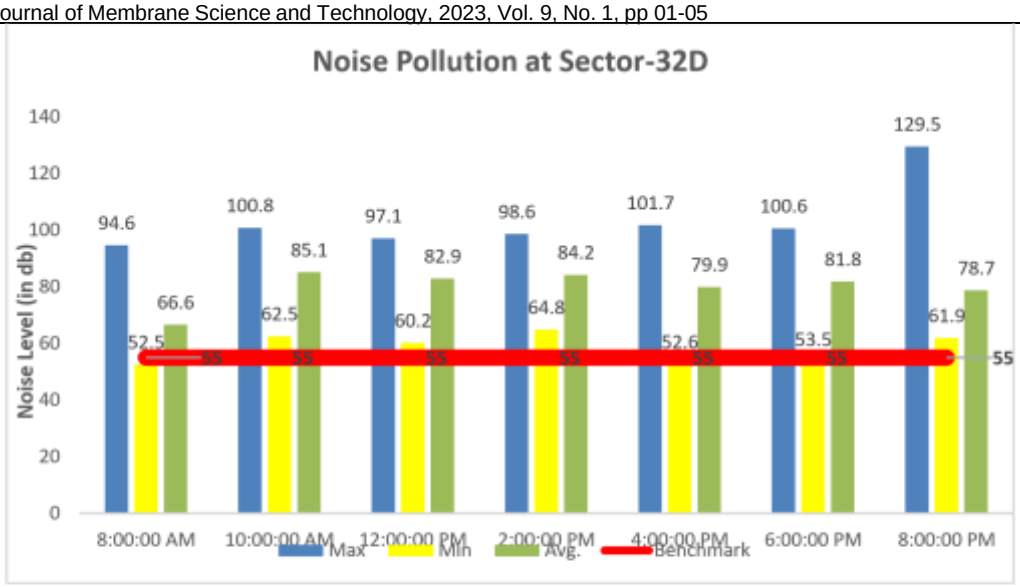
RESULTS AND DISCUSSION

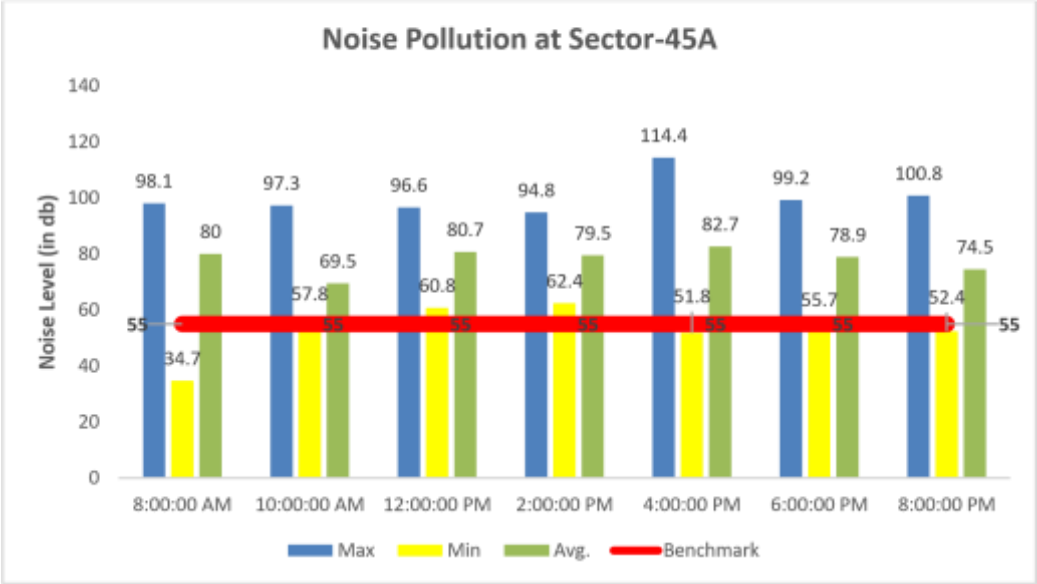
In India, vehicular population is increasing at an alarming rate; populations of cities are facing severe environmental problems from road traffic. Noise from road traffic is major source of environmental pollution.

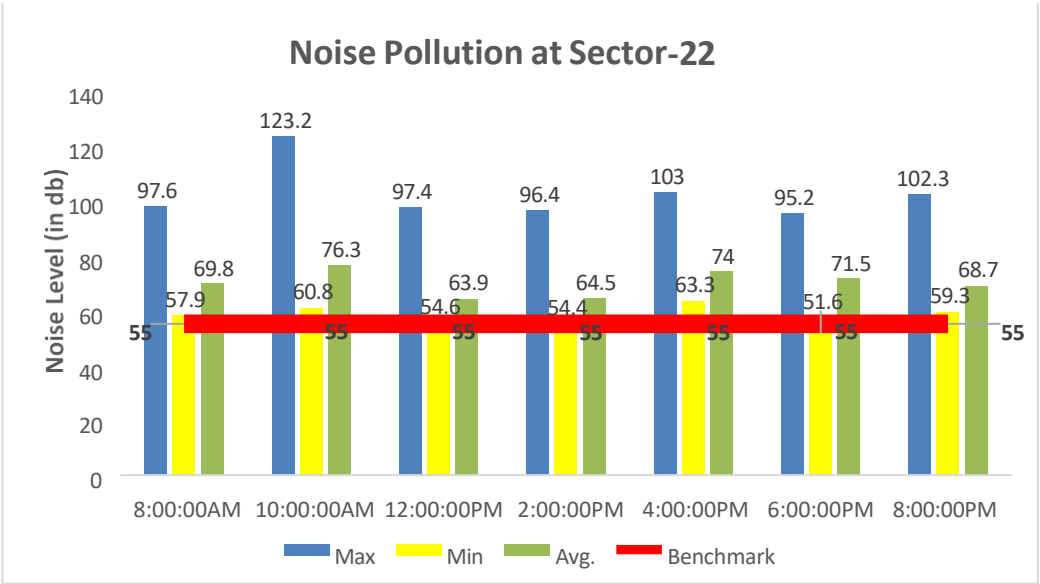
Noise Level in Residential Areas:

The residential areas of Sectors 22 A, 32 D and 45 A, were found not immune to the noise. Not a single area showed the desired noise levels during the day time. Not even a single normal value is reported during the day time.

SECTOR- 32D			**SECTOR-45 A**			**SECTOR 22**		
8 .00	MAX	94.6	8 .00	MAX	98.1	8 .00	MAX	97.6
	MIN	52.5		MIN	34.7		MIN	57.9
	AV.	66.6		AV.	80.0		AV.	69.8
10.00	MAX	100.8	10.00	MAX	97.3	10.00	MAX	123.2
	MIN	62.5		MIN	57.8		MIN	60.8
	AV.	85.1		AV.	69.5		AV.	76.3
12.00	MAX	97.1	12.00	MAX	96.6	12.00	MAX	97.4
	MIN	60.2		MIN	60.8		MIN	54.6
	AV.	82.9		AV.	80.7		AV.	63.9
2.00	MAX	98.6	2.00	MAX	94.8	2.00	MAX	96.4
	MIN	64.8		MIN	62.4		MIN	54.4
	AV.	84.2		AV.	79.5		AV.	64.5
4.00	MAX	101.7	4.00	MAX	114.4	4.00	MAX	103.0
	MIN	52.6		MIN	51.8		MIN	63.3
	AV.	79.9		AV.	82.7		AV.	74.0
6.00	MAX	100.6	6.00	MAX	99.2	6.00	MAX	95.2
	MIN	53.5		MIN	55.7		MIN	51.6
	AV.	81.8		AV.	78.9		AV.	71.5
8.00	MAX	129.5	8.00	MAX	100.8			
	MIN	61.9		MIN	52.4			
	AV.	78.7		AV.	74.5			







Hence regulation of noise will be more challenging in these sensitive areas where more care is required. Noise pollution is causing the damage silently and always remains undetected. Noise pollution control is overshadowed by other types of pollution such as air, water pollution, largely due to lack of awareness about its health implications. There are two major settings where noise occurs, viz., community noise and industrial

noise. Community noise (also called environmental noise, residential noise, or domestic noise) is defined as noise emitted from all sources, except noise at the industrial workplace. Major sources of community noise are automobiles, construction work, loudspeakers, recreational activities, fireworks, etc. At a noise level of 50 dB, an adult can get moderately annoyed and seriously annoyed around 55 dB levels, (Berglundet al 1999, 2011). There are about 2950 Small Scale and 15 Large and Medium Scale Units in existence in Chandigarh as on date. Growth of industry for the last few years has been limited in Chandigarh as it is not an industry led city because of the limited space envisaged for industrial development at the time of original planning of the city. However, still keeping in view the fact that industry would provide crucial resource base in the city, a limited area of about 1450 acres was planned for development as industrial area mainly for the development of small scale and pollution free industries. Administration is also working on traffic congestion due to insufficient capacity of roads, unrestrained demand, or long delays at light-points. This data will be parameterized about the noise created during the peak hours (when large traffic is on the roads) and the least traffic hours. Noise levels in different residential areas of Jharsuguda town in western Orissa (India), minimum, maximum, L10, L50 and L90 noise levels have been computed. It was found that noise levels in the residential areas exceed the standards set by the Central Pollution Control Board, India. Vehicular traffic, with air horns of loud noise, was found to be the main reason for these high noise levels. Strict measures need to be taken to reduce and control the noise pollution (Rita et al, 2006). With increase in the vehicular population, the noise levels are also increasing. The results of one of the study undertaken to assess the noise levels at the major traffic junctions and community area near an educational institution of an urban city. The statistical levels L10, L50, L90 were also measured to determine the Traffic Noise Index at the junctions. A holistic approach was adopted to study the impact of noise on the community. The study indicated a need for proper land-use planning when traffic corridors are built in the silence zone areas (Thakur, 2006). Ambient noise levels emanating from religious activities in residential neighborhoods are an emerging environmental problem that reduces little attention from enforcement agencies and policy makers in Ghana. That study found out the quantify religious noise exposure in urban residential neighborhoods in the Cape Coast metropolis of Ghana (Armah et al 2010). A study was carried out to assess and quantitatively evaluate ambient noise levels in Mumbai Metropolitan Region (MMR) consisting of 9 cities namely Bhiwandi-Nizampur, Kalyan-Dombivli, Mira-Bhayandar, Mumbai, Navi Mumbai, Panvel, Thane, Ulhasnagar and Vasai-Virar. The noise environment was assessed on the basis of equivalent continuous sound pressure levels (L_{EQ}), day-night noise levels (L_{DN}) and Noise Limit Exceedance factor (NEF) during day and night time of working and non-working days in four different area categories, viz. industrial, commercial, residential and silence zones. Appropriate demarcation and planned use of city space is important to avoid exposure to rising noise pollution levels (Kalawapudi et al 2020). The results of study in Vadodra had showed the highest equivalent noise level of 93.7 dBA in the commercial zone followed by 85.5 dBA in the industrial zone, 73.2 dBA in silence zone, and 70.2 dBA in the residential zone. The values of noise level were high in all the zones of the city increasing remarkably over the prescribed limit given in the Noise Pollution (Control and Regulation) Rules, 2000. Continuous exposure to such high level of noise may lead to detrimental effect on people. One of the persistent environmental issues today is high noise levels in residential areas especially in the developing countries. There are several unorganized informal sector activities such as recreational, road traffic, household and religious activities, operation of power generating sets, incompatible uses in space among others that are the sources of noise pollution in residential areas. The study in Enugu Urban has discovered that residential properties affected by noise pollution have lower rental value compared to those unaffected by 3.1% of its rental value. The study has provided some insight to guide property buyers or users, investors, property managers and valuers as regards property transactions. The study has suggested that property value spatial index of noise pollution in the study area can be built and use as a guide for urban management strategy to achieve sustainable development (Idu et al 2021)

Conclusion: This study seeks to delve into the complexities of noise pollution in residential areas, exploring its sources, impacts, and potential solutions. By examining the various factors contributing to noise pollution in residential settings and its far-reaching consequences, we aim to raise awareness of this pressing issue and advocate for effective measures to mitigate its effects. This study assesses the noise levels in residential areas and examines their implications for public health, highlighting the need for effective noise abatement measures to protect residents' health.

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