

Analysis of Road Traffic Noise At Various Zones In Bangalore, India

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Abstract- Noise technology is growing hastily because of increasing population and trade in lifestyles. Noise generated in surrounding environment and high Noise stage causes many problems like excessive blood strain, strain related infection, sleep disruption, hearing loss and so forth. In the present work an attempt has been made to assess the Noise level indistinctive zones at distinct durations of time. The distinctive parameters like Maximum, Minimum, L10, L50, L90, Leq, Laverage, Lnp, NI, and NC for two trials changed into compared. Maximum Noise level of Industrial region, Commercial sector, Residential region and Silence sector is 78.8dBA, 86.9dBA, 77.4dBA, and 77.6dBA respectively for trial 1 and maximum Noise stage of Industrial region, commercial sector, Residential region and Silence sector is 86.7dBA, 81.9dBA, 79.8dBA, and 75.7dBA respectively for trial 2. in which From the tables and graphical representations, it is concluded that the Noise degree is excessive at trial 2 in Industrial and Residential region whilst in comparison to first trial, wherein as Noise stage is high before everything trial in commercial sector and Silence sector whilst in comparison to trial 2 and in both the rigors Noise degree exceeds CPCB standards.

Keywords- Noise technology, Industrial region, Commercial sector, Residential region, Silence sector.

I. INTRODUCTION

Sound that is obnoxious or undesirable and bothers one's personal satisfaction is called as Noise. The word noise is gotten from the Latin expression "nausea". It has been characterized as "unpleasant sound or undesirable by product of society's typical everyday exercises, which is that dumped to the surrounding. If a noise in the environment exceeds or past the sure limits and if there is a lot of noise then it is termed as noise pollutants. Sound disturbs the normal activities including working, resting and so on, then the sound is unwanted. Noise pollutants impact on living beings and non living things. It affects on living being like human and animal health. apart from affecting residing beings, noise also adversely influences on non living such things as structures, background monuments and so forth. Noise pollution may be divided into categories viz., natural and man-made. natural

(air, volcanic eruptions, seas, rivers and thunder and so forth). man made (attributed to machines and current gadget of diverse sorts which includes automobiles, trains, aeroplanes, explosives, firecrackers and others).

The immoderate noise could be severe that results both there's a everlasting lack of reminiscence or a psychiatric disease, and additionally there are having many unfavourable outcomes of sudden exposure to noise or immoderate noise.

There are numerous methods that may be applied for controlling the extent of noise.

- The design and generation of equipments may be altered for low noise emission.
- Creation of noise limitations can also assist in controlling noise.
- By a shield receptors of sound is ensured,

in addition, body and window planes can be made sound evidence. apart from era, we can also adopt numerous steps to regulate the behaviour of customers of machines and equipments. even though a legal framework may be enforced to modify users of equipment, but it requires huge resources and exact governance. the public training appears to be a very good choice due to the fact it is a social problem. The social survey should be one way of locating out what form of sound upset people maximum and they appear at present to be the handiest method of determine the results of noise pollution.

II. STUDY AREA

Bangalore is the second fastest growing major metropolis in India. It is located in Southern India on the Deccan Plateau. The city has a population of about 8.42 million and situated at 12.967oN and 77.567oE. Noise monitoring was done at Industrial Town near EHSRDC (Industrial zone), Navarang Canara Bank Road (Commercial zone), Basaveshwaranagar near Panacea Hospital (Silence Zone), Rajajinagar Near Fire station (Residential zone) in Bangalore, Karnataka, India. Location of study area shown in Figure 1.



Figure 1: Location of study area in Bangalore(Bengaluru)

III. MATERIALS AND METHODOLOGY

Noise level measurement and studied were carried out in a Noise Level Meter apparatus Equipped with Tripod Stand of 1.5 meter height as shown in figure 2. Sound Level Meter CENTER 390 is used for the Noise monitoring. The Noise Measuring Level Ranges between 30dB to 130dB. By Maximum, Minimum hold mode the instrument captures and holds the maximum and minimum Noise Level for a long period using any of the time. The noise levels were recorded from morning 10.00 AM to 6.00 PM for 8 hours. Noise measurements were taken at distances of 0.90 m and 1.10 m from nearest road border. The height of noise measurement was 1 to 1.50 m above the road surface. By opening the Datalogger window, the recorded data are loaded to computer from Noise Meter in an EXCEL file format.



Figure 2: Noise Level Meter apparatus Equipped with Tripod Stand

a) Monitoring Parameters

The following noise parameters L_{min} , L_{max} , L_{10} , L_{50} , L_{90} , L_{eq} , L_{np} , NI and NC were calculated. L_{10} , L_{50} , L_{90} = noise level exceeded for 10%, 50%, 90% of the time in noise recording.

b) Standards for National Ambient Noise Level

S/ N	Zones	Limitation in dB(A)Day time	Limitation in dB(A)Night time
1	Industrial Zone	75	70
2	Commercial Zone	65	55
3	Residential Zone	55	45
4	Silence Zone	50	40

c) Noise Pollution

Noise is described as, "the unwanted, undesirable, or unpleasant sound which causes soreness to all residing beings". Sound depth is measured in decibels(dB). A noise problems typically includes 3 inter-associated elements- the supply, the receiver and the transmission route. This transmission direction is usually the surroundings via which

the sound is propagated, but can encompass the structural substances of any constructing containing the receiver. Noise may be non-prevent or intermittent. Noise may be of excessive frequency or of low frequency which is undesired for a ordinary hearing. for instance, the everyday cry of a toddler produces sound, it really is usually unfavourable to regular hearing. because it's miles undesirable sound, we call it noise.

The discrimination and differentiation among sound and noise also depends upon the dependancy and interest of the person/species receiving it, the ambient situations and effect of the sound generated for the duration of that unique period of time. There can be times that, excellently rendered musical live performance as an instance, may be felt as noise and fantastic song as properly in the direction of the direction of the concert. Sounds of frequencies much less than 20 HZ are referred to as infrasonics and extra than 20,000 HZ are known as ultrasonics. considering noise is also a valid.

d) Sources and Effects of Noise Pollution

Sources: Air compressors, diesel generator, lathe machine, milling machine, printing press, sports car, trains, trucks, car horns, jet takeoff, pneumatic chiseling, quiet garden, ticking clocks, computer rooms, type institute, oxy-acetylene cutting, pulveriser, riveting, carpentering, power operated portable saw, steam turbine.

Effects: Damage physiological and psychological health, high blood pressure, stress related illness, sleep disruption, hearing loss, productivity loss, memory loss, severe depression and heart attacks.

e) Calculation

$$L_{10} = (C1: Cn, 0.9)$$

$$L_{50} = (C1: Cn, 0.5)$$

$$L_{90} = (C1: Cn, 0.1)$$

$$Leq = L_{50} + (L_{10} - L_{90})/2/60$$

$$L_{np} = Leq + (L_{10} - L_{90})$$

$$NI = L_{90} + (L_{10} - L_{90}) - 30$$

$$NC = (L_{10} - L_{90})$$

$$\text{Maximum} = \text{Maximum}(C1:Cn)$$

$$\text{Minimum} = \text{Minimum}(C1:Cn)$$

$$\text{Laverage} = \text{Average}(C1:Cn)$$

minimum, maximum, from data logger of sound level meter.

Table.1 Comparison of Noise Level in dB(A) for different Parameters at various Zones of Bangalore City

Trial 1	Zones			
	Industrial Zone	Commercial zone	Residential zone	Silence Zone
Max	78.8	86.9	77.4	77.6
Min	57.1	59.6	49.3	39
L10	69.1	67.7	59.8	56.33
L50	63.6	63.3	54.8	47.4
L90	59.7	61.2	51.69	42.4
Leq	65.07	64	55.89	50.63
Lnp	74.47	70.5	66.4	64.56
NI	39.1	37.7	29.8	26.33
NC	9.4	6.5	8.11	13.93
Lavg	64.1	48.80	55.53	64.02
Trial 2				
Max	86.7	81.9	79.8	75.7
Min	57	55.9	48.4	40.3
L10	70.3	66.5	70.6	61.3
L50	64.1	61.9	59.5	51
L90	59.5	58.7	55.19	44.9
Leq	66.04	62.91	63.45	55.48
Lnp	76.84	70.71	78.86	71.88
NI	40.3	36.5	40.6	31.3
NC	10.8	7.8	15.41	16.4
Lavg	64.7	62.28	61.08	52.24

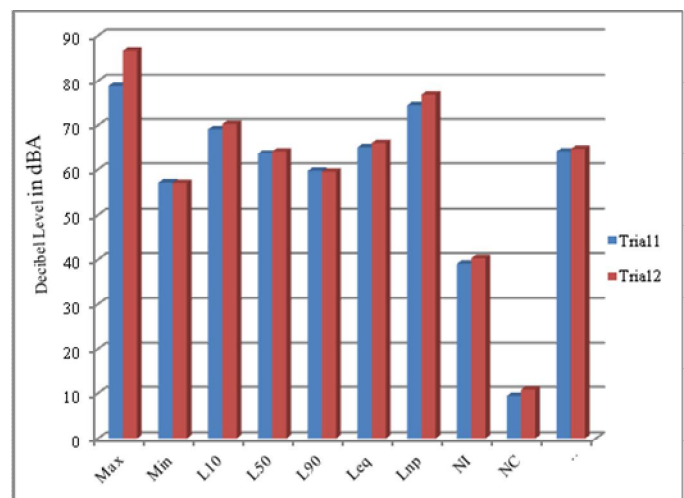


Figure 3: Comparison of Noise Level for Noise Parameters of Trial 1 and Trial 2 of Industrial Zone

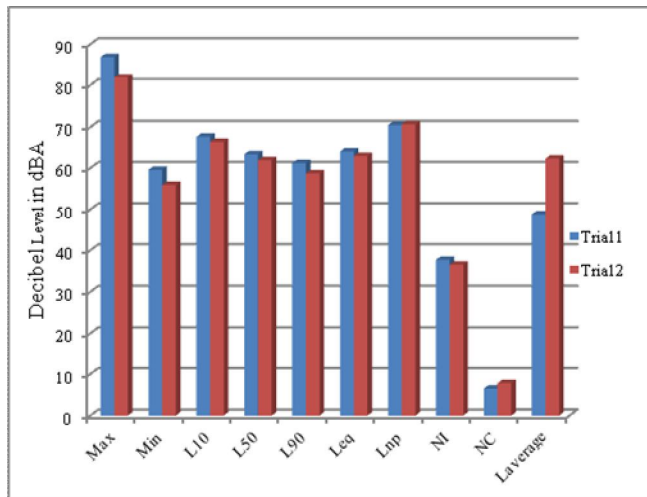


Figure 4: Comparison of Noise Level for Noise Parameters of Trial 1 and Trial 2 of Commercial Zone

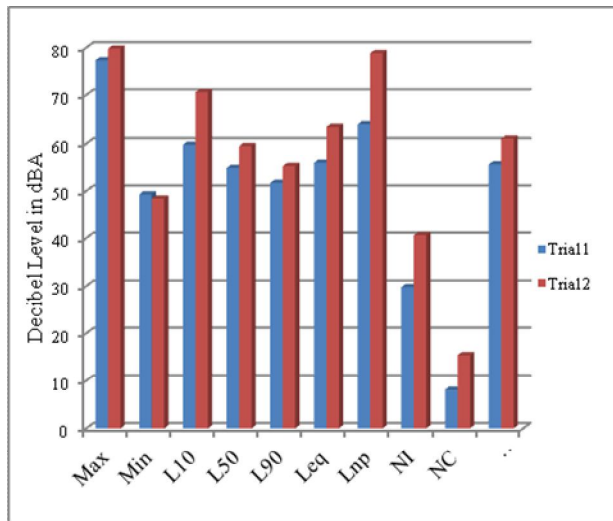


Figure 5: Comparison of Noise Level for Noise Parameters of Trial 1 and Trial 2 of Residential Zone

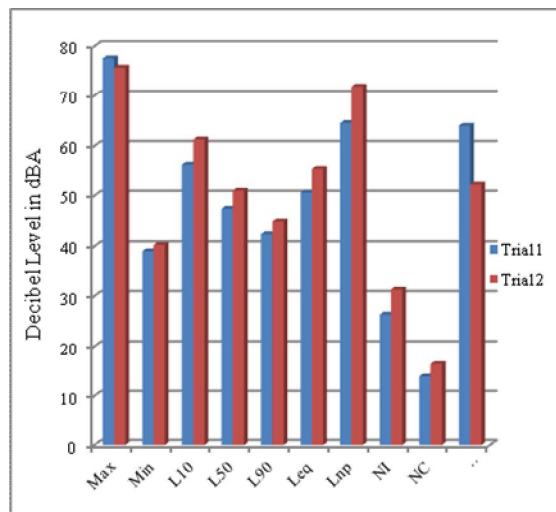


Figure 6: Comparison of Noise Level for Noise Parameters of Trial 1 and Trial 2 of Silence Zone

IV. RESULT AND DISCUSSION

In the present study the noise level at different location in various zone recorded the values higher than that of standards, the noise level varies considerably due to traffic, commercial and movement of people.

Industrial Zone

Noise Level is in the Range of about 57dBA(Min) to 86.7dBA(Max). The Noise Level is more on Second trial when compared to first trial at the location. During 90% of the time, Noise Level is 59.7dBA and 59.5dBA in Trial 1 and Trial 2 respectively. The equivalent Noise level is 65.07dBA and 66.04dBA in Trial 1 and Trial 2 respectively.

Residential Zone

Noise Level is in the Range of about 77.4dBA(Min) to 79.8dBA(Max). The Noise Level is more on Second trial when compared to first trial at the location. During 90% of the time, Noise Level is 64dBA and 78.86dBA in Trial 1 and Trial 2 respectively. The equivalent Noise level is 55.89dBA and 63.45dBA in Trial 1 and Trial 2 respectively.

Commercial Zone

Noise Level is in the Range of about 55.9dBA(Min) to 86.9dBA(Max). The Noise Level is more on first trial when compared to second trial at the location. During 90% of the time, Noise Level is 61.2dBA and 58.7dBA in Trial 1 and Trial 2 respectively. The equivalent Noise level is 64dBA and 62.91dBA in Trial 1 and Trial 2 respectively.

Silence Zone

Noise Level is in the Range of about 39dBA(Min) to 77.6dBA(Max). The Noise Level is more on first trial when compared to second trial at the location. During 90% of the time, Noise Level is 42.4dBA and 44.9dBA in Trial 1 and Trial 2 respectively. The equivalent Noise level is 50.63dBA and 55.48dBA in Trial 1 and Trial 2 respectively.

V. CONCLUSIONS

The present study shows that all the selected places in Bangalore city suffering from higher level of noise level due to traffic. For minimization of higher level of noise in the location following measures are suggested.

- i. By shutting the door, windows and insulating better window frames and panels the vehicle, buses trucks noise can be controlled.
- ii. By keeping the silencer and good engine condition of vehicle to let minimum noise emit from it while it is moving.
- iii. Can be reduced by following the limits of noise level, and placing noise limits boards near sensitive areas like near hospitals and near schools.
- iv. By planting trees and green plants can reduce noise from 5-10dBA around them because plants are good noise absorbents.
- v. For noisy machineries by checking the noise created due to vibrations, and some noise absorbents were put and by using proper lubrication an maintenance of machines noise can be reduced.
- vi. By creating awareness among people about noise pollution through various mediums and by following regulatory rules notified by government regarding noise levels, noise pollution can be controlled.

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