Environmental Noise Pollution Assessment At Selected Locations of Davanagere City

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Abstract- *The present study indicates that Davanagere city suffering from higher level of noise pollution as compared to standard stipulated by Central Pollution Control Board (CPCB), New Delhi. The modern civilization creates more and more noise, because of the development of Industries, Transportation and Technology. It has been reported that noise inside the factories can become a health hazard causing deafness which includes temporary or permanent hearing loss. An assessment of noise pollution during different seasons in Industrialized and Urbanized towns were always highly polluted. The public facing the risk of physiological ill effect of environmental pollution due to industrial development and other human activities The average noise levels in the day time at the investigation period are highest in the Industrial zone of Leq=63.5, Lmax=83.7, Lpeak=99.7, L10=67.1, L90=51.5 and in the commercial zone of Leq=77, Lmax=88.5, Lpeak=100.6, L10=82.8, L90=68.0 and in the residential zone of Leq=63, Lmax=72, Lpeak=77, L10=66.9, L90=59.8 and in the silent zone of Leq=58.5, Lmax=66.0, Lpeak=61.4, L10=61.6, L90=53.1 decibels were recorded. So an attempt has been made in Davanagere city of to measure noise level and also made recommendations to overcome this noise pollution in Davanagere city.*

Keywords- Noise Pollution, Noise effects, Permissible Noise level, Traffic, Vehicles, Davanagere.

I. INTRODUCTION

Noise is the very hazardous influential pollution on the present day to day life. Noise is discovered from the Latin word “nausea” showing un-useful sound or excess sound generation, un-delicate or un-anticipated. The most biggest cities of the world are presently suffering from high level of noise due to increasing population, rapid growth of urbanization, more industrial activities, congestion, commercial activities, human activities etc.

Excess sound can cause impacts on the quality of life. Various surveys were done in biggest cities shows that 36% of the population having hearing loss. Noise emission are the slow and silent slayer, small efforts has made to minimize the same. Now a days it has become very hazardous to quality of human life.

If the available sound is pleasant or unpleasant is mainly depends on its type of sound, duration and mood of the person. But the excess sound is definitely convert into noise. Excess noise emission is harmful to the life. Noise is indirectly harmful to the life and it is always be in the physical form. Noise emission is mainly caused due to over population and more industries are increased in the urban areas.

Noise emission is mainly depends on various factors, repeated exposure of noise decreases the age period, efficiency, productivity and sleeping hours of human life. It affects the privacy and peace of mind of a human being. Day by day surrounding environment was completely populated compared to previous measurement records due to increases of industries, urbanization, vehicle growth and population.

Noise calculation is the process of calculating the level of noise emission using the metric decibels. Noise emission is created by noise sources of various types which are propagating noise into the environment. A single source will create a certain level of emission primarily driven by originating sound power level and distance influenced by absorption and reflection. Several noise sources result in typically higher level of emission. The method or process of determining the resulting emission level is called Noise calculation, its graphical representation is called Noise mapping.

Davanagere as generally became known as the selected for smart city of Karnataka state has been noticing an increasing traffic from past few years for rapid growth of urbanization and increasing the population, construction activities etc, in the city. Noise levels increased with the increasing of vehicles, vehicle movements conjected roads, old vehicles, unnecessary honking etc.

1.1 Objectives of the Present Study

i. To measure the noise levels in the Study areas.
ii. To compare existing noise levels with standards to assess noise pollution in the study areas.
iii. To provide recommendations for preventing and controlling the noise pollution in the study areas.

II. MATERIAL AND METHODOLOGY

A. Study Area

Noise levels are measured at SS Hospital as silence zone, City Corporation office as commercial zone, Devaraj urs layout A block represented as residential area for the study and finally Karur industrial area taken as Industrial zone. Initial assessment was made at all the locations by recording sound pressure levels for eight hours (10.00AM to 06.00PM) at the interval of eight hour in each location.

B. Introduction To The Model Quirtz 1900 (Digital sound level meter)

The Quest Models 1900 are digital sound level meters which persevere a broad type of acoustical measurements. Exponential averaged and time integrated measurements may be made, with the capability of either internal or external data logging. The output of an independently weighted peak detector may also be displayed or logged. Applications include laboratory, industrial, community and audiometric measurement and analysis.

The models 2900 provide a numerical readout of measurements as well as a moving bar graph indication. The results of individual sound studies may be stored in internal memory for future reference. Meter operation is controlled from either the membrane keypad or through the communications port. AC and DC output jacks are provided for connecting to external devices such as audio recorders, chart recorders, oscilloscopes, etc. Data may be sent to a parallel printer by using a special interface cable. The meters are housed in a tough injection molded plastic case with internal shielding to protect against external electrical interference, such as that from motors or portable radios.

The Model 1900 delivers Type 1 accuracy for critical measurements, while the model 2900 is a Type 2 instrument for general field survey work. The model 2900 uses a 0.52 inch electret microphone, while the 1900 accommodates a variety of microphones to meet even the most unconventional applications. As both meters are operationally identical, this manual will refer only to the model 1900 except where appropriate.

C. Specifications of the Instrument

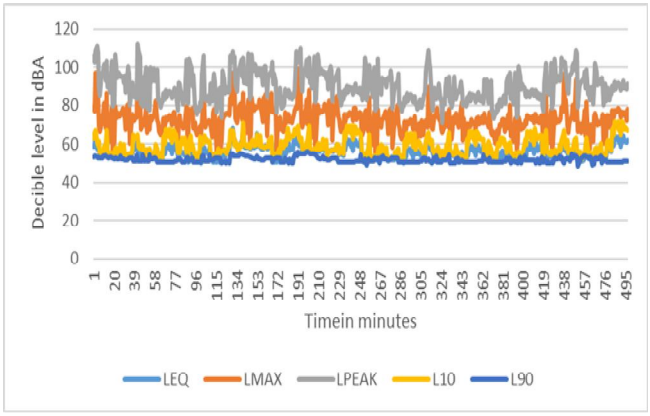
Model name	Quirtz Model 1900
Measurement range	30-130 dBa
Display	4 digit liquid crystal
Resolution	0.1 Db
Time	Minute or Second ; Hour or Minute
Automatic measurement modes	Programmed run duration
Maximum measurement	120 dB with 20 dB crest factor
Frequency weighting net works	A, C and linear
Peak onset time	Less than 50 micro-seconds
Instrument responds	Slow, Fast, Peak and Impulse
Bottom measurement range	0 VDC output
Top measurement range	1 VDC output

III. RESULTS AND DISCUSSIONS

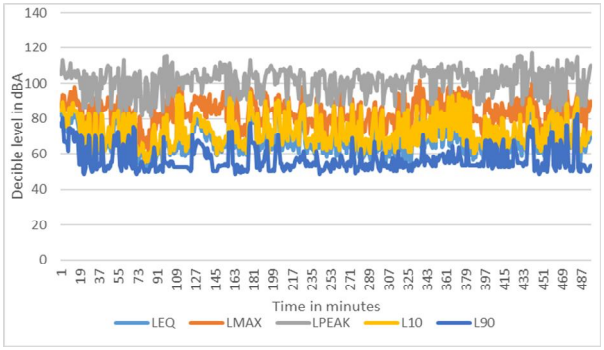
The noise data are collected in all four zones of industrial, commercial, residential and silent (hospital) zones respectively in the Davanagere city. The noise are collected for 8 hours in all zones. Overall noise data are collected for 5 months.

A. Noise Emission Reading Of February Month

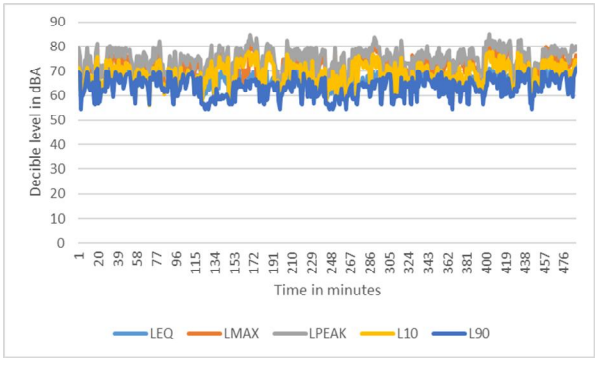
Parameters	Leq	Lmax	Lpeak	L10	L90
Industrial	56.0	72.5	90	58.1	51.8
Commercial	68.0	83.4	100.6	72.5	57.1
Residential	65.7	71.7	74.4	68.4	63.3
Silent	55.7	62.9	63.5	58.1	50.5



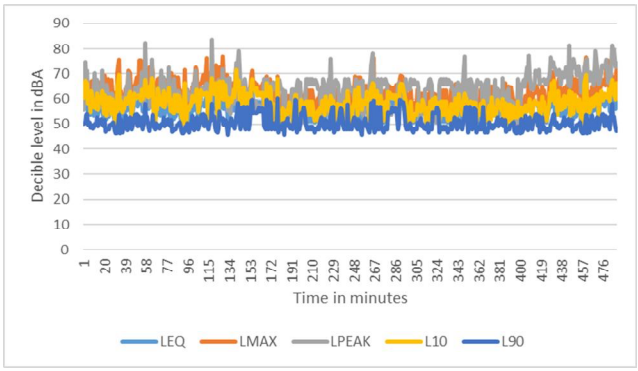
The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=56, Lmax=72.5, Lpeak=90, L10=58.1, L90=51.8 are respectively.



The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=68.0, Lmax=82.4, Lpeak=100.6, L10=72.5, L90=57.1 are respectively.



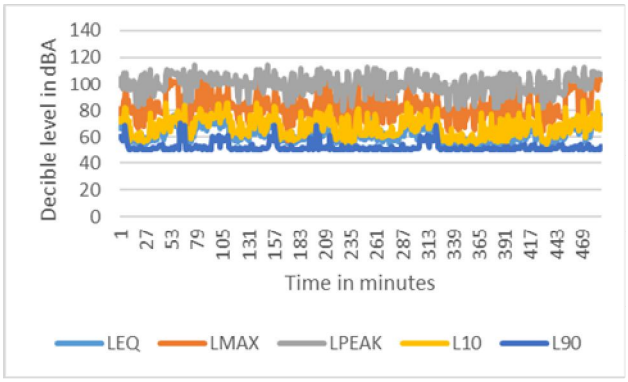
The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=65.7, Lmax=71.7, Lpeak=74.4, L10=68.4, L90=63.3 are respectively.



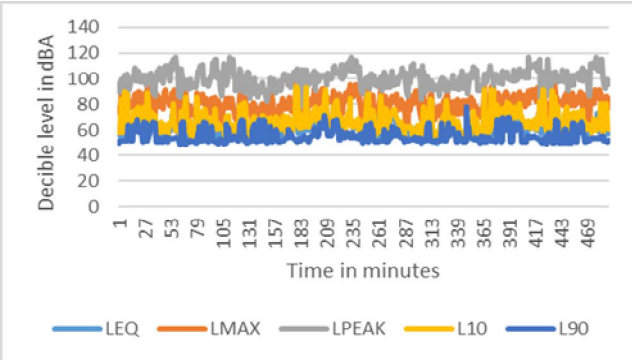
The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=55.7, Lmax=62.9, Lpeak=63.5, L10=58.1, L90=50.0 are respectively.

B. Noise Emission Reading Of March Month.

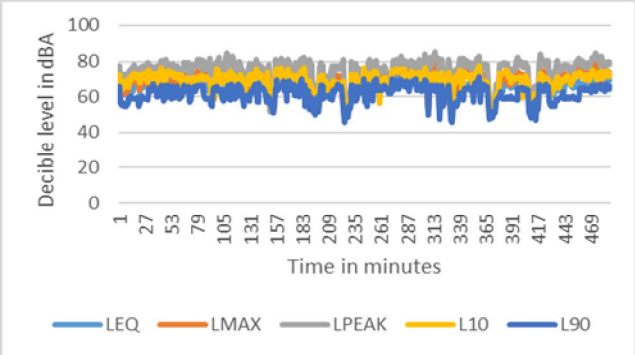
Parameters	Leq	Lmax	Lpeak	L10	L90
Industrial	63.5	83.7	99.7	67.1	51.5
Commercial	62.0	80.8	100.1	66.9	54.5
Residential	65.4	70.3	74.9	68.6	61.5
Silent	58.5	66.0	61.4	61.6	53.1



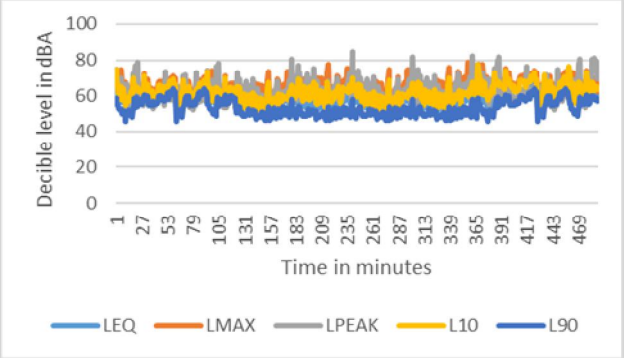
The figure 4.5 shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=61.5, Lmax=83.7, Lpeak=99.7, L10=67.1, L90=51.5 are respectively.



The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=62.0, Lmax=80.8, Lpeak=100.1, L10=66.9, L90=54.5 are respectively.



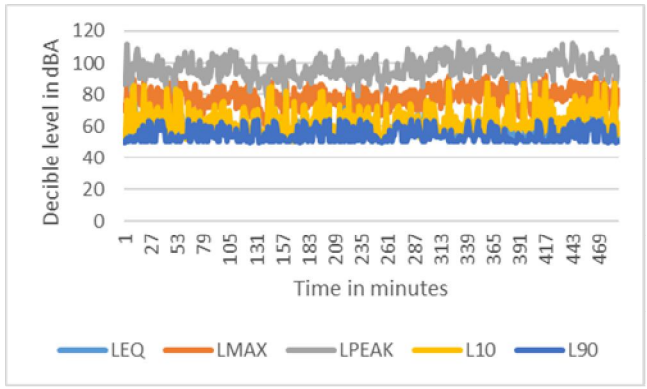
The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=65.4, Lmax=70.3, Lpeak=74.9, L10=68.6, L90=61.5 are respectively.



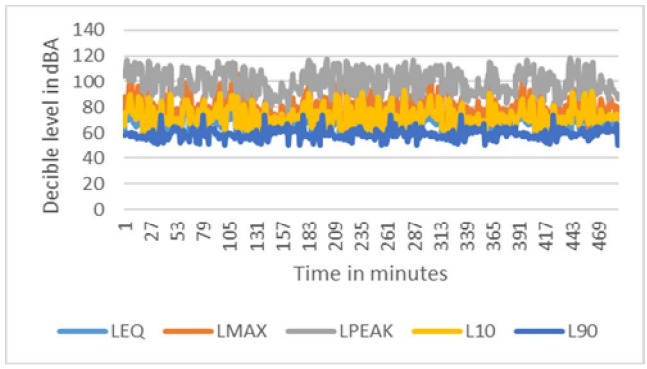
The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=58.5, Lmax=66.0, Lpeak=61.4, L10=61.6, L90=53.1 are respectively.

C. Noise Emission Reading Of April Month.

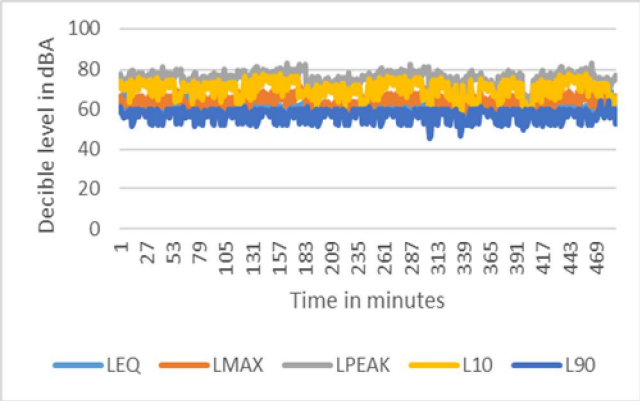
Parameters	Leq	Lmax	Lpeak	L10	L90
Industrial	59.4	77.0	95.5	63.3	54.0
Commercial	68.0	80.3	97.8	72.6	59.0
Residential	60.3	64.1	74.9	69.7	56.9
Silent	54.8	58.4	59.5	56.5	53.5



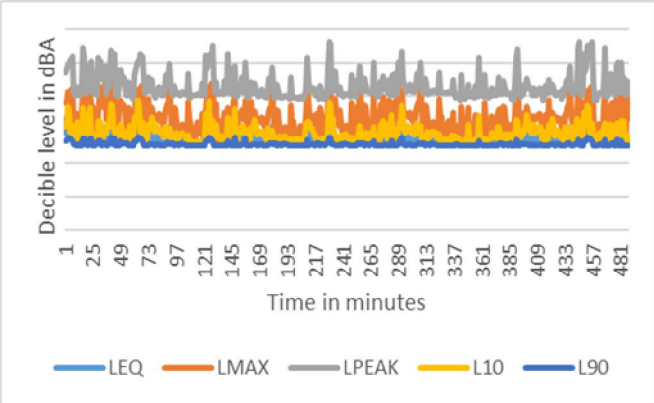
The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=59.4, Lmax=77.0, Lpeak=95.5, L10=63.3, L90=54.0 are respectively.



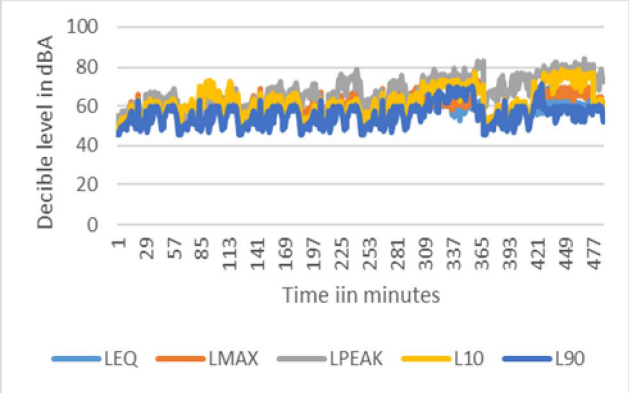
The figure 4.10 shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=68.0, Lmax=80.3, Lpeak=97.8, L10=72.6, L90=59.0 are respectively.



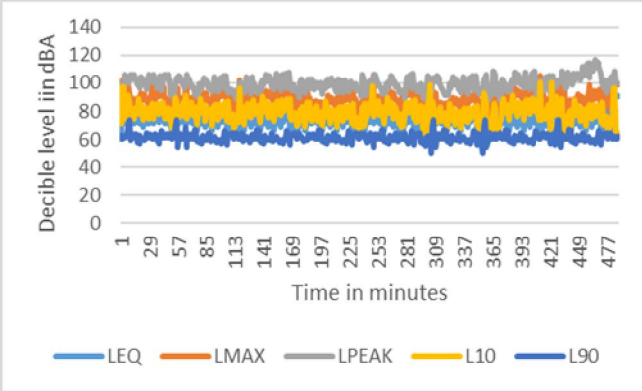
The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=60.3, Lmax=64.1, Lpeak=74.9, L10=68.6, L90=61.5 are respectively.



The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=54.1, Lmax=67.1, Lpeak=85.9, L10=57.8, L90=51.2 are respectively.



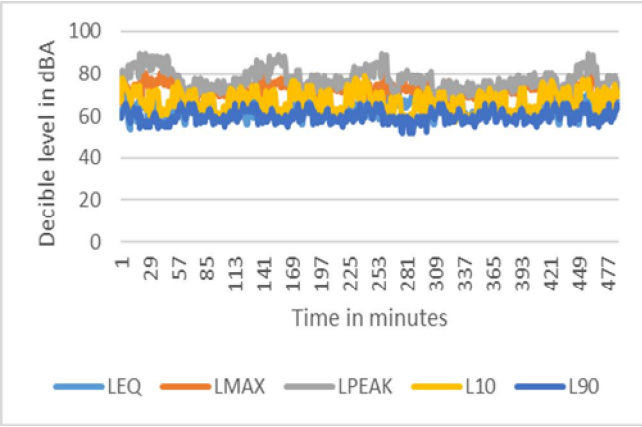
The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=54.8, Lmax=58.4, Lpeak=59.5, L10=56.5, L90=53.5 are respectively.



The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=73.8, Lmax=88.5, Lpeak=99.5, L10=78.9, L90=61.4 are respectively.

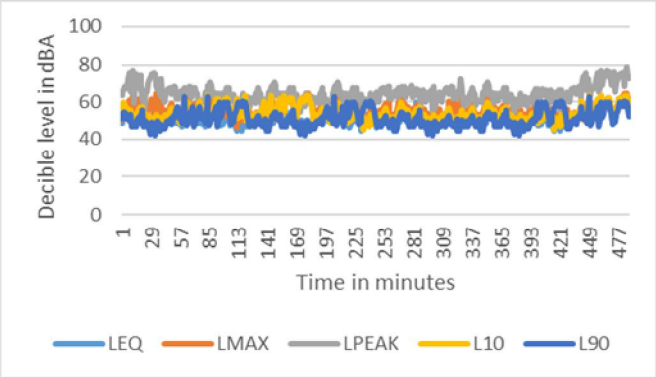
D. Noise Emission Reading Of May Month.

Parameters	Leq	Lmax	Lpeak	L10	L90
Industrial	54.1	67.1	85.9	57.8	51.2
Commercial	73.8	88.5	99.5	78.9	61.4
Residential	63.0	72.0	77.0	66.9	59.8
Silent	50.8	55.2	64.4	53.6	51.0



The figure shows the reading of industrial zone on the February month of 8 hours reading average

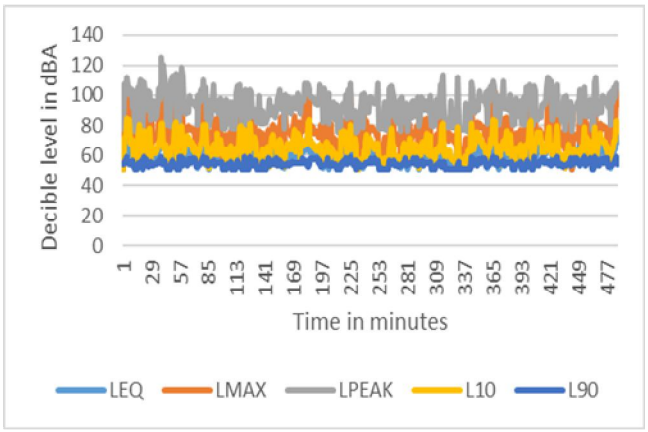
parameters are Leq=62.8, Lmax=72.0, Lpeak=77.0, L10=66.9, L90=59.8 are respectively.



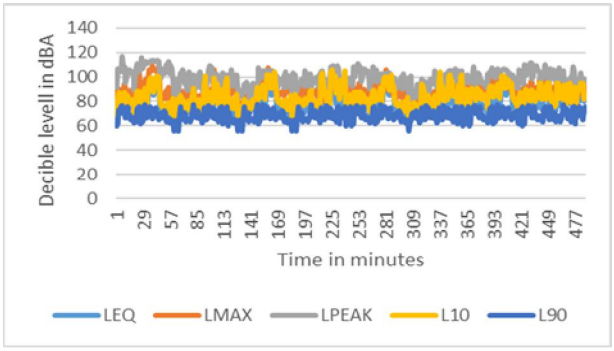
The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=50.8, Lmax=55.2, Lpeak=64.4, L10=53.6, L90=49 are respectively.

E. Noise Emission Reading Of June Month.

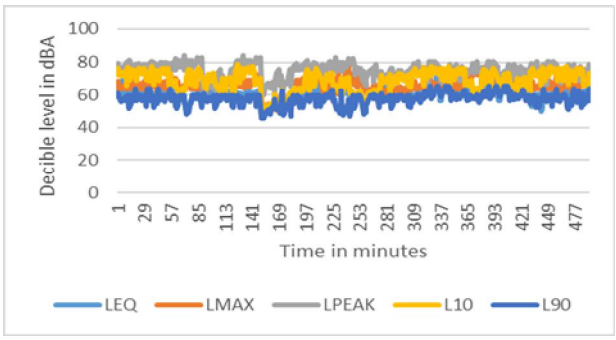
Parameters	Leq	Lmax	Lpeak	L10	L90
Industrial	59.8	75.6	92.4	64.3	54.0
Commercial	77.0	88.0	99.7	82.8	68.0
Residential	61.1	66.5	74.9	68.4	57.4
Silent	50.6	55.5	64.1	53.3	49.3



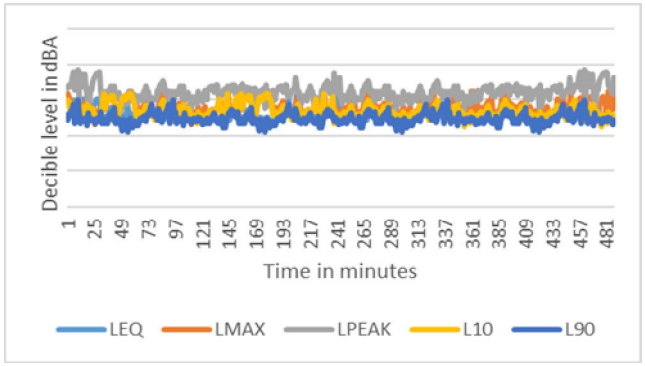
The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=59.8, Lmax=75.6, Lpeak=92.4, L10=64.3, L90=54.0 are respectively.



The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=77.0, Lmax=88.0, Lpeak=99.7, L10=82.8, L90=68.0 are respectively.



The figure shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=61.1, Lmax=66.5, Lpeak=74.9, L10=68.4, L90=57.4 are respectively.



The figure 4.20 shows the reading of industrial zone on the February month of 8 hours reading average parameters are Leq=50.6, Lmax=55.5, Lpeak=64.1, L10=53.3, L90=49.3 are respectively.

F. Comparison Of Noise Parameters With Data Collected In The Industrial Zone.

	Leq	Lmax	Lpeak	L10	L90
February	56.0	72.5	90	58.1	51.8
March	63.5	83.7	99.7	67.1	51.5
April	59.4	77.0	95.5	63.3	54.0
May	54.1	67.1	85.9	57.8	51.2
June	59.8	75.6	92.4	64.3	54.0

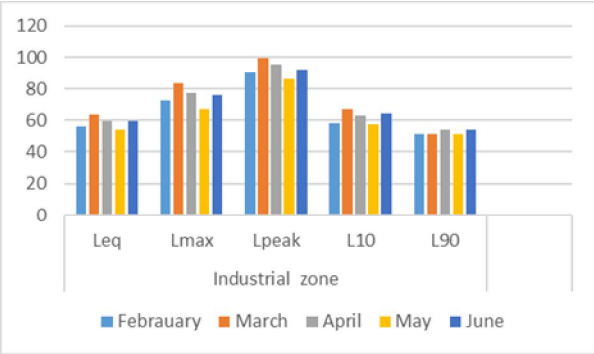


Figure shows the various parameters of noise data collected from five months in the industrial zone. The highest Lmax= 83.7db, Lpeak=99.7db, Leq=63.5db, L10=67.1, L90=51.5 were recorded in the March month.

G. Comparison Of Noise Parameters With Data Collected In The Commercial Zone.

	Leq	Lmax	Lpeak	L10	L90
February	68.0	83.4	100.6	72.5	57.1
March	62.0	80.8	100.1	66.9	54.5
April	68.0	80.3	97.8	72.6	59
May	73.8	88.5	99.5	78.9	61.4
June	77.0	88.0	99.7	82.8	68.0

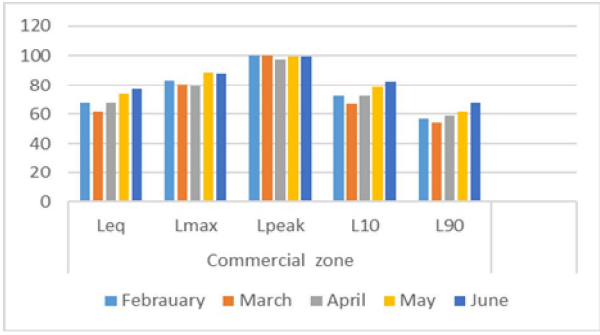


Figure shows the various parameters of noise data collected from five months in the commercial zone. The highest Lmax= 88.5db, Lpeak=100.6db, Leq=77.0db, L10=82.8, L90=68.0 were recorded in the June month.

H. Comparison Of Noise Parameters With Data Collected In The Residential Zone.

	Leq	Lmax	Lpeak	L10	L90
February	65.7	71.7	74.4	68.4	63.3
March	65.4	70.3	74.9	68.6	61.5
April	60.3	64.1	74.9	69.7	56.9
May	63	72.0	77.0	66.9	59.8
June	61.1	66.5	74.9	68.4	57.4

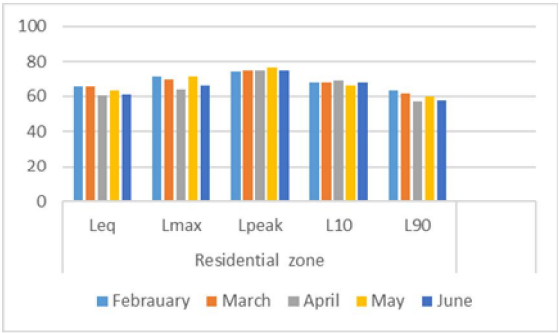


Figure shows the various parameters of noise data collected from five months in the residential zone. The highest Lmax= 72.0db, Lpeak=77.0db, Leq= 63db, L10=66.9db, L90=59.8db were recorded in the may month.

I. Comparison Of Noise Parameters With Data Collected In The Silent Zone.

	Leq	Lmax	Lpeak	L10	L90
February	55.7	62.9	63.5	58.1	50.5
March	58.5	66.0	61.4	61.6	53.1
April	54.8	58.4	59.5	56.5	53.5
May	50.8	55.2	64.4	53.6	51.0
June	51.6	55.5	64.1	53.3	49.3

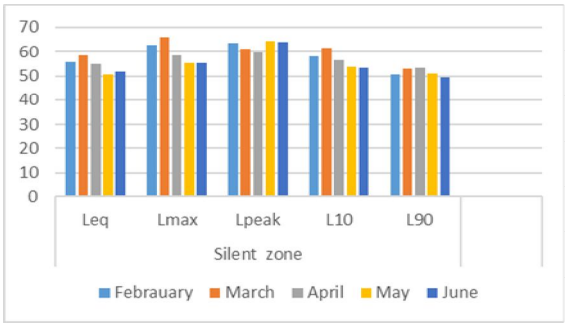


Figure shows the various parameters of noise data collected from five months in the commercial zone. The highest Lmax= 66.0db, Lpeak=61.4db, Leq=58.5db, L10=61.6db, L90=53.1db were recorded in the March month.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

- The noise level is high in commercial zone as compared to other zones in the study areas.
- Lmax, Lpeak, Leq, L10, L90 noise generated in all the zones exceeds the permissible limits.
- In the commercial zone Lmax recorded was in the 88.5dBA day time which is more than 80 dBA which exceeds the permissible limit.
- In the industrial zones Lmax recorded 83 dBA were recorded but actually 75 dBA is the permissible limit.
- Finally in the residential and silent zone maximum permissible limit is 55 and 50 dBA. But 72 and 66 dBA were recorded in these zones.

B. RECOMMENDATIONS

- The awareness program should be initiated to aware people about harmful adverse effects of noise pollution on health.
- To reduce noise pollution several measures can be implemented such as proper maintenance of vehicles and roads, plantation of trees and electricity generator should be covered under silencer, traffic movements should be maintained or control effectively by traffic police and to aware the people about noise pollution.
- Close coordination between local planning authorities and highway authorities.
- Locate and design hospitals, schools etc., to be away from the high traffic density zones so that they are not exposed to excessive or unacceptable levels of traffic noise.
- Use barriers or insulation techniques to reduce the effects of noise.

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