

Evaluation of Noise Quality in selected zones of Urban City

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ABSTRACT

The word noise is cognate with the Latin word nausaeas, which means disgust. In simple words, it is a unwanted sound. Whatever activity, every one of us given to noise pollution, by of our daily activities cause noise pollution [1]. Often ignored, noise pollution negatively affects the humans leads to temporary hearing loss, lot of irritation, etc. The most important source of noise pollution in urban center are related to transportation [3]. In the present study an attempt have been made to evaluate the noise quality of selected few areas of Guntur , Capital city of A.P., during day time. It is also asked to evaluate diurnal as well as zonal variation of noise level in the urban areas. Assessment was also made to find weather the recorded noise levels in different zones were within the recommended level or not and suggested suitable remedial techniques.

Keywords: Noise Pollution, Quality of life, Environment, Zones

1. INTRODUCTION

As per World Health Organization (WHO), there is enough authentication of exposure to night noise that causes self-reported sleep turmoil and caused sleep disturbance is watched as a health problem. And also that disturbed sleep may account the fatigue, and reduced performance and leads to accidents [5]. The rapid growth of population, industry and increasing transporting vehicles by individuals, which all causes of noise pollution and also causes to air pollution

From many years, many countries and including India has been facing the environmental pollution problem. the most important activity of fire cracker has major contribution of the noise pollution [2]. And it is becoming a one of the dominant pollution or problem even than water and air pollution. Lack of proper planning i.e.no proper zoning, Rapid increase and migration of urban population, use of individual transport instead of mass transport, use of

loud speakers or horns and etc. all has becoming problem of noise pollution in urban centers. Temporary hearing loss and mental disorders and also cardio vascular diseases may got due to noise pollution. Many of group housing, shopping complexes, malls, have very high noise levels because of many of these are placed along the roadsides and mainly due to lack of proper zoning and many are mixed with different zones. Noise, its simple unwanted sound. Sound is a form of energy, by a trembling body and on get to the ear. Sounds bred by all trembling bodies are not audible [3]. The frequency from twenty HZ to twenty thousand HZ are audible. A noise problem generally has of 3 inter-related elements of source, receiver and the communication.

2. OBJECTIVE OF THE WORK

- ❖ Evaluating the Noise levels in the selected areas at various locations or zones of the city.
- ❖ Suggest suitable mitigation and abatement measures.

3. STUDY AREA

The study area is Guntur urban city, which is the Capital Region of A.P. and it was Located 24 km away from the state capital Amravati. It is a municipal corporation and is locate on the plains at a distance of 40 miles to N of the Bay of Bengal. The city is population with number of 743,654 as per 2011 census of India. And it is located at 16.29°N 80.43°E. The local people, who uses the transportation is auto rickshaws, mini vans, and public transport of APSRTC and etc. and many of the people using individual two and four wheelers for transportation and the city has road length of eight hundred fifty three kilometers. The city has connection of many major city, state and district roads. Location Map shown in Fig. 1 and sound pressure in various places shown in Fig. 2.

4. MEASUREMENT OF NOISE INTENSITY

The noise intensity was measured by the hand held sound level meter. At first the sound level was switched on; then press the enter button into the menu. The play button was pressed for recording the sound intensity. After the recording press the stop button. Noise intensity was measured at different zones, (i.e. silence, commercial, residential and industrial) of Guntur city. Details of various Zones with category wise shown in Table 1 and Noise Quality standards of some countries and Organizations has been shown in Table 2.

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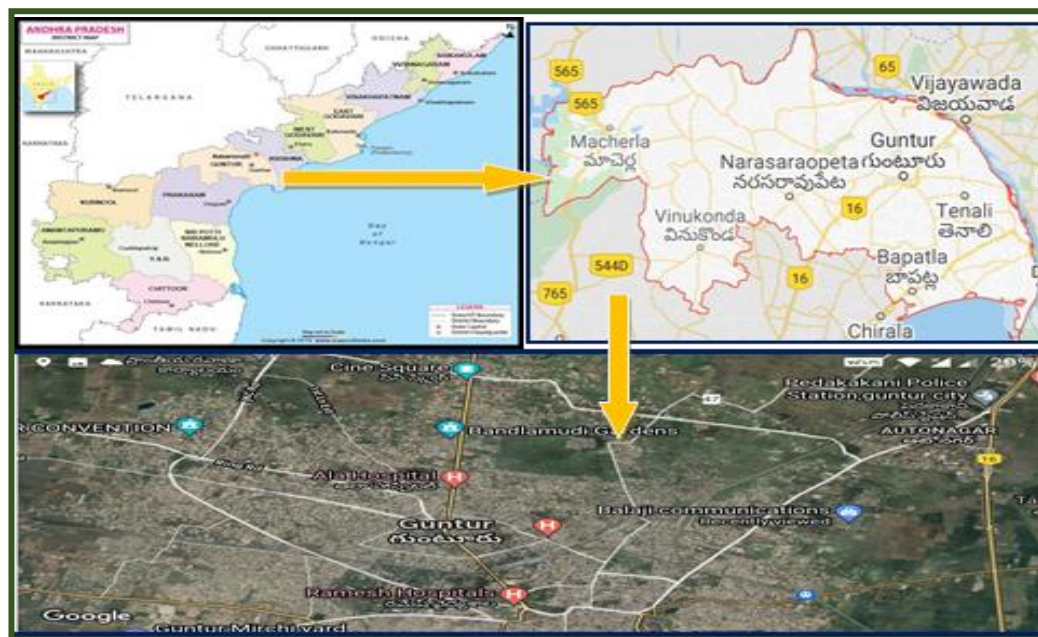


Fig. 1. Location Map of Study Area

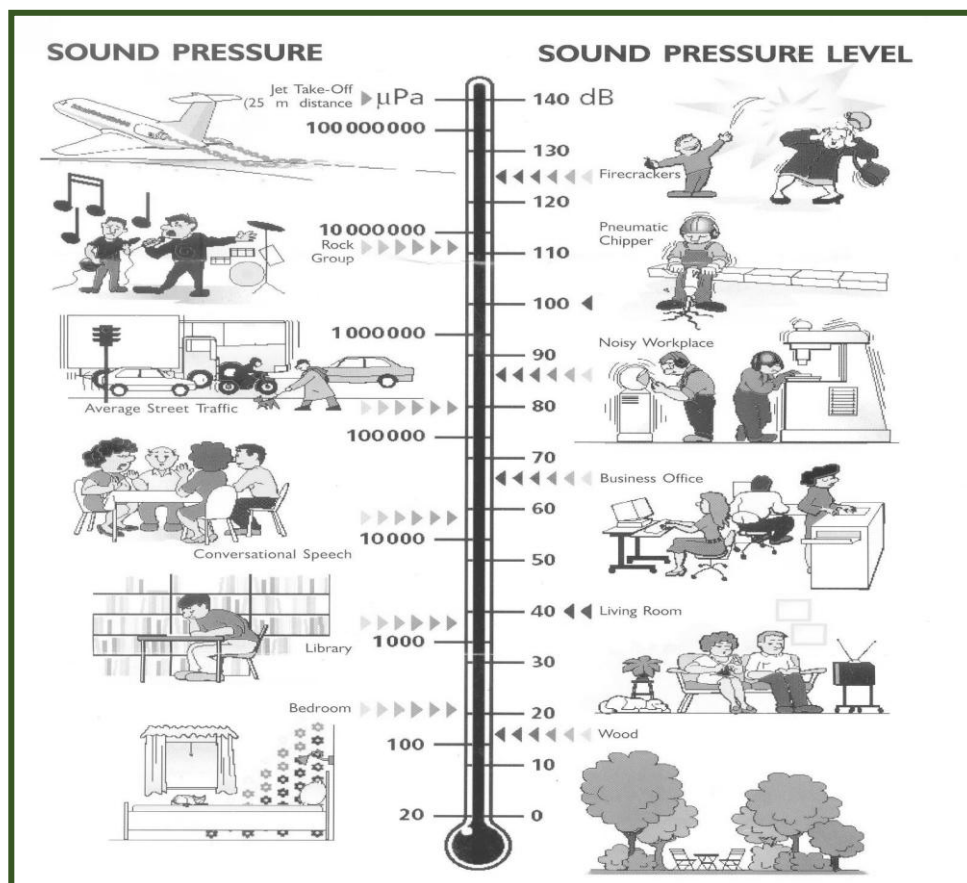


Fig. 2. Sound Pressures and Their Levels

Table 1. Details of various Zones with category wise

Sl .No.	Category of the Zone	Area Code	Name of the Area
1	Silence Zone	Z 1	Ramesh hospital
2	Silence Zone	Z 9	Govt. Hospital
3	Residential Zone	Z 10	Syamala Nagar
4	Residential Zone	Z 7	Lakshmi Puram
5	Commercial Zone	Z 2	Jihna Tower
6	Commercial Zone	Z 3	APSRTC Bus Stand
7	Commercial Zone	Z 4	Amavarathi Road.
8	Commercial Zone	Z 5	Veg. Market Road
9	Commercial Zone	Z 8	South Way Railway Station
10	Industrial Zone	Z 6	Auto Nagar Main Road

Table 2. Noise Quality standards of some countries and Organizations [7]

Country	Industrial Zone dB	Commercial Zone dB	Residential Zone dB	Silence Zone dB
	Day-Night	Day-Night	Day-Night	Day-Night
Australian Cap.Territory	65-55	55-45	45-35	45-35
India	75 -70	65-55	55-45	50-40
Japan	60-50	60-50	50-40	45-35
U.S.	70-60	60-50	55-45	45-35
W.H.O.	65-50	55-50	55-45	45-35

5. RESULTS

Noise intensity level was monitored in guntur urban city areas of 10 different locations, which, consist of different zones, during 12 hr of period from 8:00 A.M to 8:00 P.M. Two adjacent areas were selected for recording data per day. The data was taken for three consecutive days in each areas and the average value for each zone was recorded and Data

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recording of noise levels in various zones of Guntur city shown in Table 3. And graphical representation of various zones has been shown in Fig. 3 to Fig. 6.

Table 3. Noise levels at various zones

S.No	Time of Assessment	Noise Levels at Various Zones									
		Z 1	Z 2	Z 3	Z 4	Z 5	Z 6	Z 7	Z 8	Z 9	Z 10
1	8:00-AM	80.2	81.4	90.0	79.4	82.0	69.1	75.6	76.1	80.2	79.4
2	8:30-AM	79.2	84.0	99.7	84.0	77.4	72.7	74.7	76.5	79.2	82.1
3	9:00-AM	82.0	82.4	81.5	81.0	80.2	71.2	77.6	71.4	82.0	82.7
4	9:30-AM	89.1	83.0	84.8	93.9	81.0	79.8	79.4	85.4	89.1	79.8
5	10:00-AM	91.5	84.7	89.1	80.5	90.6	85.2	89.5	97.0	91.5	76.4
6	10:30-AM	89.7	86.0	99.7	83.7	84.7	73.2	82.4	88.8	89.7	81.9
7	11:00-AM	86.3	84.3	95.3	87.1	80.2	79.6	77.3	82.1	82.6	80.4
8	11:30-AM	81.4	80.2	97.1	78.8	83.0	87.6	79.9	81.7	81.4	83.2
9	12:00-PM	75.6	87.3	83.8	85.3	82.9	79.3	86.1	107.9	75.6	85.1
10	12:30-PM	93.3	89.1	88.7	81.4	95.5	69.2	96.0	89.2	93.3	90.8
11	1:00-PM	87.7	99.8	84.0	93.6	90.8	68.3	96.3	82.9	87.7	83.2
12	1:30-PM	79.8	88.2	90.2	90.2	84.7	69.7	77.1	85.3	79.8	89.1
13	2:00-PM	82.1	87.2	91.7	84.8	92.0	73.2	80.5	94.1	82.1	87.6
14	2:30-PM	89.5	97.4	102.7	89.1	99.8	69.7	74.8	54.0	89.5	83.2
15	3:00-PM	79.4	84.6	104.8	85.9	86.1	65.2	71.7	81.8	79.4	79.6
16	3:30-PM	77.6	88.4	87.3	81.2	89.1	69.3	82.0	82.0	77.6	73.2
17	4:00-PM	74.7	99.8	82.1	90.0	88.4	77.2	89.1	80.4	74.7	79.8
18	4:30-PM	85.2	92.3	83.6	90.5	82.4	83.7	91.5	100.2	85.2	85.7
19	5:00-PM	89.9	90.6	85.7	84.8	88.2	82.1	89.7	97.6	89.9	86.3
20	5:30-PM	97.3	90.0	94.6	99.7	87.6	85.3	93.3	105.0	97.3	93.2
21	6:00-PM	89.7	95.5	89.1	97.1	93.6	77.1	94.5	95.2	95.9	90.6

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22	6:30-PM	80.3	92.0	93.2	86.4	88.2	73.3	92.1	89.5	89.7	83.6
23	7:00-PM	79.9	91.9	94.8	89.3	97.6	85.2	96.4	97.3	80.3	82.1
24	7:30-PM	77.7	103.0	94.9	85.0	107.3	79.3	89.7	99.3	79.9	79.6
25	8:00-PM	82.3	97.6	99.6	90.3	93.7	82.6	82.1	89.6	82.3	82.6

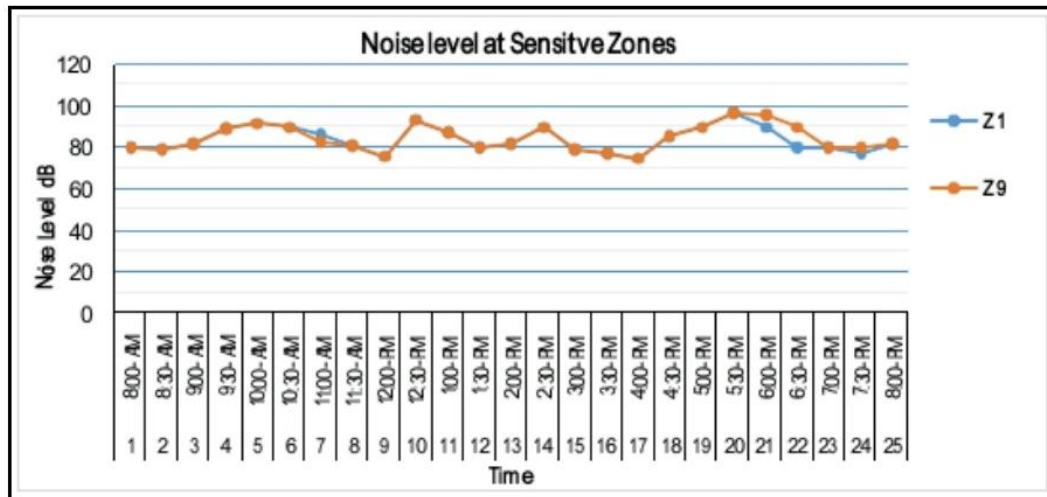


Fig. 3. Graphical representation of Noise level in Sensitive zones

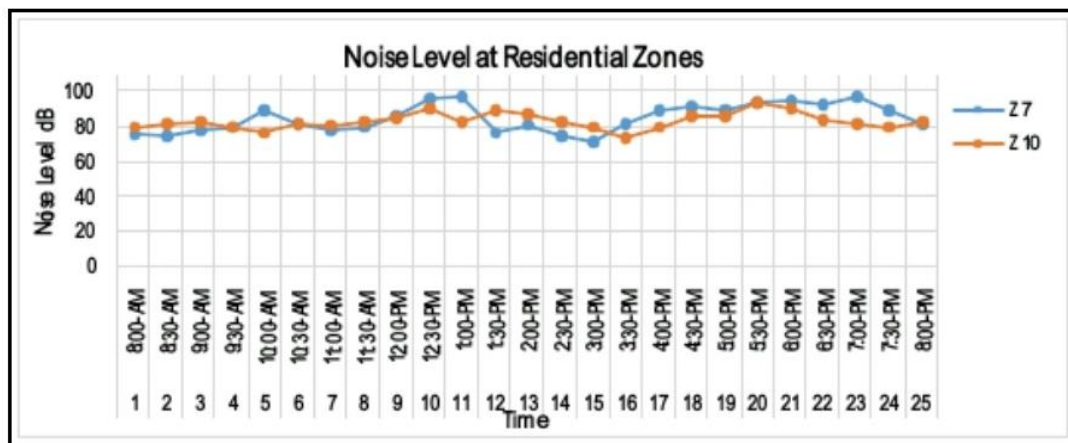


Fig. 4. Graphical representation of Noise level in Residential zones

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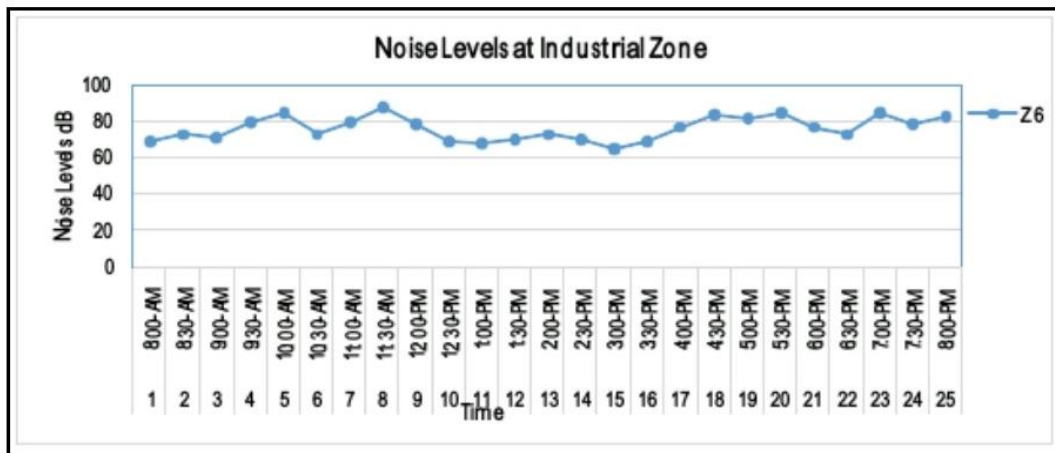


Fig. 5. Graphical representation of Noise level in Industrial zones

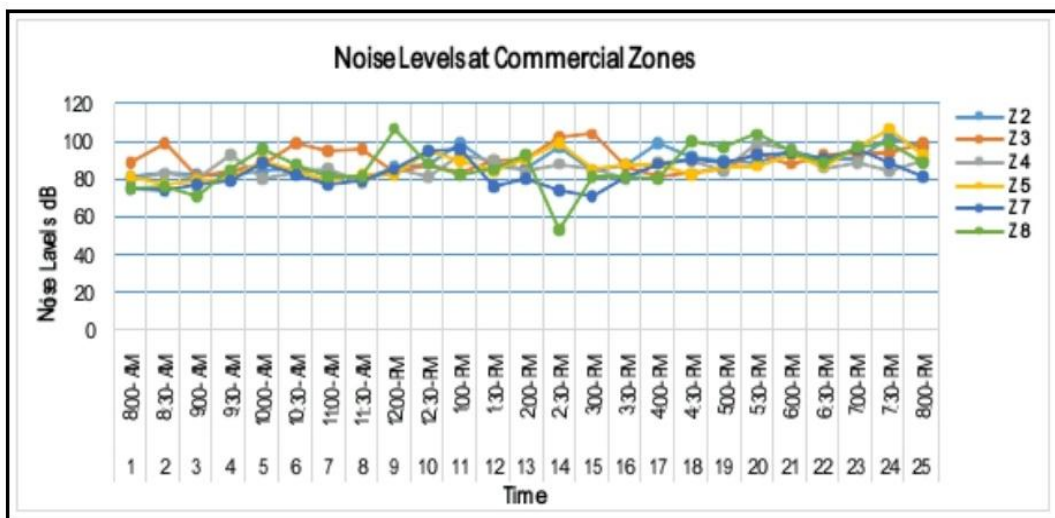


Fig. 6. Graphical representation of Noise level in Commercial zones

6. CONCLUSIONS

Noise Levels of APSRTC Bus Stand and their Avg. Noise Levels Recorded as 91.52 dB and the Zone of Jihna Tower Area Avg. Noise Levels Recorded 89.62 dB, Vegetable Market Road Avg. Noise Levels Recorded 88.28, South Way Railway Station Area Avg. Noise Levels Recorded 87.62 dB, Amavarathi Road Avg. Noise Levels Recorded 86.92, Lakshmi Puram area Avg. Noise Levels Recorded 84.72, Ramesh Hospital Area Avg. Noise Levels Recorded 84.05 dB and Syamala Nagar Area Avg. Noise Levels Recorded 83.24 dB.

All most all zones of noise levels are exceeding the permissible limits of noise. So that, Noise has influence direct and also indirect effects on blood pressure, in muscular strain, it leads to

tiredness and therefore the efficiency of person's decreases considerably. Exposure to the noise by the longtime may leads to temporary hearing loss and its leads to Cardiac disturbances in human beings [9].

Important observations

The composition of transportation of heavy vehicles like busses, lorry's, tractors and etc. in many of the study areas is very heterogeneous with a significant loads and which produces very noise pollution and resulting of traffic jams in many of intersections

Many of places are mixed with different zones. i.e. no proper zoning – silence zones are mixed with commercial zones, etc. and Many of silence zones are not displayed no-horn and or no proper signboards [4]. In the absence of fly bridges, max. transport vehicles have to pass by the small roads. Which may cause severe degradation of the road's structure and causes the increasing noise levels [8].

Following mitigation measures may be taken to have an effective control on the noise pollution:

1. Require proper zoning of the city. i.e. Silence Zone, commercial zones, sensitive zones and industrial zones [6].
2. Avoid merging of zoning in feature expunctions of the city and also maintain proper traffic management
3. Design of doors and windows: with sound insulation
4. Enclosures: Provide enclosures, shields and barriers so that some of the sound waves are cut off from propagating.
5. Planting of trees (Green Belt development): The presence of trees is likely to reduce the Vibration damping. Ashok, neem and tamarind are the best trees used as noise controls

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