

## **Assessment of Noise Levels in Different Selected Study Areas of Bengaluru City- A Case Study**

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**Abstract—** Noise pollution is one major environmental pollution on earth in recent trend due to urbanisation and industrialization also increase in vehicular population, and constructional activities, this paper has made an attempt to study the trend of noise levels caused by vehicles and other activities in Bengaluru city, the present study was carried out in selected areas of the city and the results were observed as higher than the CPCB permissible values. The study shows that the traffic volume influences to increase the noise levels in the city. During peak hour's traffic volume is plying a predominantly very high, due to this effect the noise levels were higher than the permissible.

**Keywords:** Noise level, Decibel (dB), Bengaluru.

### **1. Introduction**

The Noise pollution causes the environment crisis on earth and change in environmental condition, which initiative can be taken to rescue of environment in the city of Bengaluru city. Bangalore the capital city of Karnataka occupies important position in the state also in the country. The Bengaluru City located with 13° 10' N latitude and 77° 45' E long at an average elevation of about 900 meters. Bangalore is also famous as the 'Garden City of India. Fig 1 shows the city map. Bangalore is considered as one of the major, commercial and educational, Industrial centre in southern India. The city has taken distinction of being the fastest growing metropolis in the country. The mean annual rainfall is about 900 mm in June to September and October to November, with opposite wind regimes corresponding to Southwest and Northeast monsoons respectively. The average monthly relative humidity ranges from 85% between Jan to Oct to 44 % in dries March. The high wind speed averages 17 km/h throughout the westerly winds in the month of July and a lowest of 8 to 9 km/h during the months of April and October (Air quality trends-2006, cpcb). The figure-1 shows the google map of Bengaluru city.

It has observed that number of vehicles growing faster like cars and other type of vehicles in the cities. It is alarming to note that 32 percent of all vehicles are plying in metropolitan cities alone. The urban growth, industrialization, lack of services, energy and transport demands are most important to a vicious cycle of noise pollution. The Bengaluru city is facing the problem of various pollutions in atmosphere due to increase in the vehicles, industries and various other activities. This problem would be more in coming years considering the development rate of city. Hence serious studies are required to analyse and assess the pollution in city in order to better it.

### **2. Materials and Methodology**

The present study carried out with the selected instruments like electronic noise level measuring device for assessment of noise pollution, which works on laser scattering principles. A microphone is clear by the voltage value formed when a known, constant sound pressure is applied and this is identified as the microphone sensitivity. The instrument needs to know the sensitivity of the particular microphone being used. With this information, the instrument is capable to

Precisely convert the electrical signal back to a sound pressure, and display the resultant sound pressure level (Decibels dB). The figure-2 shows that electronic noise level measuring instrument.



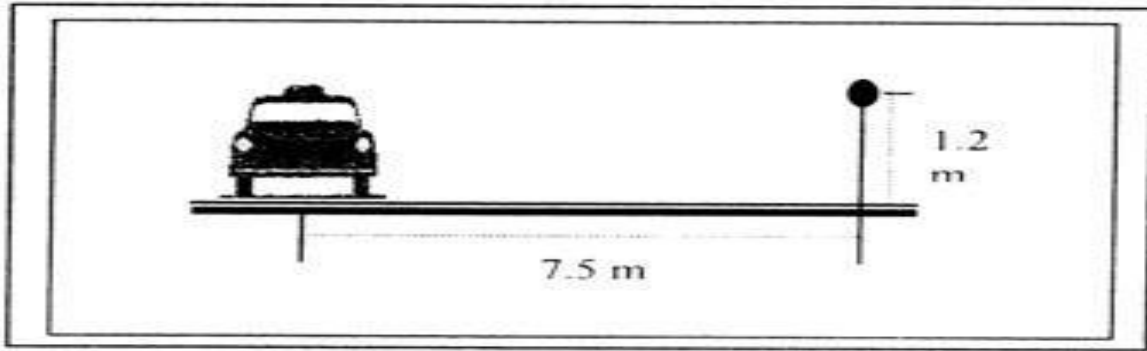
Fig 1: Google Map of Bengaluru City

The figure-2 shows that noise level measuring electronic device. In Bengaluru city most of the main traffic junctions are busy with heavy vehicles and pollution level is also high, keeping that some of the important junction points were selected for this study like Tin Factory junction and Yelahanka junction. Tin factory is a main junction point to connect four major roads, here the outer ring road passes through it and this junction connects city road towards Indiranagar circle and also it connects Kolar road which is busiest one in most of the time due to high volume of traffic, it is because of expansion of the city with high population of surrounding areas like krishnarajpura, Gattahalli and Medahalli, and also this highway leads to major institutional centres and industrial campuses. Yelahanka is also one of the busiest junction point which connects the national highway which leads to major city areas and towns, and also this junction point connects the major road which one is always busy with traffic due well developed residential and educational centres.



Fig 2: PM Measuring Electronic Device

The measurement procedure was followed as: Measurements were performed for fifteen days in the month of February 2016 in five different areas. Before taking the measurements, the sound level meter was suitably calibrated according to Level meter producer instructions. The sound level meter was placed on the pavement of the street at a height of about 1.2 m and at a distance of about 7.5 m from the existing road level as shown in figure 3.



**Fig 3: Location of the Sound Level Meter**

The sound level meter was provided with a windscreen to minimize the influence of wind during measurements. The 15 hours duration was considered at every hour measurement was taken. Noise level for different categories of vehicles was measured during three intervals ranged from 8-11 am (peak traffic hours), 12-15 pm (non-peak traffic hours) and 16-18 pm (peak traffic hours).

### 3. Results and Analysis

The present study was carried out to collect the data about noise levels in different selected areas of Bengaluru city. The data was collected hourly based in different days of weekday and on weekend days.

**Table: 1 Details of pollutants in Tinfactory and Yelahanka Junctions in week days and in weekend days**

Time	Tinfactory		Yelahanka	
	weekdays	Weekend days	weekdays	Weekend days
	Avg value of Desibles (dB)	Avg value of Desible (dB)	Avg value of Desible (dB)	Avg value of Desible (dB)
8-9 AM	85.45	76.58	73.00	67.22
9-10AM	83.85	74.60	72.60	66.42
10-11AM	81.19	75.57	73.00	68.42
11-12PM	80.74	74.30	72.50	68.27
12-1PM	80.24	76.30	73.00	65.37
1-2PM	76.46	75.50	68.00	68.00
2-3PM	81.00	73.12	71.70	67.85
3-4PM	79.61	77.07	69.60	68.82
4-5PM	80.42	80.32	72.50	67.72
5-6PM	85.82	80.37	74.60	71.30

Table-1 shows that the average values of noise levels in week days and weekend, it observed that variation of noise levels with respect to the time, the present study results were clearly shows that the peak hours were very high values those were crossing the limit of CPCB and also in the weekend days shows high in peak hours. In weekdays generally peak hours movement vehicles are more due to rushing towards office work as Bengaluru city is famous for IT city, so that many of them depends on their own private transport mode. From the analysis Peak hours like 8- 10 hours shows

High dB of 85.45 but in non-peak hours like 11-2 hours shows little less comparing with peak hours but this levels were also crossing the limits of Central Pollution Control Board, New Delhi.

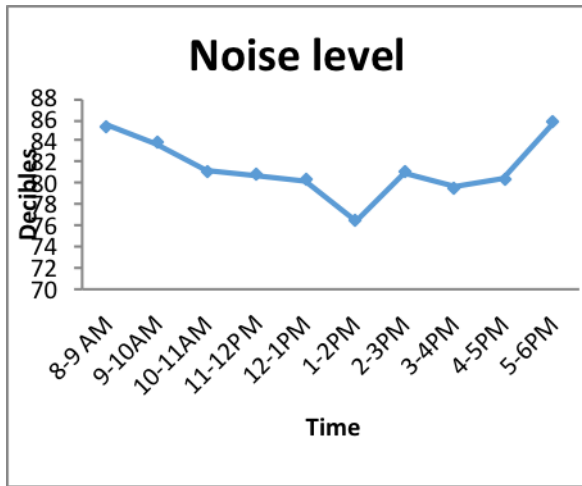


Fig4: Noise Levels in weekdays at Tin Factory Study Area

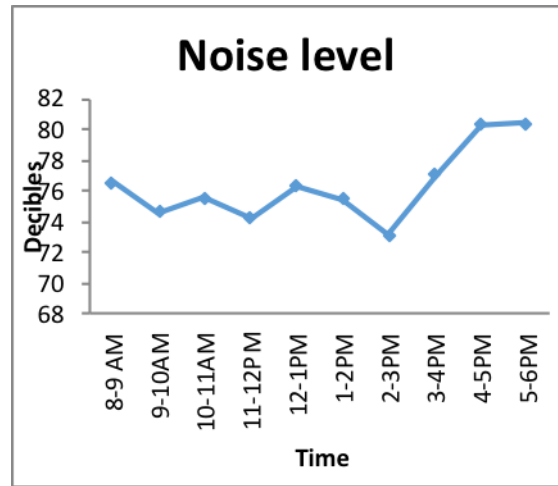


Fig 5: Noise Levels in weekend days at Tin Factory Study Area

From the fig 4 and 5 shows that the study area of Tin factory can be seen that the value varies in same trend in both the cases, but pollution levels were quite high in the weekdays as compared to weekend. This variation is just because weekdays will have more traffic movement than weekends. Due to heavy movement of vehicles to reach work places people may faces some unexpected situation this leads the traffic jams, this effects leads to horn for clearing the way. So that, this nuisance also creates to increase the level of noise in peak hours. The graphs were shows that higher levels in peak hours and little less in non-peak hours in Tin factory junction which is close to Information Technological parks of white field and marthahalli.

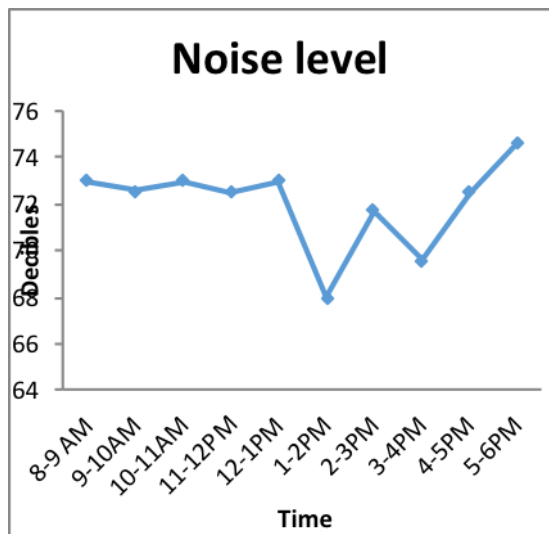


Fig 6: Noise Levels in weekdays at Yelahanka Study Area

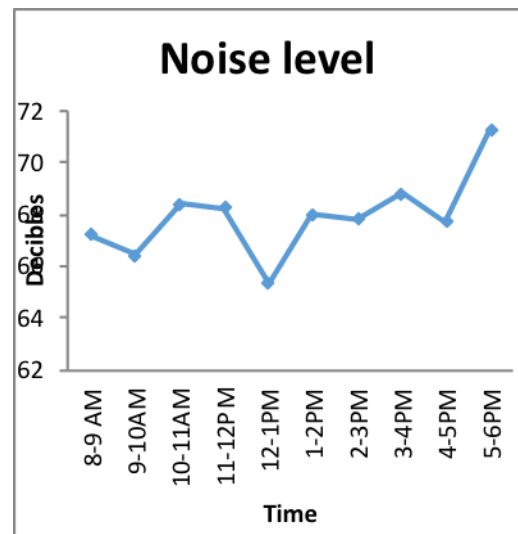


Fig 7: Noise Levels in weekend days at Yelahanka Study Area

From the fig 6 and 7 shows the study area of Yelahanka, it can be seen that the values varies in same way in both the cases, but pollution levels are quite high in the weekdays as compared to weekend. Noise levels on weekends are lesser than weekdays because of less traffic movement in weekends. Due to heavy movement of vehicles to reach work places people may faces some unexpected situation this leads the traffic jams, this effects leads to horn for clearing the way. So that, this nuisance also creates to increase the level of noise in peak hours. The graphs were shows that higher levels of

Noise in peak hours and little less in non-peak hours at Yelahanka junction which is close to the industrial areas and different educational centres.

#### **4. Conclusions**

The present study shows that the percentages of vehicles play a major role to increase the noise pollution levels in the junction areas. The two wheelers were more in the city and also other vehicular impact may cause the level of noise pollution, the classification like auto-rickshaws, heavy vehicles were also may cause pollution level more in that study points. Even by traffic jams in the study areas leads the pollution level. The noise levels were crossing the limit of CPCB, generally in peak time levels of noise were high comparing with other than peak hours.

#### **5. Acknowledgement**

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