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An Analysis of Sound Pollution in the Major Cities of India: A Comparative Study

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Abstract: ***The Noise pollution is a nuisance to the society and surrounding environment. The purpose of this paper is to compare and analyse the sound pollution in the different major cities of India. I have taken 6 major cities and collected the data from the 10 sound monitoring stations of each city which was available at CPCB.IN, the data is cleaned and taken average, it is then time series analysis and Auto regression was conducted on the it. The final data is compared Graphically yearly. The most noise polluted city during day and night is identified and suggestion were made to abate the noise pollution. Since Indian major cities are one of the busiest among the world, it was observed in the study that almost all the six cities cross their standard limits set by the city's pollution control board suggesting all six cities have noise disturbances more than normal and usual. So, there is absolutely necessary for abatement of noise pollution in these cities and much stricter and serious approach from the government to decrease the noise pollution in the cities. For all the comparison we have used data visualization. This research provides a comprehensive understanding of sound pollution and compares it on different cities of India.***

I. INTRODUCTION

The unending progression of modernisation of the world on a global and national scale though improved man's livelihood have always posed a alarming threat to the sustainability of economy, environment and human wellbeing. As civilisations started showing signs of urbanisation the progression through time have been well noted and had for long developed urban infrastructure to service people's need for travel, clean water, sanitation and energy nonetheless were executed with limited knowledge therefore have led to obvious drawbacks. The introduction of roads, one of the earlier steps towards urbanisation though have exhibited their fair of significance in the development of society, the environmental impact of transport and traffic has also been identified as one of the major contributors to air pollution and global warming next to industrial activities. Pollution causes Human major nuisance and illness in addition to having adverse effects on the ecosystem.

Unwanted sound which disrupts the quality of life of people and their environment is called noise. Sound becomes noise pollution when noise in the environment exceeds a certain limit, it is termed as noise pollution. Sound becomes undesirable when it disturbs normal activities such as working, sleeping, and during conversations. The fact that noise cannot be seen, smelt, or tasted results in it being an underrated environmental problem. The World Health Organization states that "Noise must be recognized as a major threat to human wellbeing". Unwanted sounds most clearly are defined as noise. More accurately defined: audible sounds that cause bother, disability or harmful to human health is noise.

II. RELATED WORKS

Exposure to noise at work also indicates some association with blood pressure. The effects of sound are powerful in those effects, such as irritation, which can be classified under 'health' rather than illness.

It is possible that the risk of developing a mental illness or an illness caused by environmental noise is very low, even if one of these is very close in terms of research progress. Part of the problem is that the relation between people, noise and illness is complicated. People who often find themselves exposed to sound and can develop strategies to cope with the effects of sound exposure. Successfully coping with noise can be enough to minimize any side effects. Stephen A Stansfeld & Mark P Matheson proposed the idea of sound source control can reduce the threat of noise and believe it can be harmful. It is also possible that sound can be life-threatening in situations where multiple stresses are encountered.

Evans and John Johnson found that maintaining physical activity in noisy offices is associated with increased physical effort and hormonal response.

L.Ezhilarasi, K.Sripriya, A .Suganya & K.Vinodhini focus on the environment degradation like Sound & Air pollution, which is a growing issue these days. It is necessary to monitor air quality for the future generations and sustainable development. In the paper, they propose an air quality and sound pollution monitoring system which allows to monitor and check the quality of air as well as sound pollution in particular area through IoT.

III. METHODOLOGY

The analysis is conducted on the based of pollution in major cities of India i.e. Delhi, Bangalore, Chennai, Hyderabad, Kolkata and Mumbai from the year 2014 to 2018 whose sound pollution level is recorded at every 10 busiest station of each city, the data is segregated into Day and Night.

After data collection, Data analysis is done through Autoregression, autocorrelation method, graphical method, regression analysis Two key aspects are the data source and representation of data

A. Datasets

The Collection of data is done from verified government approved source which is CPCB in excel format. The data set is used to compare the pollution level among the six cities and the cities are then ranked as which is the least and most sound polluted during the day & night time.

B. Data Visualization

In the paper, a descriptive model is created by analysing the collected data and applying statistical analysis to it. Graphical presentation of all the variables of the cities i.e. Delhi, Bangalore, Chennai, Hyderabad, Kolkata and Mumbai from the year 2014 to 2018 are compared to rank the following cities from least to most sound polluted. All the graphical representation is done with the help of excel 2016 and Microfit.

IV. RESULT

The descriptive model made in this paper provides various graphs for proper comparison among the cities. The graphs represent the parameters sets to check the quality of sound for different cities from the time period 2014 – 2018 and check if the sound pollution has risen in the last few years.

Yearly Analysis of the six cities during day time

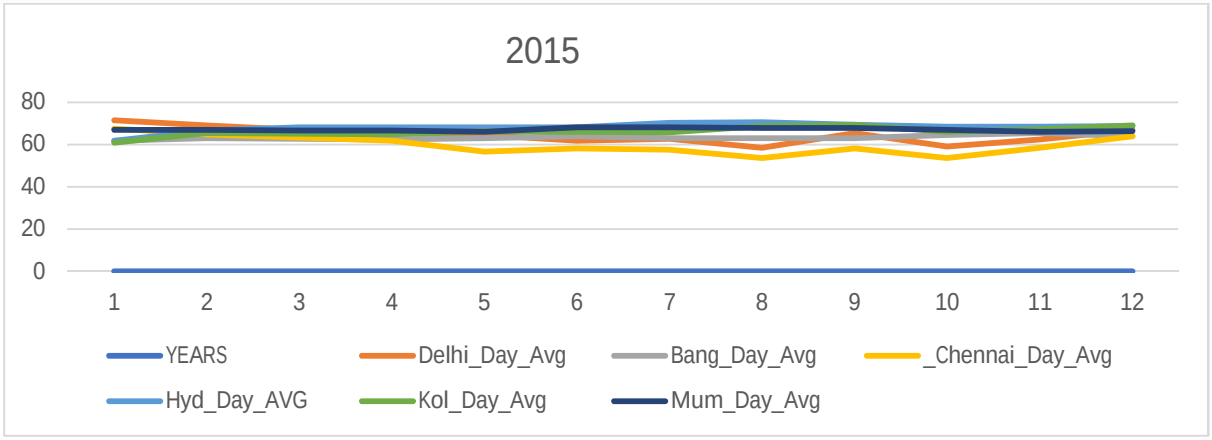

Figure: It shows the level of pollution for the year 2015 during day time

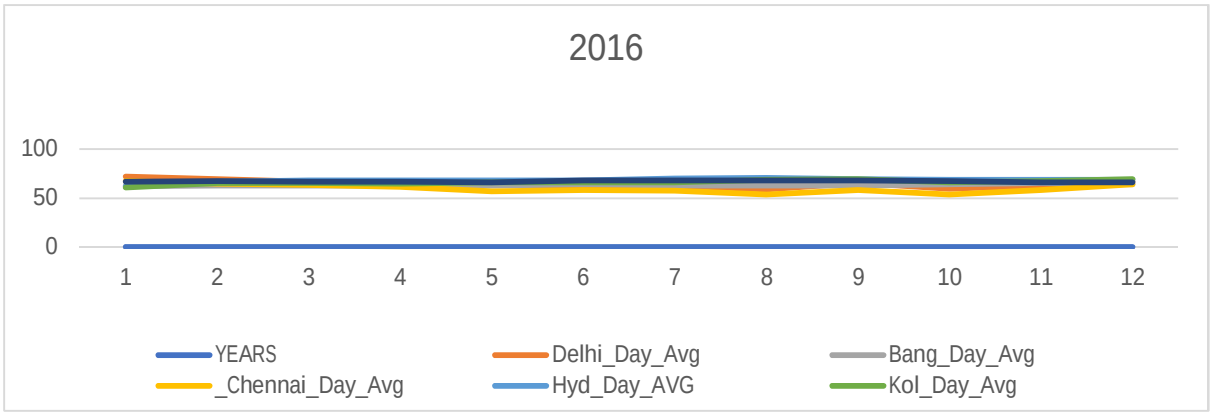

Figure: It shows the level of pollution for the year 2016 during day time

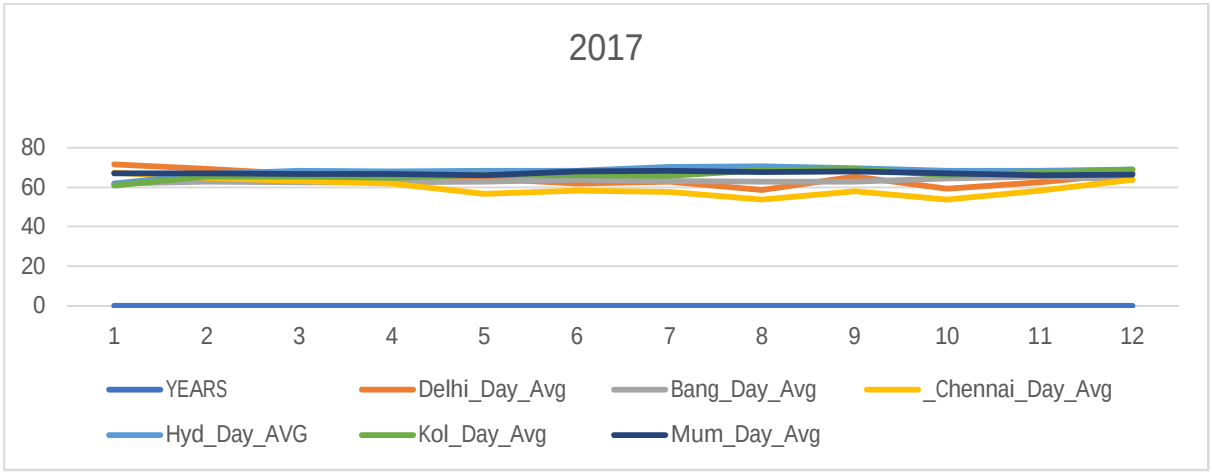

Figure: It shows the level of pollution for the year 2017 during day time.

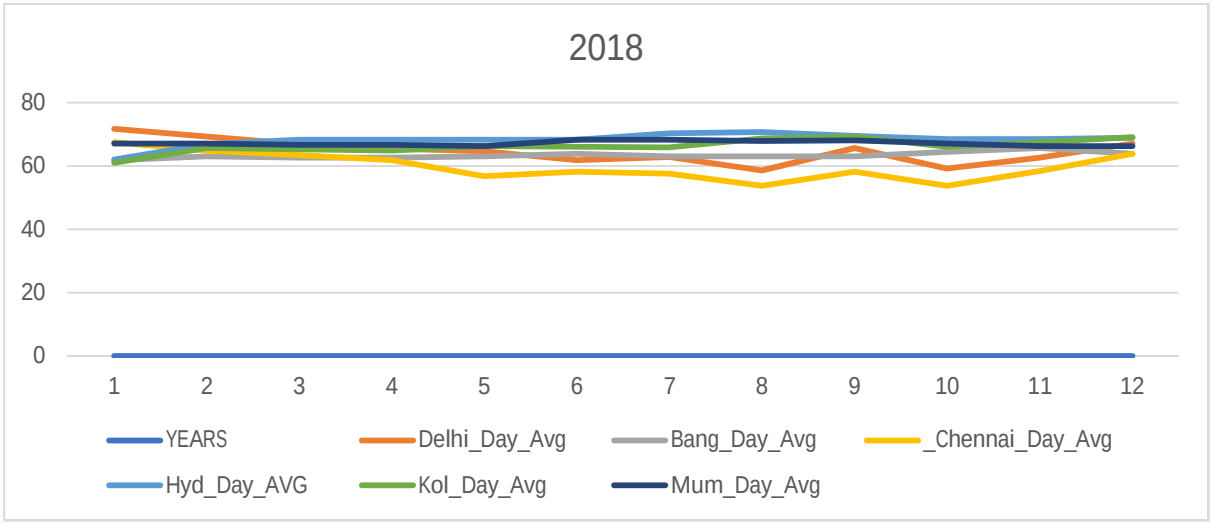

Figure: It shows the level of pollution for the year 2018 during day time.

In the year 2014 -18, Hyderabad is found to be most sound polluted city during the day time while Chennai is the least sound polluted city of the six.

Yearly Analysis of the six cities during night time

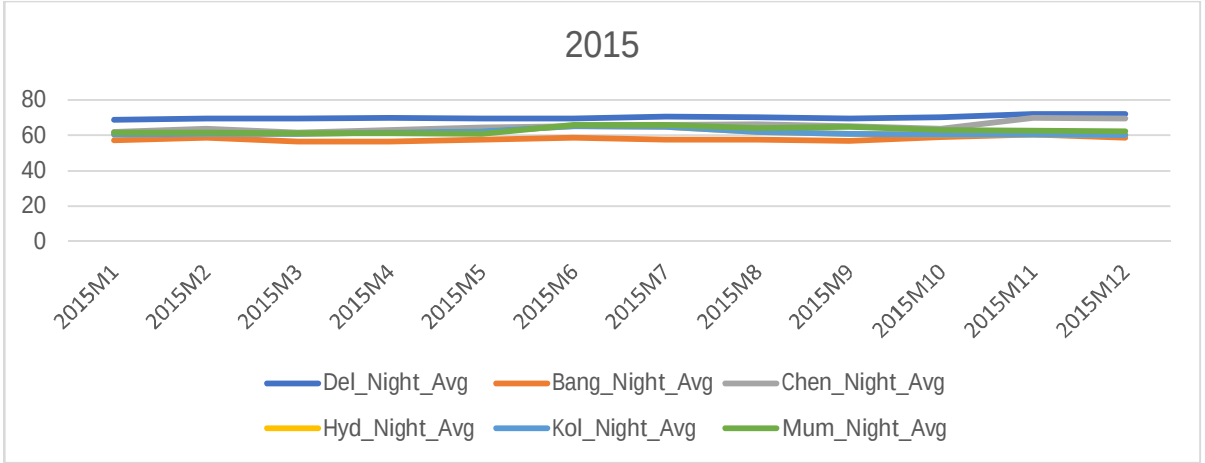

Figure: It shows the level of pollution of the year 2015 during night time

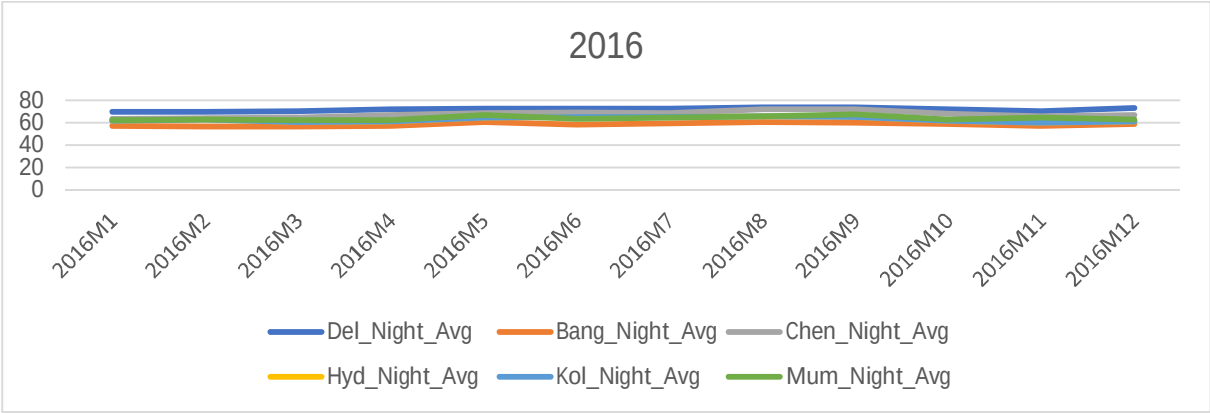

Figure: It shows the level of pollution of the year 2016 during night time

The Left- Hand Scale shows the rate of noise pollution Right-Hand Scale shows the time span over the year and the frequency of data is monthly and for pollution relates to the average for each month during night time.

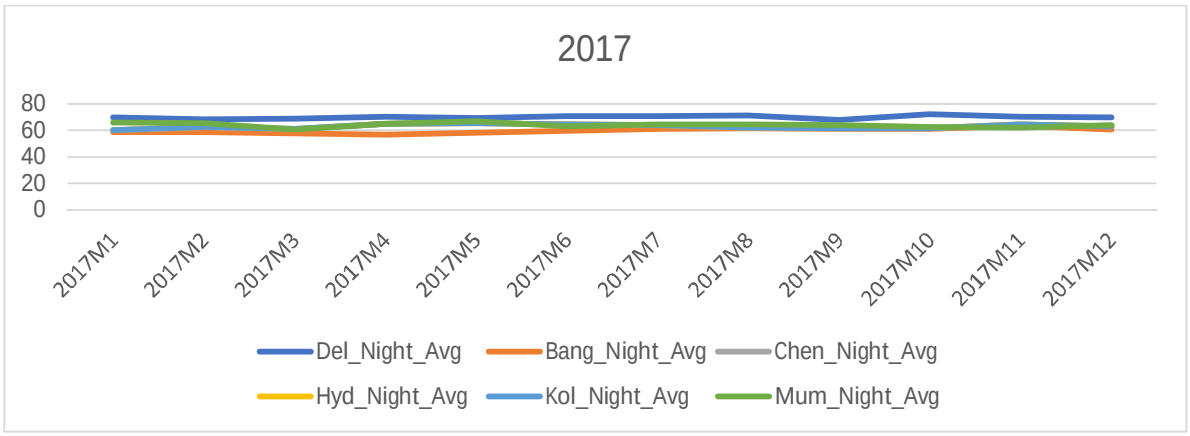

Figure: It shows the level of pollution of the year 2017 during night time

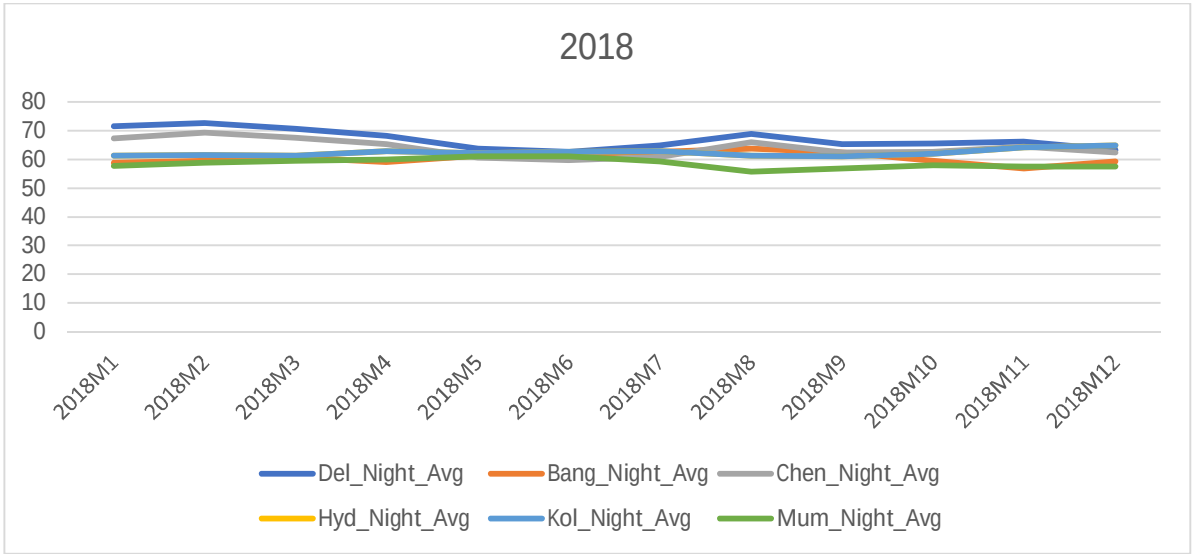

Figure: It shows the level of pollution of the year 2018 during night time

From the year 2014-2018, In the night time Delhi is found to be the most sound polluted city and Bangalore is the least sound polluted among the six.

The Left- Hand Scale shows the rate of noise pollution Right-Hand Scale shows the time span over the four years and the frequency of data is monthly and for pollution relates to the day average for each year.

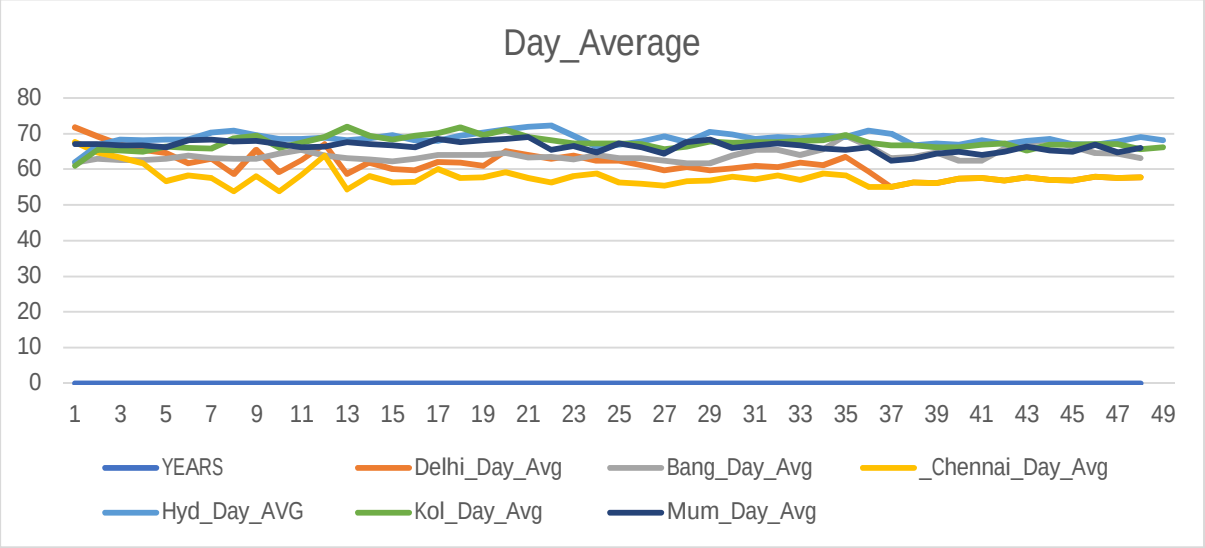

Figure: It shows the level of pollution over the years during day time

1) *Interpretation:*

a) It shows that Hyderabad and Kolkata are the mostly sound polluted cities during the day time, with the two cities constantly being on top of the chart over the years.

b) Chennai being the least sound polluted city during day time by remaining at the bottom of the chart.

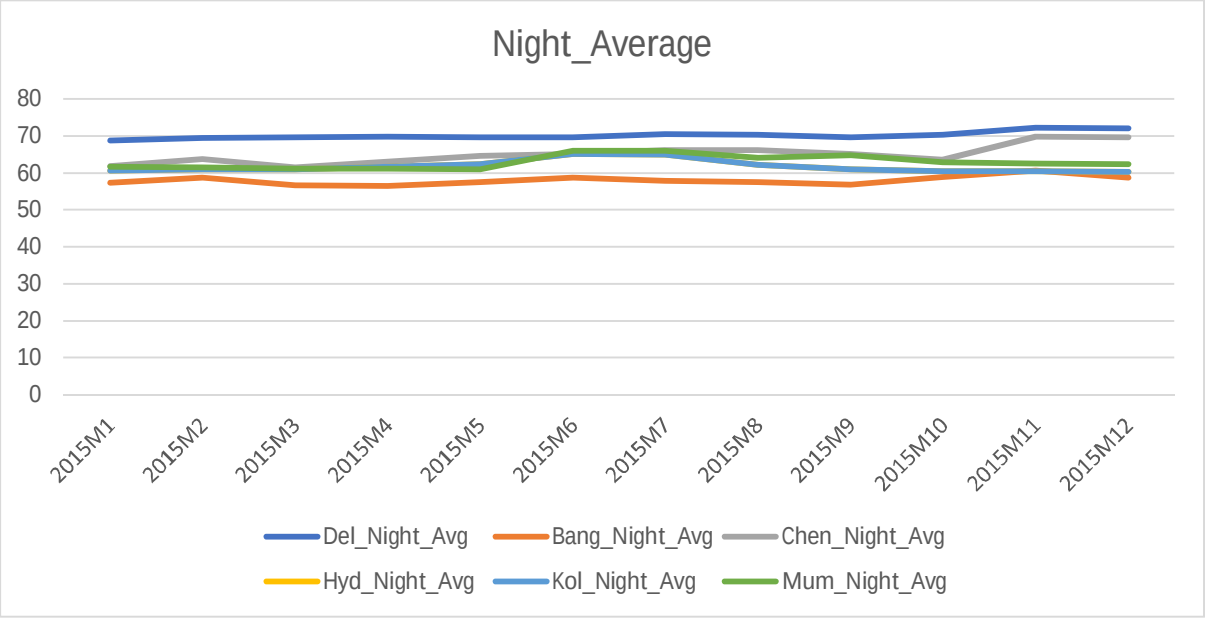

Figure: It shows the level of pollution over the years during night time

2) *Interpretation:*

a) It shows that Delhi is the most sound polluted city during night time, with the city constantly on top of the chart over the years.

b) It also shows that Bangalore is the least sound polluted city during night time by remaining at the bottom of the chart. At around 2018 January Mumbai intersects with Bangalore and dips further down to become the least sound polluted among the cities.

V. CONCLUSION

Since all of the cities pass their standard limit almost every month in the study period, it is suggested to install sound barriers at the most busiest stations in the cities to abate sound pollution. Hyderabad & Delhi both being the most polluted cities during day and night consecutively. So, there is absolutely necessary for attenuation of noise in the two cities. Hyderabad needs stringent traffic rules as it is the noisiest during day time, while Delhi needs to have strict industrial norms to reduce noise pollution during night.

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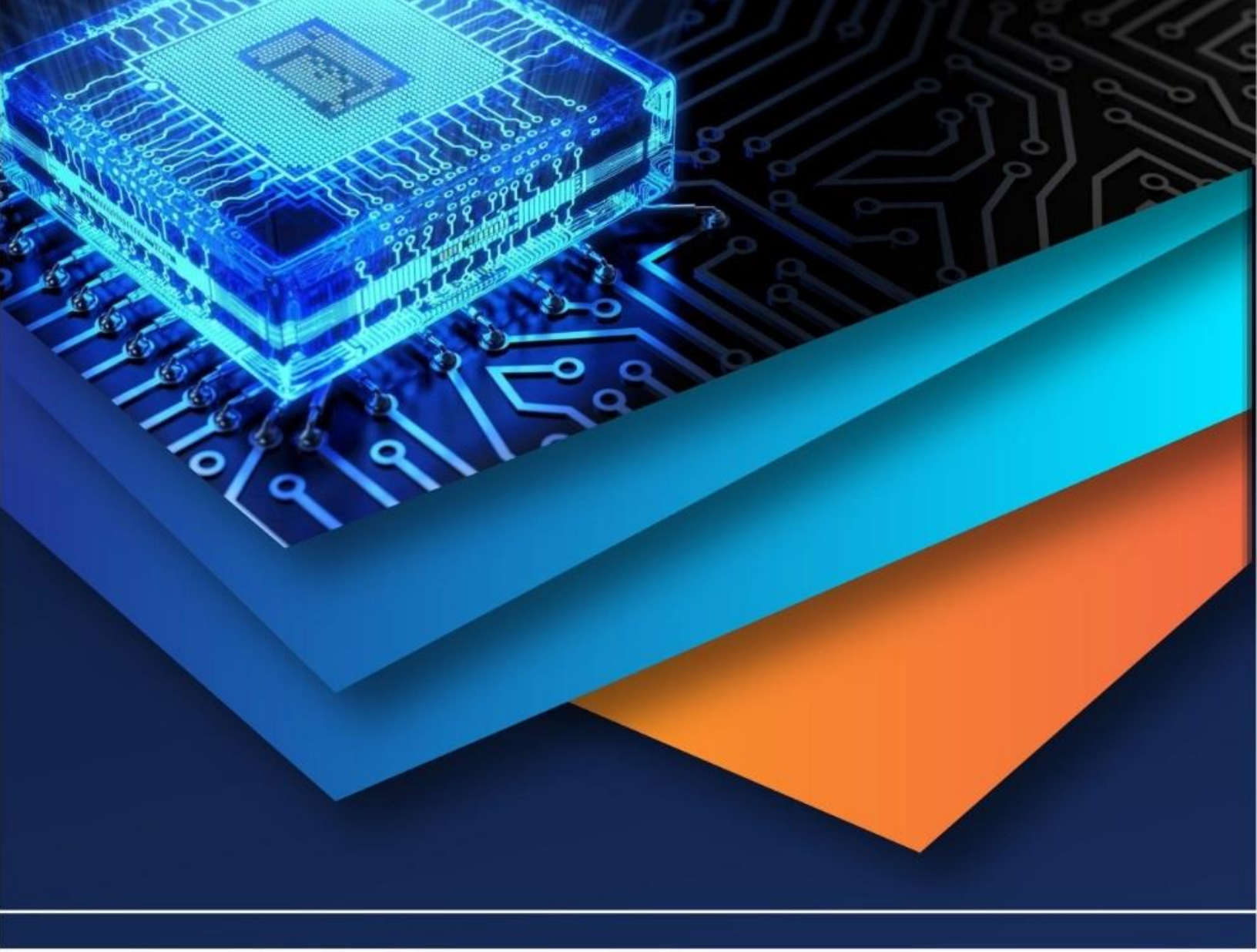

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