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Analysis Of Noise Pollution In Silence Zone Of Gwalior City For The Years 2011-2015

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Abstract - *Gwalior is historic and very important city in North-central India . As Gwalior is developing area and a good education center there is a rapid urbanization and alarming growth of population is causing serious environmental problems. Noise is one of the environmental problems that people of Gwalior suffer in daily life. Noise pollution has become major concern for communities living within the city. Considering the sudden increase in the number of vehicles passing through the Silence Zone (J.A. Hospital), rapid growth and illness effect due to noise pollution, there is need to study noise pollution in Gwalior . In this study an attempt is made to analyze the noise pollution data of Pollution Control Board, Gwalior and to monitor the noise pollution due to vehicular traffic at one of the Silence Zone Hospital of Gwalior . The variation in the noise level due to traffic flow and traffic volume data in the peak hours are studied for the years 2011-2015 and are presented in the graphical form for the selected location for the day time . The study also includes the remedies which can be provided for minimizing the noise pollution in Silence Zones*

Key Words: **Gwalior , Silence Zone , Noise Pollution , J.A. Hospital ,2011-2015**

1.INTRODUCTION

Gwalior is located at 26.22°N 78.18°E ,in northern Madhya Pradesh 300 km (186 miles) from Delhi. It has an average elevation of 197 metres (646 feet)[1]. The most old government hospital in this region is Jaya Arogya Hospital also known as JAH was built during the period of Late Madhav Rao Scindia and was inaugurated formally in 1899. [2]

Noise is defined as unwanted sound. Environmental noise consists of all the unwanted sounds in our communities except that which originates in the workplace. Environmental noise pollution, is a threat to health and well-being. It is more severe and widespread than ever before, and it will continue to increase in magnitude and severity because of Industrialization ,Population growth, Urbanization, Increase in number of vehicles and the associated growth in the use of increasingly powerful, varied, and highly mobile sources of noise. It will also continue to grow because of sustained growth in highway, rail, and air traffic, which remain major sources of environmental noise. The potential health effects of noise pollution are numerous, pervasive, persistent, and medically and socially significant. Noise produces direct and cumulative adverse effects that impair health and that degrade residential, social, working, and learning environments with corresponding real (economic) and intangible (well-being) losses. It interferes with sleep, concentration, communication, and recreation . Noise Pollution in Silence Zone comprising of Hospitals can be a biggest threat to the patients who need speedy recovery but somehow due to high number of vehicles passing and no follow up of rules and regulations has resulted in excessive noise pollution in these Silence Zones .

The Central Pollution Control Board of India constituted a Committee on Noise Pollution Control. The Committee recommended noise standards for ambient air and for automobiles, domestic appliances and construction equipments, which were later notified in Environment(Protection) Rules,1986 as given below:-

Area code	Category of area/Zone	Limits in db (a) leq *	
		Day time	Night time
(a)	Industrial area	75	70
(b)	Commercial area	65	55
(c)	Residential area	55	45
(d)	**Silence zone**	**50**	**40**

1. Daytime shall mean from 6.00 a.m. To 10.00 p.m.
2. Nighttime shall mean from 10.00 p.m. To 6.00 a.m.
3. **Silence zone is defined as an area comprising not less than 100 metres around hospitals, educational institutions and courts.** The silence zones are zones, which are declared as such by the competent authority.

4. Mixed categories of areas may be declared as one of the four above-mentioned categories by the competent authority.
*db (a) leq denotes the time weighted average of the level of sound in decibels on scale a which is relatable to human hearing.

- A "decibel" is a unit in which noise is measured.
- "a", in db (a) leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.
- Leq: it is an energy mean of the noise level, over a specified period

2. Method and Material

Noise measurements were carried out by using Sound Level Meter during the Day time from 6.00am to 10.00 pm at Jaya Arogya Hospital Main Road . Noise measurement reading were taken every 15 minutes and number of vehicles passing were noted by the Pollution Control Board Gwalior and calculated Minimum , Maximum and Average .

2.1 Results and Discussions

As per the data collected and recorded at J.A. Hospital (Silence Zone) , the results are as follows [3]:

Table 1 : Data collected at Date 22/04/2011.

	Minimum	Maximum	Average
Noise Level (db(A))	51.1	63.1	57.1
Number of vehicles counted	59	304	182

Table 2 : Data collected at Date 20/07/2011

	Minimum	Maximum	Average
Noise Level (db(A))	50.1	64.1	57.1
Number of vehicles counted	70	449	260

Table 3 : Data collected at Date 26/01/2012

	Minimum	Maximum	Average
Noise Level (db(A))	45.9	63.1	54.5
Number of vehicles counted	69	289	179

Table 4 : Data collected at Date 29/06/2012

	Minimum	Maximum	Average
Noise Level (db(A))	44.2	63.4	53.8
Number of vehicles counted	62	296	179

Table 5 : Data collected at Date 30/01/2013

	Minimum	Maximum	Average
Noise Level (db(A))	44.2	61.4	52.8
Number of vehicles counted	62	426	244

Table 6 : Data collected at 29/07/2013

	Minimum	Maximum	Average
Noise Level (db(A))	45.8	62.4	54.1
Number of vehicles counted	50	250	150

Table 7 : Data collected at Date 16/11/2013

	Minimum	Maximum	Average
Noise Level (db(A))	45.0	61.1	53.05
Number of vehicles counted	55	354	205

Table 8 : Data collected at Date 15/04/2014

	Minimum	Maximum	Average
Noise Level (db(A))	44.0	61.1	52.55
Number of vehicles counted	55	354	204

Table 9 : Data collected at Date 15/09/2014

	Minimum	Maximum	Average
Noise Level (db(A))	43.0	62.1	52.55
Number of vehicles counted	565	356	206

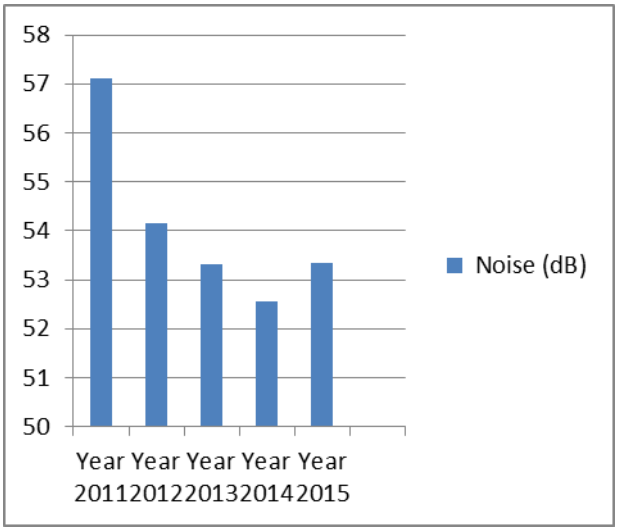
Table 10 : Data collected at Date 20/01/2015

	Minimum	Maximum	Average
Noise Level (db(A))	44.0	62.4	53.2
Number of vehicles counted	60	370	215

Table 11 : Data collected at Date 10/03/2015

	Minimum	Maximum	Average
Noise Level (db(A))	42.5	64.5	53.5
Number of vehicles counted	56	354	205

Graph 1: Showing the Noise Levels in the years 2011-2015 at a Silence Zone in Gwalior



3. CONCLUSIONS

It is very clear from the above observations that the Noise level in the Silence Zone (J.A. Hospital), Gwalior is always above the permissible limits . The honking of horns, flow of ill maintained vehicles which are found in majority in Gwalior, poor road conditions and encroachments find on road sides that cause traffic congestion were found to be the reasons for high noise level in Gwalior. People in general, patients in particular are highly exposed to noise level.

This can result in Hearing Impairment , Interference with Spoken Communications ,Sleep Disturbances, Impaired Task performances ,Negative Social behaviour and Annoyance reaction. Plantation of tree species along road side is one of the cost effective methods to control noise pollution. Many workers like [4,5]have identified the tolerant species of noise pollution on the basis of air pollution tolerant index. Azadirachta indica, Mangifera indica, Albizia lebbeck, cassia

fistula, Michelia champaca, Eucalyptus umbellate, Pongamia pinnata, Acacia nilotica are the species that are effective in controlling noise pollution.

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REFERENCES

[1] http://www.fallingrain.com/world/IN/35/Gwalior.html

[2] http://www.grmcgwalior.org/jaya-arogya-hospital.html

[3] As given by Pollution Control Board ,Gwalior

[4]Agarwal,S. and Tiwari, S.L.(1997) susceptibility level of few plants on the basis of air pollution tolerance index, Ind forester, 4, 319-322 .

[5] Kumar,S. and Paulsany, S. (2006).Studies on identification of suitable tree species for control of effect of air pollution in Tamil Nadu. Nat Env and Poll tech., 5(4) 591-599.