

Study of Noise pollution level at Shalimar area of the Nashik City during Normal days and festival days.

¹M M Bagul, ²S S Bandgar

¹Assistant Professor Department of Physics, M V P Samaj's Arts Commerce and science college, Dindori (Nashik)- 422202 India.

²Assistant Professor Department of Electronics, K.R.T Arts, B.H. Commerce, A.M. Science college, Nashik- 422002, India.

ABSTRACT :In the environment, there are different types of noise, which are not only harmful to humans, but also harmful to animals. In the past four decades, considerable efforts have been made internationally to reduce the impact of transportation on noise. Noise is a harmful sound, which can destroy the quality of life. A large amount of noise in the environment is called noise pollution, which interferes with normal activities, such as noise from work, sleep, and conversation. Community noise or environmental noise is one of the most common pollutants. Community noise includes major sources of roads, railways and air traffic, industry, construction and public works, and surrounding areas. Most areas of Maharashtra, Nasik City are overcrowded and densely populated. The city is composed of a combination of old and new structures. Due to traffic congestion and urbanization, people from villages to towns have increased the noise level of civil works through vehicles and houses. We recorded noise levels in decibels at different times of the day during weekdays and festivals in Shalimar, the main business in the district of Nashik. Compared with the standards set by the Pollution Control Board, the noise level at this location is significantly higher. The investigation of this research believes that the noise level during peak hours at night is higher than the noise level during other times of the day. Narrow roads, no plantation coverings, no proper spacing of building design and acoustic design considerations. We concluded that public awareness and public environmental education are essential for maintaining the natural environment and controlling pollution. Peoples must be aware about importance of human health and environment protection Act.1986.

KEY WORDS: Noise pollution, Shalimar, Noise data, decibel meter, tables, graphs.

1. INTRODUCTION

Noise is derived from the Latin word "NIVSEA", which means unwanted sound. It is undesirable, Unpleasant, unexpected, irritating and stressor. The sound is measured in decibels (dB). This is a logarithmic scale invented by Bell Telephone network engineers. Named after the inventor of the telephone in 1923 (Alexander Graham Bell (1847-1922), the Audio Engineering Society recommended the use of dB A space. In India, it is usually expressed as dB(A). Air may be Make pleasant sounds and unpleasant sounds. Vibrating sounds will enter our ears and hear sounds. Harmful sounds (loud sounds) will stimulate ears and human health. They are called noises, and humans cannot hear everything. Sound. The range below 20 Hz is called infrasound, and the range above 20 KHz is called ultrasound. [1-5]

There are three characteristics of sound Loudness, pitch and quality . Loudness is measured in decibel (dB). Human ear can hear sound between frequency range 20 Hz to 20 KHz. The speech zone lies in the range of 500 to 2000 Hz. The human ear is most sensitive in the range of 2,000 Hz to 5,000 Hz. The noise has been mention as ambient air pollutant. Standards in this regard are laid down under Environment (protection) Rules, 1986 and under the model rules of the factories Act. 2948. The people of Nashik City faced Noise pollution is one of the major problems in populated area or in commercial area. The major source & contributors in noise pollution are rapid growth of population, uncontrolled urbanization, rural urban migration, industrialization, road transportation, traffic jamming, civil work and machinery, human activities in festivals & cultural programme and unnecessary use of loudspeakers, loud musical systems, harsh sounds of vehicle horns, barking of dogs. [2-6]

2. EFFECTS OF NOISE POLLUTION

Noise affects health both by physiologically and psychologically Hearing loss, damage of ear, hearing deafness increasing systolic & diastolic blood pressure reduction in birth weight of baby, premature birth skin resistance alteration headache, neurological disorder, respiratory modification loss of memory hyper tension cardiovascular constriction are the physiological effects and annoyance anxiety fatigue, tension, tear, lack of concentration change in behaviour interference in communication task inference in performance reduction in work efficiency loss of sleep, cause of irritation, frustration, depression and birds, increases in heart beat rate causing respiratory difficulties in animals and birds, general stress, reaction changes the behaviours of bird, abandonment of territory, loss of ability to produce.[7]

3. NOISE POLLUTION

	dB	
Painfully loud	140 -	50 HP at 30 m
	130 -	Oxygen torch, pneumatic chipper
Uncomfortably loud	120 -	Discotheque
	110 -	Textile loom, jetliner 300 m overhead
Very loud	100 -	Farm tractor, newspaper press, air hammer, air compressor, milling machine, bench
	90 -	Heavy city traffic, train whistle
Moderately loud	80 -	Key punch machine
	70 -	Average traffic
Quiet	60 -	Conversational speech

	50 -	Business speech
	40 -	Soft whisper
Very quiet	30-	A room in a quiet house at night
	20 -	Motion picture studio
Just audible	10 -	Motion picture studio
Threshold of hearing	0 -	

4. LEGAL PROVISION

According to the report submitted by the World Health Organization to the United Nations Environment Assembly, of all environmental problems, noise is the easiest to control. It is controlled by the law and people's consciousness. The Indian Constitution stipulates environmental protection regulations in Article 48A to improve the environment and protect the country's forests and wildlife. Article 51(A)(G) stipulates that every citizen shall have the appropriate right to protect and improve the natural environment including forests, lakes, rivers and wild animals and plants. In India, many legislations have been enacted to protect and preserve the environment. The important legal act was designated as the "Environmental Protection Act of 1986." On this basis, the noise pollution, regulations and control rules 2000 were formulated. Nowadays, noise is considered a pollutant, and the production and use of high-intensity firecrackers is prohibited.[8] The Central pollution control board (CPCB) committee has recommended permissible noise level for different locations as given by Table.

Area Code	Category of Area/Zone	Limitations in Day time (dB)	Limitations in Night time (dB)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

When the sound level reaches 140 dB, our ears will be hurt. Long-term exposure to noise will cause permanent damage to the ears. Even 85 dB(A) will cause hearing loss. The noise level of 120 dB(A) is called the pain threshold. The noise level of 140 dB(A) is very harmful and can cause permanent deafness, while 150 dB(A) may kill people. The international reference pressure level of 2×10^{-5} Pa is the average hearing threshold. A survey conducted by the Central Pollution Control Board (CPCB) in Delhi showed that noise levels in most places exceeded the allowable limit. Similar surveys and studies on the Central Pollution Control Board (MPCB) in Maharashtra showed People living in commercial, industrial and quiet areas Mumbai also suffer from high levels of noise pollution. Pinkle and Koppen (1948) pointed out that fasting blood sugar can cause a sharp decrease in hearing acuity and increase fatigue. (1977) In one of their studies, they found that industrial workers' systolic and diastolic blood pressure increased significantly due to continuous exposure to noise. Shetye et al. (1982) estimated that the noise level of crowded places in Mumbai is almost twice the standard noise level of residential buildings. J.K. Datta (2005) found that in different parts of Burndown town, the sound level is in the range of 65-83 dB or higher. West Bengal. P. Bhatia (1995) showed that a noise level of 100 dB(A) will increase blood pressure and pulse rate. According to De (2000), a noise level of 65 dB at a distance of one meter will affect the human heart, while a noise level of 125 dB will affect the human ear. D Banerjee (2007) estimated that the noise level of Asansol increased during the Kalipuja festival. Noise can damage the body and mind. The effects of noise pollution are auditory and non-auditory; many researchers and researchers have discussed the effects of noise pollution on human health and behaviour. World Health Organization (WHO) suggested that the people should aware and everyone should know the impact of noise pollution on human health.[1-12]

5. INTRODUCTION OF STUDY AREA

Shalimar is a prime location in the city of Nasik and is regarded as the heart of Nasik. This overcrowded crowd, small-scale market shoppers and merchants all work here, so most people from the entire region and the entire city come here to shop for various types of goods.

6. MATERIALS AND METHODS

Noise levels were monitored in the Shalimar area of Nashik. The research was conducted on normal days and festive days. Use a sound level meter YF-20 to record an interval of 1 hour at each location, observe the noise level in the low frequency range of 40-80 (A) and the high frequency range of 80-120 dB (A), and record the average noise level. The sound level meter includes a condenser microphone calibration with a signal generator amplifier, a weighing network and a display, and an indicator meter. All readings are taken at a height of 1.5 meters from the ground. The recorded data is listed in the table and analysed through graphs.

7. RESULT AND DISCUSSION

7.1 Sound level information of Shalimar area in normal days

Table – 1 Sound level information of Shalimar area in normal day.

Sr. No.	Time in Hrs	Noise Level in dB (A)
1	06.00 to 07.00 am	40
2	07.00 to 08.00 am	41
3	08.00 to 09.00 am	43
4	09.00 to 10.00 am	51
5	11.00 to 12.00 am	62
6	12.00 to 01.00 pm	77

7	01.00 to 02.00 pm	81
8	02.00 to 03.00 pm	78
9	03.00 to 04.00 pm	65
10	04.00 to 05.00 pm	59
11	05.00 to 06.00 pm	69
12	06.00 to 07.00 pm	85
13	07.00 to 08.00 pm	87
14	08.00 to 09.00 pm	88
15	09.00 to 10.00 pm	84
16	10.00 to 11.00 pm	66
17	11.00 to 12.00 pm	55

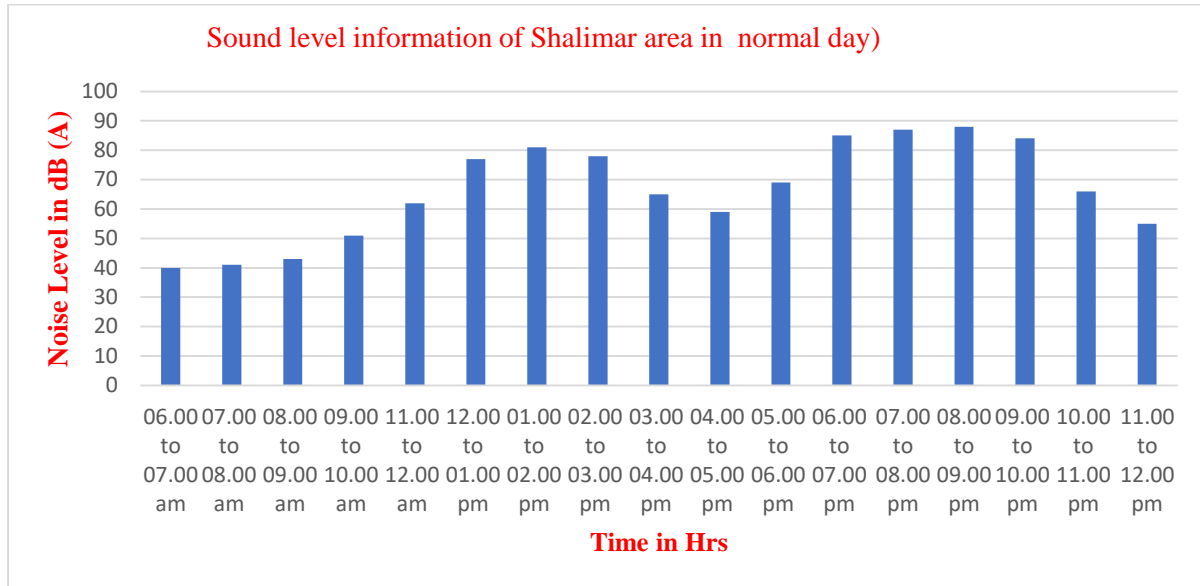


Figure a. Graph of Sound level information of Shalimar area in normal day.

7.2 Sound level information of Shalimar area during Ganpati festival day

Table - 2 Sound level information of Shalimar area during Ganpati festival day

Sr. No.	Time in Hrs	Noise Level in dB (A)
1	06.00 to 07.00 am	40
2	07.00 to 08.00 am	42
3	08.00 to 09.00 am	53
4	09.00 to 10.00 am	66
5	11.00 to 12.00 am	69
6	12.00 to 01.00 pm	79
7	01.00 to 02.00 pm	88
8	02.00 to 03.00 pm	85
9	03.00 to 04.00 pm	83
10	04.00 to 05.00 pm	78
11	05.00 to 06.00 pm	79
12	06.00 to 07.00 pm	89
13	07.00 to 08.00 pm	95
14	08.00 to 09.00 pm	98
15	09.00 to 10.00 pm	99
16	10.00 to 11.00 pm	81
17	11.00 to 12.00 pm	55

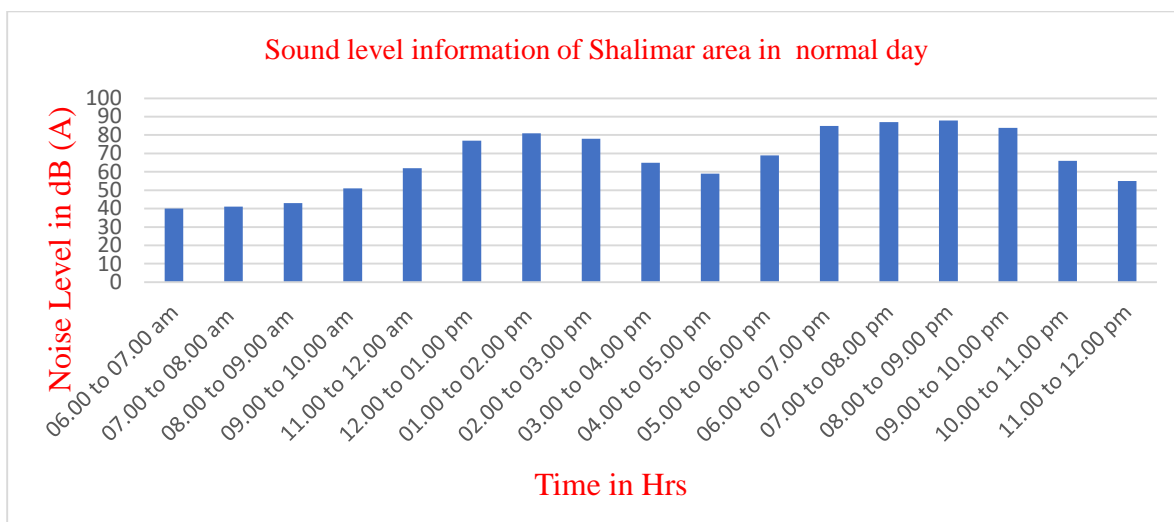


Figure b. Graph of Sound level information of Shalimar area during Ganpati festival day.

7.3. Sound level information of Shalimar area during Vijayadashami festival day

Table - 3 Sound level information of Shalimar area during Vijayadashami festival day

Sr. No.	Time in Hrs	Noise Level in dB (A)
1	06.00 to 07.00 am	40
2	07.00 to 08.00 am	42
3	08.00 to 09.00 am	43
4	09.00 to 10.00 am	67
5	11.00 to 12.00 am	70
6	12.00 to 01.00 pm	72
7	01.00 to 02.00 pm	80
8	02.00 to 03.00 pm	81
9	03.00 to 04.00 pm	77
10	04.00 to 05.00 pm	76
11	05.00 to 06.00 pm	87
12	06.00 to 07.00 pm	89
13	07.00 to 08.00 pm	90
14	08.00 to 09.00 pm	93
15	09.00 to 10.00 pm	88
16	10.00 to 11.00 pm	81
17	11.00 to 12.00 pm	61

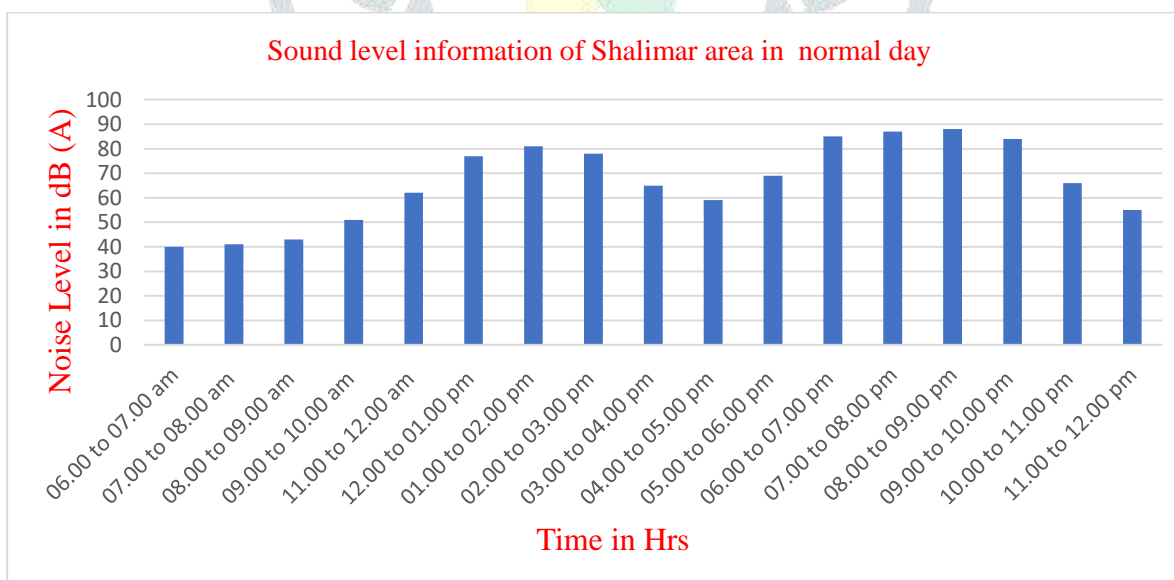


Figure c. Graph of Sound level information of Shalimar area during Vijayadashami festival day.

7.4 Sound level information of Shalimar area during Diwali festival day

Table - 4 Sound level information of Shalimar area during Diwali festival day

Sr. No.	Time in Hrs	Noise Level in dB (A)
1	06.00 to 07.00 am	40
2	07.00 to 08.00 am	47
3	08.00 to 09.00 am	53
4	09.00 to 10.00 am	68
5	11.00 to 12.00 am	78
6	12.00 to 01.00 pm	80

7	01.00 to 02.00 pm	83
8	02.00 to 03.00 pm	84
9	03.00 to 04.00 pm	89
10	04.00 to 05.00 pm	92
11	05.00 to 06.00 pm	95
12	06.00 to 07.00 pm	99
13	07.00 to 08.00 pm	101
14	08.00 to 09.00 pm	103
15	09.00 to 10.00 pm	97
16	10.00 to 11.00 pm	81
17	11.00 to 12.00 pm	61

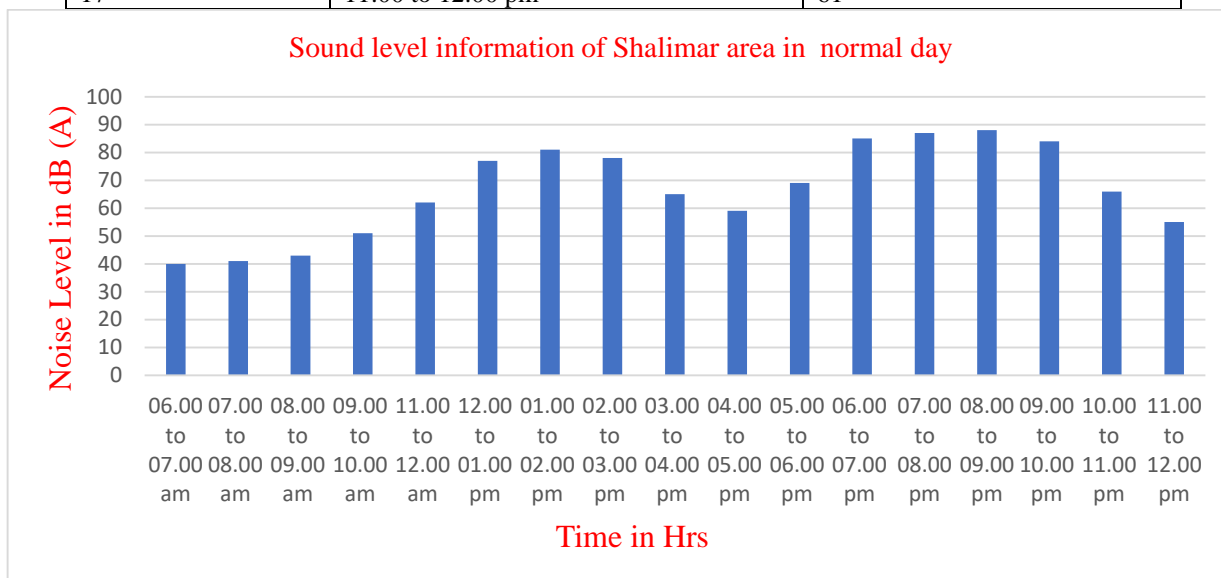


Figure d. Graph of Sound level information of Shalimar area during Diwali festival day.

7.5 Comparison of sound level in normal days and festival days.

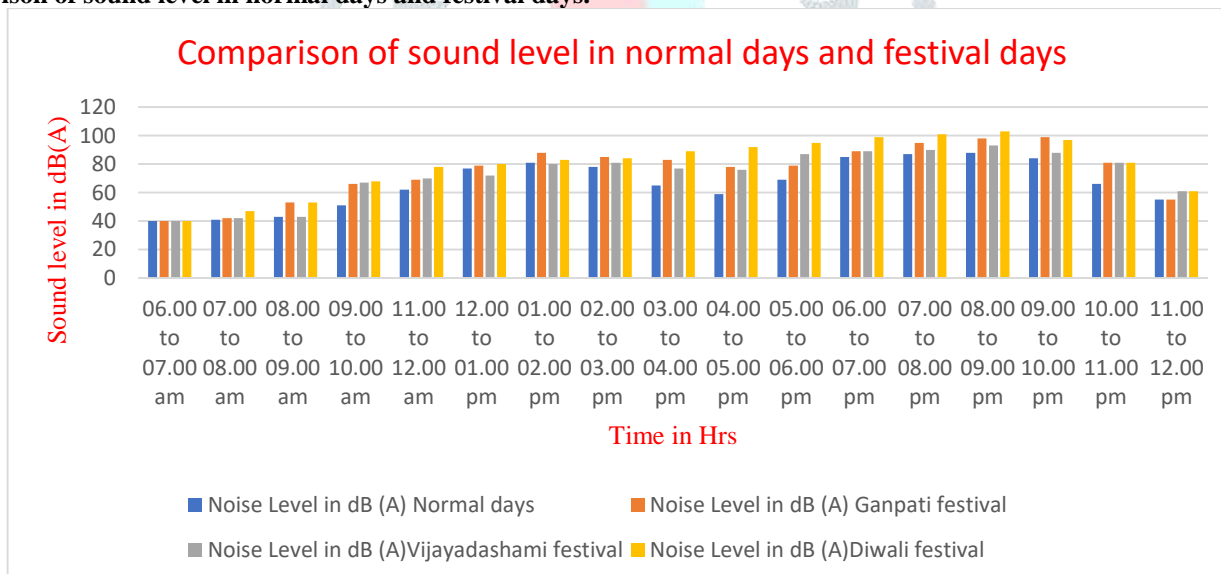


Figure e. Comparison of sound level in normal days and festival days.

The comparison of noise surveys between normal days and festivals in Shalimar area shows that the noise pollution level during festivals is significantly higher than that on normal days. During the festival, most people go to Shalimar for shopping, so the noise level is higher than usual. Compared with the standard data set by the Central Pollution Control Commission, the noise level in these two days was significantly higher. To control noise levels, the simplest control measures are to raise public awareness and public environmental education. Compliance with laws and regulations and protection of the natural environment are the responsibility of every citizen, and measures should be taken to reduce noise and overall pollution.

CONCLUSION

In this paper we conclude that the noise level is increased during festival days as more people are coming at the location that we have chosen for study. The sources, effects, assessment of noise level and offers suggestions for controlling the noise level are also discussed. To avoid the high noise level implementation of good noise control policy and to increase people’s awareness by public education and an active participation of schools & colleges in public places. The need of increase funds for environmental policy and educational programme. The future development plan should be considered with adequate plantation, walkways and underground roads at road crossings, use of insulation and sound absorbing materials in construction is essential.

ACKNOWLEDGEMENT : We wish to thanks Principal , M V P Samaj's Arts Commerce and Science College, Dindori (Nashik) India. for giving their co-operation & Providing facilities.

REFERENCES:

- [1]. Basner, M., Babisch, W., Davis, A., Brink, M., Clark, C., THE LANCET, Volume 383, issue 9925(April, 2014), page 1325-1332.
- [2]. Berglund B, Lindvall T. (eds.) Community Noise. Archives of the Center for Sensory Research. 1995;2:1-195. This document is an updated version of the document published by the World Health Organization in 1995, (January 6, 2007).
- [3]. Firdaus, G., Ahmad, A., Noise Pollution and Human Health: A Case Study of Municipal Corporation of Delhi, Indoor and Built Environment, Sage Publications(2010).
- [4]. Goines, L., Hagler, L., Noise Pollution: A Modern Plague: Southern Medical Journal 2007, 100(3): 287-294 .
- [5]. Hsu, T., Ryherd, E., Wage, K., Ackerman, J., Noise Pollution in Hospitals: Impact to patients, Clinical Review-vol.19, No.7 (July, 2012), JCOM Journal
- [6]. Lundberg U: Coping with Stress: Neuroendocrine Reactions and Implications for Health. Noise Health 1999;1(4):67-74.
- [7]. Alam, J.B., Jobair.J. Rahman.M.M, Dikshit. A.K. and Khan S.K. Study on traffic noise level of sylhet by multiple regression analysis associated with health hazardsl, Iran. J.Environ. Health. Sci.Eng., 2006; 3(2):71-78.
- [8]. Belojevic GA, Jakovljevic BD, Stojanov VJ, Slepcevic VZ, Paunovic KZ: Nighttime road-traffic noise and arterial hypertension in an urban population. Hypertens Res 2008, 31(4):775-781 4. Li B., Taoa.S, Dawsona. R.W., Caoa. J. and Lamb. K.A. GIS based road traffic noise prediction model, Applied Acoustics, 2002;63:679–691.
- [9]. Fyhri, A. and Klæboe.R. Road traffic`c noise, sensitivity, annoyance and self-reported health—A structural equation model exercisel Environment International, 2009; 35: 91–97.
- [10]. Baaj,M.H., El-Fadel.M., Shazbak.S.M. and Saliby.E. odeling noise at elevated highways in urban areas: a practical application, Journal of Urban Planning and Development, 2001;127 (4):169-180.
- [11]. Babisch W: Noise and health. Environ Health Perspect, 2005, 113(1):A14-15.
- [12]. Babisch W: Traffic Noise and Cardiovascular Disease: Epidemiological Review and Synthesis. 2000, 2(8):9-32.

