

# The Effects of Noise on Learners at Selected School in and Around Dharwad City: A Review

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**Abstract :** This paper reviews on issues relating to the sources and effects of noise on learners at eight selected school. Specially, the effects of environmental and classroom noise on learners educational performance, learners aggravation due to unwanted sound and surveys of classroom noise levels. Consistencies and discrepancies between due results of various noise parameters studies are highlighted.

**Keywords :** learners, noise, school, Dharwad city

## 1. Introduction

In general, environmental pollution is the universal for almost all the country. The environmental problems occurs in most of the places, due to road traffic, jet planes, refuse trucks, construction materials, processing units, manufacturing units and public areas are some of the major cause of noise pollution that transmitted through wind. Most of the noise related problems are ensuing as a outcome of increasing in the population growth, self centered human attitude, fast life style, number of motor vehicles, use of large number of instruments in daily life, excessive exploitation of natural resources, rapid rate of urbanization and industrialization. In the long-ago 30 years, there has been a great deal of investigate into the effects of noise on children's learning and performance at school (Biswajit Goswami, *et al.*, 2018).

Noise pollution has many sources; most of sources of noise pollution are associated with urban development: road, air and rail transport; industrial noise; neighborhood and recreational noise. A number of factors contribute to problems of high noise levels, including: a) Increasing population, particularly where it leads to increasing urbanization and urban consolidation. Activities associated with urban living generally lead to increased noise levels b) Increasing volumes of road, rail and air traffic. Community awareness of environmental noise has increased and there is a higher expectation for commonwealth, state and local government to reduce noise levels. Although noise is a significant environmental problem, it is often difficult to quantify associated costs. The noise pollution in India is given Figure 1.1.

### Noise in School

Similarly, the home and the work place, school is also considered as an important micro-environment. The school is

important for the connectivity for metal process, resourceful, and community development of kids. Schools are therefore expected to ensure the best possible circumstances for a child's physical and intellectual development, including control of excess environmental noise.

Among the environmental problems, Noise pollution is close proximity and it was found mostly in school campuses. However, enhancing in the number of motor vehicles counts an increase in noise levels. The negative affiliation between learning performance and noise levels in educational centers has been determined and noise pollution has been found to reduce learning potentiality (Ozer, *et al.* 2013).

The present study specific objectives of the present study is the source of noise in selected school, identify the effect of noise on the learners and educators during the process in the class room and compare the measured noise level with the WHO and IS noise standard

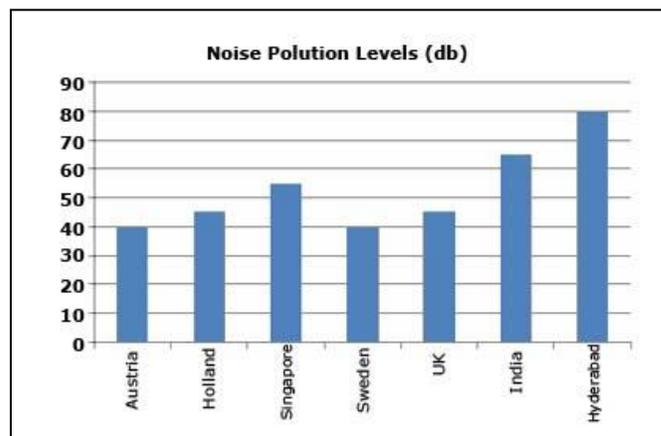


Figure 1.1 Noise pollution level in given in bar chart

## 2. Materials and Methods:

### Study Area:

The Dharwad city is situated on the edge of western Ghats at the foot of a low range hills on the northern bank, its key points as 15.46' North latitude and 75.01' East longitude, around 18 km away from the Hubli Railway station. As per the census 2011 the population of the twin cities (the city Governed by the Hubli-Dharwad Municipal Corporation) is 1,349,563. City is located

and place category with the GPS coordinates of 15° 27' 36.9072" N and 75° 0' 37.0224" E. The total area covers 200.2 km<sup>2</sup>, it is located 425km northwest of Bangalore, on the National Highway 4. The city, where the first fight for unification of Karnataka Ekikarana - was staged, Hence, it holds a special place in the hearts of the people of Karnataka. Spread over seven small hills at an average altitude of 751 meters above sea level, the city enjoys a salubrious climate amidst thick vegetation. City was known for its lakes but several have now dried out. The city has plenty of green cover. The botanical garden established by Karnatak University's has many rare plants, trees and birds. Kelgeri, Sadhanakeri, Navalur and Nuggikeri are also homes for water birds. The location map of the study area is given in Figure. 3.1.

**K E Board School, Station road Malmaddi (KEB):** The School is Higher Pri School located in Station Road Malmaddi and it is located 1 km from Dharwad railway station. The school is Co-Educational Secondary School institution affiliated with the Central Board of Secondary Education (CBSE) during 1937. The school is set with 22 class rooms and all essential facilities. There are traffic stratum from vehicles, city buses, automobiles, mini-trucks and all types of vehicles and a lot of community movement in and around it because it located besides the Veerabhadreshawara temple.

**Rajeev Gandhi Vidyalaya, Near DC office (RGV):** Rajiv Gandhi Vidyalaya located in Dakshina Bharath Hindi Parchar Sabha, D.C. Compound. It is located nearby Sri Sadashiva Wodeyar road. It is also nearby railway station and police station at 1 km, coeducation independent school. The school is set with 17 class rooms with 6 lab facilities and 8 rest rooms for educators and learners.

**Pavan School, University road (PSU):** It is located nearby malnad mini mart and nearby Barakotri roan in and around market area. The noise from school is buses, autos, mini-trucks and all types of vehicles.

**Presentation Girls high school (PGH):** This school is located nearby Kittur Channamma Park at north side, south side apartments are observed. This school is only for girls and located left side of Dharwad – Belgaum highway.

**JSS Sri Manjunatheshwar School (JSSSM):** The JSS Sri Manjunatheshwar School is in front of the Ghandinagar lake. The school located in the market area and other PU colleges are also present in and around the school. The main source noise pollution is from vehicular activity.

**Vidyagiri, Basel Mission school (VBM):** This is located near Railway station road about 4.2 km. The school campus is having ladies and boys hostel. The big mahal is also located nearby school. The main source of noise is market area.

**Shanti Sadan School (SSS):** The school located inside church and mosques, busy road and around market area. There are noise from church and mosques, market area and traffic noise from two, three and four wheelers vehicles.

**Siddrameshwar School (SS):** The school is located near Karnataka University campus it is 5.2 km from the university campus. This school located in a huge condominium house of mankind. The school is affected from residence noise, household items like washing machinery, grinders, street animals (dogs, chicken).

### Description of the Locations and Sampling Details

Noise levels was measured at three different periods of the academic year 2017 - 2018 to understand the impact of noise pollution on learners and educators inside the selected school buildings in and around the Dharwad city. Study was conducted during five academic studying days (Monday to Saturday). This period is distinguished by the maximum educational, organizational and other student activities. During this period, two different times were selected for noise measurements; at the morning rush hour (8.00-9.00 am) and an afternoon hour (1.00-2.00 pm). This time is characterized by relatively high to low activity inside the school campus because most or all students are present inside the campus and into the class rooms. Another period was the "holiday time" which included Sunday holiday. During this time, it is known that mainly the activities inside the school campus are reserved or totally closed.

### Noise parameters:

The noise parameters were selected like L10, L50, L90 were used and NC were calculated, equivalent noise level (Leq) and noise pollution level (Lnp) (Zenith Kucha, 2014, Banerjee, et al., 2008; Sanjib Chandra Chowdhury, 2010). The Leq is the total energy respond by human ear and hence an indicator of physiological trouble to the hearing machine and is given by the relation (Caciari, et al., 2013). Lnp gives the variation in sound single with fluctuation of noise (Van Kempen, 2012). L10 = Level of sound exceeded for 10% of the total time of measurement L50 and L90 Level of sound exceeded for 50% and 90% of the total time of measurement. The results were compared with the standards prescribed by CPCB, New Delhi in Chapter IV.

NC calculated using formulae  $NC = L_{10} - L_{90} \text{ dB (A)}$

$Leq = L_{50} + NC/60 \text{ dB (A)}$

$L_{np} = Leq + NC \text{ dB (A)}$

L10 = Level of noise level exceeded for 10% of the total time of measurement

L50 = Level of noise level exceeded for 50% of the total time of measurement

L90 = Level of noise level exceeded for 90% of the total time of measurement

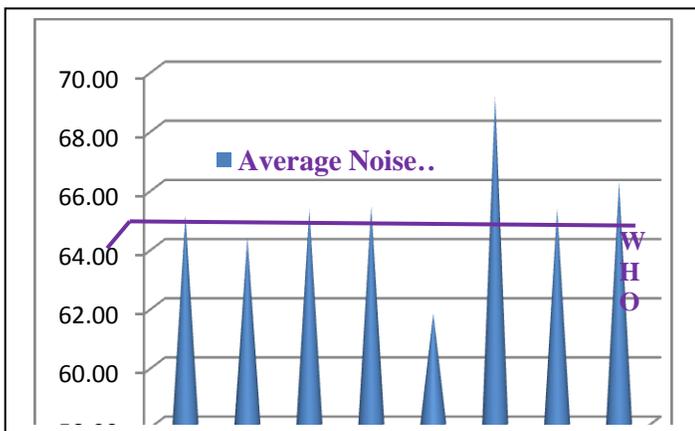
The traffic noise index (TNI) is used to measure the noise behavior of human beings exposed to traffic noise pollution and used formula  $TNI (dBA) = 4 \times (NC) + (L90 - 30) dB (A)$

### 3. Results and Discussion

**Table 4.10 Noise Index Values at different schools during the study period.**

Locations	L10	L50	L90	Leq	LNP	TNI	NC	Lmax
KEB	49.13	59.1	89.6	60.45	100.92	221.48	40.47	92.5
RGV	51.58	58.6	88.72	59.84	96.98	207.28	37.14	91.2
PSU	51.78	60.8	88.04	62.01	98.27	203.08	36.26	91.2
PGS	49.06	58.85	89.64	60.2	100.78	221.96	40.58	93.4
JSSSM	48.78	56.9	88.6	58.23	98.05	217.88	39.82	89.7
VBM	52.4	68.7	88.49	69.9	105.99	202.85	36.09	89.6
SSS	51.78	60.8	88.04	62.01	98.27	203.08	36.26	90.8
SS	50.02	60.1	89.64	61.42	101.04	218.12	39.62	92.5

Comparatively in all other four schools shown maximum at SS location is 92.50dB and minimum equivalent value shown in JSSSM location is 48.0dB during the entire study period (Figure 4.8 to 4.10). From the Table 4.10 results concludes, maximum Leq was shown in JSSM since the school is located in centre place of the city may due to vehicular movement and other human activities in and around the school may cause the source of noise pollution. The maximum Total noise index was more in SS and minimum TNI in VBM is 218.12 and 202.85 respectively.



**Figure 4.12 Average sound level in Teaching hours and threshold level of WHO**

A survey of average noise levels outside at 619 different locations during morning and afternoon at 8 different primary schools in Dharwad city has been shown in Figure 4.12. However, there was a wide range of noise level for all the locations measured, with a little school in evidently 'noisy' areas being exposed to relatively high levels of noise. This suggests

that in work concerning environmental noise exposure at school it is necessary to measure the noise rather than rely on noise contours or noise maps to give an indication of a school's noise exposure level.

### Conclusions

This paper reviews the sources, effects and controlling ways for excessive noise. Human activities turn out to be major sources of noise pollution. Most of our day-to-day activities, by knowingly or unknowingly every one of us contribute to generate noise pollution. Often neglected noise pollution adversely affects the learners in educational learning process. It is harmful for educational performance of learners (Rao, K. V., and Padmaja, p (1999) and British Medical Bulletin (2003). Indirectly, noise pollution can destroy their life generations by generations silently. It is a great threat to both health and education of learners. Because high level of noise may no cause serious or immediate effects but if such noisy environments prevail, it may impact the community in many ways. Hence, the educated community may complain to the statutory Board for violation of noise level limits by any noise producer (Bakari, C.A. (2013) and Garg, et al., (2007). The suitable action will be taken to attenuate the noise levels and controlling sound pollution.

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### References

- i. Bakari, C.A.(2013), *the hazardous effects of noise.*
- ii. Banerjee D., Chakraborty S.K., Bhattacharyya S., Gangopadhyay A. (2008), *Evaluation and analysis of road traffic noise in Asansol: An industrial town of Eastern India, International Journal of Environmental Research and Public Health, 5, 3, 165–171.*
- iii. Biswajit Goswami, Dr Yamin Hassan and Arup J D Sarma. 2018. *The Effects of Noise on Students at School: A Review, International Journal of Latest Engineering and Management Research (IJLEMR). Volume 03 - Issue 01 || January 2018 || PP. 43-45.*
- iv. British Medical Bulletin (2003), vol 68(c). *The British council. Retrieve from the internet 7th April, 2014.*
- v. Caciari T, Rosati MV, Casale T, Loreti B, Sancini A, Riservato R, et al. *Noise-induced hearing loss in workers exposed to urban stressors. Sci Total Environ 2013; 463-464:302-8.*
- vi. Garg, S, R Garg and R Garg (2007): *Environmental Science and environmental studies. Khanna Publishers, New Delhi.*
- vii. Ozer S, Zengin M, Yilmaz H (2013) *Determination of the Noise Pollution on University (Education), Campuses: a Case study of Atatürk University. Ekoloji 23(90): 49-54.*
- viii. Rao, K. V., and Padmaja, P (1999), „*Ambient Noise Level Monitoring in Guwalior at Various Zones* „, *Journal of Environmental Pollution, 6 (2&3), pp 211-214.*
- ix. Sanjib Chandra Chowdhury, M. Mahbubur Razzaque, and Md. Maksud Helali *Assessment Of Noise Pollution In Dhaka City, ICSV17, Cairo, Egypt, 18-22 July 2010*

x. Van Kempen E, Fischer P, Janssen N, Houthuijs D, van Kamp I, Stansfeld S, et al. Neurobehavioral effects of exposure to traffic-related air pollution and transportation noise in primary school children. *Environ Res* 2012; 115:18-25

xi. World Health Organization (WHO). 2001. Occupational and Community Noise," Fact sheet, no. 258, WHO, Geneva, Switzerland.

xii. Zenith Kucha, 2014. Evaluation of Noise Pollution In Educational Institutes Of Addis Ababa thesis Submitted to the School of Graduate Studies of Addis Ababa University in partial fulfillment of the requirements for the Degree of Master of Science in Environmental Science –June 2014.

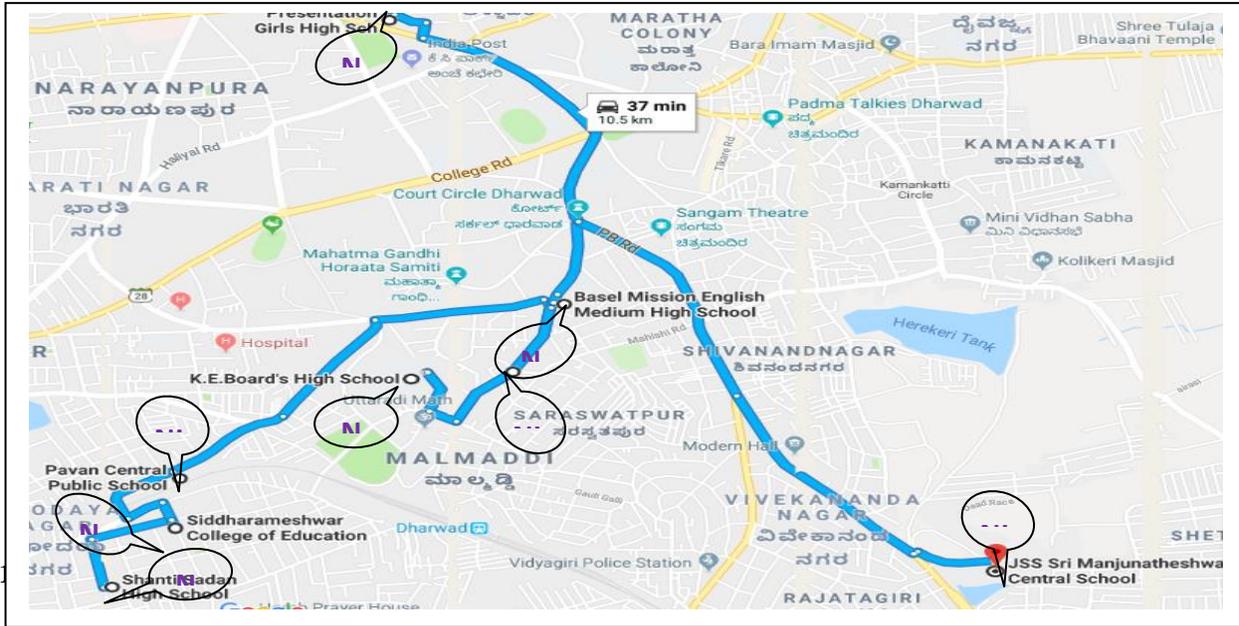


Figure 3.1