



Assessment of Noise Pollution Level in Commercial and Residential Areas of Dehradun

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Abstract

Present study regarding noise level of Dehradun reflects that noise level is increasing during weekends (Saturday and Sunday) and during vacation period level is high in residential and commercial areas. The analysis has revealed that noise pollution levels are rather higher than prescribed Indian standards at all the examined sites such as Paltan bazaar, Sahastradhara crossing, Mandakni vihar enclave. It is evident from the noise data analysis that during the Sunday, noise pollution of the Dehradun city is higher as compared to other days of the week. Awareness related to noise pollution is a very effective way to control it.

INTRODUCTION

The expression noise is nothing but a sound, which is basically an energy particle. The sound is converted to noise by virtue of its magnitude of appearance and becomes intolerable by the human beings and environment (Poddar, 2017). Section 2 of the Air (Prevention and Control of Pollution) Act, 1981 defines the expression "pollutant" as gaseous, solid or liquid substances which is present in the environment in such a quantity that is harmful to human beings, animals, property and the environment. There are other serious health implications as well such as deafness, heart condition, sleep disorders and cognitive impairment in children. In 2011 WHO said that sleep disturbance and annoyance were the major components of health burden due to noise and in Dehradun level of noise fluctuated due to this is the route city of various religious journey (Semwal and Upreti, 2019 a,b).

Dehradun city is facing noise pollution majorly because of being the capital of Uttarakhand State, where several major government offices and

people have shifted, good jobs opportunities and facilities are available and hence people intend to prefer to reside here, which create extra pressure on the environmental scenario of the city. In order to realize concrete reasons of the noise pollution in Dehradun city, it is necessary to study the road network, transport system, escalating number of vehicles and rising rate of population growth that plays a vital role in the physical, social and economic development of the city (Singh Vartika, 2011). Present study is focused on the noise level in commercial and residential areas of Dehradun.

MATERIALS AND METHODS

Sites: Studies have taken into account of two zones residential and commercial for measuring noise pollution levels in Dehradun. For each zone we have selected two areas to measure the noise level. In residential zone we select the two colonies Kirsali and the Mandakini Vihar Enclave while for commercial zone two areas Paltan bazaar and Shastradhara crossing were selected to measure the

noise level. During this study three different time period were selected i.e at morning, afternoon, evening.

Sampling method : Levels of noise intensity were measured by the sound meter. Sound meter is a device that measure sound pressure level, commonly used in noise pollution studies for the measurement of different kinds of noise, especially for traffic environmental and household noise. The noise level was recorded from all the four sites in the month of April 19 (8/4/19-14/4/19) and May (6/5/19-12/5/19). The data was collected from Monday to Sunday to observe variation during the week.

Different sound level devices can be used but in the present study an android application 'Noise Meter level' has been used. At each selected location, the instrument was operated continuously for 1 minute as a start- up time, and for a continuous measuring period of 10-15 minutes during which several readings of noise were automatically recorded and saved. At the end of this period, the lowest and highest levels in addition to the weighted value were considered at the net results.

RESULTS AND DISCUSSION

The acceptable limits by Central Pollution Control Board 45 (night) -55(day) for residential and 55(night)-65 (day) for commercial. noise of sound measurement is called decibels (dB).

Residential Area I: Kirsali

Morning Hours: The sound level was found within the permissible limit in the morning afternoon and evening hour in the month of April and May. The minimum reading recorded was 30db in the morning hour in month of April and May. In April it was recorded (30dB) on Monday, in May it was recorded on Tuesday.

Afternoon Hours: The maximum reading noted 33db in the month of April, Friday & 35dB on Wednesday and Sunday in May. In afternoon hour 32 dB was recorded for afternoon in the month of April and may.

Evening Hours: In the evening hour, the minimum 32 dB was recorded in the month of April and 33 dB in the month of May. Maximum 36dB was recorded for evening in the month of April and 39dB in the month of May.

Residential Area II: Mandakini Vihar Enclave

Mandakini Vihar as stated above is in surrounded with restaurants workshops, small scale shops, school (Guru Ram Rai). It is densely populated area

and the Mussorie bypass is adjacent to it therefore heavy traffic was observed.

Morning Hours: The noise level in both the month of April and May in the morning hours were in the permissible limit as less number of vehicles were observed during this time. There was one deviation that was observed in Sunday on dated 12/5/19 by seeing heavy traffic on Mussorie road, the increase in number of vehicles was also observed in the month of May at morning time. The minimum reading in the morning hours in the month of April was 34dB .The minimum reading in the morning hours in the month of May was 35dB.

Maximum reading in the morning hours in the month of April was 45dB (Sunday) and 56dB in the month of May (Sunday) respectively. In afternoon and evening hours the sound levels were above the permissible limits in both the month of April and May as shown in table no.1.

Afternoon Hours: In month of April the minimum and maximum reading recorded in the afternoon time was 54dB (Thursday) & 59dB respectively. In May, at afternoon hour's minimum 55dB and maximum 59 dB reading was recorded in Mandakini at Sunday.

Evening Hours: In month of April the minimum reading 55dB and maximum 59 dB (Sunday) was recorded in evening hour. In May, minimum reading 56dB and maximum 59 dB (Sunday) was noted in evening.

It was observed that during weekends (Saturday and Sunday), the noise level increased more as it is on Mussorie road. The number of vehicles increases on Saturday and Sunday. It was found that the restaurant had more visitors on Saturday and Sunday.

Commercial sites I: Paltan bazaar

Morning hours:The sound level in the morning hours in the paltan market was observed in permissible limit in month of April and may. In April the minimum sound level noted was 41 dB (Monday) and maximum 51dB (Sunday). In May, the minimum sound level observed 42dB (Monday) & maximum 51dB (Sunday).

Afternoon hours:The sound level in the afternoon hours in May and June was above permissible limit. In April, the minimum noise level was 71dB on (Monday) and maximum 81dB (Sunday), in May, the minimum noise level was 72 dB (Monday) and 83dB (Sunday).

Evening hours: The sound level in evening hours in May and June was also above permissible limit. In April the minimum noise level was 73dB (Monday, Tuesday) & maximum noise level was 78dB (Saturday, Sunday). In May, the minimum noise level was 74dB (Monday) & maximum noise level was 83dB (Sunday) followed by Saturday 81dB.

The noise pollution in Paltan bazaar (Clock tower) was higher than the permissible limit as selected before by Dev & Singh V (2011). Paltan bazaar is the centre of Dehradun all & it is a famous shopping area located near the clock tower in Dehradun. Clock tower also known as “Ghanta ghar” is a very famous tourist attraction it is also marks the gateway of Dehradun city and all major commercial centers are easily accessible from here. Almost all city buses or auto pass through nearby clock tower. Heavy traffic & rush is seen in afternoon and evening hours. In our present study the high noise level were also observed in paltan market (clock tower).

Commercial sites II: Sahastradhara crossing

Morning hours: The noise level during morning time is in the permissible limit in the month of April

and May. The minimum sound level observed in April was 38dB (Monday) and maximum 47dB (Sunday), the minimum noise level in April was 39dB and maximum 50dB in the month of May.

Afternoon hours: The noise level in the month of April and May during afternoon were higher than the permissible limit. The minimum sound level 65dB Monday and maximum 71dB (Sunday) in the month of April. The minimum sound level 66dB (Monday) and maximum 77dB (Sunday) in the month of May.

Evening hours: The noise level in the month of April and May during evening were higher than permissible limit. The minimum noise level in the month of April in evening was 73dB and maximum was 78dB (Sunday). The minimum noise level in the month of May in evening was 74dB and maximum 84 dB (Sunday).

The noise level is higher on Sunday in month of April and May; Sahastradhara road has many shopping complex, malls, and restaurants. Traffic from Survey chowk and Raipur road are merges on Sahastradhara crossing. Therefore, the noise level recorded is higher than permissible limit in Sunday at evening time as compared to other days.

Table 1: Noise level (dB) readings of Residential area

DAYS		MORNING		AFTERNOON		EVENING	
		Kirsali	Mandakinivi har	Kirsali	Mandakinivi har	Kirsali	Mandakinivi har
A P R I L	Monday	30±0.54	37±0.43	34±0.42	56±1.06	33±0.49	55±0.44
	Tuesday	31±0.41	36±0.54	34±0.26	54±1.21	36±0.67	56±0.13
	Wednesday	31±0.21	37±0.09	33±0.19	55±0.98	33±0.38	57±0.44
	Thursday	31±0.09	37±0.18	32±0.05	54±0.65	32±0.25	57±0.51
	Friday	33±0.34	34±0.16	36±0.07	56±0.58	35±0.42	58±0.82
	Saturday	30±0.47	42±0.20	34±0.16	58±0.71	35±0.49	59±0.11
	Sunday	31±0.25	45±0.31	34±0.27	59±0.62	34±0.52	59±0.28
M A Y	Monday	32±0.30	38±0.22	37±0.34	57±0.16	36±0.38	58±1.21
	Tuesday	30±0.05	37±0.18	33±0.36	57±0.52	33±0.74	57±0.68
	Wednesday	35±0.12	37±0.14	35±0.41	55±0.34	36±0.13	56±0.66
	Thursday	32±0.14	35±0.12	33±0.19	56±0.38	34±0.62	57±0.37
	Friday	33±0.52	36±0.08	33±0.26	55±0.27	34±0.45	57±0.29
	Saturday	34±0.41	43±0.09	36±0.08	59±0.18	38±0.84	59±0.18
	Sunday	35±0.44	56±0.33	36±0.04	59±0.91	39±1.06	59±0.85

Table 2: Noise level (dB) readings of commercial area

DAYS		MORNING		AFTERNOON		EVENING	
		Paltan Market	Sahastrdhara	Paltan Market	Sahastrdhara	Paltan Market	Sahastrdhara
A P R I L	Monday	41±0.58	38±1.53	71±2.08	65±1.53	80±1.53	73±2.08
	Tuesday	43±1.53	39±1.53	75±0.58	67±1.00	81±0.58	73±2.52
	Wednesday	47±0.58	40±1.00	76±0.58	67±1.53	81±1.00	74±2.52
	Thursday	46±0.58	43±1.53	78±0.58	69±1.53	81±1.53	75±3.61
	Friday	47±1.73	43±2.08	78±2.52	69±1.53	82±1.15	76±1.00
	Saturday	48±1.53	46±1.53	79±1.53	71±0.58	83±1.53	78±1.00
	Sunday	51±0.58	47±2.08	81±1.43	71±1.53	83±2.52	78±1.53
M A Y	Monday	42±0.52	39±1.45	72±2.17	66±1.32	82±1.43	74±2.05
	Tuesday	44±1.56	40±1.32	74±0.12	69±1.11	83±0.18	76±2.33
	Wednesday	48±0.61	42±1.02	77±0.33	70±0.61	84±1.06	77±2.15
	Thursday	45±0.53	45±1.44	80±0.22	72±1.02	84±1.73	77±2.11
	Friday	49±1.62	46±2.02	81±2.05	74±1.07	86±1.25	79±0.22
	Saturday	49±1.05	48±1.39	83±1.50	73±0.27	86±1.43	81±1.08
	Sunday	53±0.43	50±2.03	83±1.65	77±1.22	87±2.12	83±0.42

Conclusion

The study concludes that the noise level in commercial and the residential areas of Dehradun city is higher than the acceptable limits except in Kirsali. Kirsali is less populated with a smaller number of vehicles. Dehradun city is developing city of Uttarakhand which is attracting more and more population towards it and due this increasing population the number of vehicles in the city is growing rapidly which are creating high level of noise pollution. The increasing noise nuisance in the city should be reduced and abated, if their adverse effects on human health are to be controlled. The measurements of noise levels have been recorded at the different residential and commercial zones of the city. The analysis has revealed that noise pollution levels are rather higher than prescribed Indian standards at all the examined sites such as Paltan bazaar, Sahastradhara crossing, Mandakni vihar enclave. It is evident from the noise data analysis that during the Sunday, noise pollution of the Dehradun city is higher as compared to other days of the week. This could be due to the holidays, therefore a huge crowd and traffic was observed in the market. In the noisy place, we should wear earplugs and earmuffs. Communities should be educated on the negative

effort of noise. The regular monitoring of pollution, proper maintenance of vehicles, ban on use of old vehicles, plantation widening of roads and public awareness are the most vital and essential measures to be implemented in order to improve present status of environmental entity in the Dehradun city.

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