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Assessment of Noise Level at Different Places of Barasat Town North 24-Parganas, West Bengal

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Abstract

Barasata is the headquarters of North 24-Parganas district (West Bengal), coordinates of the town are $22^0$43′51′′N and $88^0$28′32′′E. Present work was undertaken to evaluate sound levels at Barasat town during different periods of day time. From the study, four sound level category zones could be recognized, viz. high sound level category zone two (H_2SLCZ, sound range : 80 to 89 dB), high sound level category zone one (H_1SLCZ, sound range : 70 to 79 dB), moderate sound level category zone (MSCLZ, sound range : 60 to 69 dB) and low sound level category zone (LSLCZ, sound range : 50 to 59dB). It is found that except Kishalay Boy's home campus, in all places sound levels lie above the permissible limit (64—95 dB or above), Champadali bus stand and 12 No. Rail gate regions are the victim of most stringent noise pollution (more than 100 dB). Thus acoustic situation in Barasat town is adverse to public health. So sound levels must be checked through various technological methods and legal measures.

Key words : Noise pollution, Sound level category zones, Acoustic situation, Silence zone.

Barasata is the headquarters of North 24-Parganas district, coordinates of the town are $20^0$43′51′′N and $88^0$28′32′′E (1). It is about 21 km away from Kolkata by road and railway. It is an old town with population size of approx 298,127. Now it is an emerging business town. From 1834 to 1861, Barasat was the seat of a joint-magistrate, known as Barasat district. The place is familiar for Kali Puja which is the best within West Bengal. At present, this overcrowded old town with narrow roads and streets suffers from noise polution. Noise (from Latin nausea) pollution is a from of air pollution that implies unwanted sounds with a mixture of many tones in a non-musical manner dumped into the atmosphere leading to health hazards (2) such as hearing impairment, threshold shift, cardiovascular and gastrointestinal problems, neurological disorders, sleep interference, fatigue, tension, annoyance, reduced efficiency. Noise of 90-120 dB corresponds with heath hazards and 140 dB is the threshold pain. The present work was undertaken to evaluate sound levels at Barasat town during different periods of the day time to develop a sound profile of the town that would be helpful to take administrative measures to save people. In West Bengal, similar noise survey was performed at Bardhaman town (3).

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Methods

At Barasat town noise data were recorded at various important points during a period of 4 minutes with the interval of 10 seconds on some specified time viz. around 6 am, 10 am, 2 pm, 4 pm and 6 pm. To measure noise, A mini sound level meter (Metravi SL—4010, accuracy ± 1.5 dB) was used to evaluate sound pressures in deciBells (dBs). For present work, the C weighting network was adopted.

Results and Discussion

The noise data collected from various important points of Barasat town at specified times are shown in Table 1. Minimal, maximal and modal values have been noted. It is seen that most of the places are much noisy around 10 am and 4 pm as those are office hours. Depending on maximum and minimum values, it may be concluded that Champadali bus stand and 12 no. rail gate are the victim of most stringent noise pollution (more than 100 dB), except the zones the

Table 1. Sound profile at Barasat town.

Locations	Time	Sound Levels (dBs) Minimum value	Maximum value	Modal value
	6 am	61	92	76
1. Barasat sadar	10 am	68	96	80
hospital	2 pm	70	97	83
	4 pm	67	92	80
	6 pm	68	97	78
	6 am	66	95	74
2. Champadali bus	10 am	73	100	87
stand (Titumir bus	2 pm	71	96	80
stand)	4 pm	70	97	80
	6 pm	73	97	81
	6 am	65	95	80
3. Colony more	10 am	72	94	81
	2 pm	71	92	81
	4 pm	72	96	80
	6 pm	73	95	82
	6 am	63	96	67
4. 12 No. rail gate	10 am	65	110	69
	2 pm	63	87	69
	4 pm	63	86	69
	6 pm	65	103	71
	6 am	68	90	75
5. Haritala more	10 am	70	92	77
	2 pm	68	93	80
	4 pm	68	93	79
	6 pm	70	94	79
	6 am	61	80	67
6. Barasat railway	10 am	62	87	70
station	2 pm	63	81	71
	4 pm	62	83	70
	6 pm	64	85	69
	6 am	54	87	65
7. Courtmath market	10 am	67	95	78
	2 pm	61	90	73
	4 pm	61	88	70
	6 pm	59	94	72
	6 am	60	94	70
8. Rabindra Bhawan	10 am	68	93	77
	2 pm	64	93	73
	4 pm	66	94	77
	6 pm	66	100	80
	6 am	62	93	77
9. Dakshin Para	10 am	69	96	82
More	2 pm	65	92	78
	4 pm	66	96	80
	6 pm	68	93	80
	6 am	67	91	77
10. Duck Bungalow	10 am	71	93	80
More	2 pm	72	89	80
	4 pm	72	92	77
	6 pm	70	93	77
	6 am	64	93	70
11. Barasat Sandhya	10 am	68	89	72
College (11No.	2 pm	65	90	70
Rail Gate)	4pm	66	91	78
	6 pm	66	90	72
	6 am	57	77	61
12. Napara	10 am	63	84	70
	2 pm	59	80	66
	4 pm	62	87	69
	6 pm	63	87	70
	6 am	52	76	65
13. Barasat Govt.	10 am	62	82	71
College	2 pm	61	83	71
	4 pm	60	84	72
	6 pm	63	83	67
	6 am	47	56	51
14. Kishalay Boys'	10 am	49	58	51
Home Campus	2 pm	47	59	51
	4 pm	47	59	50
	6 pm	49	61	52

town is more or less homogeneous regarding level of noise pollution. There is another exception also, i.e. The Kishalay Boy's home campus is a cool and calm place like a hermitage within the busy town. In reference to noise pollution, the place may be regarded as 'control' or natural environment with minimum anthropogenic sonic interference. The piece results from absorption of sounds by big trees in the place. The site exhibits another interesting feature, here sound level variation in different time of the day is more or less absent. This feature increases the pleasure of the site as both stringency of noise pollution and sound level variation are directly proportional to acoustic fatigue.

Figures 1 to 5 show the sound levels in different sites of the town at specific times. Athough maximum sound levels in an area indicate the stringency of

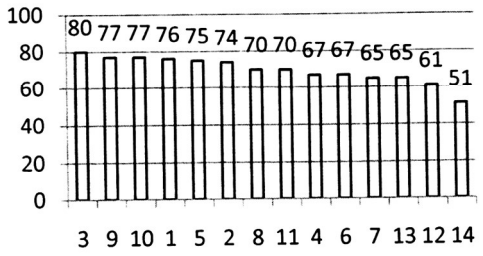

Figure 1. Sound levels at 6 am.

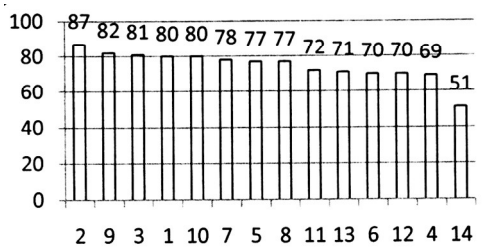

Figure 2. Sound levels at 10 am.

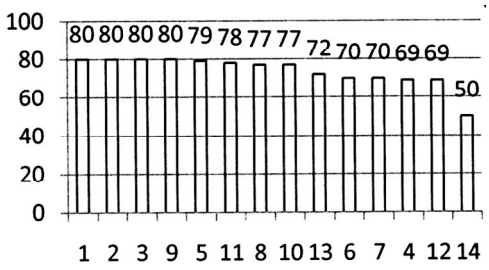

Figure 4. Sound levels at 4 pm.

pollution as well as the acute acoustic situation and these values are required to take remedial measures, modal values indicate the overall noise property and chronic acoustic situation in a site. So, modal values have been used. The modal values of sound levels in different sites at specified times were arranged in descending order on Y axis ; X axis denotes locations. On top of each bar the value indicates the modal value. From these figures, four sound level category zones could be recognized, viz. high sound level category zone two (H_2SLCZ, sound range : 80 to 89 dB), high sound level category zone one (H_1SLCZ, sound range : 70 to 79 dB), moderate sound level category zone (MSLCZ, sound range : 60 to 69 dB) and low sound level category zone (LSLCZ, sound range : 50 to 59dB) (Table 2). Among the sites, 5,7, 8 and 9 show less fidelity to their respective categories. Table 3 shows the permissible noise level according to Environmental Protection Rules, 1986 (Schedule-III) and the correspondence of the sound level category zones of Barasat town to the area type specified by the Protection Rules (1986). It is seen that zones H_2SLCZ and H_1SLCZ correspond to industrial area while zones MSLCZ and LSLCZ correspond to commercial and residential areas respectively. Unfortunately, in the town industrial, commercial and residential areas are intermingled with each other. Under the circumstances, some measures should be taken for acoustic welfare of the people such as maintenance of silence zone 100 m around the premises of Barasat sadar Hospital, Barasat Government College, Sandhya college and schools, construction of fly overs at Champadali region over Jessore road towards Bangaon, fly over the junction of Jessore road and Taki road, introduction of unidirectional roads at Champadali region, construction of subway below or over bridge over 12 no. rail gate, construction of noise absorbing tree belt (of native trees such as neem,

Table 2. Permissible Noise Level according to Environmental Protection Rules, 1986 (Schedule-III). Source : Tripathy (2).

Area cose	Type of area	Limits (dB)	
		Day time	Noght time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence zone	50	40

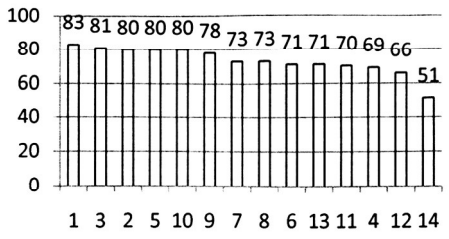

Figure 3. Sound levels at 2 pm.

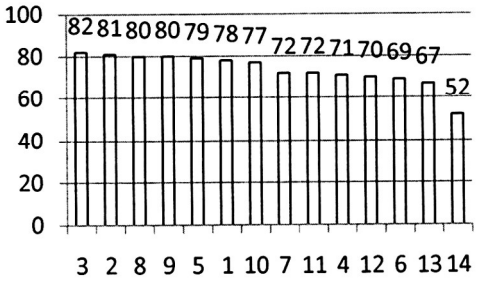

Figure 5. Sound levels at 6 pm.

Table 3. Different sound level category zones at Barasat town.

	Sound level (dBs)	Sound level category zone	Remarks	Location
1	89—80	High Sound Level Category Zone Two (H_2SLCZ)	correspond to industrial area	1, 2, 3, 9
2	79—70	High Sound Level Category Zone One (H_1SLCZ)		5,7,8,10,11
3	69—60	Moderate Sound Level Category Zone (MSLCZ)	corresponds to commercial area	4,6,12,13
4	59—50	Low Sound Level Category Zone (LSLCZ)	ideal for residential area (control)	14

ashok, mahogony) along roads and railway track within town, use of ear muffs among schhol going children. It is found that in all the places (except Kishalay) sound levels lie above the permissible limit (64—95 dB or above) (Table 1), it is adverse to public health. So sound levels must be checked through various technological methods and legal measures.

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