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A Sonic Profile of Krishnagar City, Nadia, West Bengal

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Abstract

Krishna Nagara (or Krishnagar as nickname to local people) is the headquarters of Nadia district (West Bengal), coordinates of the city are 23^{0}24′5′′N and 88^{0}30′6′′E. The present work was undertaken to evaluate sound levels in Krishnagar city during different periods of day time (sonic profile). From the study, four sound level category zones were recognized, viz. high sound level category zone two (H_2SLCZ, sound range : ³ 80 dB), high sound level category zone one (H_1SLCZ, sound range : 70—79 dB), medium sound level category zone (MSLCZ, sound range : 60—69 dB) and low sound level category zone (LSLCZ, sound range : £ 59 dB). It is found that except Kadamtala Ghat region beside river Jalangee, in all places sound levels lie above the permissible limit (64—95 dB or above). Krishnagar Sadar Hospital More, Krishnagar Bus Stand More (petrol pump) and Beledanga More are the victim of most stringent noise pollution (near or more than 100 dB). Thus acoustic situation in Krishnagar City is adverse to public health. So sound levels must be checked through various technological methods and legal measures.

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

Krishna Nagara (or Krishnagar as nickname to local people) is the headquarters of Nadia district, coordinates of the city are 23^{0}24′5′′N and 88^{0}30′6′′E (1). It is about 100 km away from Kolkata by road and railway. The place is famous for sculpture and clay modelling and the sweets namely sarbhaja and sarpuriya. Krishnagar Rajbari also is famous in history of Bengal. It is by the river Jalangee (local name Khore). At present, this overcrowded old city with narrow roads and streets suffers from noise polution. Noise (from Latin *nausea*) pollution is a form 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 hazads (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 different points in Krishnagar City during different periods of the day time to develop a sonic profile (i.e. a document of noise level at different places on different specified times) of the city that would be helpful to take administrative measures to save people. In West Bengal, similar noise survey was performed in Bardhaman town (3).

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Methods

In Krishnagar City noise data were recorded at various important points Table 1 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 Krishnagar City at specified times are shown in Table 1. Minimal, maximal and modal values have been noted. Most of the places are much noisy around 10 am and 4 pm as those are office hours. Depending

Table 1. Sound profile in Krishnagar City. dBs—deciBells, unit of sound measurement.

Location	Time	Sound levels (dBs) Minimum value	Maximum value	Modal value
	6 am	54	93	63
	10 am	64	96	79
1. Holy Family School	2 pm	60	96	72
	4 pm	60	98	69
	6 pm	63	94	77
	6 am	63	95	72
	10 am	68	97	82
2. Krishnagar Sadar Hospital	2 pm	68	91	75
	4 pm	69	96	77
	6 pm	67	100	73
	6 am	62	96	71
	10 am	65	93	73
3. Post Office More	2 pm	62	91	70
	4 pm	65	93	73
	6 pm	68	94	75
	6 am	53	84	63
	10 am	60	92	69
4. Challange More	2 pm	58	87	65
	4 pm	64	91	75
	6 pm	64	93	77
	6 am	55	92	70
	10 am	65	98	75
5. A. V. School	2 pm	64	94	74
	4 pm	65	96	73
	6 pm	65	100	73
	6 am	67	101	75
	10 am	70	99	81
6. Krishnagar Bus Stand	2 pm	70	102	83
	4 pm	71	102	82
	6 pm	70	101	83
	6 am	60	98	73
	10 am	67	96	80
7. Neder Para More	2 pm	66	99	78
	4 pm	68	96	77
	6 pm	68	99	83
	6 am	63	95	70
	10 am	64	100	77
8. Beledanga	2 pm	64	93	70
	4 pm	63	91	67
	6 pm	66	96	73
	6 am	56	81	62
	10 am	59	87	66
9. Shaktinagar Hospital	2 pm	57	83	62
	4 pm	58	82	63
	6 pm	59	86	66
	6 am	57	84	64
	10 am	61	89	67
10. Shaktinagar 5–Matha More	2 pm	60	86	66
	4 pm	60	93	68
	6 pm	60	89	65
	6 am	58	84	62
	10 am	60	90	79

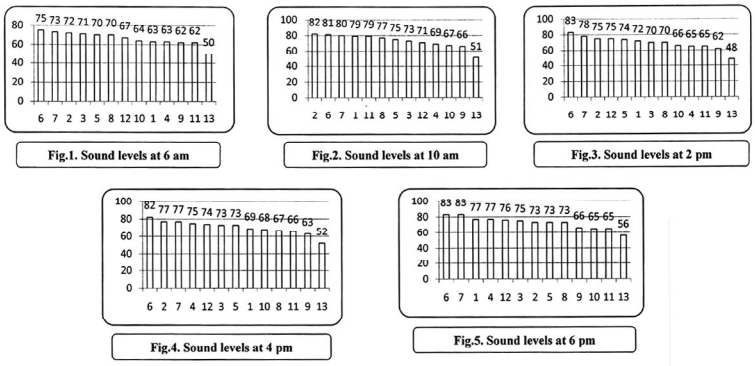
Table 1. Continued.

Location	Time	Sound levels (dBs) Minimum value	Maximum value	Modal value
11. Anandamayeetala	2 pm	58	89	65
	4 pm	61	86	66
	6 pm	60	92	65
	6 am	61	89	67
	10 am	65	97	71
12. Ghurni Haldarpara More	2 pm	64	92	75
	4 pm	64	95	74
	6 am	66	94	76
	6 am	47	57	50
	10 am	48	56	51
13. Kadamtala Ghat	2 pm	48	61	48
	4 pm	46	59	52
	6 pm	43	71	56

on maximum and minimum values, it may be concluded that Krishnagar Sadar Hospital More, Krishnagar Bus Stand More (petrol pump) and Beledanga More are the victim of most stringent noise pollution (near or more than 100 dB). This is normal because Krishnagar Sadar Hospital More is the entrance into the city from NH_{34} connecting Krishnagar with Kolkata and North Bengal and also from Nabadwip and the district Bardhaman while Krishnagar Bus Stand connects Krishnagar City (Head quarters of the district) to different parts of the District. Beledanga More is the level crossing between the railway from Kolkata to Lalgola and road connecting the city to NH_{34}. Except these zones the town is more or less homogeneous regarding level of noise pollution. There is another exception also, i.e. Kadamtala Ghat region beside river Jalangee—this is a cool and calm place like a hermitage along the North boundury of 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 re-

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

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



Figures 1—5. Sonic profile of Krishnagar City.

sults from absorption of sounds by big trees in the place, absence of traffic and low population density. The site exhibits another feature, here sound level variation in different time of the day is absent (except in the evening when people come here for recreation from direct contact with nature). This feature increase the pleasure of the site as 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 city at specified times. Although maximum sound levels in an area indicate the stringency of pollution and 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 in Figures. In each figure, modal values of sound levels in different sites at specified times have been 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: ^{3} 80dB), high sound level category zone one (H_1SLCZ, sound range : 70—79 dB), medium sound level category zone (MSLCZ, sound range : 60—69 dB) and low sound level category zone (LSLCZ, sound rage : ≤ 59 dB) (Table 2). Among the sites, 1, 4 and 11show 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 Krishnagar City to the area type specified by the Protection Rules (1986). It is seem that zones H_2SLCZ and H_1SLCZ correspond to industrial area while zones MSLCZ and LSLCZ correspond to commercial and residential areas respectively. 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 Krishnagar Sadar Hospital, Shaktinagar Hospital and schools within city, construction of fly over on Beledanga More over rail way, over the station approach road and also over Post Office More, introduction of unidirectional roads near Krishnagar Station, construction of noise abosorbing tree belt (of native trees such as neem, ashok, mahogony) along roads, use of ear muffs

Table 3. Different sound level category zones in Krishnagar City.

	Sound level (dBs)	Sound level category zone	Remarks	Location
1	^{3} 80	High sound level category zone two (H_2SLCZ)	Corresponds to industrial area	6,7
2	79—70	High sound level category zone one (H_1SLCZ)		1,2,3,5,8,12
3	69—60	Moderate sound level category zone (MSLCZ)	Corresponds to commercial area	4,9,10,11
4	£ 59	Low sound level category zone (LSLCZ)	Ideal for residential area (control)	13

among school going children. In Kadamtala region ecotourism and ecoparks along the river covering Nabadwip and Mayapur may be established to relieve people from noise pollution. It is found that in all the places (except Kadamtala) 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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