

1.0 INTRODUCTION

Noise is a prominent feature of our environment. Whether at work, at home or in public places the world around us is becoming an increasingly noisy place. Freedom from unwanted sound is now much sought after as advances in science and technology bring along this undesirable problem. The trucks and cars, the aero planes, the high speed machine tools, the compressors and the D.G. sets all beneficial in themselves have contributed to the background noise which is becoming one of the distinguishing features of everyday life. Of all the present day sources of noise, the noise from traffic is the most diffused and accounts for 55% of the noise in our environment. Social noises from loudspeakers, portable generators, domestic appliances, building construction activities, cottage industrial activities, etc. are also major sources of nuisance and complaints.

Noise is typically defined as unwanted sound. Audible sound is in the frequency range 20 Hz to 20,000 Hz. Sound which pleases the listeners is music and that which causes pain and annoyance is noise. Ambient noise may be defined as all encompassing noise associated with any given environment and usually a composite of sounds from many sources, near and far. Noise level may vary widely with time. Noise intrusions are characterized by their transient quality and are especially annoying when they are needless e.g. acceleration of a noisy motor bike, or a car without a muffler. Similarly, the ambient noise from bursting of firecrackers on religious festivals like Deepawali becomes unbearable for several hours. In our country, indiscriminate use of loudspeakers has given a new dimension of the problem.

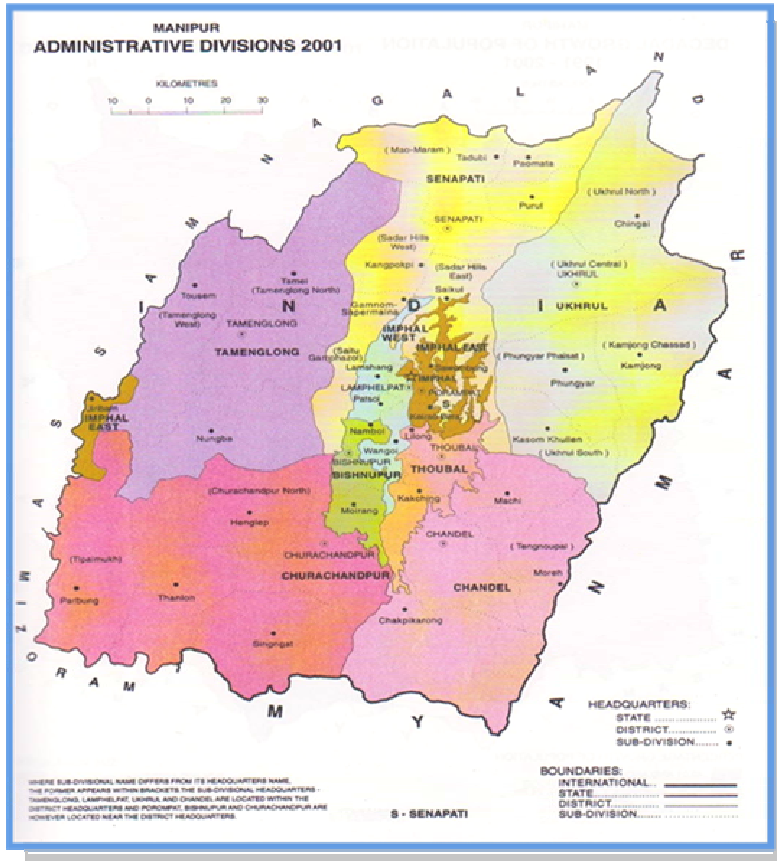
Noise can disturb our work, rest, sleep and communication. It can damage our hearing capability and can evoke psychological, physiological and even pathological reactions. The primary effects of sleep disturbance are increase in blood pressure, heart beat rate, depressed mood and ultimately decrease in performance. These effects ultimately lead to various secondary effects on the health of an individual (CPCB, 2002). When considering the effects of noise on

human health and quality of life, the intensity of the sound in question, its duration, and the time and place at which it is heard have to be taken in account. A long exposure to noise can bring partial loss of hearing and a constant ringing sound in the ear known as tinnitus. Exposure to noise over 90dBA continuously for 10 minutes can result in damaging effects on the hearing system and sounds louder than 100dBA can even cause permanent damage to the hearing system (Singal, 2007). Noise interferes in complex task performance, modifies social behaviour and causes annoyance. Studies of occupational and environmental noise exposure suggest an association of noise with hypertension. In both industrial and community studies, noise exposure is related to rise in catecholamine secretion. In children, long term aircraft noise exposure impairs reading comprehension and long-term memory and may also be associated with raised blood pressure (Stansfeld and Matheson, 2003).

Noise studies in India were initiated during the late fifties by Pancholi and later on these studies were carried out by many others (Pananjay and Tiwari, 2007). Like many other countries of the world, India has also included noise as a pollutant in the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986. The Noise Pollution (Control and Regulation) Rules, 2000 has also been notified to restrict noise in the country. Standards have also been laid down for the noise levels generated from vehicles, generators and firecrackers.

2.0 AREA DESCRIPTION

Manipur is situated in the north-eastern corner of India. It is a landlocked isolated hilly state having a distinct geographical identity. It is almost rectangular in shape with a valley encircled by hill ranges. This small valley spreads over an area of 2,007 Km², which is about 9% of the total area of the state. The last few years have witnessed rapid urbanization in the state. Traffic volume has also increased considerably and there is the need for appropriate urban planning. Manipur Pollution Control Board with financial assistance from MoEF, New Delhi and CPCB, Delhi conducted Ambient Noise Level Monitoring in order to assess the



level of noise pollution in the state. Important towns, educational areas, an industrial estate and a NAMP station were selected as monitoring points in ascertaining the compliance of noise level standards. They are-

Keishampat Junction

This is a commercial area in Imphal city with heavy traffic

during day time. The Keishampat Bridge connects the people of Kwakeithel, Wahengleikai and Keishampat Junction with the main city resulting in frequent traffic congestions. Shops, printing press, rice mills, coaching centers, etc. are located in the area.

Singjamei Market

This is also a commercial hub in the south eastern corner of Imphal city. There is a popular market dealing with foreign goods. The Singjamei Supermarket Complex is also a main business centre. Traffic is congested and the NH-39 leading to Myanmar border passes through the Singjamei Market.

Manipur University

This is a major educational area in the State and located at the outskirts towards south of the Imphal city. Students from all parts of the state and outside the state study in this University.

Lamphelpat Residential Area

This is a residential area situated to the west of the Imphal city. There are many government quarters in the area and the area is generally considered a VIP area. The area has low traffic and industrial activity. There is a shopping complex with a Cinema Hall at the area.

Takyel Industrial Estate

At present, this is the only industrial estate in the state and is situated to the west of Imphal city. The area has two plastic carry bag manufacturing industries, an electronic industry and a PVC water tank industry. It also accommodates some institutes of significance in the state.

Kangla Park

Kangla Park is the centre of the Imphal city. The Governor's bungalow, the Imphal Bazar, the Polo Ground, etc. are located to the west of Kangla Park. Traffic is quite heavy and congested as the NH-39 passes through the area.

Imphal Secretariat

This is the main centre of activity of Imphal city and a NAMP station is presently installed in the New Secretariat Building. Many main office buildings such as the Imphal Head Post Office, the Police Headquarters, the A.G. Building, the Head Office of BSNL, the CM's residence and office and the office of the Board of Secondary Education of Manipur are located near the area.

RIMS

The Regional Institute of Medical Sciences is a major health care institute of the state and is located in the Lamphel sub-division. The RIMS road is also a major market centre.

Central Agriculture University

The Central Agriculture University is located at Eroishemba at the outskirts of Imphal city.

Nambol Bazar

Nambol Bazar is located in the Nambol Municipal Area. This is the biggest market of Bishnupur district and is a commercial place for the villages of Leimapokpam, Khathong, Naorem, Sanjenbam, Thiyamlampok, Kamom, Ishok, Phojing, etc.

Bishnupur Bazar

The market is in the Bishnupur Municipal Area and is near the headquarters of Bishnupur district. This is the second biggest market of Bishnupur district and is a commercial place for the villages of Toubul, Khujuman, Nachou, Ngaikhong, Joypur Khunou, etc.

Thoubal Bazar

The market is near the headquarters of Thoubal district and an important market of Thoubal district. The market is a commercial centre for the villages of Khangabok, Wangbal, Thoubal Athokpam, etc.

Moirang Bazar

Moirang Bazar is in the Moirang Municipal Area and is another major market of Bishnupur district. The market is the commercial center for the villages of Thanga, Kumbi, Wangoo, Wangoo Sagang, Khodarak, Nongmaikhong, Kwakta, etc.

Kakching Bazar

This is the second biggest market of Manipur valley after Imphal Bazar. This is the commercial hub for the southern part of Thoubal District. This is the commercial centre for the villages of Pallel, Keirak, Hiyanglam, etc.

Lamlong Bazar

This is a major market for the northern part of Imphal East District.

Ambient noise level monitoring was also conducted during Deepawali festival at Thangal Bazar, Paona Bazar, and Keishampat junction.

3.0 METHODOLOGY

Sound intensity is the magnitude of the fluctuations in air pressure caused by sound waves and is measured in logarithmic decibel (dB) scale. A Cygnet Sound Level Meter (Type 1) placed at a height of 1.2 m above ground level was used to monitor the Ambient Noise at the selected monitoring points. Half hourly observations were made from 9.30am to 10.00 am, 1.30 pm to 2.0pm, 4.30 pm to 5.0 pm and 7.30 pm to 8.0 pm. For a given time interval, noise levels may be fluctuating giving momentarily exceptionally high and low values. In such situation, a value which is representative of all the noise levels occurring over a given period of time needs to be established.

Equivalent sound level, L_{eq} is the level of that steady sound which over the same interval of time contains the same total energy (or dose) as the fluctuating sound.

$$L_{eq} = 10 \log_{10} \left[\sum_{i=1}^N F \times 10^{L_i/10} \right]$$

L_{eq}	= Equivalent sound level in dB (A)
F	= Fraction of time for which the variable sound pressure level persists
L_i	= Variable sound pressure level in dB
N	= Number of readings
L_{90}	= Ninety percentile exceeding noise level which exceeds 90 percent of the observation time
L_{10}	= Ten percentile exceeding noise level which exceeds 10 percent of the observation time
L_{min}	= Minimum noise level
L_{max}	= Maximum noise level

To determine the above descriptors, statistical analysis of data was conducted with the aid of MS Excel.

4.0 RESULTS AND DISCUSSION

Table 1 is the representation of Ambient Noise Level monitored at Keishampat Junction in the month of June, 2007. The Ambient Noise Level at Keishampat is considerably higher during the traffic peak hours of Imphal City (9.30 am to 10.0 am and 4.30 pm to 5.0 pm) because of frequent traffic congestions. The Ambient Noise Level during traffic peak hours is lower on Sundays and holidays. The result indicates traffic as the main source of noise in the area. The day time Ambient Noise Level at the traffic peak hours is beyond the prescribed standards. However, the Ambient Noise Level between 7.30 pm to 8.0 pm meets the prescribed standards and may be due to the limited activity at this period in the city.

Table 1: Noise level monitoring at Keishampat Junction

Place	Date/Day Temp/Rain	Noise level (dB)	Time			
			9.30 to 10.0am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Keishampat Junction	02/06/07 Saturday 29.2-21.2°C 0.0mm	L _{min}	53.5	45.8	53.5	49.8
		L _{max}	80.4	80.4	81	78.9
		L ₁₀	71.2	70.4	72.4	70.2
		L ₉₀	59.8	58.9	59.8	56.7
		L _{eq}	68.2	62.4	68.2	65.9
	03/06/07 Sunday 29.0-20.3°C 0.0mm	L _{min}	49.8	44.8	53.5	49.8
		L _{max}	78.9	77.9	78.9	73.9
		L ₁₀	70.4	70.7	69.8	55.7
		L ₉₀	58.9	59.8	59.8	65.4
		L _{eq}	67.3	62.4	66.5	62.7
	04/06/07 Monday 29.4-19.3°C 2.8mm	L _{min}	-	-	-	-
		L _{max}	-	-	-	-
		L ₁₀	-	-	-	-
		L ₉₀	-	-	-	-
		L _{eq}	-	-	-	-
	08/06/07 Friday 27.3-22.0°C 0.2mm	L _{min}	58.4	49.8	55.7	49.8
		L _{max}	78.9	78.5	78.5	65.6
		L ₁₀	72.6	65.3	71.2	62.1
		L ₉₀	59.8	59.8	59.8	53.5
		L _{eq}	68.7	65.1	68.5	59.8
09/06/07 Saturday 27.1-22.0°C 0.0mm	L _{min}	49.8	49.8	53.5	49.8	
	L _{max}	78.5	77.8	78.9	73.9	
	L ₁₀	64.6	70.4	69.5	65.3	
	L ₉₀	58.9	58.8	59.8	55.7	
	L _{eq}	62.6	65.4	66.3	62.2	
13/06/07 Wednesday 30.6-21.6°C 0.0mm	L _{min}	58.9	49.8	58.5	49.8	
	L _{max}	78.9	77.0	78.5	65.6	
	L ₁₀	71.2	59.8	71.2	62.1	
	L ₉₀	59.8	65.4	59.8	53.5	
	L _{eq}	67.7	65.1	68.7	59.6	
15/06/07 Friday	L _{min}	58.4	53.5	55.7	49.8	
	L _{max}	78.9	78.5	78.5	65.6	

	28.8-21.8°C 1.8mm	L ₁₀	74.5	65.3	71.2	62.1
		L ₉₀	59.8	59.8	59.8	53.5
		L _{eq}	69.6	66.1	68.6	59.6

Table 2 is the representation of the Ambient Noise Level Monitoring at Singjamei area in the month of June, 2007. The Ambient Noise Level at the area is also found to be higher during traffic peak hours and lower during the period from 7.30pm to 8.0pm on all days. The results indicate a comparatively low ambient noise level on Sunday.

Table 2: Noise level monitoring near Singjamei Market

Place	Date/Day Temp/Rain	Noise level (dB)	Time			
			9.30 to 10.0am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Singjamei Bazar	19/06/07 Tuesday 29.8-22.0°C 0.0 mm	L _{min}	53.5	41.2	48.5	41.2
		L _{max}	77.4	65.6	76.5	65.6
		L ₁₀	65.6	62.6	69.8	59.8
		L ₉₀	59.8	44.3	48.5	42.3
		L _{eq}	64.6	59.2	65.8	54.5
	21/06/07 Thursday 29.4-22.8°C 0.0 mm	L _{min}	53.5	41.2	45.4	40.4
		L _{max}	74.5	66.8	79.8	65.6
		L ₁₀	65.4	65.3	69.9	64.9
		L ₉₀	58.9	42.4	48.5	42.3
		L _{eq}	64.8	61.7	66.1	58.9
	24/06/07 Sunday 28.9-23.2°C 1.0 mm	L _{min}	40.5	41.2	41.2	41.2
		L _{max}	73.2	72.1	73.2	73.2
		L ₁₀	64.9	65.3	65.3	62.3
		L ₉₀	42.3	42.3	42.4	41.5
		L _{eq}	61.3	60.9	63.2	59.6
	25/06/07 Monday 31.2-23.0°C 0.0 mm	L _{min}	56.7	41.2	48.5	39.6
		L _{max}	79.8	74.5	79.8	71.2
		L ₁₀	70.4	65.4	69.8	65.3
		L ₉₀	59.8	44.3	48.5	41.5
		L _{eq}	66.8	63.0	65.6	62.0
26/06/07 Tuesday 31.4-23.0°C 0.4 mm	L _{min}	53.5	41.2	45.4	40.4	
	L _{max}	79.8	71.2	79.8	64.6	
	L ₁₀	65.4	65.3	66.4	62.1	
	L ₉₀	56.4	42.4	48.5	41.5	
	L _{eq}	67.7	62.4	64.8	55.6	
27/06/07 Wednesday 31.0-22.8°C 0.2 mm	L _{min}	53.5	41.2	48.5	40.5	
	L _{max}	79.8	71.2	79.8	64.6	
	L ₁₀	62.3	65.4	48.5	62.3	
	L ₉₀	55.7	44.3	66.4	42.3	
	L _{eq}	67.1	62.9	65.1	57.2	
30/06/07 Saturday 31.4-22.3°C 1.2 mm	L _{min}	48.5	41.2	48.5	40.5	
	L _{max}	79.8	66.8	76.5	65.6	
	L ₁₀	68.4	65.3	69.8	64.6	
	L ₉₀	55.7	42.4	48.5	42.3	
	L _{eq}	65.9	61.7	65.8	59.2	

Table 3 is the representation of the Ambient Noise Level Monitoring near the main gate of Manipur University, Canchipur in the month of July, 2007. The area is located at the outskirts of Imphal city and the noise level is comparatively low. Noise is mainly generated from traffic of NH-39 and from construction activities. However, the noise level from 9.30 AM to 10.0 AM is higher than the prescribed standards for an institutional area.

Table 3: Noise level monitoring at Manipur University

Place	Date/Day Temp/Rain	Noise level (dB)	Time			
			9.30 to 10.0am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Manipur University	11/07/07 Wednesday 29.2-23.2°C 0.0 mm	L _{min}	36.2	32.4	39.5	36.2
		L _{max}	67.9	67.8	72.4	61.9
		L ₁₀	54.9	55.5	55.5	43.5
		L ₉₀	37.3	34.7	40.6	36.4
		L _{eq}	51.3	51.1	51.7	45.0
	18/07/07 Wednesday 27.3-23.2°C 2.0 mm	L _{min}	-	-	-	-
		L _{max}	-	-	-	-
		L ₁₀	-	-	-	-
		L ₉₀	-	-	-	-
		L _{eq}	-	-	-	-
	20/07/07 Friday 26.3-22.3°C 0.6 mm	L _{min}	36.2	36.2	40.5	36.2
		L _{max}	70.2	67.4	67.4	67.4
		L ₁₀	57.5	54.5	60.5	54.5
		L ₉₀	40.5	41.4	45.7	41.4
		L _{eq}	52.8	48.6	50.0	47.6
	22/07/07 Sunday 27.8-21.6°C 0.8 mm	L _{min}	35.4	36.2	40.5	35.4
		L _{max}	65.6	66.5	64.5	60.5
		L ₁₀	62.3	48.5	58.5	48.5
		L ₉₀	37.4	38.4	44.7	37.5
		L _{eq}	51.2	47.9	49.2	47.1
02/08/07 Tuesday 26.7-21.8°C 0.4 mm	L _{min}	35.2	36.2	40.5	35.2	
	L _{max}	70.2	70.5	70.2	67.4	
	L ₁₀	60.5	60.5	60.5	54.5	
	L ₉₀	40.3	39.4	40.7	37.4	
	L _{eq}	52.6	51.2	52.5	47.6	
05/08/07 Sunday 28.3-22.3°C 0.2 mm	L _{min}	38.9	37.2	40.5	35.4	
	L _{max}	67	66.5	67.0	64.0	
	L ₁₀	64.6	48.5	60.5	48.5	
	L ₉₀	41.4	41.4	42.8	40.5	
	L _{eq}	50.7	48.3	49.9	49.1	
06/08/07 Monday 28.0-22.3°C 0.8 mm	L _{min}	35.4	37.2	40.5	37.5	
	L _{max}	67.4	67.0	67.2	65.0	
	L ₁₀	64.6	52	58.5	58.5	
	L ₉₀	40.5	39.4	40.8	37.3	
	L _{eq}	54.3	53.1	52.2	50.2	

Table 4 is the representation of Ambient Noise Level at Lamphelpat Area near the VIP residential quarters monitored in the month of August, 2007. The data indicate that the Ambient Noise Level in the residential area is well within the prescribed standards. There is less hourly variation of the noise level in the area and the traffic volume is very low.

Table 4: Noise level monitoring at Lamphelpat Residential Quarters

Place	Date/Day Temp/Rain	Noise level (dB)	Time			
			9.30 to 10.0 am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Lamphelpat Residential Quarters	07/08/07 Tuesday 28.4-22.3°C 0.4 mm	L _{min}	32.4	41.2	39.5	32.4
		L _{max}	66.5	64.5	64.5	60.5
		L ₁₀	54.4	48.5	60.5	48.5
		L ₉₀	35.4	41.4	45.6	37.8
		L _{eq}	51.5	51.3	53.9	48.8
	09/08/07 Thursday 30.1-22.3°C 1.2 mm	L _{min}	32.4	41.2	45.5	35.4
		L _{max}	63.4	61.9	63.4	60.5
		L ₁₀	39.7	55.6	60.5	48.5
		L ₉₀	57.8	41.4	45.7	37.8
		L _{eq}	52.0	51.6	54.3	49.4
	10/08/07 Friday 31.4-22.8°C 0.2 mm	L _{min}	40.5	41.2	45.5	39.5
		L _{max}	66.7	63.2	62.3	60.5
		L ₁₀	57.8	54.5	60.5	48.5
		L ₉₀	41.5	41.4	45.7	37.8
		L _{eq}	53.8	51.5	54.1	49.4
	11/08/07 Saturday 31.5-23.2°C 0.0 mm	L _{min}	39.7	41.2	45.5	35.4
		L _{max}	62.3	64.3	60.5	61.2
		L ₁₀	55.6	48.5	57.8	48.5
		L ₉₀	41.2	41.4	45.7	39.7
		L _{eq}	50.9	51.5	52.4	48.3
12/08/07 Sunday 29.4-23.2°C 0.8 mm	L _{min}	32.4	39.5	39.5	32.4	
	L _{max}	66.5	64.5	64.5	60.5	
	L ₁₀	54.5	54.5	60.5	49.8	
	L ₉₀	37.8	41.2	45.6	37.8	
	L _{eq}	51.5	52.0	53.9	48.8	
19/08/07 Sunday 29.4-22.3°C 0.8 mm	L _{min}	32.4	39.5	39.5	32.4	
	L _{max}	64.5	64.5	64.5	60.5	
	L ₁₀	54.5	55.6	60.5	49.8	
	L ₉₀	37.8	41.4	45.6	37.8	
	L _{eq}	50.8	52.5	54.1	48.8	
20/08/07 Monday 29.8-21.3°C 0.2 mm	L _{min}	41.2	41.2	45.5	39.5	
	L _{max}	65.7	63.2	62.3	60.5	
	L ₁₀	57.8	54.5	60.5	48.5	
	L ₉₀	41.5	41.4	45.7	37.8	
	L _{eq}	52.4	51.5	54.1	49.4	

Table 5 is the representation of Ambient Noise Level monitored within the premises of Takyel Industrial Estate in the month of August, 2007. The industries in the area

generate little or no noise and there is also less traffic in the area. Therefore, the noise level is comparatively low. The hourly variation of noise is not consistent and no correlation can be established.

Table 5: Noise level monitoring at Takyel Industrial Estate

Place	Date/Day Temp/Rain	Noise level (dB)	Time			
			9.30 to 10.0 am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Takyel Industrial Estate	21/08/07 Tuesday 30.3-22.5°C 0.0 mm	L _{min}	32.4	41.2	39.5	32.4
		L _{max}	67.4	61.2	60.5	65.4
		L ₁₀	51.2	48.5	57.8	48.5
		L ₉₀	36.7	41.5	39.8	37.8
		L _{eq}	50.3	49.7	51.6	49.5
	22/08/07 Wednesday 28.0-21.3°C 1.6 mm	L _{min}	-	39.8	41.2	32.4
		L _{max}	-	62.3	60.5	60.5
		L ₁₀	-	48.5	48.5	48.5
		L ₉₀	-	40.4	41.5	37.8
		L _{eq}	-	46.7	49.0	47.6
	23/08/07 Thursday 29.1-21.3°C 1.6 mm	L _{min}	-	41.2	44.3	32.4
		L _{max}	-	61.2	60.5	60.5
		L ₁₀	-	48.5	58.5	48.5
		L ₉₀	-	41.5	45.5	37.8
		L _{eq}	-	49.7	53.2	47.4
	29/08/07 Wednesday 28.0-23.0°C 0.2 mm	L _{min}	41.2	41.2	44.3	32.4
		L _{max}	64.3	62.3	63.2	60.5
		L ₁₀	55.6	48.5	58.5	48.5
		L ₉₀	41.5	41.5	45.6	37.8
		L _{eq}	51.9	50.7	53.8	47.6
30/08/07 Thursday 29.9-22.3°C 0.0 mm	L _{min}	32.4	32.4	39.5	32.4	
	L _{max}	64.5	61.9	60.5	54.5	
	L ₁₀	46.4	48.5	54.5	48.5	
	L ₉₀	37.8	39.8	45.4	39.7	
	L _{eq}	49.7	47.3	51.4	44.5	
02/09/07 Sunday 26.7-21.8°C 0.4 mm	L _{min}	32.4	32.4	39.5	32.4	
	L _{max}	61.2	57.8	60.5	60.5	
	L ₁₀	48.5	48.5	57.8	48.5	
	L ₉₀	36.7	35.4	39.8	37.8	
	L _{eq}	46.7	43.5	51.6	46.7	
03/09/07 Monday 28.9-21.7°C 0.2 mm	L _{min}	32.4	41.2	41.5	39.5	
	L _{max}	65.7	61.8	64.5	60.1	
	L ₁₀	51.2	48.5	48.5	45.6	
	L ₉₀	35.4	41.5	42.3	41.2	
	L _{eq}	50.2	47.6	49.5	45.3	

The Ambient Noise Level monitored at Kangla Park Area opposite PWD building during the month of September, 2007 is shown at Table 6. The Ambient Noise

Level of the Area is higher during peak hours of traffic. The noise level meets the prescribed standards when the traffic intensity is low.

Table 6: Noise level monitoring at Kangla Park (Western Gate)

Place	Date/Day Temp/Rain	Noise level (dB)	Time			
			9.30 to 10.0 am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Kangla Park	14/09/07 Friday 28.1-21.6°C 0.2 mm	L _{min}	53.5	53.5	53.5	49.8
		L _{max}	77.5	76.5	75.4	78.9
		L ₁₀	72.4	70.4	72.4	70.2
		L ₉₀	58.9	59.8	59.8	58.5
		L _{eq}	67.0	66.3	67.0	65.9
	15/09/07 Saturday 29.1-22°C 0.2 mm	L _{min}	49.8	53.5	53.5	49.8
		L _{max}	78.9	77.2	76.5	73.9
		L ₁₀	70.7	70.4	70.4	55.7
		L ₉₀	59.8	59.8	59.8	65.4
		L _{eq}	67.4	66.5	67.0	62.7
	17/09/07 Monday 27.9-22.3°C 0.6 mm	L _{min}	55.7	49.8	55.7	49.8
		L _{max}	78.9	78.9	78.5	67.8
		L ₁₀	74.3	70.4	74.3	65.3
		L ₉₀	59.8	58.9	59.8	55.7
		L _{eq}	68.9	67.2	69.7	61.7
	19/09/07 Wednesday 25.3-21.8°C 2.0 mm	L _{min}	-	-	-	-
		L _{max}	-	-	-	-
		L ₁₀	-	-	-	-
		L ₉₀	-	-	-	-
		L _{eq}	-	-	-	-
20/09/07 Thursday 28.4-19.3°C 0.0 mm	L _{min}	55.7	49.8	53.5	49.8	
	L _{max}	78.5	77.8	78.9	73.9	
	L ₁₀	68.0	70.4	70.4	65.3	
	L ₉₀	59.8	58.8	59.8	55.7	
	L _{eq}	67.7	66.4	67.8	62.2	
21/09/07 Friday 30.6-20.7°C 0.0 mm	L _{min}	58.7	58.4	58.5	49.8	
	L _{max}	78.9	77.0	78.5	67.0	
	L ₁₀	73.0	66.0	71.2	64.9	
	L ₉₀	59.8	59.8	59.8	55.7	
	L _{eq}	68.7	65.4	68.7	60.6	
22/09/07 Saturday 29.8-17.4°C 0.0 mm	L _{min}	58.4	53.5	55.7	49.8	
	L _{max}	78.9	78.5	78.5	66.7	
	L ₁₀	74.5	65.3	71.2	62.5	
	L ₉₀	59.8	59.8	59.8	56.4	
	L _{eq}	69.6	66.1	68.6	61.2	

Table 7 is the representation of noise level monitored at Secretariat area during the month of September, 2007. A NAMP station is installed at the new Secretariat Building. The ambient noise level is high during traffic peak hours. However, the noise level is low on non-working days.

Table 7: Noise level monitoring near Imphal Secretariat

Place	Date/Day Temp/Rain	Noise level (dB)	Time			
			9.30 to 10.0 am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Near Secretariat Complex	23/09/07 Sunday 29.1-17.5°C 0.0 mm	L _{min}	41.2	32.4	44.5	41.2
		L _{max}	67.9	67.8	72.4	61.9
		L ₁₀	59.9	60.5	60.5	48.5
		L ₉₀	42.3	39.7	45.6	41.4
		L _{eq}	56.3	55.1	56.7	50.0
	24/09/07 Monday 27.3-18.8°C 0.0 mm	L _{min}	53.5	43.4	45.4	41.2
		L _{max}	74.5	68.0	79.8	66.8
		L ₁₀	69.0	67.0	69.9	65.3
		L ₉₀	59.8	59.9	48.5	42.4
		L _{eq}	65.4	64.9	66.1	61.7
	25/09/07 Tuesday 28.1-19.2°C 0.0 mm	L _{min}	51.2	41.2	41.2	49.8
		L _{max}	73.2	72.1	73.2	65.6
		L ₁₀	67.4	65.4	73.2	62.1
		L ₉₀	59.8	42.3	48.5	53.5
		L _{eq}	64.7	62.0	69.2	59.8
	26/09/07 Wednesday 30.2-19.0°C 0.0 mm	L _{min}	56.7	41.2	48.5	39.5
		L _{max}	79.8	74.5	79.8	65.6
		L ₁₀	70.4	65.4	69.8	64.6
		L ₉₀	59.8	44.3	48.5	41.4
		L _{eq}	66.8	63.0	65.6	56.8
27/09/07 Thursday 29.5-19.3°C 0.0 mm	L _{min}	53.5	41.2	45.4	40.4	
	L _{max}	77	71.2	79.8	64.6	
	L ₁₀	71.2	65.3	66.4	62.1	
	L ₉₀	56.4	42.4	48.5	41.5	
	L _{eq}	65.9	62.4	64.8	55.6	
28/09/07 Friday 29.8-19.3°C 0.4 mm	L _{min}	55.7	45.4	53.5	40.4	
	L _{max}	78.5	79.8	78.9	67.4	
	L ₁₀	68.0	66.4	70.4	64.6	
	L ₉₀	59.8	48.5	59.8	41.5	
	L _{eq}	66.7	64.8	67.8	57.3	
30/09/07 Sunday 29.4-21.3°C 0.0 mm	L _{min}	41.2	41.2	45.5	41.2	
	L _{max}	73.2	67.4	67.4	67.4	
	L ₁₀	41.5	60.5	60.5	54.5	
	L ₉₀	60.5	41.4	45.7	41.4	
	L _{eq}	57.8	53.6	55.0	52.6	

Table 8 is the representation of noise level monitored near RIMS Gate during the month of September, 2008. Noise is generated from traffic, construction activities and operation of DG set. The observed Ambient Noise Level tends to be comparatively higher than the prescribed standards for an institutional and hospital area even on Sundays.

Table 8: Noise level monitoring near RIMS Gate

Place	Date/Day Temp/Rain	Noise level (dB)	Time			
			9.30 to10.0am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
RIMS Gate	21/09/08 Sunday 31.7-21.9°C 0.0 mm	L _{min}	39.5	40.2	40.2	40.2
		L _{max}	72.2	71.1	72.2	72.2
		L ₁₀	63.9	64.3	64.3	61.3
		L ₉₀	41.3	41.3	41.4	40.5
		L _{eq}	57.3	59.9	57.2	55.6
	22/09/08 Monday 32.1-22.3°C 0.0 mm	L _{min}	47.5	40.2	44.5	40.2
		L _{max}	70.4	65.6	70.5	65.6
		L ₁₀	65.6	62.6	66.8	59.8
		L ₉₀	55.8	44.3	48.5	44.3
		L _{eq}	60.6	57.2	60.8	52.5
	23/09/08 Tuesday 30.4-21.3°C 8.9 mm	L _{min}	-	-	-	-
		L _{max}	-	-	-	-
		L ₁₀	-	-	-	-
		L ₉₀	-	-	-	-
		L _{eq}	-	-	-	-
	24/09/08 Wednesday 29.8-20.7°C 0.4 mm	L _{min}	44.5	40.2	41.5	37.2
		L _{max}	74.4	65.6	74.5	65.6
		L ₁₀	65.6	62.6	69.8	59.8
		L ₉₀	53.8	44.3	48.5	42.3
		L _{eq}	60.6	54.2	60.8	50.5
25/09/08 Thursday 30.8-21.4°C 1.3 mm	L _{min}	44.5	39.2	41.4	38.4	
	L _{max}	70.5	66.8	70.8	65.6	
	L ₁₀	65.4	65.3	69.9	64.9	
	L ₉₀	54.9	42.4	48.5	40.3	
	L _{eq}	57.8	54.7	60.1	54.9	
26/09/08 Friday 31.4-21.4°C 0.0 mm	L _{min}	48.5	40.2	40.5	38.2	
	L _{max}	68.4	60.6	70.5	60.6	
	L ₁₀	65.6	62.6	64.8	58.8	
	L ₉₀	52.8	44.3	44.5	42.3	
	L _{eq}	57.6	55.2	60.8	50.5	
27/09/08 Saturday 29.3-21.3°C 0.0 mm	L _{min}	43.5	36.2	40.4	35.4	
	L _{max}	67.5	66.8	70.8	65.6	
	L ₁₀	65.4	65.3	64.9	63.9	
	L ₉₀	58.9	42.4	44.5	42.3	
	L _{eq}	58.8	58.7	60.1	54.9	
28/09/08 Sunday 27.6-20.6°C 1.2 mm	L _{min}	38.5	39.2	39.2	-	
	L _{max}	65.2	68.1	69.2	-	
	L ₁₀	63.9	65.3	65.3	-	
	L ₉₀	42.3	42.3	42.4	-	
	L _{eq}	56.3	56.9	54.2	-	
29/09/08 Monday 29.2-22.3 °C 2.1 mm	L _{min}	40.5	-	-	-	
	L _{max}	63.8	-	-	-	
	L ₁₀	61.3	-	-	-	
	L ₉₀	50.7	-	-	-	
	L _{eq}	57.1	-	-	-	
30/09/08 Tuesday 26.5-19.3 °C 14.0 mm	L _{min}	-	-	-	-	
	L _{max}	-	-	-	-	
	L ₁₀	-	-	-	-	
	L ₉₀	-	-	-	-	
	L _{eq}	-	-	-	-	

Table 9 is the representation of noise level monitored near Central Agriculture University, Eroishemba during the month of September, 2008. The area is also comparatively calm and the ambient noise level is within the standards prescribed for an educational area.

Table 9: Noise level monitoring at Central Agriculture University, Eroishemba

Place	Date/Day Temp/Rain	Noise level (dB)	Time			
			9.30 to 10.0 am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Central Agriculture University	01/10/08 Wednesday 29.1-17.5°C 0.0 mm	L _{min}	32.4	41.2	39.5	32.4
		L _{max}	67.4	61.2	60.5	65.4
		L ₁₀	51.2	48.5	57.8	48.5
		L ₉₀	36.7	41.5	39.8	37.8
		L _{eq}	50.3	49.7	50.6	49.5
	03/10/08 Friday 30.8-21.3°C 4.6 mm	L _{min}	-	-	-	-
		L _{max}	-	-	-	-
		L ₁₀	-	-	-	-
		L ₉₀	-	-	-	-
		L _{eq}	-	-	-	-
	04/10/08 Saturday 27.2-20.6°C 8.7 mm	L _{min}	-	-	-	-
		L _{max}	-	-	-	-
		L ₁₀	-	-	-	-
		L ₉₀	-	-	-	-
		L _{eq}	-	-	-	-
	05/10/08 Sunday 29.4-20.1°C 4.1 mm	L _{min}	32.4	-	-	-
		L _{max}	64.5	-	-	-
		L ₁₀	46.4	-	-	-
		L ₉₀	37.8	-	-	-
		L _{eq}	49.7	-	-	-
09/10/08 Thursday 23.9-19.7°C 2.4 mm	L _{min}	-	-	39.5	32.4	
	L _{max}	-	-	60.5	54.5	
	L ₁₀	-	-	54.5	48.5	
	L ₉₀	-	-	45.4	39.7	
	L _{eq}	-	-	49.4	44.5	
10/10/08 Friday 27.2-18.7°C 0.8 mm	L _{min}	32.4	32.4	39.5	32.4	
	L _{max}	61.2	57.8	60.5	60.5	
	L ₁₀	48.5	48.5	57.8	48.5	
	L ₉₀	36.7	35.4	39.8	37.8	
	L _{eq}	46.7	43.5	51.6	46.7	
11/10/08 Saturday 28.8-19.7°C 0.0 mm	L _{min}	32.4	41.2	41.5	39.5	
	L _{max}	65.7	61.8	64.5	60.1	
	L ₁₀	51.2	48.5	48.5	45.6	
	L ₉₀	35.4	41.5	42.3	41.2	
	L _{eq}	50.2	47.6	49.5	45.3	
12/10/08 Sunday 29.8-18.8°C 0.0 mm	L _{min}	32.4	32.4	39.5	32.4	
	L _{max}	64.5	61.9	60.5	54.5	
	L ₁₀	46.4	48.5	54.5	48.5	
	L ₉₀	37.8	39.8	45.4	39.7	
	L _{eq}	49.7	47.3	51.4	44.5	
13/10/08 Monday 29.7-20.4°C	L _{min}	37.2	41.2	40.3	32.4	
	L _{max}	64.3	62.3	60.2	60.5	
	L ₁₀	55.6	48.5	58.5	48.5	

	0.0 mm	L ₉₀	41.5	41.5	45.6	37.8
		L _{eq}	48.9	50.7	49.8	47.6
	14/10/08 Tuesday 30.4-18.8 °C 0.0 mm	L _{min}	32.4	41.2	41.5	39.5
		L _{max}	65.7	61.8	64.5	60.1
		L ₁₀	51.2	48.5	48.5	45.6
		L ₉₀	35.4	41.5	42.3	41.2
		L _{eq}	50.2	47.6	49.5	45.3

Table 10 is the representation of noise level monitored at Nambol Bazar during the month of October, 2008. The data indicate that the Ambient Noise Level at Nambol Bazar is within the standards prescribed for a commercial area.

Table 10: Noise level monitoring at Nambol Bazar

Place	Date/Day Temp	Noise level (dB)	Time			
			9.30 to 10.0am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Nambol Bazar	16/10/08 Thursday 29.8-16.4°C	L _{min}	41.2	40.4	44.5	41.2
		L _{max}	70.9	69.8	72.4	61.9
		L ₁₀	65.9	64.5	64.5	48.5
		L ₉₀	44.3	47.7	49.6	41.4
		L _{eq}	60.3	62.1	59.7	50.0
	17/10/08 Friday 29.4-15.8°C	L _{min}	53.5	43.4	45.4	41.2
		L _{max}	74.5	68.0	79.8	66.8
		L ₁₀	69.0	67.0	69.9	65.3
		L ₉₀	59.8	59.9	48.5	42.4
		L _{eq}	65.4	64.9	66.1	61.7
	18/10/08 Saturday 29.0-13.2°C	L _{min}	51.2	41.2	41.2	49.8
		L _{max}	73.2	72.1	73.2	65.6
		L ₁₀	67.4	65.4	73.2	62.1
		L ₉₀	59.8	42.3	48.5	53.5
		L _{eq}	64.7	62.0	69.2	59.8
	19/10/08 Sunday 29.5-13.5°C	L _{min}	32.4	32.4	39.5	32.4
		L _{max}	61.2	57.8	60.5	60.5
		L ₁₀	48.5	48.5	57.8	48.5
		L ₉₀	36.7	35.4	39.8	37.8
		L _{eq}	46.7	43.5	51.6	46.7
20/10/08 Monday 28.5-13.6°C	L _{min}	53.5	41.2	45.4	40.4	
	L _{max}	77	71.2	79.8	64.6	
	L ₁₀	71.2	65.3	66.4	62.1	
	L ₉₀	56.4	42.4	48.5	41.5	
	L _{eq}	65.9	62.4	64.8	55.6	
21/10/08 Tuesday 29.6-16.6°C	L _{min}	55.7	45.4	53.5	40.4	
	L _{max}	78.5	79.8	78.9	67.4	
	L ₁₀	68.0	66.4	70.4	64.6	
	L ₉₀	59.8	48.5	59.8	41.5	
	L _{eq}	66.7	64.8	67.8	57.3	
22/10/08 Wednesday 26.5-17.5°C	L _{min}	41.2	41.2	45.5	41.2	
	L _{max}	73.2	67.4	67.4	67.4	
	L ₁₀	41.5	60.5	60.5	54.5	
	L ₉₀	60.5	41.4	45.7	41.4	

		L _{eq}	57.8	53.6	55.0	52.6
23/10/08 Thursday 26.5-17.5°C		L _{min}	51.2	41.2	41.2	49.8
		L _{max}	73.2	72.1	73.2	65.6
		L ₁₀	67.4	65.4	73.2	62.1
		L ₉₀	59.8	42.3	48.5	53.5
		L _{eq}	64.7	62.0	69.2	59.8
24/10/08 Friday 26.5-17.5°C		L _{min}	51.2	41.2	41.2	49.8
		L _{max}	73.2	72.1	73.2	65.6
		L ₁₀	67.4	65.4	73.2	62.1
		L ₉₀	59.8	42.3	48.5	53.5
		L _{eq}	64.7	62.0	69.2	59.8
25/10/08 Saturday 26.5-17.0°C		L _{min}	51.2	41.2	41.2	49.8
		L _{max}	73.2	72.1	73.2	65.6
		L ₁₀	67.4	65.4	73.2	62.1
		L ₉₀	59.8	42.3	48.5	53.5
		L _{eq}	64.7	62.0	69.2	59.8

Table 11 is the representation of the noise levels monitored at Bishnupur Bazar during the month of November, 2008. The Ambient Noise Level at Bishnupur Bazar also meets the standards prescribed for a commercial area.

Table 11: Noise level monitoring at Bishnupur Bazar

Place	Date/Day Temp	Noise level (dB)	Time			
			9.30 to 10.0am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Bishnupur Bazar	01/11/08 Saturday 25.0-16.0°C	L _{min}	40.2	44.4	43.5	40.2
		L _{max}	70.9	70.8	70.4	65.9
		L ₁₀	64.9	65.5	65.5	60.5
		L ₉₀	44.3	44.7	46.6	45.4
		L _{eq}	60.3	61.1	61.7	57.0
	02/11/08 Sunday 26.0-17.0°C	L _{min}	52.5	43.4	44.4	41.2
		L _{max}	73.5	68.0	77.8	66.8
		L ₁₀	68.0	67.0	67.9	65.3
		L ₉₀	58.8	58.9	46.5	42.4
		L _{eq}	62.4	63.9	64.1	61.7
	03/11/08 Monday 25.0-16.1°C	L _{min}	51.2	41.2	41.2	49.8
		L _{max}	73.2	72.1	73.2	65.6
		L ₁₀	67.4	65.4	73.2	62.1
		L ₉₀	59.8	42.3	48.5	53.5
		L _{eq}	64.7	62.0	69.2	59.8
04/11/08 Tuesday 26.0-16.0°C	L _{min}	56.7	41.2	48.5	39.5	
	L _{max}	79.8	74.5	79.8	65.6	
	L ₁₀	70.4	65.4	69.8	64.6	
	L ₉₀	59.8	44.3	48.5	41.4	
	L _{eq}	66.8	63.0	65.6	56.8	
05/11/08 Wednesday 26.0-17.0°C	L _{min}	53.5	41.2	45.4	40.4	
	L _{max}	77	71.2	79.8	64.6	
	L ₁₀	71.2	65.3	66.4	62.1	
	L ₉₀	56.4	42.4	48.5	41.5	
	L _{eq}	65.9	62.4	64.8	55.6	

	06/11/08 Thursday 26.0-17.0°C	L _{min}	55.7	45.4	53.5	40.4
		L _{max}	78.5	79.8	78.9	67.4
		L ₁₀	68.0	66.4	70.4	64.6
		L ₉₀	59.8	48.5	59.8	41.5
		L _{eq}	66.7	64.8	67.8	57.3
	07/11/08 Friday 26.0-16.0°C	L _{min}	41.2	41.2	45.5	41.2
		L _{max}	73.2	67.4	67.4	67.4
		L ₁₀	41.5	60.5	60.5	54.5
		L ₉₀	60.5	41.4	45.7	41.4
		L _{eq}	57.8	53.6	55.0	52.6
	08/11/08 Saturday 26.0-17.0 °C	L _{min}	51.2	41.2	41.2	49.8
		L _{max}	73.2	72.1	73.2	65.6
		L ₁₀	67.4	65.4	73.2	62.1
		L ₉₀	59.8	42.3	48.5	53.5
		L _{eq}	64.7	62.0	69.2	59.8
	09/11/08 Sunday 26.0-17.0 °C	L _{min}	51.2	41.2	41.2	49.8
		L _{max}	73.2	72.1	73.2	65.6
		L ₁₀	67.4	65.4	73.2	62.1
		L ₉₀	59.8	42.3	48.5	53.5
		L _{eq}	64.7	62.0	69.2	59.8
10/11/08 Monday 26.0-17.0 °C	L _{min}	51.2	41.2	41.2	49.8	
	L _{max}	73.2	72.1	73.2	65.6	
	L ₁₀	67.4	65.4	73.2	62.1	
	L ₉₀	59.8	42.3	48.5	53.5	
	L _{eq}	64.7	62.0	69.2	59.8	

Table 12 is the representation of the noise levels monitored at Thoubal Bazar during the month of November, 2008. The data indicate that the Ambient Noise Level at Thoubal Bazar also meets the prescribed standards for a commercial area.

Table 12: Noise level monitoring at Thoubal Bazar

Place	Date/Day Temp	Noise level (dB)	Time			
			9.30 to 10.0am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Thoubal Bazar	11/11/08 Tuesday 25.8-17.8°C	L _{min}	38.2	40.4	44.5	41.2
		L _{max}	67.9	67.8	72.4	61.9
		L ₁₀	57.9	60.5	60.5	48.5
		L ₉₀	40.3	42.7	45.6	41.4
		L _{eq}	56.3	55.1	56.7	50.0
	12/11/08 Wednesday 26.8-17.5°C	L _{min}	53.5	43.4	45.4	41.2
		L _{max}	74.5	68.0	79.8	66.8
		L ₁₀	69.0	67.0	69.9	65.3
		L ₉₀	59.8	59.9	48.5	42.4
		L _{eq}	65.4	64.9	66.1	61.7
	13/11/08 Thursday 26.8-17.0°C	L _{min}	51.2	41.2	41.2	49.8
		L _{max}	73.2	72.1	73.2	65.6
		L ₁₀	67.4	65.4	73.2	62.1
		L ₉₀	59.8	42.3	48.5	53.5
		L _{eq}	64.7	62.0	69.2	59.8
14/11/08 Friday	L _{min}	56.7	41.2	48.5	39.5	
	L _{max}	79.8	74.5	79.8	65.6	

	26.0-17.0°C	L ₁₀	70.4	65.4	69.8	64.6
		L ₉₀	59.8	44.3	48.5	41.4
		L _{eq}	66.8	63.0	65.6	56.8
	15/11/08 Saturday 26.0-17.2°C	L _{min}	53.5	41.2	45.4	40.4
		L _{max}	77	71.2	79.8	64.6
		L ₁₀	71.2	65.3	66.4	62.1
		L ₉₀	56.4	42.4	48.5	41.5
		L _{eq}	65.9	62.4	64.8	55.6
	16/11/08 Sunday 26.0-17.0°C	L _{min}	55.7	45.4	53.5	40.4
		L _{max}	78.5	79.8	78.9	67.4
		L ₁₀	68.0	66.4	70.4	64.6
		L ₉₀	59.8	48.5	59.8	41.5
		L _{eq}	66.7	64.8	67.8	57.3
	17/11/08 Monday 26.4-16.6°C	L _{min}	41.2	41.2	45.5	41.2
		L _{max}	73.2	67.4	67.4	67.4
		L ₁₀	41.5	60.5	60.5	54.5
		L ₉₀	60.5	41.4	45.7	41.4
		L _{eq}	57.8	53.6	55.0	52.6
	18/11/08 Tuesday 26.5-16.4 °C	L _{min}	53.5	41.2	45.4	40.4
		L _{max}	77	71.2	79.8	64.6
L ₁₀		71.2	65.3	66.4	62.1	
L ₉₀		56.4	42.4	48.5	41.5	
L _{eq}		65.9	62.4	64.8	55.6	
19/11/08 Wednesday 26.4-16.0 °C	L _{min}	55.7	45.4	53.5	40.4	
	L _{max}	78.5	79.8	78.9	67.4	
	L ₁₀	68.0	66.4	70.4	64.6	
	L ₉₀	59.8	48.5	59.8	41.5	
	L _{eq}	66.7	64.8	67.8	57.3	
20/11/08 Thursday 26.3-15.9 °C	L _{min}	41.2	41.2	45.5	41.2	
	L _{max}	73.2	67.4	67.4	67.4	
	L ₁₀	41.5	60.5	60.5	54.5	
	L ₉₀	60.5	41.4	45.7	41.4	
	L _{eq}	57.8	53.6	55.0	52.6	

Table 13 is the representation of the noise levels monitored at Moirang Bazar during the month of November, 2008. The Ambient Noise Level meets the prescribed standards for a commercial area.

Table 13: Noise level monitoring at Moirang Bazar

Place	Date/Day Temp	Noise level (dB)	Time			
			9.30 to 10.0 am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Moirang Bazar	21/11/08 Friday 26.4-16.0°C	L _{min}	39.2	37.4	42.5	38.2
		L _{max}	67.9	67.8	70.4	61.9
		L ₁₀	59.9	60.5	60.5	48.5
		L ₉₀	42.3	39.7	45.6	41.4
		L _{eq}	54.3	55.1	56.7	50.0
	22/11/08 Saturday 26.7-15.6°C	L _{min}	45.5	42.4	40.4	38.2
		L _{max}	72.5	68.0	70.8	66.8
		L ₁₀	67.0	66.0	68.9	65.3

		L ₉₀	58.8	59.9	46.5	41.4
		L _{eq}	62.4	61.9	60.1	60.7
23/11/08 Sunday 26.0-16.7°C		L _{min}	41.2	41.2	41.2	40.8
		L _{max}	69.2	69.1	72.2	65.6
		L ₁₀	65.4	64.4	70.2	62.1
		L ₉₀	58.8	41.3	47.5	46.5
		L _{eq}	62.7	60.0	62.2	59.8
	24/11/08 Monday 26.8-16.4°C		L _{min}	52.7	41.2	48.5
		L _{max}	77.8	74.5	76.8	65.6
		L ₁₀	70.4	65.4	66.8	64.6
		L ₉₀	58.8	44.3	46.5	41.4
		L _{eq}	64.8	63.0	63.6	56.8
25/11/08 Tuesday 26.8-16.8°C		L _{min}	53.5	41.2	45.4	40.4
		L _{max}	77	71.2	79.8	64.6
		L ₁₀	71.2	65.3	66.4	62.1
		L ₉₀	56.4	42.4	48.5	41.5
		L _{eq}	65.9	62.4	64.8	55.6
26/11/08 Wednesday 26.0-17.0°C		L _{min}	55.7	45.4	53.5	40.4
		L _{max}	78.5	79.8	78.9	67.4
		L ₁₀	68.0	66.4	70.4	64.6
		L ₉₀	59.8	48.5	59.8	41.5
		L _{eq}	66.7	64.8	67.8	57.3
27/11/08 Thursday 26.0-17.0°C		L _{min}	41.2	41.2	45.5	41.2
		L _{max}	73.2	67.4	67.4	67.4
		L ₁₀	41.5	60.5	60.5	54.5
		L ₉₀	60.5	41.4	45.7	41.4
		L _{eq}	57.8	53.6	55.0	52.6
29/11/08 Saturday 26.0-17.0°C		L _{min}	53.5	41.2	45.4	40.4
		L _{max}	77	71.2	79.8	64.6
		L ₁₀	71.2	65.3	66.4	62.1
		L ₉₀	56.4	42.4	48.5	41.5
		L _{eq}	65.9	62.4	64.8	55.6
30/11/08 Sunday 26.0-17.0°C		L _{min}	53.7	45.4	52.5	40.4
		L _{max}	76.5	79.8	75.9	67.4
		L ₁₀	67.0	66.4	69.4	64.6
		L ₉₀	57.8	48.5	57.8	41.5
		L _{eq}	64.7	64.8	65.8	57.3
01/12/08 Monday 26.0-17.0°C		L _{min}	44.2	44.2	45.5	41.2
		L _{max}	75.2	69.4	68.4	67.4
		L ₁₀	44.5	63.5	63.5	54.5
		L ₉₀	63.5	44.4	47.7	41.4
		L _{eq}	60.8	56.6	56.0	52.6

Table 14 is the representation of the noise levels monitored at Kakching Bazar during the month of December, 2008. The Ambient Noise Level is high during 9.30 to 10.0 am, 1.30 to 2.0 pm and 4.30 to 5.0 pm.

Table 14: Noise level monitoring at Kakching Bazar

Place	Date/Day Temp	Noise level (dB)	Time			
			9.30 to10.0am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Kakching Bazar	02/12/08 Tuesday 26.0-17.0°C	L _{min}	43.2	45.4	44.5	41.2
		L _{max}	72.9	74.8	72.4	66.9
		L ₁₀	69.9	69.5	65.5	60.5
		L ₉₀	60.3	60.7	59.6	50.4
		L _{eq}	67.3	67.1	67.7	58.0
	03/12/08 Wednesday 26.0-17.0°C	L _{min}	53.5	45.4	45.4	41.2
		L _{max}	74.5	70.0	79.8	66.8
		L ₁₀	69.0	68.0	69.9	65.3
		L ₉₀	60.8	61.9	48.5	42.4
		L _{eq}	66.4	66.9	66.1	61.7
	04/12/08 Thursday 26.0-17.0°C	L _{min}	51.2	41.2	41.2	49.8
		L _{max}	73.2	72.1	73.2	65.6
		L ₁₀	67.4	65.4	73.2	62.1
		L ₉₀	59.8	42.3	48.5	53.5
		L _{eq}	64.7	62.0	69.2	59.8
	05/12/08 Friday 26.0-17.0°C	L _{min}	56.7	48.2	48.5	40.5
		L _{max}	79.8	74.5	79.8	68.6
		L ₁₀	70.4	71.4	72.8	66.6
		L ₉₀	59.8	64.3	60.5	50.4
		L _{eq}	66.8	67.0	68.6	60.8
	06/12/08 Saturday 26.0-17.0°C	L _{min}	53.5	41.2	45.4	40.4
		L _{max}	77	71.2	76.8	64.6
		L ₁₀	71.2	69.3	68.4	62.1
		L ₉₀	62.4	62.4	58.5	41.5
		L _{eq}	67.9	67.4	66.8	55.6
	07/12/08 Sunday 26.0-17.0°C	L _{min}	55.7	45.4	53.5	40.4
		L _{max}	78.5	79.8	78.9	67.4
		L ₁₀	68.0	66.4	70.4	64.6
		L ₉₀	59.8	48.5	59.8	41.5
		L _{eq}	66.7	64.8	67.8	57.3
	08/12/08 Monday 26.0-17.0°C	L _{min}	58.9	49.8	58.5	49.8
		L _{max}	78.9	77.0	78.5	65.6
		L ₁₀	71.2	59.8	71.2	62.1
		L ₉₀	59.8	65.4	59.8	53.5
		L _{eq}	67.7	65.1	68.7	59.6
	09/12/08 Tuesday 25.0-16.0°C	L _{min}	58.4	53.5	55.7	49.8
		L _{max}	78.9	78.5	78.5	65.6
		L ₁₀	74.5	65.3	71.2	62.1
		L ₉₀	59.8	59.8	59.8	53.5
		L _{eq}	69.6	66.1	68.6	59.6
	10/12/08 Wednesday 25.0-16.0°C	L _{min}	55.7	45.4	53.5	40.4
		L _{max}	78.5	79.8	78.9	67.4
		L ₁₀	68.0	66.4	70.4	64.6
		L ₉₀	59.8	48.5	59.8	41.5
		L _{eq}	66.7	64.8	67.8	57.3
11/12/08 Thursday 25.4-15.0°C	L _{min}	58.9	49.8	58.5	49.8	
	L _{max}	78.9	77.0	78.5	65.6	
	L ₁₀	71.2	59.8	71.2	62.1	
	L ₉₀	59.8	65.4	59.8	53.5	
	L _{eq}	67.7	65.1	68.7	59.6	

Table 15 is the representation of the noise levels monitored at Lamlong Bazar during the month of December, 2008. The Ambient Noise Level is high during traffic peak hours. However, the Ambient Noise Level is low on non-working days.

Table 15: Noise level monitoring at Lamlong Bazar

Place	Date/Day Temp	Noise level (dB)	Time			
			9.30 to 10.0 am	1.30 to 2.0 pm	4.30 to 5.0 pm	7.30 to 8.0 pm
Near Secretariat Complex	12/12/08 Friday 26.4-16.0°C	L _{min}	50.5	41.2	48.5	41.2
		L _{max}	70.4	65.6	70.5	65.6
		L ₁₀	65.6	62.6	69.8	59.8
		L ₉₀	59.8	44.3	48.5	42.3
		L _{eq}	63.6	59.2	64.8	54.5
	13/12/08 Saturday 26.5-16.0°C	L _{min}	53.5	41.2	45.4	40.4
		L _{max}	71.5	66.8	72.8	65.6
		L ₁₀	65.4	65.3	69.9	64.9
		L ₉₀	58.9	42.4	48.5	42.3
		L _{eq}	64.8	61.7	66.1	58.9
	14/12/08 Sunday 26.5-16.0°C	L _{min}	40.5	41.2	41.2	41.2
		L _{max}	70.2	71.1	71.2	67.2
		L ₁₀	64.9	65.3	65.3	62.3
		L ₉₀	42.3	42.3	42.4	41.5
		L _{eq}	61.3	60.9	63.2	59.6
	15/12/08 Monday 26.8-16.0°C	L _{min}	52.7	41.2	48.5	39.6
		L _{max}	70.8	69.5	70.8	68.2
		L ₁₀	68.4	65.4	68.8	65.3
		L ₉₀	59.8	45.3	48.5	41.5
		L _{eq}	66.8	63.0	65.6	60.0
16/12/08 Tuesday 26.8-16.0°C	L _{min}	53.5	41.2	45.4	40.4	
	L _{max}	74.8	71.2	72.8	64.6	
	L ₁₀	65.4	65.3	66.4	62.1	
	L ₉₀	56.4	42.4	48.5	41.5	
	L _{eq}	66.7	62.4	64.8	55.6	
17/12/08 Wednesday 26.4-16.5°C	L _{min}	53.5	41.2	48.5	40.5	
	L _{max}	72.8	71.2	70.8	64.6	
	L ₁₀	62.3	65.4	48.5	62.3	
	L ₉₀	55.7	44.3	66.4	42.3	
	L _{eq}	67.1	62.9	65.1	57.2	
18/12/08 Thursday 26.4-16.0°C	L _{min}	48.5	41.2	48.5	40.5	
	L _{max}	71.8	66.8	70.5	65.6	
	L ₁₀	68.4	65.3	69.8	64.6	
	L ₉₀	55.7	42.4	48.5	42.3	
	L _{eq}	65.9	61.7	65.8	59.2	
19/12/08 Friday 26.4-16.0°C	L _{min}	52.5	41.2	48.5	40.5	
	L _{max}	72.8	71.2	71.8	64.6	
	L ₁₀	62.3	65.4	48.5	62.3	
	L ₉₀	55.7	44.3	66.4	42.3	
	L _{eq}	67.1	62.9	65.1	57.2	
20/12/08 Saturday 26.5-16.4°C	L _{min}	48.5	41.2	48.5	40.5	
	L _{max}	74.8	66.8	72.5	65.6	
	L ₁₀	68.4	65.3	69.8	64.6	
	L ₉₀	55.7	42.4	48.5	42.3	
	L _{eq}	65.9	61.7	65.8	59.2	

	21/12/08 Sunday 26.4-16.4 °C	L _{min}	40.5	41.2	41.2	41.2
		L _{max}	73.2	72.1	73.2	73.2
		L ₁₀	64.9	65.3	65.3	62.3
		L ₉₀	42.3	42.3	42.4	41.5
		L _{eq}	61.3	60.9	63.2	59.6

Table 16 is the representation of the noise levels monitored at different parts of the city on the occasion of Deepawali, 2006. The Ambient Noise Level due to bursting of firecrackers with background traffic noise is high and increases at night time.

Table 16: Noise level monitoring during Deepawali festival

Date/Day/ Temp/Rain	Place	Noise level (dB)	Time		
			9.30 to 10.0 am	5.30 to 6.0 pm	8.30 to 9.0 pm
09/11/07 Friday 26.3-13.3°C 0.4 mm	Thangal Bazar	L _{min}	50.1	56.0	56.0
		L _{max}	82.0	80.0	84.0
		L ₁₀	77.8	77.8	78.0
		L ₉₀	62.4	67.8	64.0
		L _{eq}	73.8	72.3	76.8
	Paona Bazar		10.30 to 11.0 pm	6.30 to 7.0 pm	9.30 to 10.0 pm
		L _{min}	54.1	57.0	55.4
		L _{max}	82.0	80.0	90.8
		L ₁₀	76.8	78.0	83.5
		L ₉₀	60.5	68.0	67.4
	Keishampat Junction		11.30 to 12.0 pm	7.30 to 8.0 pm	10.30 to 11.0 pm
		L _{min}	56.8	57.0	56.0
		L _{max}	75.0	78.0	83.4
		L ₁₀	73.0	72.0	75.8
		L ₉₀	66.5	64.0	67.8
	L _{eq}	70.5	69.4	70.4	

5.0 CONCLUSIONS

The Ambient Noise Level is high at Keisampat Junction, Kangla Park (Western Gate), Singjamei Bazar and Kakching Bazar especially during 9.30 to 10.0 am and 4.30 to 5.0 pm. The noise level also tends to be higher in Regional Institute of Medical Sciences (RIMS). The noise level is comparatively low in non-working days in most parts of the Imphal city.

At present, there is no problem of noise pollution in the institutional areas of Manipur University and Central Agriculture University. The results also indicate a comparatively low Ambient Noise Level at Nambol Bazar, Thoubal Bazar, Bishnupur Bazar and Moirang Bazar.

The first approach to the solution of noise pollution is to reduce noise level at the source. Noise can be reduced by prescribing noise limits for vehicles, ban on honking of gas horns, well planned traffic and creation of silence zones near schools, hospitals, etc. The awareness of the public is very essential for control and prevention of noise pollution and for this, radios, televisions, cinema halls, newspapers, etc. should be the medium of campaign for wide publicity.

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APPENDICES

Table A1. Ambient Noise Standards

Category of Area/Zone	Limits in dB(A) Leq	
	Day time	Night time
Industrial area	75	70
Commercial area	65	55
Residential area	55	45
Silence Zone	50	40

Note:

Day time shall mean from 6.0 am to 10.0 pm

Night time shall mean from 10.0 pm to 6.0 am

Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions and courts, religious places or any other area which is declared as such by the competent authority

Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority

(Source: The Noise Pollution (Control and Regulation) Rules, 2000)

Table A2. Noise Limits for new petrol/kerosene generator sets

Category of Area/Zone	*Noise Limits from	
	September 1, 2002	September 1, 2003
Sound Pressure Level, L_{WA}	90 dB(A)	86 B(A)

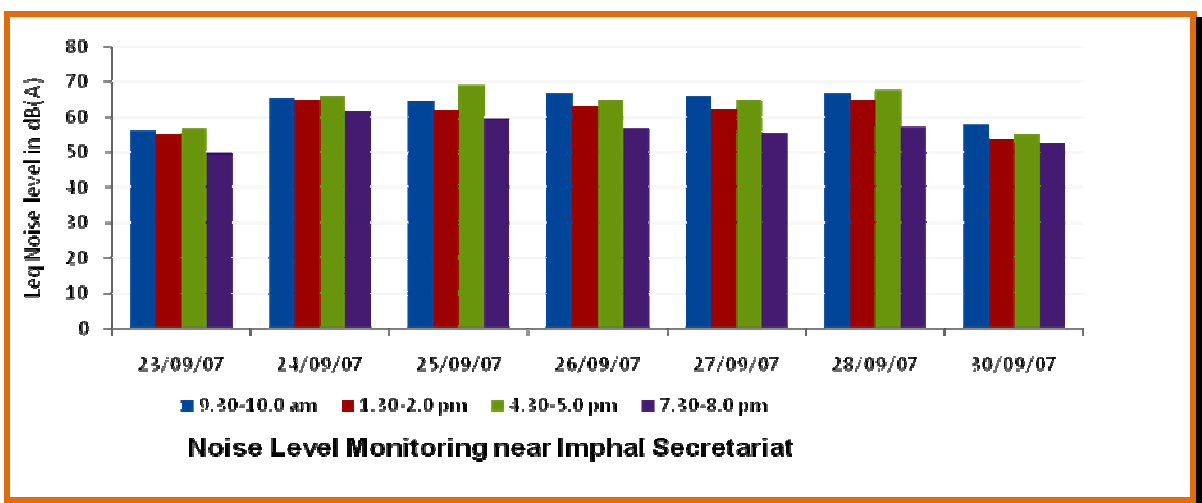
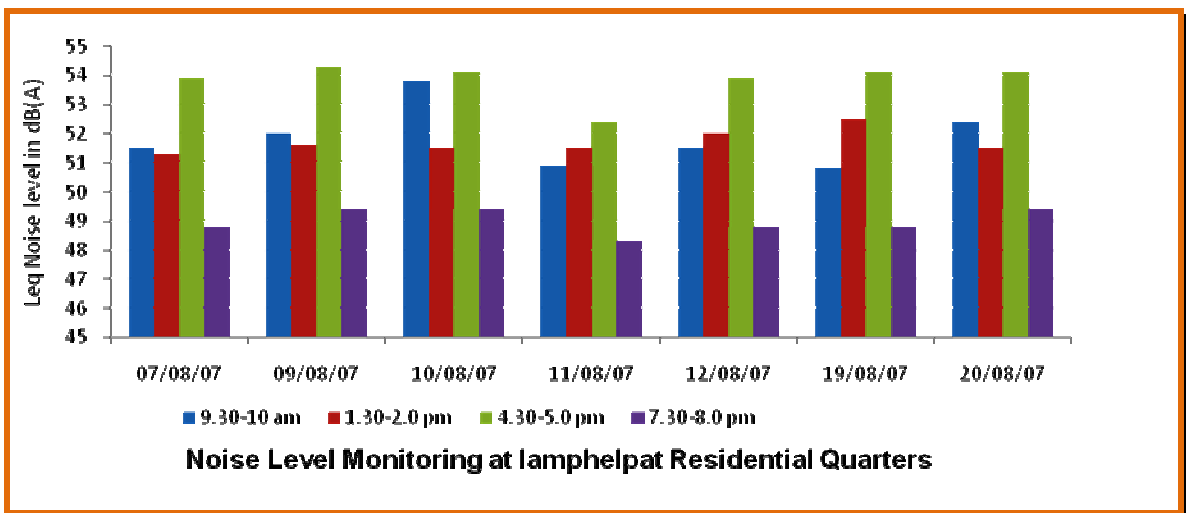
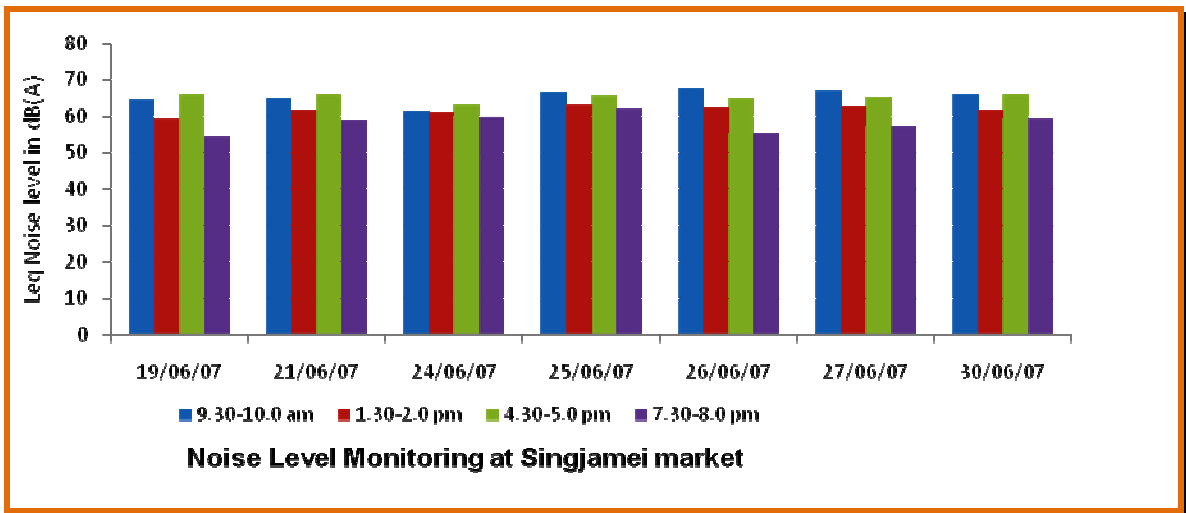
*The standard is applicable at the manufacturing stage

(Source: GSR 742(E), September 25, 2000 and its amendments)

Table A3. Noise Limits for vehicles at manufacturing stage

Sl. No.	Type of Vehicles	Noise Limit dB(A)
1.0	Two Wheelers	
1.1	Displacement up to 80 cc	75
1.2	Displacement more than 80 cc but up to 175 cc	77
1.3	Displacement more than 175 cc	80

2.0	Three Wheelers	
2.1	Displacement up to 175 cc	77
2.2	Displacement more than 175 cc	80
3.0	Vehicles used for the carriage of passengers and capable of having not more than nine seats, and a maximum Gross Vehicle Weight (GVW) of more than 3.5 tonnes	74
4.0	Vehicles used for the carriage of passengers having more than nine seats, including the driver's seat, and a maximum Gross Vehicle Weight (GVW) of more than 3.5 tonnes	
4.1	With an engine power less than 150 KW	78
4.2	With an engine power of 150 KW or above	80
5.0	Vehicles used for the carriage of passengers having more than nine seats, including the driver's seat: Vehicles used for the carriage of goods	
5.1	With a maximum GVW exceeding 3.5 tonnes	76
6.0	Vehicles used for the transport of goods with a maximum GVW exceeding 3.5 tonnes	
6.1	With an engine power less than 75 KW	77
6.2	With an engine power of 75 KW or above but less than 150 KW	78
6.3	With an engine power of 150 KW or above	80





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