

**Comparative Noise Quality Status of Mandideep Industrial Area of Madhya Pradesh,
India**

Reeta Kori, Alok Saxena, Harish Wankhade, Asad Baig, Ankita Kulshreshtha*
Saket Mishra and Smriti Sen

Central Laboratory, Madhya Pradesh Pollution Control Board, Paryavaran Parisar, E-5, Arera Colony, Bhopal, India

Abstract

The noise level in ambient air of Mandideep industrial area of Madhya Pradesh, India was done during year 2017-18 and 2018-19. Total thirteen locations were selected in Mandideep industrial area for noise quality monitoring during four quarters of two consecutive years. The noise data were collected during day time (6AM to 10 PM) and night time (10 PM to 6 AM) at the all monitoring locations. All noise monitoring was done as per standard guidelines followed by Central Pollution Control Board which complying IS 9989:1981 (R2001). All results were compared with standard limits for industrial area prescribed in Noise Pollution (Regulation and Control) Rules (2000). Noise level found within limit of standard of noise level 75 dB (A) Leq in day time and 70 dB (A) Leq in night time as per Noise Pollution (Regulation and Control) Rules (2000) for industrial area at all selected monitoring locations during two consecutive years study. In Mandideep industrial areas, industry machines, pump sets, horns and ill noise may main sources of noise pollution.

Key Words: Industrial Area, Ambient Noise, Noise Pollution

* Corresponding author: Ankita Kulshreshtha (ankita.kuls@gmail.com)

1. Introduction

India and all other countries are facing noise pollution problem for a long period due to increasing number of vehicles, musical instruments, small scale industries, urbanization and human activities are the main source of noise pollution [1]. Noise is nothing but an unacceptable level of sound that hampers mental and physical peace, and may induce severe damage to the health. It damages our hearing capacity and causes other health hazard such as stress, hypertension, increased blood pressure, heart disease and headache. It can also interfere with communication at work, which could lead to accident. The normal range of hearing for a healthy young person is from approximately 20 Hz (Hertz) to 20,000 Hz (20 kHz) [2]. Noise pollution causes various degrees of psychological and physiological effects on human health. It directly or indirectly influences our behavior, cognition, mental performance, normal sleep duration and studies of students. Due to high volume of noise the metabolism, quickened heart rate, boosted blood pressure, rapid stomach contraction etc., are increased [3]. Though noise pollution is a slow and subtle killer, yet very little efforts have been made to ameliorate the same [4]. Some machines such as chain saws, chippers, hammered saw blades and those containing many welds together with power generating sets emit high noise levels. However, these relatively short duration exposures happen many times per shift and may therefore pose a serious hazard to hearing and other health related problems. Though noise pollution is a slow and imperceptible killer, very little efforts have been made to cushion its effects on humans [5]. Noise pollution is recognized as one of the major environmental issue in cities and affecting the quality of life [6]. The present environmental problems are universal in almost all the countries [7]. Road traffic, garbage trucks, constructions, manufacturing process, road congestion are major sources of this unwanted sound that are routinely transmitted in to the air [8]. All these problems are due to consequence of rapid population growth, which resulted in increase of usage of large number of vehicles, excessive exploitation of natural resources [9]. The Increase of traffic noise levels in urban environment depends on various factors such as with heavy density of vehicle flow related with the traffic composition, road slope, width and surface structure distance to crossroad etc [10]. The Noise Pollution in stone quarrying industry intensity of noise within the industry and workplace in general is rising continuously and causing severe nuisance in the immediate surroundings and to the people working therein causing occupational health hazards [11].

Discrimination and differentiation between sound and noise also depends upon the habit and interest of the person or species receiving it, the ambient conditions and impact of the sound generated during that particular duration of time [11]. Exposure to high level of noise causes severe stress on the auditory and nervous system [12]. Premature hearing loss, blood pressure alteration, hypertension, several cardiovascular and non-cardiovascular diseases, and lack of concentration among industrial workers are well-known outcomes of noise exposure at work [13-15]. Therefore this two consecutive years study reveals the status of comparative noise level quality of Mandideep industrial area of Madhya Pradesh, India.

2. Methodology

2.1. Study Area

Mandideep is a municipality in Goharganj subdistrict of Raisen district in the Indian state of Madhya Pradesh. Mandideep is a Industrial area established in year 1975, is situated near Bhopal, 25 KM away from state capital of Madhya Pradesh. As of 2011 India census, Mandideep had a population of 59654. It is situated between the latitude 22°47' and 23°33' north and the longitude 77°21' and 78°49' east and is bounded in the west by Sehore District, in the north by Vidisha District, in the east and southeast by Sagar District, and in the south by Hoshangabad and Sehore districts.

3.2. Monitoring Locations

Total thirteen locations in Mandideep industrial area were selected for noise quality monitoring is depicted in table no 1 and figure no 1.

Table 1: Monitoring Locations

S.N	Code	Monitoring Points
1	N1	Near St Chavara, H. S. School, New Satlapur Mandideep
2	N2	Near M/S Bansal Extraction & Exports Pvt, Ltd Mandideep
3	N3	Near M/S Bhaskar Industry, Mandideep
4	N4	Near M/S Proctor & Gamble, Mandideep
5	N5	Near M/S Mahindra Steel Service Centre, Mandideep
6	N6	Near M/S Dawat Food Industry, Mandideep
7	N7	Near M/S TMTL (Eicher Tectors), Mandideep
8	N8	Near M/S HEG, Mandideep
S	N9	Near M/S Lupin ltd, Mandideep
10	N10	Near M/S Vardhman Yarns, Mandideep
11	N11	Near Lalit Gitanjali Hospital, Mandideep
12	N12	Near AKVN, Mandideep
13	N13	Near M/S Crompton & Greaves, Mandideep

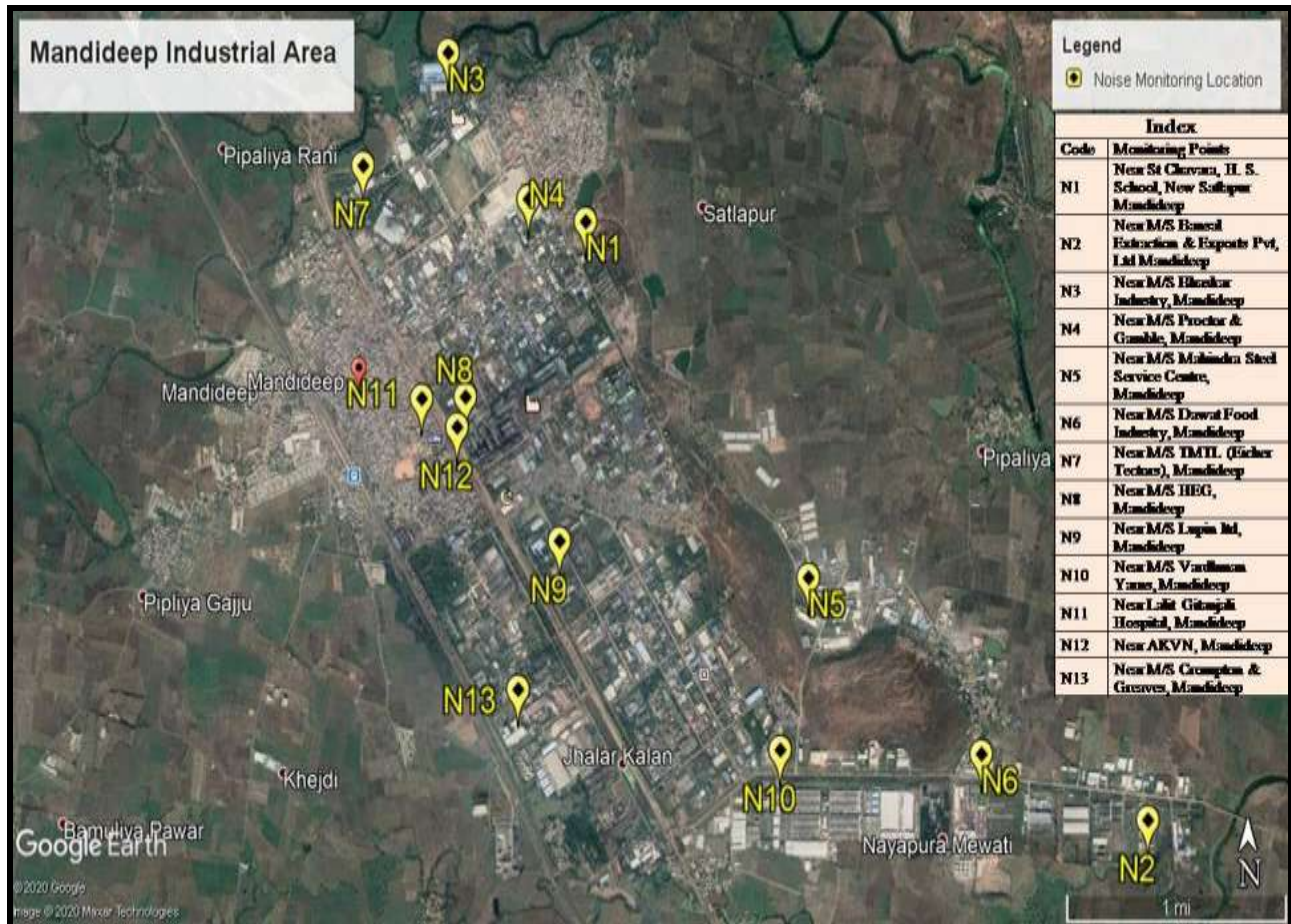


Figure 1 : Monitoring Locations

2.3. Monitoring

Noise level measurements were carried out in “A” weight age using the Cirrus Sound Level Meter. The instrument was placed at selected site on a height of about 1.2 meter above the ground. Care was also taken to ensure that no reflections took place near the instrument. The noise data were collected from different monitoring locations at different time in order to assess the changing noise level at sites. Data collected during day time (6AM to 10 PM) and night time (10 PM to 6 AM) at the all monitoring locations during year 2017-18 and 2018-19. All noise monitoring was done as per standard guidelines followed by Central Pollution Control Board which complying IS 9989:1981 (R2001) [15]. All results were compared with standard limits prescribed in Noise Pollution (Regulation and Control) Rules (2000) [16].

3. Results & Discussion

The observed noise level at all selected monitoring locations of Mandideep Industrial area are depicted in table 2.

Table 2: Noise Level in Ambient Air

S. N	Duration	Unit	Ambient noise rule 2000 standard	N1		N2		N3		N4		N5	
				2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19
1	Day Time Avg	dB (A) Leq	75	61.8	62.1	59.2	54.8	58.2	57.2	60.7	64.4	59.6	56.4
2	Night Time Avg	dB(A) Leq	70	56.4	54.8	51.3	50.7	53.1	52.1	57.3	60.3	43.9	52.1

Continue..

S. N	Duration	Unit	Ambient noise rule 2000 standard	N6		N7		N8		N9	
				2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19
1	Day Time Avg	dB (A) Leq	75	58.6	59.6	56.2	60.9	64.8	68.8	53.9	61.4
2	Night Time Avg	dB(A) Leq	70	51.1	47.8	53.6	48.4	59.8	61.7	50.4	53.8

Continue..

S. N	Duration	Unit	Ambient noise rule 2000 standard	N10		N11		N12		N13	
				2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19
1	Day Time	dB (A)	75	67.1	64.5	61.3	59.6	64.3	62.5	61.3	59.7
	Avg	Leq									
2	Night Time	dB(A)	70	54.2	57.9	58.4	54.1	57.2	58.9	54.8	54.8
	Avg	Leq									

Figure no 1 is showing that minimum average noise level in day time was found 53.9 dB (A) Leq (N9) & 54.8 dB (A) Leq (N2) and maximum 64.8 dB (A) Leq (N8) & 68.8 dB (A) Leq (N8) during year 2017-18 and 2018-19 respectively.

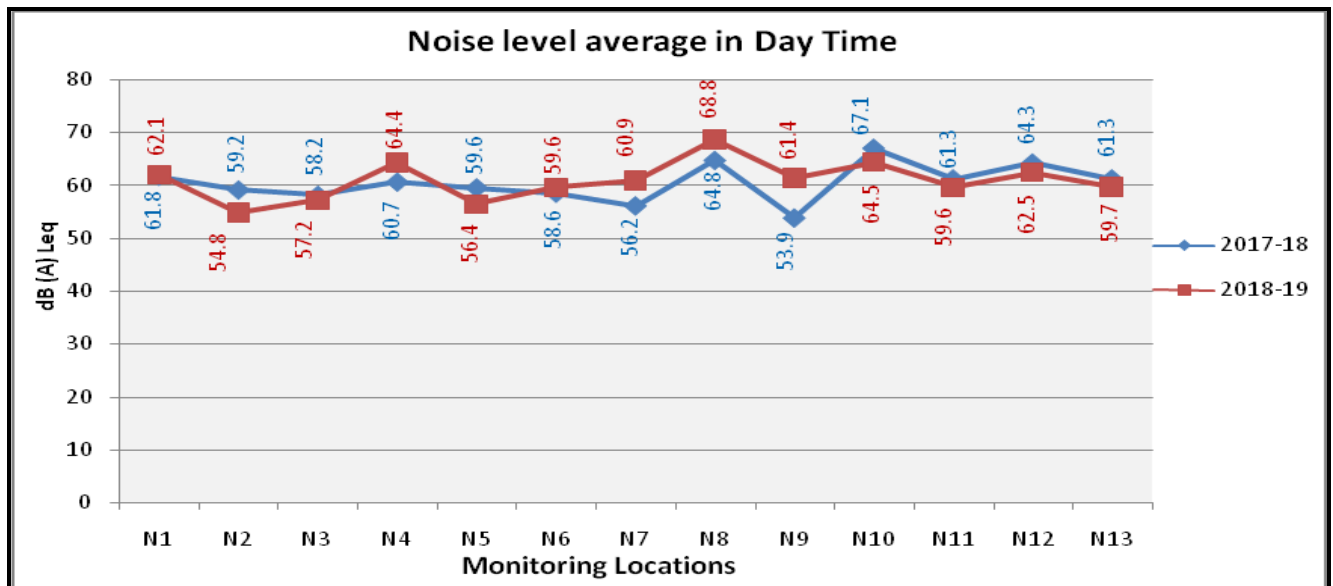


Figure no 1 : Noise level average in day Time

Figure no 2 is showing that minimum average noise level in night time was found 43.9 dB (A) Leq (N5) & 47.8 dB (A) Leq (N6) and maximum 59.8 dB (A) Leq (N8) & 61.7 dB (A) Leq (N8) during year 2017-18 and 2018-19 respectively.

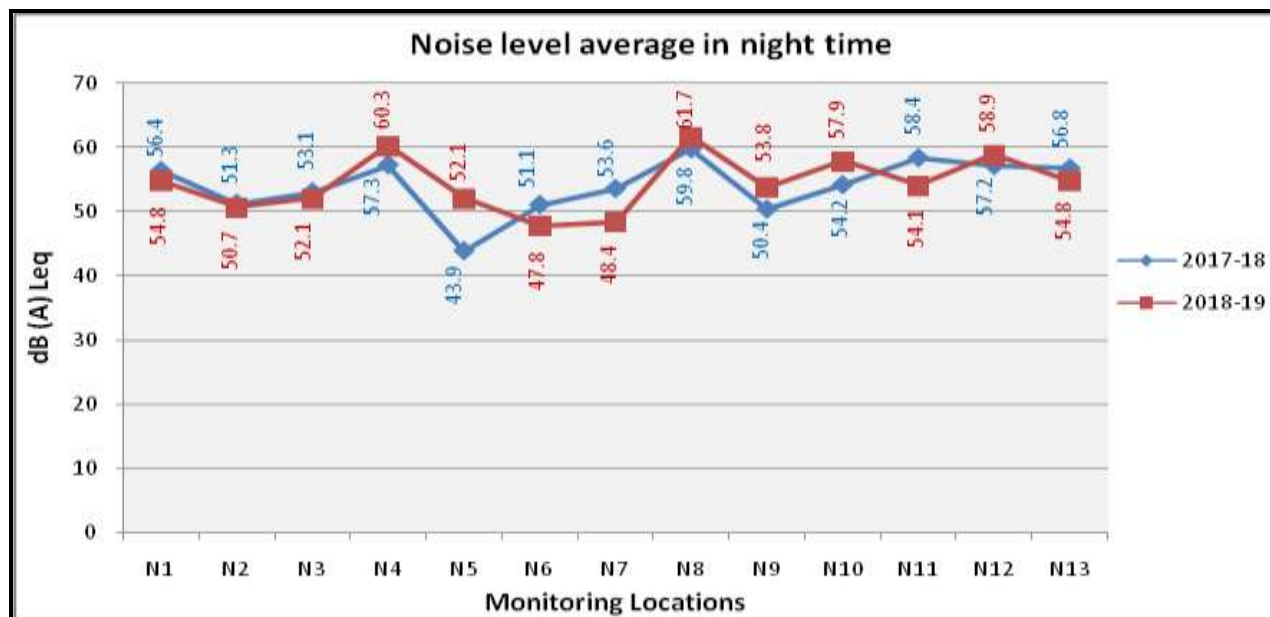


Figure no 2 : Noise level average in night time

4. Conclusion

The noise quality in ambient air of Mandideep industrial area of Madhya Pradesh, India was done during year 2017-18 and 2018-19. Noise level found within limit of standard of noise level 75 dB (A) Leq in day time and 70 dB (A) Leq in night time as per Noise Pollution (Regulation and Control) Rules (2000) for industrial area during this study. The flow of ill maintained vehicles, honking of air horns industrial activities, instruments, encroachments and heavy vehicle activity of NH12 highway may be the reasons of observed noise level. Noise pollution is may due to a higher concentration of population, industrial and transport activities. Noise like other pollutants is a byproduct of industrialization, urbanization and modern civilization. In Mandideep industrial areas, industry machines, pump sets, horns and ill noise are main sources of noise.

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