

EXPERIMENTAL STUDY ON NOISE POLLUTION OF DIFFERENT PLACES OF GREATER NOIDA: A CASE STUDY

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ABSTRACT: Sound is such a common part of everyday life that we rarely appreciate all of its functions. Sound in nature is caused by the trembling of particles exhibit noticeable all around that achieves the human ears and animates a sentiment hearing. At the point when sound turns out to be noisy, or repulsive, or undesirable, or irritating, it moves toward becoming clamor. If the level of noise is so much high so it effects the person and animals which is called noise pollution. In this research paper, firstly select the various places in greater noida and categories as residential, commercial and industrial areas. Greater noida is the emerging city in the Uttar Pradesh state having more population. In this region, noise pollution found more due to vehicles, residential and industrial area. Sound pressure level is measured at the time of morning, afternoon and the evening at the selected regions in the city. After evaluation the noise level appropriate strategy will be applied to overcome this problem.

Keywords: Noise Pollution, Greater Noida, Industrial, Residential place

I. INTRODUCTION

Other than with the developing level of air and water contamination, street activity clamor contamination has been perceived ascending as another danger to the occupants of urban communities. The urban natural nature of creating nations —cities| has been weakened by a boundless increment of vehicles, foundation, and populace Thusly, the persistent expanded force of movement commotion level because of the populace has corrupted urban personal satisfaction. Street activity clamor is the huge challenge for urban organizers and ecological designers to defeat street activity commotion in urban communities (Li B., Taoa et al., 2002). If the volume of noise is high on the residential areas so it effects the health and nervous system (Jamrah, A et al. , 2006.M.M, Murthy et al. ,2007) and the various sources which are generated noise/sound such as transportation, industrial works (Veronique sels et al., 2012). At present noise pollution is considered as one of the key issues of urban groups that has various dangerous consequences for the urban condition and may bring about a lot of expenses on the general public ((Martin et al., 2006). Gangwar (2006) depicted that the expanding number of vehicles, melodic instruments, little scale enterprises, urbanization and human exercises are the fundamental wellsprings of clamor contamination. Movement commotion levels increment with expanding thickness of activity related with the activity sythesis, the street incline, width, and surface structure separation to intersection (Williams and McCrae, 1995). Loudness of sound compares to the level of sensation relying upon the force of sound and affectability of ear (Garg et.al. 2007). The unit of sound force estimation is decibel (dB) and every decibel rise portrays ten times increment in sound power. In this paper evaluate the noise level at different places

II. ACCEPTABLE LIMITS OF NOISE LEVEL

The passable commotion resilience levels of noise level are shown as given in the (Table 1). The desirable outdoor noise levels in different types of residential areas, as well as the acceptable indoor noise levels for various types of buildings, as recommended by Indian standard code IS : 4954-1968.

Table 1: Limits if noise in different type of areas according to GoI

Sr .No.	Category of area/zone	Limits in dB (A) Leq at day time	Limits in dB (A) Leq at night time
1.	Industrial area	75	70
2.	Commercial area	65	55
3.	Residential area	55	45
4.	Silence zone	50	40

1.1 Acceptable Outdoor Noise Level In Residential Areas

Table 2: Acceptable outdoor noise level in residential areas (Faheem et al 2016)

Sr .No	Location	Noise level in dB
1.	Rural areas	25-35
2.	Suburban areas	30-40
3.	Urban residential areas	35-45
4.	Residential and business urban areas	40-50
5.	City areas	45-55
6.	Industrial areas	50-60

1.2 Acceptable Indoor Noise Level in Various Types of Buildings in Residential Areas

Table 3: Acceptable indoor noise level in residential areas (Sewage disposal S K garg)

Sr .No	Location	Noise level in dB
1.	Radio and T.V. studios	25-35
2.	Music rooms	30-35
3.	Hospitals, class rooms, auditoria	35-40
4.	Apartments, hotels, homes, conference rooms, small offices	35-40
5.	Court rooms, private offices, libraries	40-45
6.	Large public offices, banks, stores, etc.	45-50
7.	Restaurants	50-55

II. STUDY AREA

2.1 Greater Noida City

Greater Noida City is a north Indian city with a population in excess of 100,000, located in the Gautam Budh Nagar district of the northern state of Uttar Pradesh. The city was created under the UP Industrial Area Development Act, 1976. It is a part of the National Capital Region (NCR) of India (www.climatedata.org).

2.2 Materials And Methods

The present investigation on evaluation and analysis of environmental noise pollution was conducted in the city of greater Noida during the period of summer season (march to April). Table 4 shows the data on greater Noida city in context to demography, geographic locations and meteorological aspects during the course of study. Noise levels were measured using & quot; ENVIROTECH SLM 100 SOUND LEVEL METER". The meter was held 1.2 to 1.5m above the ground surface and .5m away from the chest (body). For each sampling location, The data collected from each location was processed for statistical analysis. All the monitoring experiments were carried out under ideal meteorological conditions as mentioned earlier (table).

Table 4: Demographic, geographic locations and meteorological aspects of Greater Noida city during the study period

Sr .No	Parameters	Documented Values
1.	Population (2011 census)	1.08 lakhs
2.	Geographical area (km 2)	308km 2
3.	Population density (no. Of persons/km 2)	327
4.	Latitude	28.4744N
5.	Longitude	77.5040E
6.	Annual rainfall(mm)	932.18mm
7.	Max. Temp. From march to June	45°C
8.	Min. Temp. From march to June	23 °C

2.3 Selected locations for Noise Pollution Observations

Locations were selected from 10 different places across greater noida as categories in industrial and residential area respectively. Five different locations considered as industrial area and five another locations are also considered as residential area as shown in Table.5.

Table 5: Sampling Location for noise pollution monitoring in Greater noida city

INDUSTRIAL AREA	RESIDENTIAL AREA
Site v kasna	Jaypee housing
Surajpur Industrial	GBU Residential
Ecotech-II	Sec-pi Residential
UPSIDC-SiteC	Swarn nagri
Swarn Nagri Ind.	Alpha-I industrial

III OBSERVATIONS

The observations were carried out for the period of ten days with three times of monitoring per day with gap. The schedule selected during the day time was as follows: - morning 08:00-9:00a.m., afternoon 01:300-02:00 p.m., night 09:30-10:30 p.m.

3.1 Industrial Area

There are five places selected for the industrial area and the observations of noise at the different places with different time as tabulated in Table 6 and data representation as shown in Fig. 3.1.

Table 6: Noise observation of the Industrial area

Places	Days	Morning time	Afternoon time	Evening time
Site V kasna	1	66.4	66.5	63.3
	2	65.1	65.1	68.9
	3	66.9	66.9	67.8
	4	68.9	68.9	64.2
	5	70.4	70.4	66.4
	6	71.3	71.3	69.2
	7	67.8	67.8	65.8
	8	66.5	66.5	64.5

	9	69.9	69.9	67
	10	67.2	67.2	67.8
Surajpur Industrial	1	69.2	70.5	67.5
	2	66.7	71.2	69.2
	3	66.8	69.3	70.2
	4	67.2	72.3	68.6
	5	68.6	69.2	68.2
	6	64.7	67.9	69
	7	65.8	68.5	70.1
	8	69.8	71.7	69.3
	9	65.9	70.2	68.7
	10	69.7	67.9	66.5
Ecotech-II	1	64.5	69.8	68.4
	2	66.1	70.6	69.2
	3	64.7	68.2	68.6
	4	65.2	72.3	70.1
	5	64.8	73.2	69.7
	6	66	68.3	67.9
	7	66.5	72.4	68.5
	8	63.9	72.7	69.7
	9	66.2	71.7	70.2
	10	64.5	69.5	70.4
UPSIDC-SiteC	1	63.4	66.6	65.1
	2	64.3	67.8	66.1
	3	64.5	68.1	66.8
	4	66.2	67.2	65.9
	5	65.1	69.1	67.1
	6	63.8	65.9	64.9
	7	63.7	67.6	65.2
	8	64.8	66.9	68
	9	65.1	69.4	67.6
	10	66.1	64.8	66.4
Swarn Nagri Ind.	1	71.2	72.4	67.3
	2	70.1	74	67
	3	71.3	76.3	66
	4	69.8	75.4	66.6
	5	68.6	71.8	65.5
	6	70.2	70.7	65.2
	7	70.8	72.2	67.8
	8	69.1	74.6	68.1
	9	68.5	75.2	67.1
	10	69.7	73.1	66.9

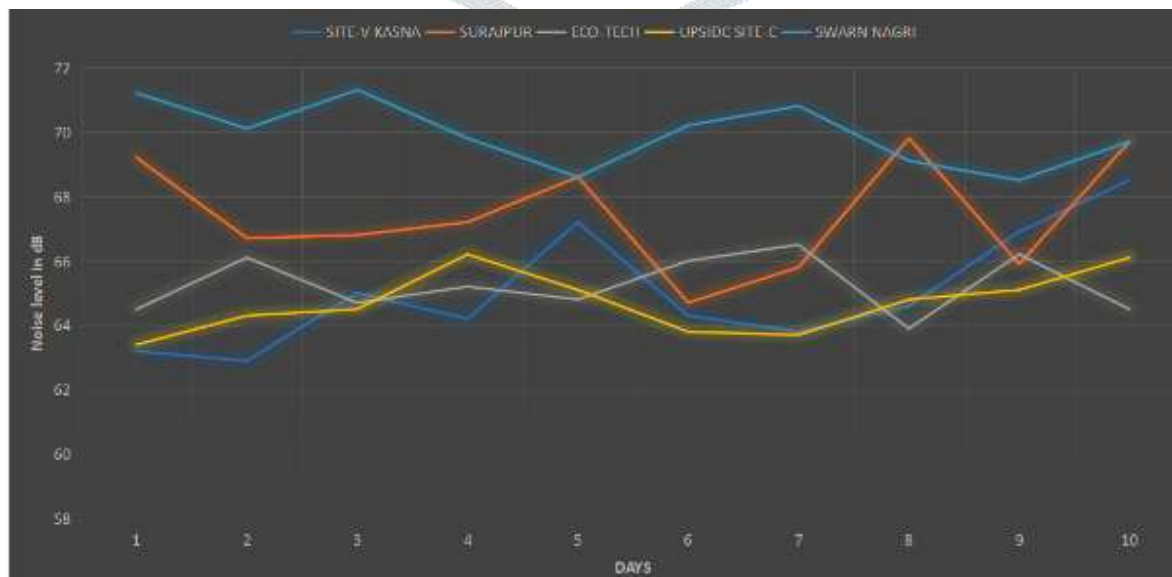


Figure 3.1: Noise observation of the industrial (Morning time)

3.2 Residential Areas

There are five places selected for the residential area and the observations of noise at the different places at different time as tabulated in Table 7 and data representation as shown in Fig. 3.1..

Table 7: Noise observation of the residential area

Places	Days	Morning time	Afternoon time	Evening time
Jay-pee Housing	1	61.4	63.5	58.3
	2	61.8	64.6	57.8
	3	60.4	62.9	59.5
	4	61.6	66.4	59.8
	5	62.2	62.1	58.4
	6	59.12	63.7	56.7
	7	60.3	64	57.9
	8	58.9	63.2	58.1
	9	61.4	64.7	58.5
	10	60.8	56.9	62.6
GBU Residential	1	54.9	60.2	55.2
	2	54.3	59.6	56.1
	3	52.1	56.4	57.6
	4	53.5	55.4	55.8
	5	54.8	57.7	48.3
	6	54.6	56.9	51.1
	7	54.2	54.5	49.5
	8	55.2	60.6	50.6
	9	52.1	59.5	53.7
	10	54.7	57.8	47.6
Sec-pi Residential	1	60.7	57.3	50.6
	2	60.2	56.2	50.1
	3	61.4	57.6	48.3
	4	57.8	63.4	49.8
	5	60.9	61.2	53.2
	6	56.2	59.6	51.3
	7	57.8	61.8	50
	8	59.6	65.6	50.3
	9	61.3	56.9	47.3
	10	62.8	60.3	55.2
Alpha-I	1	60.3	66	55.1
	2	61.2	64.1	57.3
	3	63.1	65.3	56.2
	4	64.1	66.8	58.8
	5	62.2	67.1	59.5
	6	62.6	65.5	56.8
	7	63.8	64.4	56.4
	8	59.9	65.8	57.5
	9	60.5	67.3	57.3
	10	60.9	63.2	57.6
Swarn Nagri	1	57.6	55.6	46.2
	2	56.8	57.9	45.6
	3	58.1	58.1	46.8
	4	54.3	53.7	46.8
	5	53.1	54.8	49.7
	6	56.8	58.9	45.8
	7	55.7	59.1	48.2
	8	52.5	56.8	47.8
	9	53.9	58.9	44.3
	10	54.1	57.1	49.2

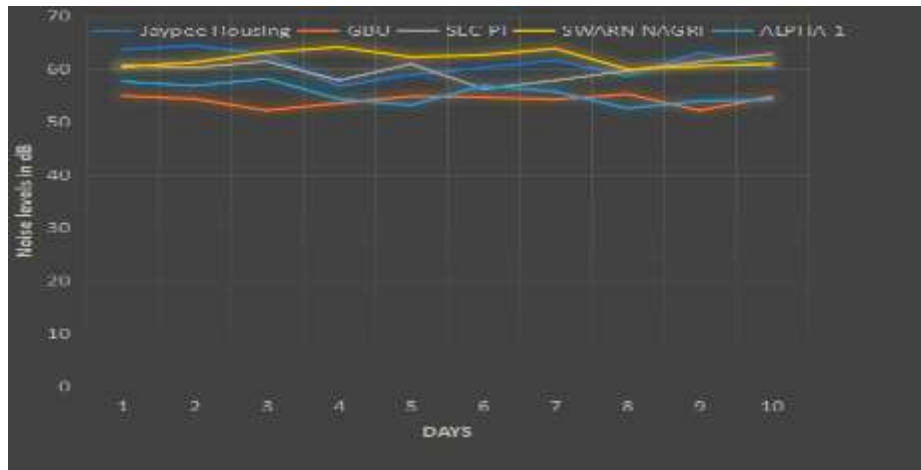


Figure 3.2: Noise observation of the residential (Morning time)

IV. CONCLUSION

The conclusions that can be drawn from our study of noise levels in Greater Noida are: -

1. The noise levels in residential areas, all silent zones and most of the commercial areas are above the permissible limit.
2. The noise levels in industrial areas were below the permissible limits.
3. This concludes that the industrial areas in the region are well planned as comparison to other zones
4. The low values in industrial zones are also because of the less noise producing industries like Moser bear, Asian paints etc and also because of proper greenbelt around the areas.
5. The high values of noise in residential areas and industrial areas are because of the high volume of traffic around those places.

V. RECOMMENDATIONS

• Suitable control measures need to be adopted urgently in the city before it is too late. Here are some recommendations:

1. There should be no submergence of the silent zone with the other zones to avoid the interference of noise pollution by any means.
2. The residential areas should be guarded by the noise barriers like green belt development to enhance the sustainable development, turn down global warming and coherently reduce the noise pollution.
3. The commercialization of the residential areas should be immediately barred to avoid the chaos in the city.
4. A committee can be organized to maintain the peaceful environment in the city, with the anonymous public complain system and penalize whosoever against it.

Apart from the above official measures, proper awareness must be spread among the people, about the negative impacts of noise pollution and the legislative rules, through schools, engineering and other educational institutions

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