

Noise Pollution Monitoring of Residential Areas In Sedam Taluka Kalaburgi Districts

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ABSTRACT

Sound which is undesirable for human hearing is called as noise. When there is a lot of noise from various sources, it constitutes what is called as noise pollution. Noise pollution can be caused due to various sources there is street noise, traffic noise, and noise in public transport places, noise in playgrounds and parks etc.. One of the greatest sources of noise pollution is Heavy vehicles like Trucks and Buses. The Noise level in Sedam Taluka of Kalaburgi District of Karnataka, India has been increasing rapidly due to rapid urbanization, uncontrolled movements of vehicles.

In this paper we are trying to present about the result of noise level in dB (A) on various points of sedam Taluka of Kalaburgi District. It has been found out that noise levels are more than permissible in all the investigated various spots around the Sedam Taluka.

The minimum noise level by taking into account of morning, afternoon & evening hours is 60.30dB and the maximum noise level of morning, afternoon & evening is 76.88dB and the average of both is 68.83dB, which is more than the limits compared to CPCB Standards. Result shows, the noise should be identified as the major environmental problem and should take necessary steps to minimize it.

KEYWORDS:- Noise, Sound Level Meter, Decibel, Sedam Taluka

INTRODUCTION

Noise pollution is a growing environmental concern that affects millions of people worldwide. It is characterized by excessive or unwanted sound that disrupts the natural environment and has negative impacts on human health and wildlife. The sources of noise pollution are diverse, ranging from traffic and construction to industrial activity and recreational events. Prolonged exposure to loud noise can lead to hearing loss, sleep disturbance, stress, and anxiety, among other health problems.

Furthermore, noise pollution can also disrupt the natural habitats and behaviors of wildlife, highlighting the need for effective measures to mitigate its effects and promote a healthier environment.

OBJECTIVES

- 1.To monitor Noise pollution in different areas of Sedam Taluka.
- 2.Comparing the level of noise with CPCB standards
- 3.To examine ways to control (Suggestions) Noise Pollution.

SOURCES OF NOISE POLLUTION

Transportation:

Road traffic: Cars, trucks, motorcycles, and honking contribute to significant noise levels in urban areas.

Urbanization:

Urban infrastructure: Power generators, air conditioners, and other machinery in densely populated areas.

Natural Sources:

Natural disasters: Earthquakes, volcanic eruptions, and thunderstorms create loud and disruptive sounds.

Wildlife: In some areas, particularly near forests or coastlines, animals can contribute to noise pollution.

CAUSES OF NOISE POLLUTION AS FOLLOWS

1. Transportation:

Road traffic (cars, trucks, buses)
Air traffic (airplanes and helicopters)
Railways (trains, trams)

2. Industrial Activities:

Factories and manufacturing plants
Construction sites (machinery, demolition)
Mining and quarrying activities

EFFECTS OF NOISE POLLUTION

NOISE POLLUTION'S EFFECTS ON ANIMALS:-

1. Stress and Health Impacts: Permanent damage to the ears, leading to partial, resulting in weakened immune systems and lower rates of successful reproduction, and even death. Stressful environments can cause animals to abandon their habitats, leading to population declines.
2. Communication Disruption: Many animals rely on sound for communication, navigation, and detecting predators or prey. Noise pollution can mask these sounds, leading to difficulties in finding mates, coordinating group activities, or avoiding danger.

NOISE POLLUTION'S EFFECTS ON PLANTS:-

1. Disruption of Pollinators: Many plants rely on animals, such as bees, birds, and bats, for pollination. Noise pollution can disrupt the behaviours of these pollinators by masking the sounds they use to communicate, navigate, or locate food. For instance, some birds may avoid noisy areas, reducing the chances of pollination for plants in those regions.
2. Altered Growth Patterns: Certain research indicates that noise pollution (NP) can alter plant growth patterns indirectly. For example, if noise pollution affects the behaviour of herbivores, it could change grazing patterns, which in turn could influence the growth and distribution of certain plants.

NOISE POLLUTION IMPACT ON HUMAN HEALTH AND ENVIRONMENT:- :-

1. Hearing Loss :-Chronic Exposure: A long duration to loud noise, especially in workplaces or urban areas, this can result in permanent hearing loss. Even everyday sounds like traffic, & construction, and loud music can contribute to this over time. Temporary Threshold Shift: Short-term exposure to loud noise can cause a temporary reduction in hearing, known as a temporary threshold shift, which can become permanent with repeated exposure.
2. Sleep Disturbances:- Noise pollution, especially during night time, can interfere with sleep patterns, making it harder to fall asleep & wake up a lot and overall poor sleep quality. Chronic sleep abnormalities have been linked to heart disease and cognitive decline, among other long term health issues.
3. Mental Health Impacts:- Noise pollution is correlated with higher levels of tension, anxiety, and irritation. It can furthermore contribute to more health issues like depression and cognitive impairment, especially who are sensitive to noise or already have pre-existing conditions.

LITERATURE REVIEW

1. Bablu Kumar, et.al.:- Noise pollution, a significant global health hazard, has increased due to technological advancements, industrialization, urbanization, and communication systems. It can cause health issues like high blood pressure, sleeplessness, nausea, heart attacks, depression, dizziness, headaches, and hearing loss. A road traffic noise survey was conducted in Bhopal city at five sites, including Rani Kamalapati railway station, board office square, Bhopal railway station, Prabhat square, and Bhopal talkies square. The study provides broad conclusions and suggests ways to reduce traffic noise.

2. Singhal, et.al. (2009):- The study aimed to assess the impact of industrial noise on the cardiovascular system of workers in lock factories. The study group comprised 114 workers exposed to industrial noise levels above 80 dB, while the control group consisted of 30 individuals who had never been in a noisy environment. The results

indicated significant changes in systolic and diastolic blood pressure, mean arterial pressure, pulse pressure, and heart rate among the factory workers. This suggests that industrial noise may be a contributing factor in the development of arterial hypertension.

3. Bhavan Tandel, et.al:- "Traffic-related noise pollution makes up nearly two-thirds of the total noise pollution in urban areas. Noise, which is a result of urbanization, industrialization, and motorization, is increasingly acknowledged as an environmental nuisance that has an impact on human health and well-being. The noise from traffic on urban roads reduces the quality of life and property values for people living near these urban corridors." Surat is currently the tenth largest city in India, with an estimated population of over 4 million. The city has experienced an astonishing population growth rate of 76.02% in the last decade, largely due to rapid industrialization. The job opportunities created by this industrialization have led to significant migration from various parts of India, particularly from Orissa, U.P., M.P., Bihar, and Rajasthan.

4. Singh D,et.al:- It concerns the monitoring of noise pollution in various locations across Meerut City during the Deepawali festival night. The study involved precise measurements of noise levels using advanced sound metering technology. Over the past three years, there has been a remarkable and consistent decrease in noise pollution, with the lowest recorded levels in 2009, demonstrating a clear improvement compared to 2008 and 2007. This decline can be confidently attributed to the growing environmental consciousness among the residents of Meerut City. Significantly, a growing number of schools in the city now actively promote the celebration of Deepawali, the festival of lights, without sound and smoke. There is a strong expectation that the campaign for an eco-friendly Deepawali will not only gain momentum but also be widely embraced by the people of Meerut City, based on their strong commitment to environmental conservation.

STUDY AREA

→ Sedam formerly known as seram it is a town in gulbarga district in Indian State of Karnataka.

→ Sedam is famous for Historical places like Temples. Here cement factory vasvadatta is famous

→ Sedam taluka is largest for Gulbarga district as comparing to Other Talukas

Here is a detailed overview of Kalaburagi covering its residential, Commercial and industrial areas.

According to the 2011 census, of India Sedam taluka in gulbarga, district, Karnataka State, had the following key demographic details

The Sedam Town municipal council has a population of 39,341 in 2011 with 19,816 males and 19,525 Females, Sedam as a sub-division of Kalaburagi has a total population of 218,572 according to 2011 census.

→ The Sex ratio in sedam taluk is 10,126 meaning there are 10,126 females for every 1000 males This ratio is based on the 2011 census,

→ The literacy rate of Kalaburagi district, which includes Sedam is 65%

The district has a male literacy rate of 74.4%. And a female literacy rate of 55% ,67.6% which is lowest in the district.

→ According to census 2011 There was 30,493 children between age 0 to 6 years in sedan Taluka out of which 15,372 were male and 15,121 were female

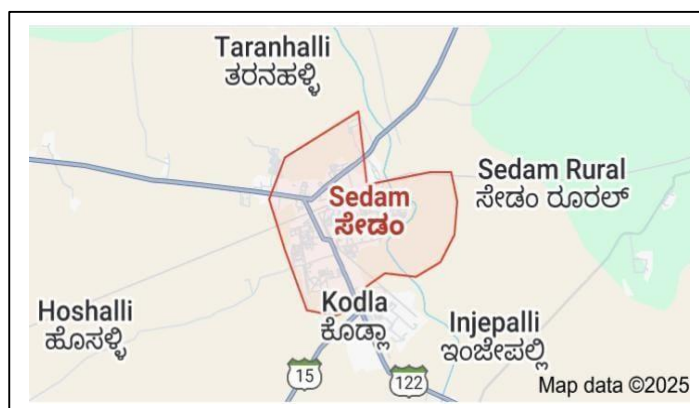


Fig. Represents Sedam Town

RESIDENTIAL AREAS:-

Sedam has seen significant growth in its residential sectors. Some prominent residential areas include:

Lohar Galli

Vidya Nagar

Basava Nagar

Ganesh nagar



Fig. R represents the Residential Area of Sedam Taluka (Lohar Galli)

METHODOLOGY

The process of measuring noise level entails the use of specialist tools, such as sound level meter, often known as noise dosimeter, can gauge and record the noise level in a specific space. Noise pollution is measured in various parts of Sedam taluka using the device shown below, to measure and quantify the intensity of sound in each environment.

About the Instrument: To monitor the sound pollution, we used an instrument which is known as Decibel meter or meter for Sound Level.



Fig. Represents the Sound level meter

Functioning of Sound Level Meter (SLM)

The instrument shown in the above image is a sound level meter, specifically the HT-80A model from Hti (Hongda industrial).

A sound level meter measures the intensity of sound waves in decibels (dB). It is commonly used to assess (quality) noise levels in various environments, such as workplaces, construction sites, and public spaces.

Procedure of SLM

Power ON

Press the <POWER> button to turn on the device. The device is in a suspended state.

Sound Detection: The sound level meter has a microphone (the black foam cover at the top) that detects sound waves in the environment.

Signal Processing: The detected sound waves are converted into an electrical signal, which is then processed by the meter's internal circuitry.

Measurement: The processed signal is measured and displayed on the LCD screen as a decibel value.

Weighting: The meter may apply weighting filters (such as A, C, or Z) to the measurement to account for the human ear's sensitivity to different frequencies.

Display: The measured decibel value is displayed on the LCD screen, along with other information such as the maximum and minimum values recorded.

OBSERVATION

Table: Represents the Noise Level During Morning, Afternoon and Evening Hour's In (Db)

Days	Hour's	Time	LAmx	LAmin	LAavg
Day 1	Morning	9:00 to 9:10	80.7	60.6	70.65
	Afternoon	1:50 to 2:00	79.2	57.8	68.5
	Evening	4:50 to 5:00	75.6	60.9	68.25
Day 2	Morning	9:10 to 9:20	84.4	56.4	70.4
	Afternoon	1:40 to 1:50	76.8	59.2	68
	Evening	4:30 to 4:40	80.2	69.2	74.7
Day 3	Morning	9:20 to 9:30	74.2	56.6	65.4
	Afternoon	1:30 to 1:40	76.8	60.2	68.5
	Evening	4:20 to 4:30	72.9	62.6	67.75
Day 4	Morning	9:30 to 9:40	78.6	60.2	69.4
	Afternoon	2:00 to 2:10	70.9	58.6	64.75
	Evening	4:40 to 4:50	77.2	59.9	68.55
Day 5	Morning	8:50 to 9:00	82.2	58.9	70.55
	Afternoon	1:50 to 2:00	72.9	64.4	68.65
	Evening	5:00 to 5:10	73.9	60.9	67.4
Day 6	Morning	9:00 to 9:10	85.4	54.6	70
	Afternoon	1:50 to 2:00	71.6	60.3	65.95
	Evening	4:50 to 5:00	78.2	66.1	72.15
Day 7	Morning	9:20 to 9:30	73.2	62.4	67.8
	Afternoon	2:00 to 2:10	73.2	62.4	67.8
	Evening	5:10 to 5:20	76.4	64.2	70.3
			LAmx=76.88	Lamin=60.30	LAavg=68.83

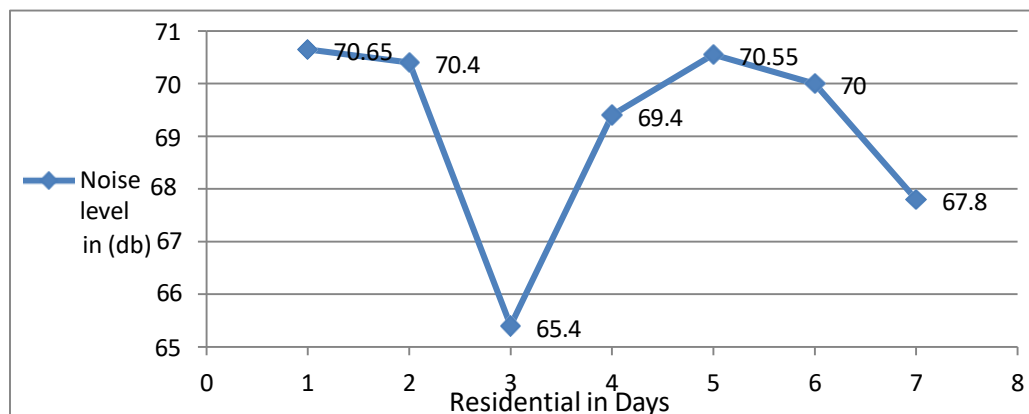


Fig: Represents Average Variation In Noise Level In Residential Area At Morning

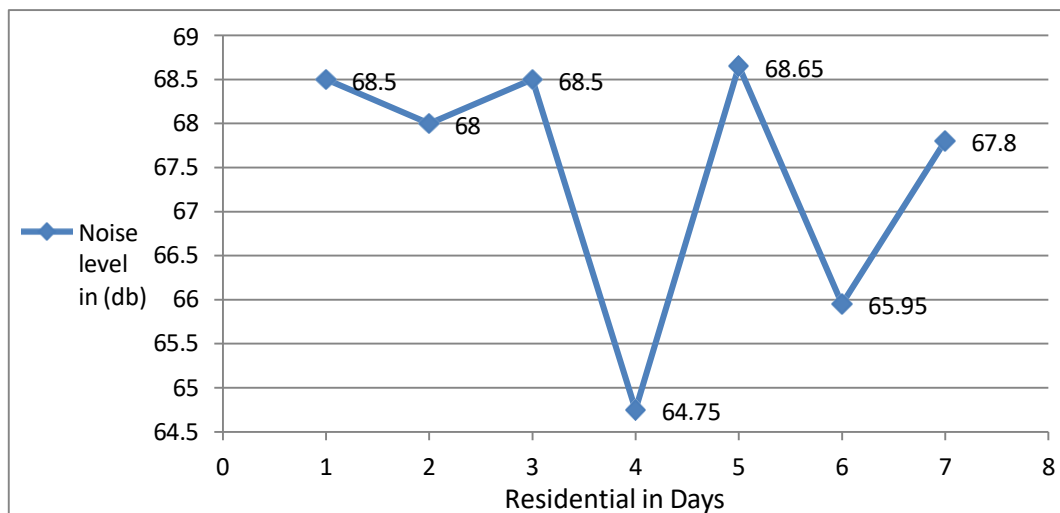


Fig: Represents Average Variation In Noise Level In Residential Area At Afternoon

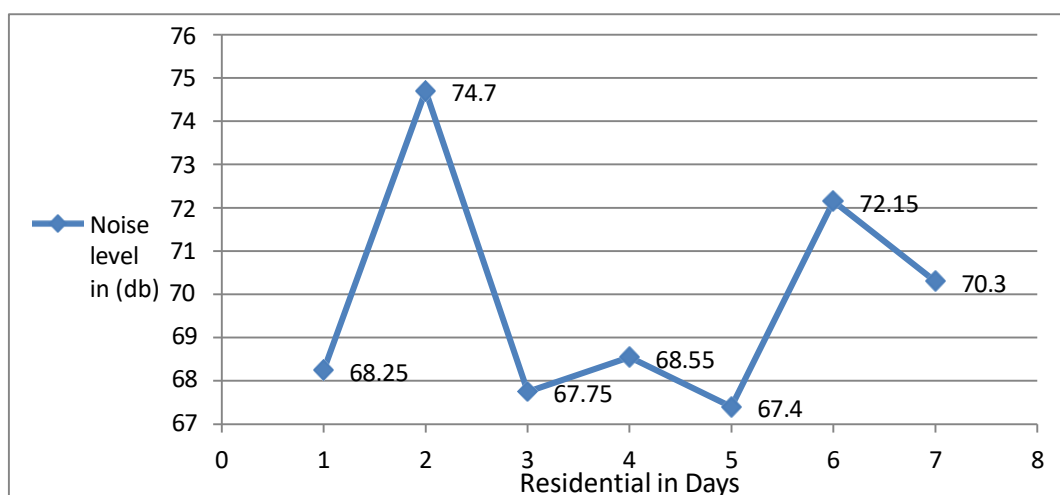


Fig: Represents Average Variation In Noise Level In Residential Area At Evening

RESULTS AND DISCUSSION

Identified different locations in Sedam Taluka. The readings of the residential areas we have taken readings shown below. By monitoring the Noise Pollution in residential areas in morning, afternoon & evening hours, we have observed the readings from the table which varies from day 1 to day 7. The minimum noise level by taking into account of morning, afternoon & evening hours is 60.30dB and the maximum noise level of morning, afternoon & evening is 76.88dB and the average of both is 68.83dB, which is more than the limits compared to CPCB Standards.



Monitoring of Noise level in Residential Area

CONCLUSION

The study focused on different locations in Sedam taluka and specifically took readings in Lohar Galli Residential Area (R.A) at various times of the day (morning, afternoon, evening). The climatic conditions in Lohar Galli varied daily (cloudy, rainy, sunny) and also changed throughout the day depending on the time (morning, afternoon, evening).

The study suggests that the noise pollution in the Residential area (Lohar Galli) of the Sedam taluka, the noise levels are more than the limits of CPCB standards. At the same time educating the people about the effects of the noise pollution is necessary and to create awareness to reduce it.

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