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Noise Pollution Monitoring of Residential Areas In Jewargi Town Kalaburgi District

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ABSTRACT

Sound which is undesirable for human hearing is called as noise. When there is a more 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 Jewargi 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 Jewargi Town of Kalaburgi District. We have came to know that noise levels are more than permissible in all the investigated various spots around the Jewargi Town.
The minimum noise level by taking into account of morning, afternoon & evening hours is 60.82dB and the maximum noise level of morning, afternoon & evening is 76.70dB and the average of both is 68.75dB, 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, Jewargi Town, Decibel.

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 Jewargi town.
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.
Construction sites: Activities like drilling, hammering, and the operation of heavy equipment cause noise pollution.
Urbanization:
Public spaces: Loudspeakers, public announcements, and events can increase volume of noise in parks and squares.

CAUSES OF NOISE POLLUTION AS FOLLOWS

1. Transportation:
Road traffic (cars, trucks, buses)
Air traffic (airplanes and helicopters)
Railways (trains, trams)

2. Household Sources:
Loud music, television, and home appliances
Power tools, lawnmowers, and leaf blowers

IMPACTS OF NOISE POLLUTION

NOISE POLLUTION'S IMPACTS ON ANIMALS:-

1. Stress and Health Impacts: Prolonged exposure to noise can lead to chronic stress in animals, 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 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 behaviors 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 behavior 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: Prolonged exposure 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 severe mental health issues like depression and cognitive impairment, especially in individuals who are sensitive to noise or already have pre-existing conditions

LITERATURE REVIEW

1. Nirjar.R.S.(2003):- The rapid urbanization of India has led to a significant increase in vehicles on roads, resulting in overcrowded roads and increased pollution. A study comparing three noise prediction models - FHWA Model, CORTN Model, and Stop-and-Go Model - found that both models were satisfactory for Indian conditions, with acceptable results. Statistical analysis showed good agreement between measured and predicted values. A regression model for predicting noise levels was developed from data collected at eight different locations in Delhi. The study highlights the need for improved noise prediction methods in India to address the growing issue of overcrowding and pollution.

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. 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.

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

→ Jewargi is a town in Kalaburgi district of Karnataka India.
It is the Head quarters of the Jewargi Taluk.
→ Jewangi town has 23 wards which are of municipal council
→ Jewargi town has a famous mahalaxmi temple and Jain Temple
Here is a detailed overview of Jewargi covering its, residential, areas Commercial and Industrial
→ According to the 2011 Census of India Jewargi taluk in Gulbarga district. Karnataka State had the following.
Key demographic details
The Jewargi town municipal council has a population of 25,686 of which are. 12,976 are males and 12,710 are females as per report relased by census India 2011
→ The Sex ratio of Jewargi Taluka is 25,686 people 12,976 and 12,710 females giving a sex ratio of 980 as per 2011 Cent
The literacy rate of Kalaburayi district, which includes jewargi is 73.83%
The male literacy rate is 82.75%
while the female literacy rate is only 64.78%.
→ According to Census 2011 There was 4083 children between age 0-6 Years in Jewargi.

Fig.No.1.Represents the location of Jewargi town

RESIDENTIAL AREAS:-
Jewargi has seen significant growth in its residential sectors. Some prominent residential areas include:
Muslim basthi road
Talvar area
Laxmi nagar
Sansar colony

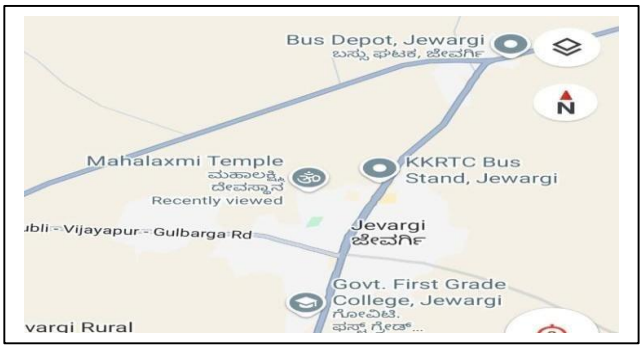

Fig.No.2.Represents the Residential Area of Jewargi town(Laxmi Nagar)

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 level of noise in a specific space. Noise pollution is measured in various parts of Jewargi town 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.No.3.Representing the Sound level meter to measure Noise pollution of Jewargi town

Functioning of Sound Level Meter (SLM)

The machine 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 sound waves are most commonly 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	LAmax	LAmin	LAavg
Day 1	Morning	9:00 to 9:10	84.4	56.4	70.4
	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 2	Morning	9:10 to 9:20	85.4	54.6	70
	Afternoon	1:40 to 1:50	73.2	62.4	67.8
	Evening	4:30 to 4:40	76.4	64.2	70.3
Day 3	Morning	9:20 to 9:30	73.2	62.4	67.8
	Afternoon	1:30 to 1:40	76.8	60.2	68.5
	Evening	4:20 to 4:30	73.9	60.9	67.4
Day 4	Morning	9:30 to 9:40	80.7	60.6	70.65
	Afternoon	2:00 to 2:10	70.9	58.6	64.75
	Evening	4:40 to 4:50	80.2	69.2	74.7
Day 5	Morning	8:50 to 9:00	82.2	58.9	70.55
	Afternoon	1:50 to 2:00	79.2	57.8	68.5
	Evening	5:00 to 5:10	75.6	62.9	69.25
Day 6	Morning	9:00 to 9:10	70.2	58.6	64.4
	Afternoon	1:50 to 2:00	76.8	59.2	68
	Evening	4:50 to 5:00	77.2	59.9	68.55
Day 7	Morning	9:20 to 9:30	78.6	60.2	69.4
	Afternoon	2:00 to 2:10	73.2	61.4	67.3
	Evening	5:10 to 5:20	72.9	62.6	67.55
			Lamax=76.70	Lamin=60.82	LAavg=68.75

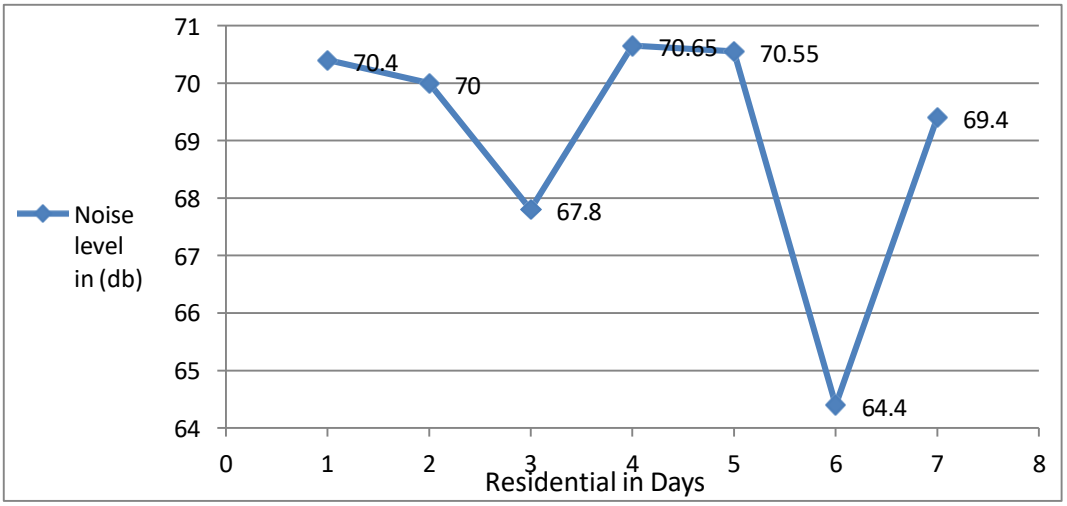

Fig: Represents Average Variation In Noise Level In Residential Area At Morning

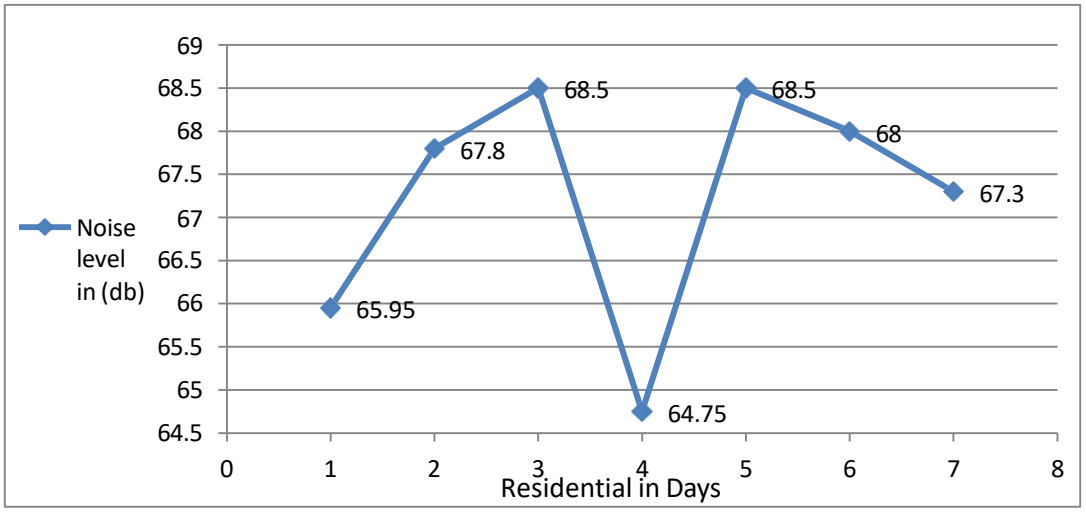

Fig: Represents Average Variation In Noise Level In Residential Area At Afternoon

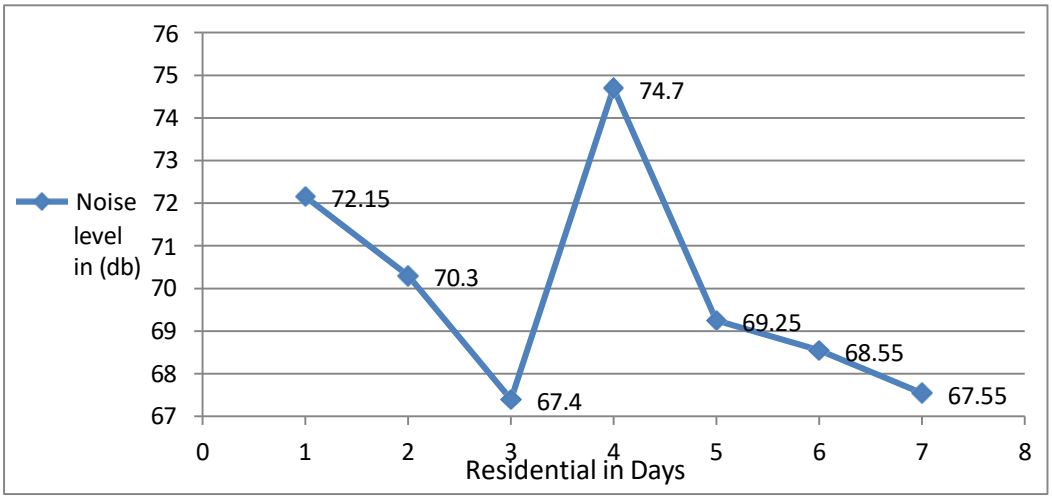

Fig: Represents Average Variation In Noise Level In Residential Area At Evening

RESULTS AND DISCUSSION

Identified different locations at Jewargi Town in kalaburagi city. 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 60.82dB and the maximum noise level of morning, afternoon & evening is 76.70dB and the average of both is 68.75dB, which is more than the limits compared to CPCB Standards.

Fig.No.4.Monitoring of Noise level in Reidential Area

CONCLUSION

The study focused on different spots in Jewargi town and specifically took readings in Laxmi nagar's Residential Area (R.A) at various times for the day (morning, afternoon, evening). The climatical conditions in Laxmi nagar varied daily (cloudy, rainy, sunny) and also changed throughout the day depending on the climate (morning, afternoon, evening).

The study suggests that the noise pollution in the Residential area (Laxmi Nagar) of the Jewargi town, the noise levels are more then 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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