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NOISE POLLUTION AND HEALTH IN NORTHERN GREATER MUMBAI: CASE OF RN WARD

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ABSTRACT

Greater Mumbai is urbanizing at a rapid pace, leading to extensive construction activities, widespread use of machinery, and heavy traffic, which contribute significantly to noise pollution in the city. This study aims to measure noise levels in the study area, analyze their impact on residents' health, and recommend practical solutions to mitigate the adverse effects. The research methodology includes secondary data sourced from news articles to compile a literature review. Primary data is collected through a structured questionnaire administered via Google Forms to facilitate efficient data collection. A sample size of 80 respondents, randomly selected from locations with high noise levels, was chosen for the study. The key findings reveal elevated noise levels across most locations, with significant health impacts reported by respondents. These impacts include stress, sleep disturbances, and hearing impairment. The recommendations emphasize the importance of educating the public about the harmful effects of noise pollution and the need to plant large canopy trees, particularly in noisy areas, to absorb sound effectively. Additionally, hearing impairment is commonly identified as an occupational hazard, particularly among individuals working in industries associated with high noise levels.

Keywords: Noise, Pollution, Health, Impacts, Control

1. INTRODUCTION

Noise pollution is an increasingly pervasive environmental issue that affects millions worldwide. From bustling city streets to industrial zones and even suburban neighborhoods, the relentless clamor of human activity disrupts natural rhythms and impacts both health and well-being. Understanding its sources, effects, and potential solutions is crucial in mitigating its adverse effects on society and the environment alike. The noise problem is a major problem in cities around the world. Noise is defined as unwanted sound. Noise adversely affects general health and well-being in the same way as chronic stress. The growing numbers of cars, trucks, automobiles, and two-wheeled vehicles have played an important role in the production of high-pitched noise and noise pollution from vehicles. The most common manifestation of noise pollution is hearing loss or impairment. Hearing impairment is mostly classified as an occupational hazard especially when the individual is affiliated with an industry that propagates loud sound or noise. In adults, noise pollution is associated with blood pressure and cognitive difficulties. Within recent decades, the increasing speed of urban development worldwide caused the problem of noise pollution to be more severe and deserve significant attention.

2. REVIEW OF LITERATURE

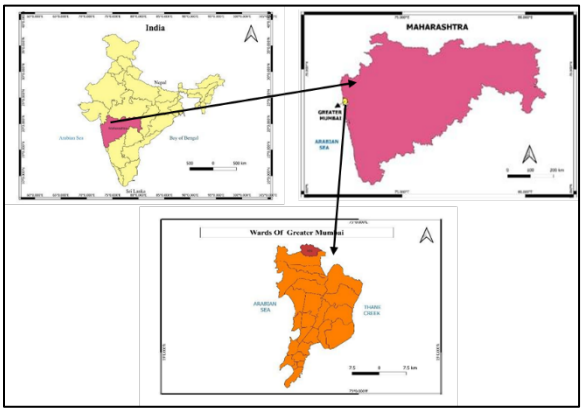
(Gupta and Nougkynrih, 2014) the study was to understand community noise pollution in urban India. The topic was Community Noise Pollution in Urban India: Need for Public Health Action. Rapid urbanization has led to various public health challenges including public health, and environmental pollution. (Thakur, 2019)Delhi's first action plan to curb noise pollution. According to the plan by December 2019 the pollution and civil bodies will develop a real-time monitoring network in different areas. The Delhi police agencies have come up with the first action plans to curb noise pollution in Delhi. Civil agencies and the police have been asked to procure hand-free devices within three months so that noise levels can be better monitored. (Mohamed, Paleologos and Howari , 2021)in their research paper in the year January 2021, gives an overview of the noise pollution problem in view of policy and standards by the World Health Organization. Dehradun is at a crossroads and prominent national institutions like the Survey of India, Oil and Natural Gas Corporation, Forest Research Institution, Indian Military Academy, Indian Institute of Remote Remote Sensing Wadia Institute of Himalayan Geology, Central and State Government offices are changing Dehradun into a busy, economically active vibrant city. (Anjum and Kumari, 2022) have studied the evaluation of noise pollution in Bengaluru City India during Covid -19. The very recent research paper made by (Fahim and Adnan, 2024) suggested some modifications to reduce noise pollution and the socioeconomic aspect of shallow-engine vehicles. (Karki, Neupane and Padam Ben, 2024) Critical Analysis of Noise Pollution and its Effects on human health 2024/02/09.No visible action no pollution, May 1122022-Times of India. National Green Tribunal's eastern zonal, bench of justice has observed that there is no action or at least visible =on the ground and nothing has been placed before us to show that the noise pollution (regulates and controls) rules. People of all ages are increasingly experiencing hearing loss due to increased use of cell phones and noise pollution. They are not elderly but they come from all age groups.

2.1. RESEARCH OBJECTIVES

1) To measure the noise levels of the study area
2) To find out the causes of noise pollution in the study area
3) To understand health problems caused due to noise pollution in the study area
4) To recommend suggestions to reduce noise pollution in the study area

3. RESEARCH METHODOLOGY

- **Coverage**



The area of study is the RN Ward, which includes Dahisar, located in the suburbs of Greater Mumbai. The latitudinal extent is 19.2502° north, and the longitudinal extent is 72.8595° east. This position indicates Dahisar's location north of the equator and east of the Prime Meridian. Dahisar covers an area of approximately 12 square kilometers; however, the administrative boundaries and size may change over time due to urban development and planning. Dahisar is divided

into smaller localities. Major areas in Dahisar East and West include IC Colony, Ovaripada, Kandarpada, Shailendra Nagar, Ambawadi, Avdhoot Nagar, Gaodevi, Vaishali Nagar, and others.

- **Data collection**

Secondary data is sourced from news articles, literature reviews, research papers, magazines, and books. Primary data is collected through a mixed type of questionnaire prepared in Google Forms for the ease of data collection. The sample size is 80 randomly selected respondents from the study area. The data representation is done using graphs and statistical formats.

3.1. RESEARCH HYPOTHESIS

H- There is a relation between age and people bothered due to noise pollution.

H0- There is no relation between age and people bothered due to noise pollution.

4. RESULT ANALYSIS AND DISCUSSION

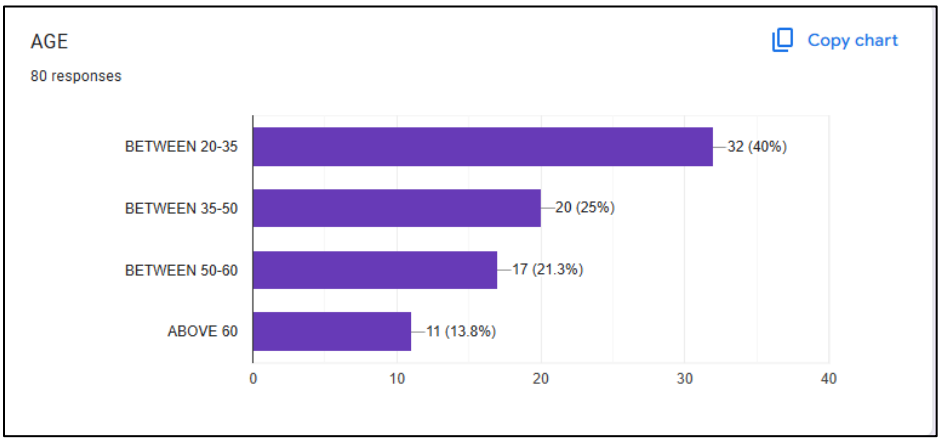


Figure 1

Based on Figure 1, the respondents fall into different age groups. The majority of responses were from individuals aged 20 to 35, making this the dominant group. The second-largest group was aged 35 to 40, contributing 20 responses. The third group, aged 50 to 60, provided 17 responses, while the last group, aged 60 and above, accounted for 11 responses. In conclusion, most responses were collected from individuals aged 20 to 50.

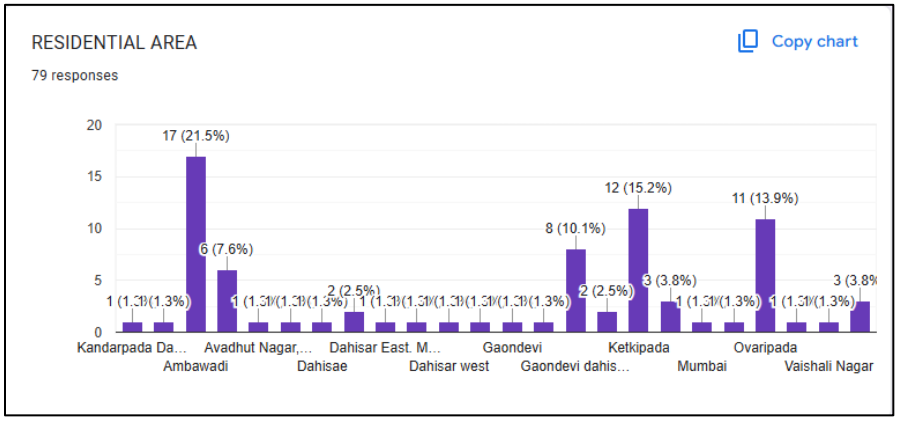


Figure 2

The primary areas of study include Kandarpada Dahisar, Ambawadi, Avdhut Nagar, Gaodevi, Ketkipada, Ovaripada, and Vaishali Nagar, which collectively represent the RN Ward. The highest number of responses came from Ambawadi,

followed by Ketkipada, and then Ovaripada. Gaodevi and Avdhut Nagar contributed the least, with a 2% difference between them. These areas face significant noise issues due to metro and road construction activities. Being among the busiest areas in RN Ward, they are particularly affected.

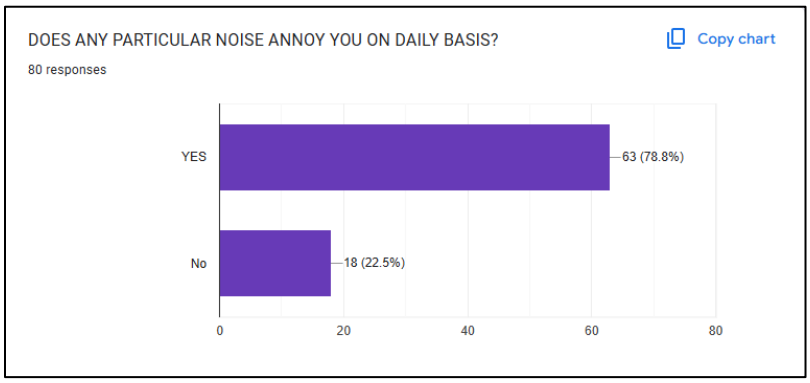


Figure 3

Respondents reported that noise pollution negatively impacts their areas, with primary sources including honking, temples, vehicles, and other factors. Sixty-three respondents indicated that they experience some form of noise that annoys them regularly. This indicates that most of the area is hit by increased levels of noise.

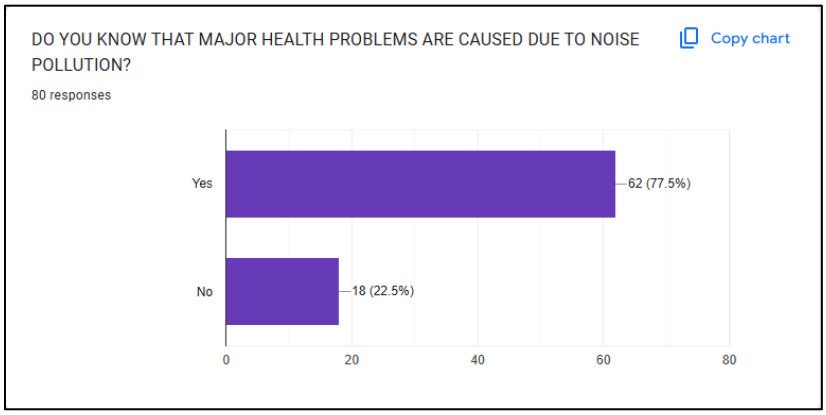


Figure 4

A majority of respondents (62) confirmed experiencing health problems caused by noise pollution. Common health issues include increased stress levels, sleep disturbances, hearing impairment, and cardiovascular problems. Respondents also expressed awareness of the long-term effects of noise pollution on well-being and quality of life. It indicates that there is awareness however, there lacks a solution to the problem of noise pollution.

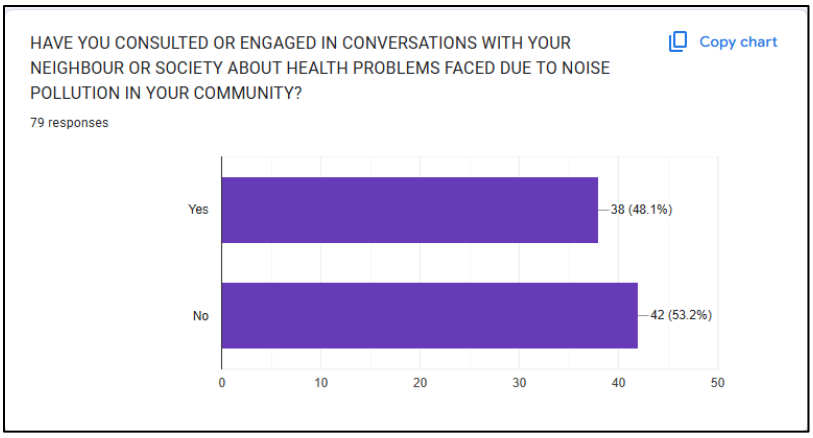


Figure 5

When asked whether they had discussed health issues caused by noise pollution with neighbors or in their community, most respondents said no. This highlights a lack of awareness about the health effects of noise pollution. The study emphasizes raising awareness about these problems and their adverse effects.

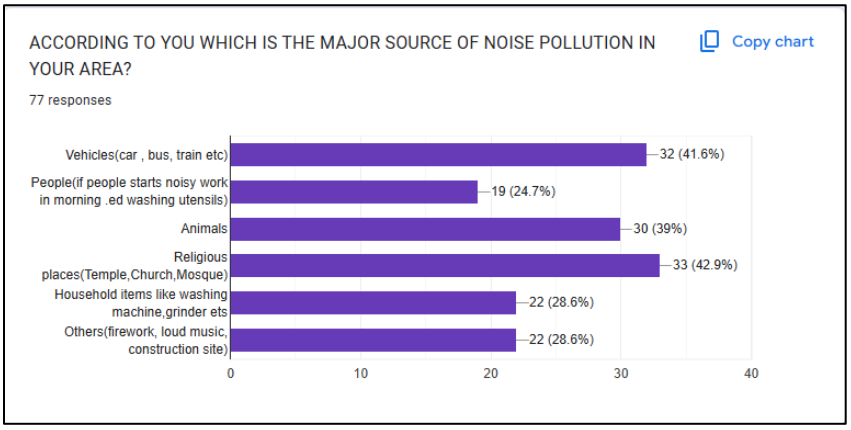


Figure 6

Noise pollution in the studied areas primarily arises from religious places (e.g., mosques, churches, temples) during ceremonies, festivals, or calls to prayer. Vehicles, including cars, buses, and trains, are the second-largest source, followed by animals. These three sources contribute significantly to the noise pollution problem.

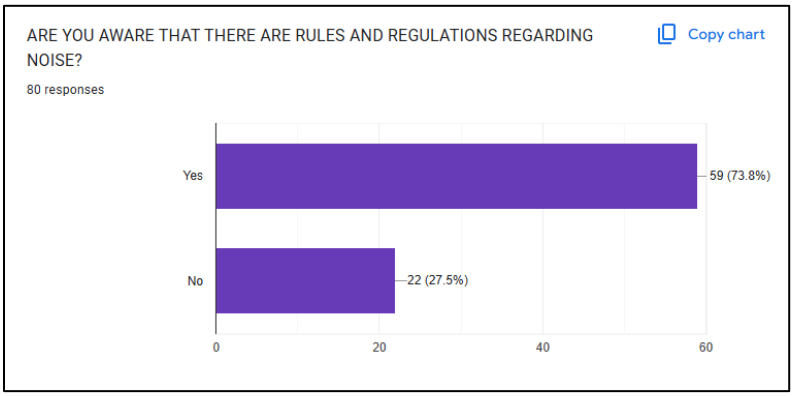


Figure 7

Respondents displayed awareness of rules and regulations established by local authorities, buildings, or the government. Following these rules is essential for maintaining peace and harmony and supporting public health.

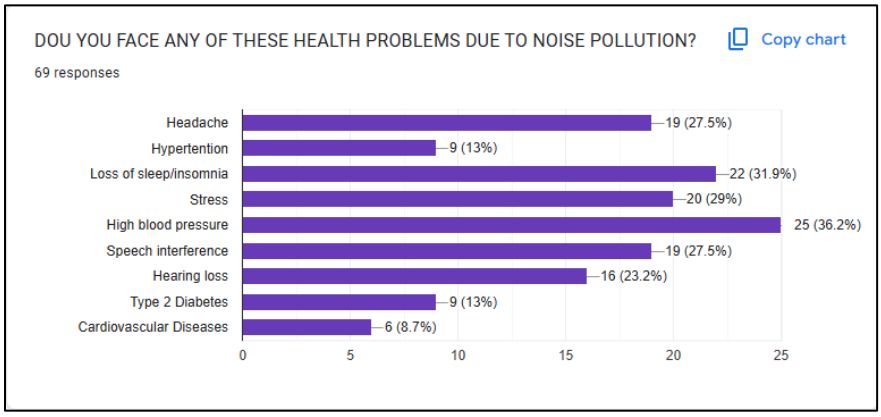


Figure 8

Respondents identified health issues caused by noise pollution, with the most common being high blood pressure, followed by headaches and sleep disturbances. Other significant problems include stress, hypertension, hearing loss, speech interference, and cardiovascular diseases. Addressing these issues requires implementing effective regulations, promoting awareness, and encouraging community action.

Table 1 Noise Levels in dB across Areas

Area	Noise Levels (dB)
IC Colony	106
Ovripada	121
Kandarpada	104
Shailendra Nagar	124
Ashok Van	100
Rustomjee School	87
N.L. Complex	90
Daulat Nagar	100
Gaodevi Mandir	120
LIC Colony	114

Source Primary data collection

The analysis shows that Shailendra Nagar, located in the eastern RN Ward near the railway station, has the highest noise levels at 124 dB. Ovripada follows at 121 dB. Noise pollution in these areas is exacerbated by low tree density, which reduces natural sound absorption.

H1- There is a relation between age and impact of noise pollution.

H0- There is no relation between age and impact of noise pollution.

The calculated value of r = -0.19 and p-value at 78 degrees of freedom is 0.09. Since p > r, the null hypothesis is rejected which further implies that there exists a relation between age and people bothered due to noise pollution. The higher the age the more is the impact of noise pollution and vice-versa. Hence, it is important to control noise levels for the better health of the elderly.

5. CONCLUSION

Noise pollution adversely affects mental well-being and causes disturbances. The study reveals alarming noise levels in RN Ward, emphasizing the need for regular monitoring and immediate action. Measures such as soundproofing religious places and reducing overall noise emissions are essential for improving environmental quality and public health.

6. RECOMMENDATIONS

Install Sound Barriers along Highways and Busy Roads: Installing sound barriers, such as walls, fences, or green walls, along highways and busy roads can significantly reduce noise pollution by absorbing and deflecting sound waves. These barriers are particularly effective in urban areas where traffic is a primary noise source. Utilizing innovative designs, such as vegetated barriers, can enhance aesthetic appeal and provide additional environmental benefits like air purification.

- **Educate People About the Health Impacts of Noise Pollution:** Public awareness campaigns should be conducted to educate individuals about the harmful effects of noise pollution on physical and mental health. These initiatives could include workshops, informative brochures, social media campaigns, and community engagement programs to explain how noise pollution contributes to stress, hearing loss, sleep disturbances, and cardiovascular problems. Education empowers individuals to adopt quieter practices and advocate for noise reduction policies in their communities.

- **Promote Regular Health Check-Ups to Monitor Noise Pollution Effects:** Regular health check-ups should be encouraged, focusing on detecting early symptoms of noise-induced health issues such as hearing loss, hypertension, and stress-related disorders. Health camps can be organized in noise-prone areas to assess and address the community's health concerns. Early intervention through regular check-ups can help mitigate long-term health impacts and improve the overall well-being of individuals exposed to high noise levels.
- **Plant Shrubs and Trees in Noisy Areas to Absorb Sound:** Vegetation acts as a natural sound buffer by absorbing and dispersing noise. Planting shrubs, trees, and green hedges in noise-prone areas such as near highways, industrial zones, and residential areas can help mitigate noise levels. Apart from reducing noise, these plants improve air quality, enhance biodiversity, and create a visually pleasing environment, contributing to a healthier and more sustainable urban ecosystem.
- **Restrict Nighttime Activities, Such as Construction, to Reduce Noise Levels:** Imposing restrictions on nighttime activities, particularly construction and industrial operations, can significantly lower noise levels during hours when people are most affected by disturbances. Enforcing stricter regulations and providing guidelines for noise-generating activities can help maintain a peaceful environment, especially in residential areas. Noise limits should be monitored and strictly enforced to ensure compliance with local laws and policies.

CONFLICT OF INTERESTS

None.

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