NOISE POLLUTION ANALYSIS IN DIFFERENT MEGA CITIES OF INDIA DURING DEEPAWALI FESTIVAL

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ABSTRACT

Noise pollution is recognized as one of the major fear that affects the quality of life in urban areas across the globe. In India Deepawali is the biggest and the brightest festival among all the Hindu Festivals. Crackers of varied colors and sounds fill the skies during this festival. The study of the characterization of crackers used during Deepawali festival is undertaken to specify maximum sound pressure levels. It is observed that the sound pressure level produced by Indian crackers is higher than the permissible limits prescribed by the Central Pollution Control Board (CPCB). The objective of this study is to focus the influence of fireworks on the noise increment in India during Deepawali of years 2008, 2009, 2010, 2011, 2012 and 2013 showing the regular increment in the sound pressure levels. This study may help to disseminate awareness about noise pollution among the people, by which they will be able to take required precautionary measures to save themselves from the adverse effects of noise pollution and to improve the quality of the environment.

Key Word : Noise pollution, Deepawali festival, Mega cities, Sound pressure, Public health

INTRODUCTION

Noise pollution is the excessive noise that may harm the activity or balance of human or animal life. Because of the rapid increase in industrialization, urbanization and other communication and transport systems, noise pollution has reached to a disturbing level over the years. Noise is also being caused by different types of crackers used in festivals and marriages in India.

The crackers produce a lot of noise pollution much higher than the permissible limits prescribed by the Central Pollution Control Board (CPCB). Noise standards for firecrackers dated 16th October, 2006 states that the manufacture, sale or use of firecrackers generating noise level exceeding 125 dB(A) or 145 dB(C) at 4 meters distance from the point of bursting shall be prohibited.

From the previous studies it has been proved that noise may damage the human hearing efficiency and neuron cells of brain of human body. Other effects due to noise are constant stress, fatigue and hypertension, sleeping disorders, cardiovascular disease. Wildlife also faces more problems due to noise pollution as compared to humans since they are more sensitive to sound.

AIMS AND OBJECTIVES

To analyze the contribution of fireworks towards noise increment in the mega cities of India during Deepawali festival.

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MATERIAL AND METHODS

The Central Pollution Control Board has conducted ambient noise monitoring at various locations in Delhi on normal days and on the occasion of Deepawali festival and state pollution control boards of Maharashtra and West Bengal did the same for their states. To see the impact of bursting of crackers on the Environment, the study here compares the increasing noise levels due to bursting of crackers in Delhi, Mumbai and Kolkata on Deepawali nights and on normal days of years 2008, 2009, 2010, 2011, 2012, 2013 with the normal days noise level values. Delhi covering a land area of about 1,484 km$^2$ consists of about 16.3 million population. Stations selected for monitoring of noise levels in Delhi are Connaught place, CPCB, Delhi college of Engineering, Dilshad Garden and ITO as in Fig.1. Mumbai covers a land area of about 603 km$^2$ with 18.4 million populations. The monitoring stations selected for noise levels are Borivali National Park, Goregaon, Ghatkopar, Navi Mumbai and Centacruz Airport as depicted in the Fig. 2. Kolkata covers a land area of about 185 km$^2$ with 14.1 million populations. The stations selected for monitoring of noise levels in Kolkata are salt lake, Newalipur, Bosepukur, Kankurgachi and Banguihat (Fig. 3).

![Fig. 1: Monitoring stations in Delhi, India](image1)

![Fig. 2: Monitoring stations in Mumbai, India](image2)

![Fig. 3: Monitoring stations in Kolkata, India](image3)
RESULTS AND DISCUSSION

Noise scenario in Delhi, India
All the crackers produce an impulsive noise having high peak sound pressure level of short duration. The characteristics of such noise are mainly peak pressure, pulse duration, time duration etc. The results obtained of increased noise levels due to crackers on Deepawali festival from 2008 to 2013 for Delhi is summarized in Fig. 4. The Ambient noise level data monitoring at five locations in Delhi on normal days from 2008 to 2013 is summarized in Fig. 5.

Analyzing the noise data of Deepawali days and normal days in Delhi we find that the noise levels at CPCB was increased the most on Deepawali festival. After the CPCB area Dilshad Garden shows the second most increment.

Fig. 4: Annual variation of noise level during Deepawali festival in Delhi, India

Fig. 5: Annual variation of noise level during normal days in Delhi, India
While the noise levels at Delhi College of Engineering does not show much variation between normal days and Deepawali days. The average noise level in Delhi during the Deepawali festival from 2008 to 2013 was found to be 70 dB(A), while on normal days, it was only 61.85 dB(A).

**Case study of Mumbai, India**

Taking the noise data of the last six years of Mumbai city\(^5,6\) on Deepawali and comparing them with the normal day noise data, we find that the noise produced by crackers on Deepawali is much higher than that of normal day noise data. Results of Deepawali noise levels from 2008 to 2013 in Mumbai are summarized in Fig. 6. And the normal day noise data of Mumbai at various locations from 2008 to 2013 is summarized in Fig. 7.

Among all the three mega cities Mumbai shows the largest increment rate in noise level on Deepawali festival.\(^7\)-\(^10\) In last past years noise levels of Mumbai East and Mumbai South shows the largest increments on Deepawali festival when compared to normal days. While Mumbai West shows the least increment with even the noise levels larger on a normal day than on the Deepawali days in some years like 2011.\(^11\)-\(^15\)

![Fig. 6](image1.png)  
**Fig. 6 :** Annual variation of noise level during Deepawali festival in Mumbai, India

![Fig. 7](image2.png)  
**Fig. 7 :** Annual variation of noise level during normal days in Mumbai, India
Case study of Kolkata, India

Kolkata with 14.1 million of the population also shows a huge difference in noise levels during Deepawali and on normal days. Results of Deepawali noise levels from 2008 to 2013 in Kolkata at different locations are summarized in Fig. 8. And the normal day noise data of Kolkata from 2008 to 2013 is summarized in Fig. 9.

The Bengalis, Oriyas and Assamese adore the goddess Kali on Deepawali when the rest of India worships goddess Lakshmi on this day. And on comparing the noise values of the Deepawali festival at different places in Kolkata it was found that the noise levels in 2008 at a place named New Alipur was highest with 95 dB(A). And the least noise value of 59 dB(A) was found in salt lake in 2012. And the average values from 2008 to 2013 of Kolkata were found to be 78 dB(A) on Deepawali nights and on normal days it was 69 dB(A).

Analyzing the above figures, it is clear that there is a large increment in the noise levels on Deepawali festival as compared to the normal days values in all the three mega cities. And the values are above the limits as prescribed by the Central Pollution Control Board (CPCB). The Ambient Noise Standards prescribed by the Central Pollution Control Board (CPCB) are given in the Table 1.
The time has come when an individual should become aware about the noise pollution they are creating on Deepawali festival so that they can take precautions to save themselves and the Environment from the adverse effects of noise pollution and choose Environmental Quality as the priority.

**CONCLUSION**

The study compares the noise levels during Deepawali days and normal days of three Mega cities of India namely Delhi, Mumbai and Kolkata. All the three cities show a remarkable difference in the results showing large increment in noise levels during Deepawali festival. And the average noise level increment of all the three mega cities is found to be about 8 dB(A) on Deepawali festival.

**REFERENCES**