

# AN ASSESSMENT OF CHANGE IN NOISE POLLUTION DURING A FESTIVAL OF NAVRATRI IN JABALPUR CITY

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**Abstract:** The present paper deals with monitoring of Noise Pollution at various places of Jabalpur city during Navratri festival. Noise pollution is considered as environmental stressor which now becomes a problem of all over the world especially in developing countries like India. During this festival Garba dance (one of the most popular folk dances in India) is organized by local public at various places of the city. During the present study the noise levels were measured with the help of sound level meter at three different locations during Navratri festival. It was clear from our study that the noise levels are extremely high and are found to be above the prescribed limits of CPCB even in the silent zones. The main sources of noise pollution are loud speakers, powerful sound systems, orchestra, drums etc. Major effects of noise pollution include interference with communication, sleeplessness, and reduced efficiency. Noise pollution is considered as environmental stressor which now becomes a problem of all over the world especially in developing countries like India. Jabalpur city (Union Territory) is second biggest city of Madhya Pradesh having population of 10.55 lacs and selected in first round of smart city mission under the government of India.

**Keywords -:** Noise pollution, sound level, loudspeaker, Navratri, festival, Jabalpur city.

## I. INTRODUCTION

India is well known for its culture all over the world. The Indian culture is an admixture of diverse cultures within the country. 'It appears as if the inhabitants from the Himalayas in the north to Kanyakumari in the south and Kutch in the west to Arunachal in the east are woven together into a beautiful tapestry'. In India, noise pollution is at historic highs and festivals are compounding the problem. India's culture is steeped in tradition, and festivals observing sacred occasions are an important part of part of Hindu tradition [1]. Noise is an unwanted sound that may cause some psychological and physical stress to human beings exposed to it. It is also considered as an environmental stressor and nuisance. Noise pollution has become an inevitable part of modern civilization. It is a fact that sound intensity above 80dB level is harmful to individual belonging to all ages [2]. Celebration of the festivals in India is becoming more and more non-eco-friendly. Use of powerful sound systems, orchestra etc. along with disturbing loud speakers have become regular features of the society and adversely affect human as well as social health. This kind of noise pollution is beyond tolerable limits which disturbs social and human life. It has become a serious threat to the quality of the environment. At present we are facing serious environmental problems in the form of noise pollution. Noise pollution can be minimized with the help of individual control. Optimum sound is pleasant to human ear, but large intensity sounds are dangerous to health and they major contributors to noise pollution. Environmental protection act 1986 is enforced on 19 Nov 1986 to control the noise pollution [3]. Navratri is an important Hindu festival of worship and dance. In Sanskrit Navratri literally means "nine nights" and that's how long it lasts. But as cities like Mumbai, Surat, Bhopal and many others become immersed in the cacophony of the festival's health-threatening decibel levels, no one in government is enforcing or even monitoring the noise levels. In fact, it seems they're encouraging noisemakers [1].

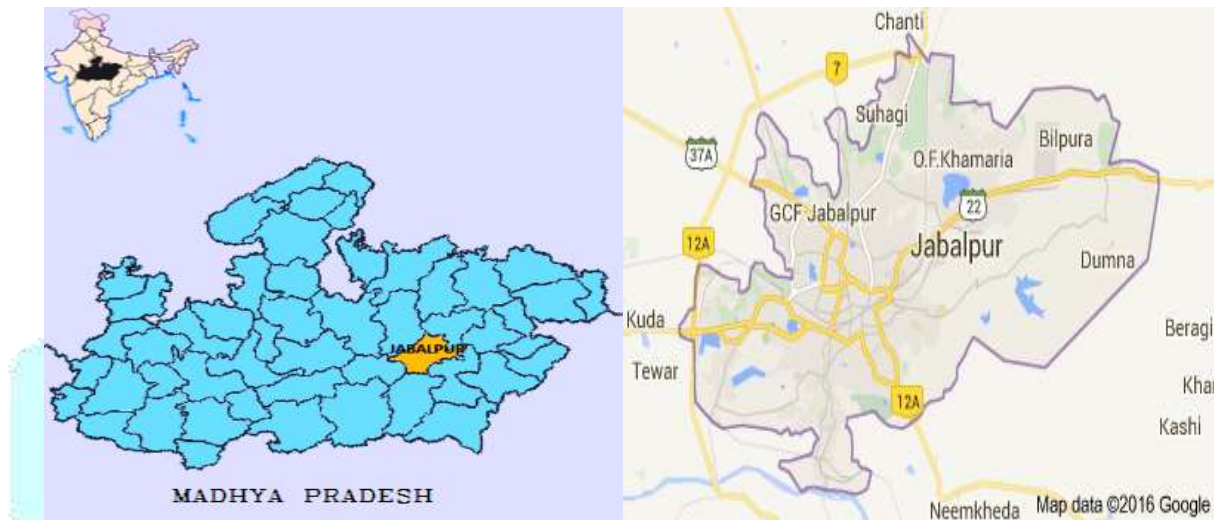
## II. PREVIOUS WORK

Study of Noise Pollution Levels during a Hindu Festival in Dhar Town, MP, and India Noise pollution has become an inevitable part of modern civilization. It is a fact that sound intensity above 80dB level is harmful to individual belonging to all ages. The minimum value recorded was 75 dB at LC-5 location between 9.00 and 10.00 pm on 6th Oct 13 because It was the first day of the festival and more over Garba dance was not being performed in this locality. The maximum value recorded was 125 dB at LC-1 location during 11.00 and 12.00 pm on 13th Oct 13 as it was the last day of the festival and the Garba dance which was being performed in this area was at the pick along with the annual fair organized by local Municipal Corporation. Both the maximum and minimum values are much higher than that of the prescribed limits [6]. The most striking feature of the study is the fact that the average noise intensity even in district hospital area (LC-4) which comes under sensitive / silence area as per CPCB, is much higher than that of the prescribed limits [6]. This is something very disturbing and disappointing that people become over sensitive in the name religious festivals without taking care of their own environment. Noise pollution has become an environmental problem in Dhar and also in other

parts of India during religious festivals. This can cause negative impact on public health and welfare. Noise interferes in complex task performance, modifies social behaviour and causes annoyance [2].

### III. AREA OF STUDY

Study Area: Jabalpur district is situated 23°10'N 79°57'E / 23.17°N 79.95°E. The central point of India is located in Jabalpur district. It has an average elevation of 411 meters (1348 ft.). The area of Jabalpur city is 53 sq. kms with the population of 10,55,525. The present study was conducted during Navratri festival between 1<sup>st</sup> and 9<sup>th</sup> Oct 2017. Sound level will be measured by following standard procedure prescribed by CPCB using calibrated sound level (SL-4023SD) meter and recorded at 03 different selected locations of the town between 7.00 am to 9.00 am and 06.00 pm to 10.00 pm. The instrument used is in the range of 30 – 180 dB (A). Standard noise level for different location during day and night time is followed according to CPCB guideline [4].



JABALPUR CITY MAP

### IV. RESEARCH METHODOLOGY

1. Various locations of Jabalpur city for measuring the noise.
2. Noise Levels will have been recorded by means of "Precision Noise Level Meter"
3. The basic parts of a sound level meter include acoustic calibrator and a display reading in decibel (one-tenth part of "Bell", unit of sound).
4. The data will collect for overall 6 hours on the respective day at the selected sites.
5. The time being selected the most prior ones.
6. The location possibly, the readings have been taken from at least 1.5 m above the ground level and 1.2 meter far away from road edge, at the concerned hours for 5 minutes as is expanded by the fluctuating levels over the same time.

Further, calculations have been done using formula of

$$L_{eq} = 10 \log \sum_{i=1}^{i=n} 10^{L_i/10} \times t_i$$

Where,

n = Total number of sound samples

$L_i$  = Noise level of any  $i^{\text{th}}$  sample

$t_i$  = Time duration of  $i^{\text{th}}$  sample expressed as fraction of total time sample

$L_{eq}$  = Statistical value of sound pressure level that can be Equated to any fluctuating noise level.

Thus,

$L_{eq}$  is defined as const. Noise level which over a given time expands the same amount of energy as is expanded by the fluctuating levels over the same time.

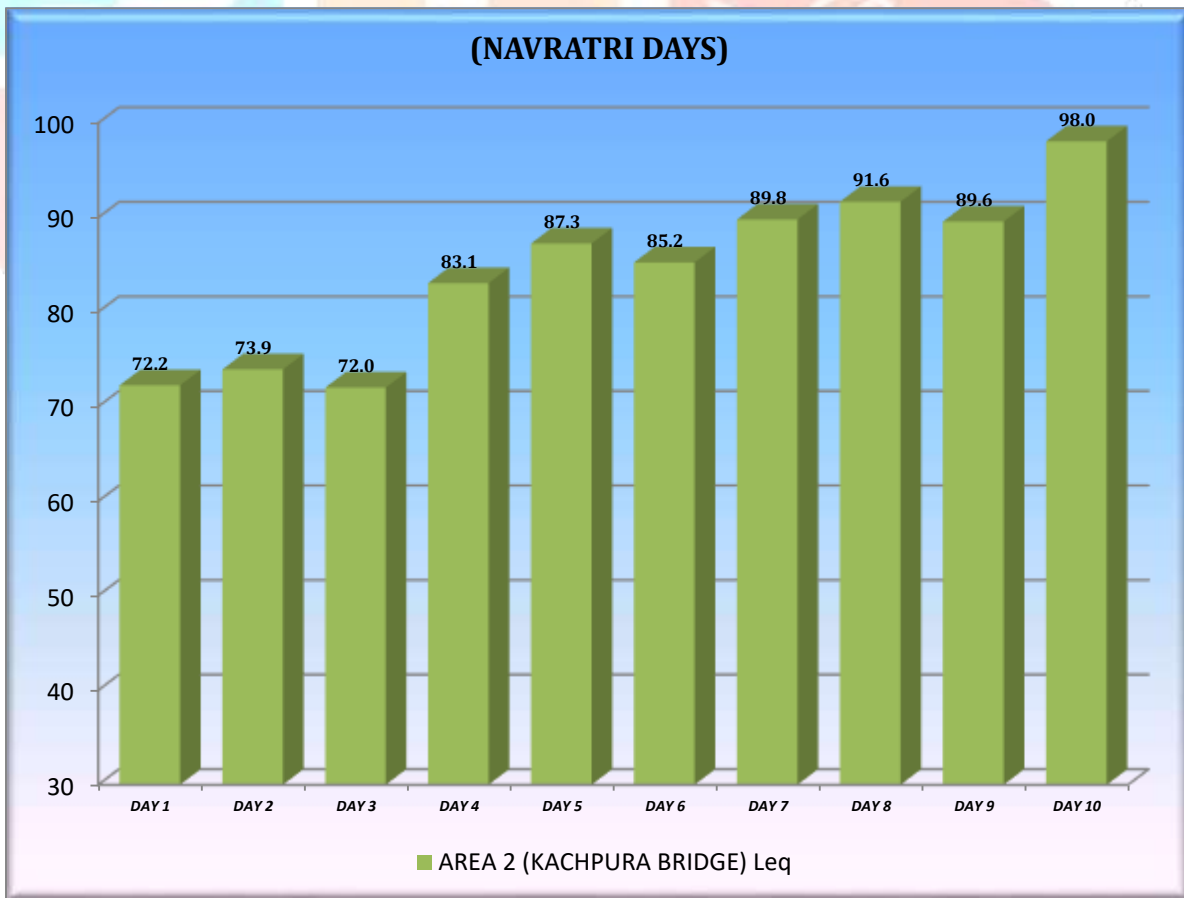
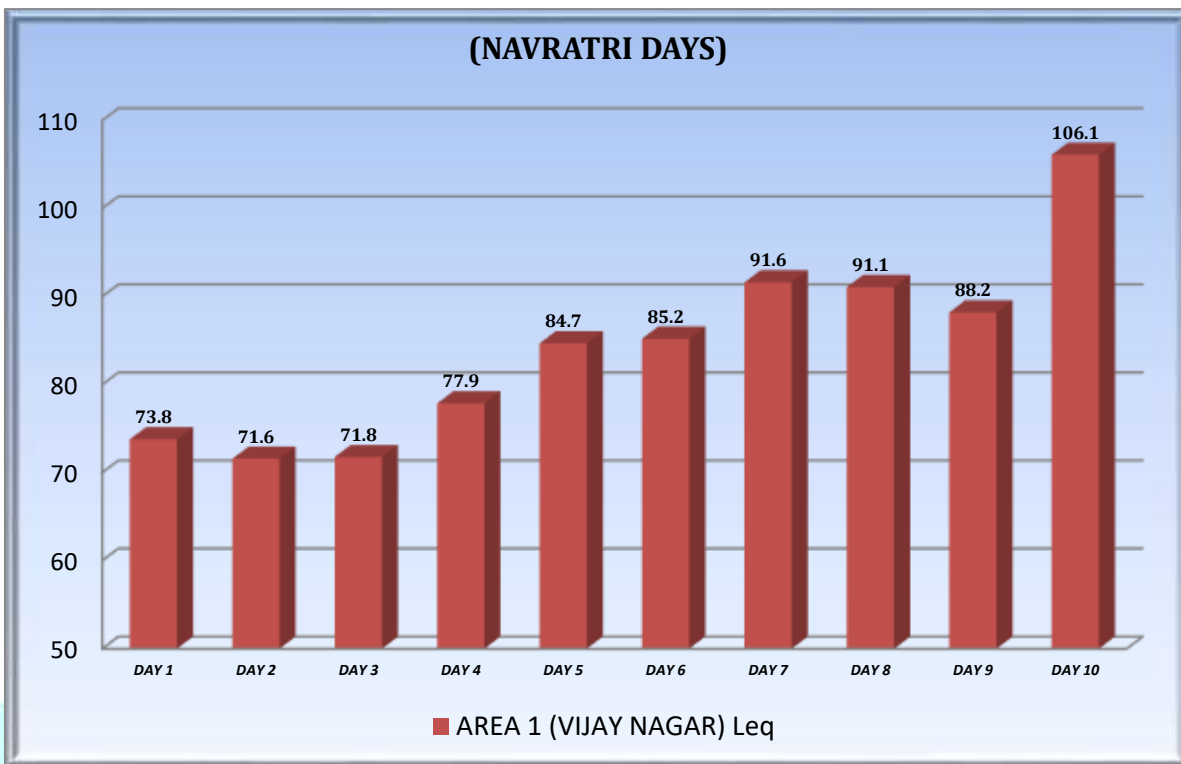
## V. RESULTS AND DISCUSSION

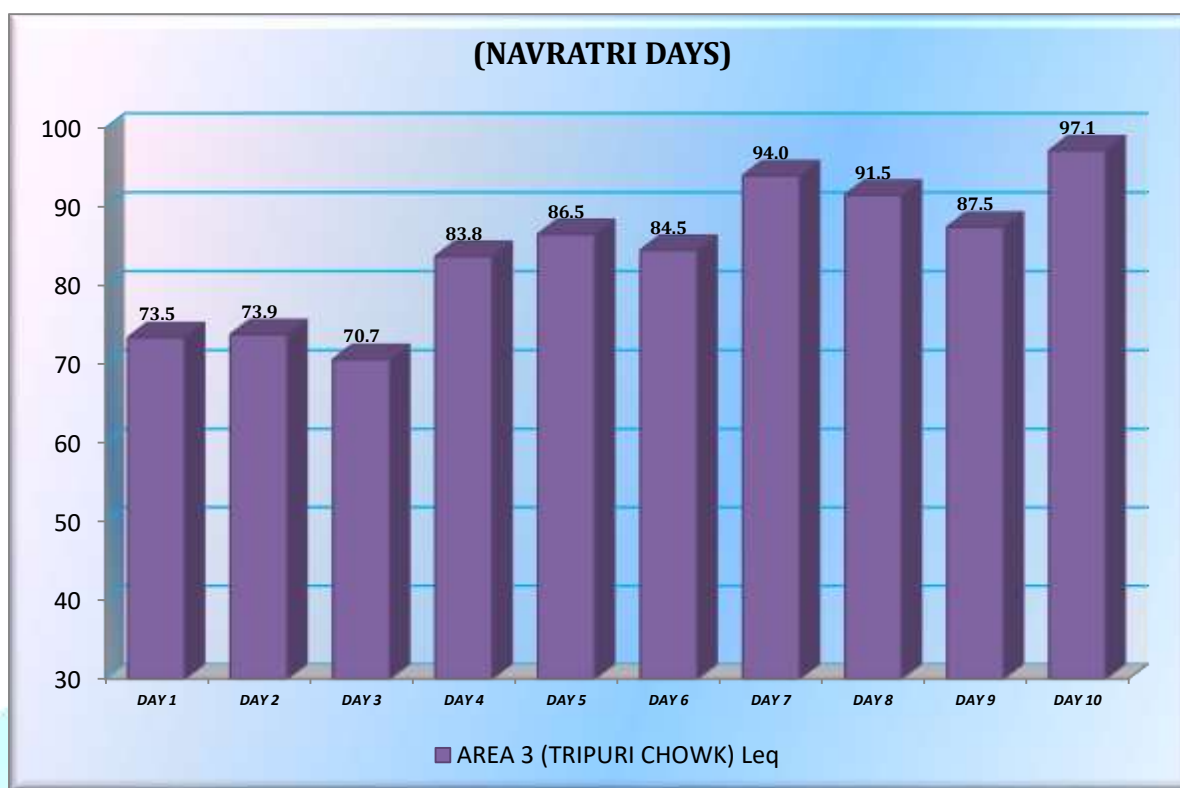
The noise levels recorded at various locations in Jabalpur city during the study period are shown in table 1. And figure show location wise average values of noise levels.

**Table 1: Noise parameters ( $L_{eq}$ ,  $L_{max}$ ,  $L_{min}$ ) at different monitored location at different time interval**

DATE	TIME	AREA 1 (VIJAY NAGAR)			AREA 2 (KACHPURA BRIDGE)			AREA 3 (TRIPURI CHOWK)		
		$L_{eq}$	$L_{max}$	$L_{min}$	$L_{eq}$	$L_{max}$	$L_{min}$	$L_{eq}$	$L_{max}$	$L_{min}$
21/09/2017	8-9 AM	73.7	84.2	54.2	72.3	91.4	51.4	74.6	91.7	54.2
	9-10 AM	72.8	90.1	53.1	71.9	93	56.3	72.0	94.1	52.4
	6-7 PM	69.3	78.8	50.8	68.4	77.9	49.9	69.9	79.4	51.4
	7-8 PM	71.2	82.7	52.1	72.2	81.7	53.7	73.6	83.1	55.1
	8-9 PM	73.9	83.4	55.7	73.2	82.7	54.7	74.7	84.2	56.2
	9-10 PM	73.6	89.1	49.8	72.8	90.3	62.3	72.9	89.4	61.4
22/09/2017	8-9 AM	71.0	86.2	52.3	73.1	82.3	51.4	74.4	83.6	60.2
	9-10 AM	70.1	84.3	46.8	69.8	86	55.2	72.9	83.1	58.2
	6-7 PM	73.7	87.7	49.8	74.4	86.3	56.4	73.3	87.2	49.8
	7-8 PM	69.1	89.7	55.9	76.8	86.7	56.8	75.0	84.2	48.7
	8-9 PM	72.5	88.4	58.5	72.4	90.3	60.4	73.7	85.6	52.6
	9-10 PM	69.4	85.3	55.4	70.3	87.2	57.3	72.6	82.5	52.6
23/09/2017	8-9 AM	69.7	83.6	54.2	72.3	88.7	53.8	68.6	80.7	54.4
	9-10 AM	71.8	87.8	54.1	69.7	84.5	53.7	69.9	84.3	53.2
	6-7 PM	70.7	85.6	54.8	71.9	79.8	58.2	73.0	86.2	58.3
	7-8 PM	71.26	84.3	51.7	72.3	87.1	56.3	71.0	84.6	52.9
	8-9 PM	71.6	86.4	52.7	69.7	84.5	53.7	67.7	82.5	51.7
	9-10 PM	73.5	88.3	54.6	73.7	88.5	57.7	70.3	85.1	54.3
24/09/2017	8-9 AM	76.7	88	61.6	84.3	91.4	71.2	84.6	91.7	71.5
	9-10 AM	78.8	90.1	63.7	85.9	93	72.8	87.0	94.1	73.9
	6-7 PM	76.5	84.6	57.8	75.9	84	57.2	77.6	85.7	58.9
	7-8 PM	75.6	83.7	56.9	77.3	85.4	58.6	79.5	87.6	60.8
	8-9 PM	77.7	85.8	59	80.8	88.9	62.1	80.0	88.1	61.3
	9-10 PM	79.4	88.9	60.9	81.9	90	63.2	81.7	89.8	63
25/09/2017	8-9 AM	87.9	96	69.2	84.6	94.1	66.1	89.8	97.9	71.1
	9-10 AM	86.9	95	68.2	91.7	99.8	73	88.8	96.9	70.1
	6-7 PM	69.3	78.8	50.8	68.4	77.9	49.9	69.9	79.4	51.4
	7-8 PM	73.2	82.7	54.7	72.2	81.7	53.7	73.6	83.1	55.1
	8-9 PM	73.9	83.4	55.4	73.2	82.7	54.7	74.7	84.2	56.2
	9-10 PM	79.6	89.1	61.1	80.8	90.3	62.3	79.9	89.4	61.4
26/09/2017	8-9 AM	80.0	88.1	61.3	80.9	89	62.2	82.2	90.3	63.5
	9-10 AM	79.6	87.7	60.9	80.1	88.2	61.4	80.2	88.3	61.5
	6-7 PM	83.0	92.5	64.5	80.4	89.9	61.9	82.0	91.5	63.5
	7-8 PM	84.4	93.9	65.9	83.2	92.7	64.7	82.3	91.8	63.8

	8-9 PM	86.4	95.9	67.9	85.5	95	67	87.0	96.5	68.5
	9-10 PM	87.9	97.4	69.4	88.7	98.2	70.2	86.1	95.6	67.6
27/09/2017	8-9 AM	81.4	89.5	62.7	82.2	90.3	63.5	81.1	89.2	62.4
	9-10 AM	81.8	89.9	63.1	81.0	89.1	62.3	82.8	90.9	64.1
	6-7 PM	77.7	82	72.4	75.8	80.1	70.5	80.1	84.4	74.8
	7- 8 PM	93.1	99.2	72.5	91.2	97.3	70.6	95.5	101.6	74.9
	8-9 PM	95.0	100.4	72.5	93.4	98.5	70.6	97.7	102.8	74.9
	9-10 PM	82.4	92.8	75.3	84.9	95.2	77.7	81.6	91.9	74.4
28/09/2017	8-9 AM	90.	98.7	71.9	92.2	100.3	73.5	88.5	96.6	69.8
	9-10 AM	82.4	90.5	63.7	80.7	88.8	62	88.7	96.8	70
	6-7 PM	71.8	77.6	49.5	70.7	77.6	50.5	70.7	77.6	50.5
	7- 8 PM	95.2	100.4	72.5	95.4	99.2	87	94.6	99.9	75.8
	8-9 PM	82.7	85.8	75.8	82.5	86.3	75.8	83.3	86.5	76.5
	9-10 PM	82.5	92.8	75.3	89.7	99	71.1	93.2	101.9	71.1
29/09/2017	8-9 AM	87.7	102.5	63.4	90.8	101.8	61.4	89.4	100.6	67.9
	9-10 AM	89.2	98.7	65.9	88.7	100.3	64.7	87.4	96.6	65.9
	6-7 PM	82.8	87	78.9	83.4	88.2	78.7	83.0	89.2	76.2
	7- 8 PM	85.7	93.2	80.7	90.7	100.2	75.8	87.0	94.9	78.8
	8-9 PM	83.3	89	79.4	84.9	93	78.7	82.7	89	76.2
	9-10 PM	91.4	104.2	77.2	91.0	100.2	75.8	88.7	98.9	78.8
30/09/2017	8-9 AM	86.5	96.8	62.1	86.5	95.4	68.4	84.0	98.5	66.4
	9-10 AM	87.0	98.2	68.4	88.5	96.4	66.4	85.9	94.8	68.2
	6-7 PM	101.0	109.7	64.7	93.69	101.3	64.8	94.3	101.6	74.2
	7- 8 PM	101.9	112.8	67.8	99.8	115.8	66.2	99.1	113.8	73.9
	8-9 PM	101.4	110.1	68.2	100.6	110.1	74.5	98.8	110.1	75.6
	9-10 PM	110.1	127.5	62.4	98.0	107.3	74.8	98.3	108.3	72.4





The results obtained from the study clearly indicate that noise levels in all the three localities under study during Navratri festival are much higher than that of the prescribed standard limits of CPCB, i.e. 55 dB (A) for residential area during day hours 45 dB (A) for residential area during night hours [5]. It is similar to the values documented by some authors studied noise Pollution during Deepawali Festival in Kolhapur City of Maharashtra [6-11]. Sources, effects and control of noise Pollution and its Levels in different cities of India have also been studied by some scientists [11]. Noise pollution has become an environmental problem in Jabalpur and also in other parts of India during religious festivals. This can cause negative impact on public health and welfare. Noise interferes in complex task performance, modifies social behaviour and causes annoyance [12].

## V. CONCLUSION

Considering the above aspects, we can conclude that noise dominates the spectrum of environmental noise. The people living in noisy area especially above 70 dB (A) should take precaution in order to avoid noise induced hearing loss and other problems. Celebration of festivals should be eco-friendly. Unlimited use of powerful sound systems should be controlled. Public education appears to be the best method as suggested by the respondents. However, government and NGOs can play a significant role in this process. Therefore need of Eco-City planning and awareness of people in the matter of environment will be a solution of noise pollution problem. Necessary preventive measures must be taken by the appropriate authority to implement the Noise Pollution (Regulation and Control) Rules, 2000 in time bound manner. As it is a short term assessment of noise pollution problems in the town, further study may also be required to address the chronic effect of noise pollution in the Jabalpur city.

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