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Article : ASSESSMENT OF NOISE LEVEL DURING PRE- DIWALI, DIWALI AND POST- DIWALI WEEKS IN SANGAMNER CITY, MAHARASHTRA

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ABSTRACT :

The present study is an attempt to estimate traffic noise pollution at ten sites of Sangamner city, Maharashtra. The sources of noise at the studied sites are mostly vehicular traffic. Noise pollution is raising problem in urban areas and transport sector is major source of noise pollution. The noise levels of ten sites were found to be above permissible limits. Over all noise level was higher in morning, evening and lower at noon. Per-diwali revealed 0.1% to 20.6%; diwali revealed 2.7% to 24.7% and post-diwali as 0.4% to 20.3% higher sound level than prescribed limit. The combination of various types of vehicular to noise was found to be minimum 70.2 (0.3% higher) and maximum 90.0 (29% higher). The contributions of individual vehicular noise level were found to be more than the traffic noise limits i.e. 70 dB and varies vehicles tyo vehicles.

INTRODUCTION :

Noise pollution is silent killer problem growing day-by-day. A definite solution to it has not been yet developed, because the health effect due to noise pollution has not paid much attention like other pollutions. It has become an unjustifiable interferences and imposition upon human health (Little, 1962; Gopalkrishana, 1978; Lakshimipathi, 1978), comfort and qualitative of human life (Gorai and Pal, 2006). To meet the demand of good wealth and health services of over increasing population, that noise and traffic have become busy and hence there are always incidence of noise population in urban area. The increasing of industrialization with transportation increases the pollution problem again.

The noise surveys showed conclusively that road traffic is the predominant source of problem. The total horse power which is built in automobile vehicle exceed 20 times the horse power of all movers combined (aircraft, ship and power station) (Robinson, 1971; Roy et al, 1984; Thakur, 2006). The mechanism of noise due to outside from vehicle has been basically different than the noise generation by the vehicle internally. Thus the noise emitted depends upon the vehicle level, characteristic and interaction of directly radiated noise from the system. The other important noise generating system is transmitting (Cohn and Meroy, 1982; Dixit et al, 1982; Jain and Parida, 2001; Banerjee and Chakarborty, 2006).

In Maharashtra studies on the traffic noise is limited which has been carried out at different cities like Bombay, Dadar, Pune, Nashik, Ahmednagar, Phaltan, etc. and average noise level in these cities recorded to be more than the recommended values (Dixit et al, 1982; Pondhe et al, 2002; Dhembare et al, 1999: Shamita, 1993; Pondhe and Dhembare, 1998; Dhembare and

Pondhe, 1999). However, the studies of Sangamner city is new and lacking hence present study was assigned.

MATERIALS AND METHODS :

Study sites: The first site selected for noise monitoring was the bus station area, the place on the highway NH-60 and SH-44 from which there is diversion to Nashik, Pune, Ahmednagar and Akole. This is the busiest traffic, where larger number of vehicles of all types run. The second spot was the Panchyat Sammitee where there was congregation of large number of peoples. The third site was senior college road, which is on NH-60 highway and mostly younger generation is the traffic source. The fourth spot was high school, which is academic place and pupils are the sources of traffic. The fifth site was court place, where as particular group of peoples were seen in between 11 am to 5 pm. The sixth site was vegetable market, which is busy early in morning and evening for the perches of fresh vegetables. The seventh spot was Delhi Naka, which is junction of four roads as NH-60 and SH-44 meet from where there is a diversion to Nashik, Pune, Ahmednagar and Akole. The eight spots was Ganesh Mandir, which is holey place. The ninth spot was Shramik Mangal Karyalaya, which located on bypass road to Nashik. The last spot was Cloth Market. It is the major crowded area because of hospitals and cloth shops are located on either side of the road.

Noise level measurement: Noise level measured seven times in each sites during early in the morning (7.00 to 7.30 am), afternoon (1.00 t0 1.30 pm) and evening (7.00 to 7.30 pm) times with the help of sound level meter (YF-20 Made in Taiwan) during pre-diwali, diwali and post-diwali weeks. It is a compact and portable instrument designed against JIS dB (A) specification. It has a range of 40–80 dB (Low-value scale) and 80-120 dB (High value scale). This meter is provided with ON-OFF switch, battery check, calibration Low-Scale, Hi-Scale. The reading was taking by holding the instrument 100–150 cm above the ground level for site of specific timings. Due to the traffic signals at some site there was a rush of vehicles follower by lull and again follow by rush of vehicles. Hence, the noise levels during the rush of vehicles as well as during the lull were recovered. The meter was switched on for 2 to 3 minutes. A set of reading have been presented in table1. On the base of morning, afternoon and evening average noise level were worked out and percent increase over standard prescribed limit was evaluated and presents in table 1. As there is no prescribed limits of noise level for road by Central Pollution Control Board (CPCB) of India. However, detailed noise level in the present study was compared with the prescribed basic noise level (tolerable) of United Kingdom i.e. 70 dB (Krishna Murthy, et al, 2007).

RESULT AND DISCUSSION :

In the present work, an attempt was made for comprehensive study of traffic noise at ten sites at and around the Sangamner city during per-diwali, diwali and post-diwali weeks during 2010. The traffic noise was measured about ten different sites along the crowded areas at and around Sangamner city, which is commercial in nature. The minimum and maximum noise level observed were 70.1 dB (A) and maximum 86.4 dB (A) (Table 1). The sources of noise pollution were motor vehicular traffic. The permissible limit of traffic noise is 70 dB (Krishna Murthy, 2007). However, all the sites, the noise level measured was above the permissible limits.

It is observed from table1 that average minimum (1.9%) percent increase noise and maximum (17.7%) at morning, minimum (0.3%) and maximum (14.6%) at afternoon and minima (2.0%) and maxima (23.6%) at evening were encountered at pre-diwali week recorded. It is noticed from the data recorded at diwali week as minimum 11.7%, 8.9% and 7.6% while maximum 24.7%, 22% and 23.6% increased noise level at morning, afternoon and evening period during diwali week. At the post-diwali week noise level revealed minimum increase was 0.4%, 0.7% and 3.4% where as maximum as 13.3%, 10.7% and 14.4% regarding morning, afternoon and evening respectively.

It can be mainly attributed due to incoming and outgoing activities of buses, rickshaw, jeeps, cars, two vehicles, etc in the area of bus station where maximum (76.3dB) noise was recorded during morning followed by evening (75.8 dB) and lower (73.5dB) at afternoon. Pondhe et al (1998) reported that average 75.6 dB noise levels at S T Station at Sangamner. In the present it is revealed 79.4, 75.9 and 78.2 dB levels at the same location during morning, noon and evening respectively. It indicates increased sound pollution would be due to increased vehicular traffic. Panchyat Sammitee site is official site which showed highest sound (76.1 dB) level at morning and followed by evening (75.2 dB) where as minimum (74.1 dB) at noon. A site at college road average low noise level 72.1 dB noticed at noon because this times are quite cool for traffic and noticed higher 75.4 dB at evening. High school site is an academic site which revealed lower (70.2 dB) noise level in noon and higher (75.2 dB) at morning and evening too. Mostly students' coming and going are seen early in the morning and evening. Court is official site, which showed only particular group of person come and visit to this location. The noise level at this station was comparatively lower than other sites in city.

Vegetable market, cloth market and Delhi Naka are the crowded areas where sound level was lower at noon and higher at morning and evening. Because in the morning traders and farmers market their commodities. At Delhi Naka high noise pollution was recorded during and evening (86.6 dB) and morning (82.4 dB) while lowest at noon because this site traffic level is mixed type. At the same site Pondhe et al. (1998) recorded 75.65 dB but now it is recorded average 83 dB (9.7%) increase from the previous measurement. It indicates more noise pollution due to traffic load. Heavy vehicles were coupled with commercial activities. It was observed from data that lower noise pollution was recorded at Ganpati Mandir over three times and three weeks measured. Cloth Market is major junction and by pass of Sangamner–Ahmednagar and mostly cloth and Hospitals is located on the either sides of road. Similar trend was also observed on diwali and post diwali weeks during measurement of noise level.

Attempt were also made to measure the noise generated from various vehicles in order to assess their contribution to noise pollution and know the status of the engine and air horn of particular vehicle as episodic and impulsive noise. The episonic and impulsive noise level of different vehicles are presented in table 2. Noise produced by motorcycle, bolero/pickup, truck, tempo, tractor, dumper, S T bus and cargo ranges from 3.0 to 22.0 %, 0.7 to 20.3%, 0.3 to 26.6%, 3.4 to 16.3%, 10.7 to 30.3%, 7.9 to 31.7%, 1.7 to 22.0% and 13.0 to 29.0% higher dB (A) than the prescribed limits respectively. The tractor and dumper engines and inadequate silencing arrangement are notorious noise producer with sound level 30% more than the prescribed limits and other vehicles (Roy et al. 1984; Nirjas et al. 2003). The motor cycles noticed 22% maximum

sound as compared to standard. However, the numbers of two wheelers are increasing alarmingly day-by-day adding noise to road. It is noticed that none of the vehicle generated sound within the prescribed limits i.e. 70 dB (A) during the study period.

It is general observation (not recorded) that the people strongly supported the action from authorized body or committee to reduce noise pollution. Most of them focused on the ban of hydraulic horn, old vehicle and installation of high noise creating industries such as stone crusher, use of sound amplifying mike, advertising and election campaigns. The local administration should take some steps and regulatory measures to be abate such noise pollution (Kumar et al, 2004; Yang and Kang, 2005; Das, 2006; Datta et al, 2006; Patel et al, 2006; Garg et al, 2007). In rapid industrialization and urbanization the transport sector is growing rapidly and vehicular number on road also increases. This leads to overcrowding and noise pollution (Anonymous, 2000; Krishna Murthy, 2007).

It is expected from the present study that the noise level in the city are more than prescribed limits, however, there is no medicine to cure hearing loss, prevention of unnecessary noise is the a better alternative. Also we suggest a bypass road for heavy loaded traffic away from residential area. The control measures should be adopted to minimize the noise level, the authors also have a great role to play in this regard. As noise damages the hearing mechanism affects communication, blood pressure, mental, physical health, interferes with sleep, working efficiency, physiological responses, performance effects, etc. It is essential to study scientifically to know the extent of noise pollution. Therefore, in the study an attempt has been made to evaluate noise quality and its effect by collecting the primary data in Sangamner city and the details of the sites where described with the respect of minimum and maximum at morning, afternoon and evening periods.

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Table1: Showing sound level in dB (percent) in Sangamner city during 2010.

Sr. No	Sites	Pre-diwali			Diwali			Post-diwali		
		M	A	E	M	A	E	M	A	E
1	S.T. Stand	78.3 (11.9)	75.5 (7.9)	77.8 (11.1)	84.3 (16.1)	79.1 (13.0)	80.9 (15.6)	76.2 (8.9)	73.2 (4.6)	75.6 (8.0)
2	Panchyat Sammitee	76.1 (8.7)	74.1 (5.9)	75.2 (7.4)	83.1 (18.7)	82.1 (17.3)	84.6 (20.9)	75.2 (7.5)	74.6 (6.6)	73.5 (5.0)
3	College Road	73.8 (5.4)	72.1 (3.0)	75.4 (7.7)	80.0 (14.3)	77.3 (10.4)	77.2 (10.2)	74.7 (6.7)	71.0 (1.4)	75.3 (7.6)
4	High school Road	71.3 (1.9)	70.2 (0.3)	72.1 (3.0)	78.2 (11.7	76.2 (8.9)	79.2 (13.1)	74.1 (5.9)	71.4 (2.0)	72.3 (3.3)
5	Court	72.4 (3.4)	71.1 (1.6)	72.1 (3.0)	80.0 (14.3)	79.2 (13.1)	82.1 (17.3)	75.2 (3.1)	72.2 (1.7)	72.5 (3.6)
6	Vegetable Market	75.2 (7.4)	71.2 (1.7)	75.3 (7.6)	82.3 (17.6)	80.5 (15.0)	84.6 (20.9)	74.2 (6.0)	73.3 (4.7)	76.8 (9.7)
7	Delhi Naka	82.4 (17.7)	80.2 (14.6)	86.5 (23.6)	84.2 (20.3)	85.3 (21.9)	86.1 (23.0)	79.2 (13.1)	77.5 (10.7)	80.1 (14.4)
8	Ganpati Mandir	70.3 (0.4)	70.2 (0.3)	71.4 (2.0)	79.2 (13.1)	77.5 (10.9)	79.5 (13.6)	70.3 (0.4)	70.5 (0.7)	72.4 (3.4)
9	Shramik Mangal Karyalaya	74.3 (6.1)	72.5 (3.6)	76.5 (9.3)	78.5 (12.1)	77.5 (10.7)	75.3 (7.6)	72.2 (3.1)	71.3 (1.9)	72.6 (3.7)
10	Cloth Market	80.2 (14.6)	76.5 (9.3)	78.5 (12.1)	87.3 (24.7)	85.4 (22.0)	86.5 (23.6)	79.3 (13.3)	77.5 (10.7)	78.4 (12.0)

M= Morning (7.00 to 7.30 am), A= Afternoon (1.00 to 1.30 pm), E = Evening (7.00 to 7.30 pm)
Figures in parenthesis are percent value over prescribes limits (70 dB).

Table 2. Showing noise levels (20 observations) of respective vehicles.

Sr. No.	Vehicles	Sound level (dB)	
		Minimum	Maximum
1	Motorcycle	72.1 (3.0)	85.4 (22.0)
2	Bolero/Pickup	70.5 (0.7)	84.2 (20.3)
3	Truck	70.2 (0.3)	88.6 (26.6)
4	Tempo	72.4 (3.4)	81.6 (16.3)
5	Tractor	77.5 (10.7)	91.2 (30.3)
6	Dumper	75.5 (7.9)	92.2 (31.7)
7	S T Bus	71.2 (1.7)	85.4 (22.0)
8	Cargo	79.1 (13.0)	90.3 (29.0)

Figures in parenthesis are percent value over prescribed limit (70 dB).

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Fig. !. Showing noise level during pre-diwali, diwali and post-diwali in Sangamner.

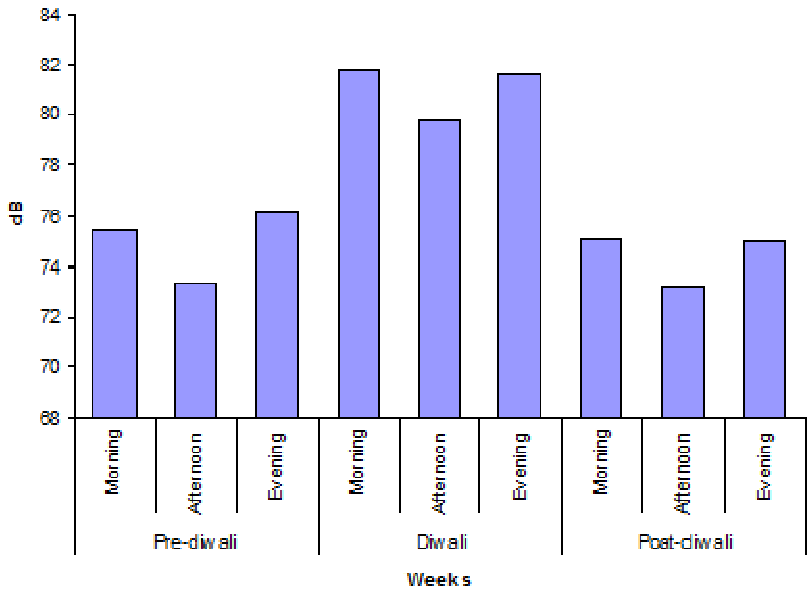
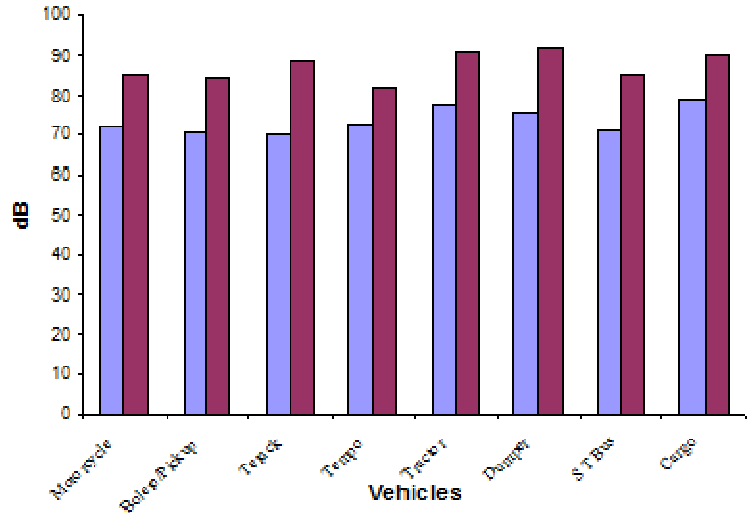


Fig:2. Showing minum and maximum noise level from vehicles



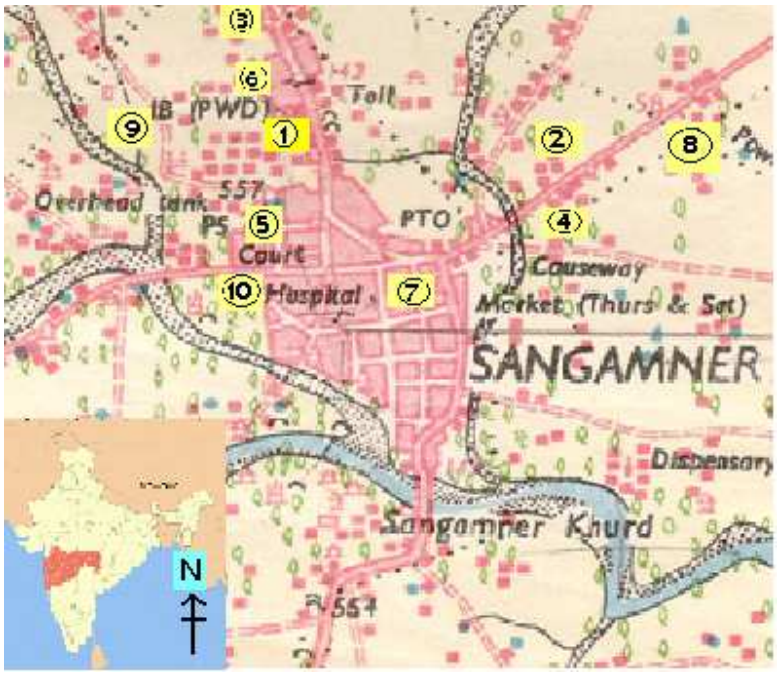


Fig. 1. Showing study area and 1 to10 sites.