



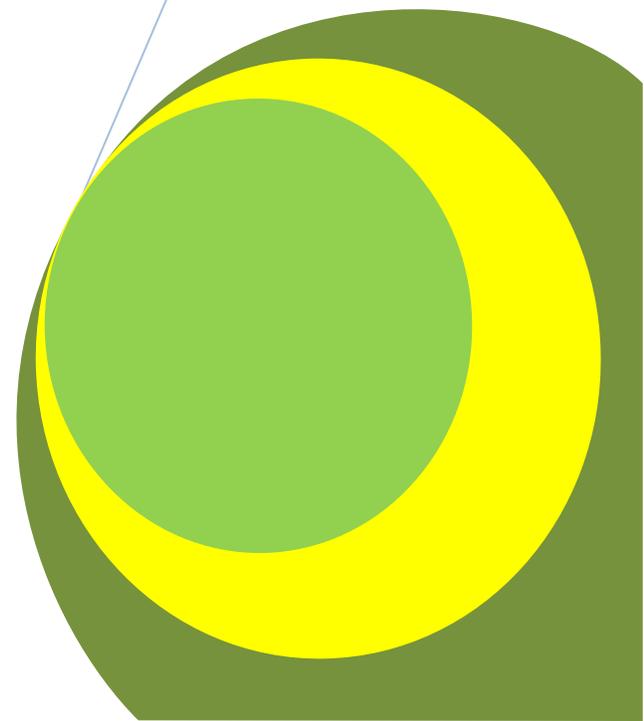
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Research Article

Comparative Study of Noise Levels in Various Areas of Faisalabad, Pakistan

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ABSTRACT

Noise pollution has become widespread due to increasing number of vehicles, Industries and urbanization. A survey was conducted to assess the noise levels in various areas of Faisalabad, at day and night time. The selected spots were divided into 5 categories distinguished by EPA Pakistan like, Commercial area, Residential area, Industrial area, Silence Zones and noise level on busy roads. The selected areas were visited randomly and the noise levels were noted and their mean values were found to get a single value in day and as well as in night. Similarly, 5 readings from single site were measured and recorded. For the estimation of these noise levels the Sound level meter was used. After obtaining all readings, the data were subjected to appropriate statistical analysis. During industrial noise levels comparison, maximum noise level for day and night was recorded in Farooq Spinning and least level was recorded in Kalash Textile and fell within the NEQs limit (Day time 75 dB(A), Night 65 dB(A)). Commercial area comparison showed maximum noise level for day was noted at Clock Tower and for night was observed and at Koh-e-nor that fell within the NEQs (Day time 65 dB(A), Night 55 dB(A)), while the minimum noise level for day and night was noted at Digluspura and Clock Tower respectively. Noise levels comparison at congested roads suggested that the maximum noise pollution was noted at Sargodha road while the minimum noise pollution was found for day and night at Khurliwanwala Road (Day, Night 85dB(A)). The assessment of different silence zones showed that the maximum noise level for day and night was recorded at Allied Hospital which was beyond the NEQs level, while on other hand the minimum noise level for day night was estimated in AUF that fell within NEQs (Day time, 50 dB(A), Night time 45 dB(A)). Comparison of various residential areas where the maximum noise level for day and night was noted in Faizabad which was exceeding the NEQs level, minimum noise level for day was noted in Liaqat town and for night was noted in Peoples Colony #2 which fell within NEQs (Day time 55 dB(A), Night Time 45 dB(A)). It was concluded that noise pollution was higher at day time while it was minimum at night time but even those minimum levels were not complied with NEQs.

Keywords: Noise, Industrial area, Commercial area, NEQs, Pollution.

INTRODUCTION

A human being is the best creature among all the creatures of Allah but he has mastered the skill of distorting environment with noise of such proportions that's intolerable in this world (Khan et al., 2010).

As said by Robert Koch German bacteriologist, a Nobel Prize Winner, "A day will come man will have to fight merciless noise as the worst enemy of health", noise originated from the Latin word "nausea" expressing 'unwanted sound' or 'sound that is loud or unexpected, unpleasant' (Chauhan, 2010). Rise in noise pollution has been faced by the larger due to transportation, growing population, congestion and accompanying commercial and industrial activities (Chauhan, 2008). It is becoming a big problem but still unnoticed type of pollution in many developed cities of the world also. Moreover, noise is an undesirable sound that can cause some psychological and physical damages to living and non-living entities exposed frequently. (Singh and Davar, 2004). Residences away from high levels of noise and close to the semi urban roads have become very famous recently. People give preferences to the places away from noisy areas for living (Yilmaz and Özer, 1998). The main sources of noise pollution are musical instruments, small scale industries, transportation local industries, urbanization and anthropogenic activities (Gangwar et al., 2006). Fire cracker noise pollution is one of the most important environmental problems (Singh and Joshi, 2010). It is reported that 16% of people in Europe are exposed to 40 dB or more of traffic noise pollution at

night in their bedrooms as compared to W.H.O which is average estimates of 30 to 35 dB while considering undisturbed sleep (Bond, 1996). The noise makes its origin from anthropogenic activities, importantly the urbanization and the unsustainable growth of industry and transport, though, the population in cities are affected at the most by this kind of pollution, however, small towns and villages along side industries or roads are also exposed to problem (Chuhan et al., 2010).

Noise is an important characteristic of the environment which includes noise from industry, vehicles and neighbors. Transport noise is a rising feature of the urbanization and makes noise pollution a prominent health issue of environmental health (WHO; Garg et al., 2007). Noise pollution is increasing gradually in urban areas since the past 4 years. People exposed to noise pollution are increasing in great proportion. This may cause direct and indirect impacts to the people exposed that can cause serious hazard to the health (Kryter, 1985). The studies conducted on examining the effects of noise level on human health reported that the workers, who are exposed to average noise level of 85 dBA for 8h, experience significant hearing impairment problems from a lifetime of exposure (Lutman, 2000). The noise level of 80 dBA and less may not result in significant problems on human health and its effect can be prevented by using personal hearing protections such as earplugs or earmuffs (Güvercin and Aybek, 2003).

Permanent hearing loss, muscle tension, high blood pressure, increased aggression headaches, migraine, higher cholesterol levels, irritability insomnia, gastric ulcers and psychological disorder are the important health hazards caused by noise pollution (Haines et al., 2005). The importance of the research regarding urban noise pollution and impacts on our environment has encouraged various research studies on the issue in many countries (Ugwuanyi et al., 2004).

Faisalabad is the 3rd largest city of Pakistan and it is the industrial hub for Pakistan. Its population is increasing day by day. No wonder Faisalabad is coping with a huge problem of noise pollution from a variety of sources such as Motorbikes, Cars, autoricksahwas buses, tractors, trucks, power looms within congested areas and drills etc.

Keeping in view the above facts, a study was planned to assess the noise levels in different areas of Faisalabad and to compare these levels with standards set by EPA.

MATERIAL AND METHODS

The proposed research study was conducted in various areas of Faisalabad, during summer 2011. The different site were selected for this study to assess the noise level of those areas at day and night time. The selected sites were categorized into 5 categories differentiated by EPA Pakistan like, Commercial area, Residential area, Industrial area, Silence Zones and noise level on busy roads. The location of sites is shown in Figure 1. These different categories have different standards with day and night parameters of noise designated by the EPA in National Environmental Quality Standards (NEQs).

The selected areas were visited randomly and recorded the noise levels and found their mean values to get a single value in day and as well as in night. Similarly, 5 readings from single site were measured and recorded.

For the measurement of these noise readings, the Sound level meter was used. The model of the sound level was 40477 and it was made by the Extech Company. This meter has the ability to measure the noise in dB(A) and dB(C). Similarly, it has the function of fast and slow response with maximum reading holding capacity.

For recording the noise level, the instrument firstly is calibrated and then put to the mode of slow response and dB(A). After collecting all readings, to analyze the data the statistiX 9x software were used.

RESULTS AND DISCUSSION

Table 1 describes the comparison of industrial noise pollution with NEQs and with each other, in this table the maximum noise level for day and night was recorded in Farooq Spinning and minimum was recorded in Kalash Textile and fall within the NEQs limit.

A survey was conducted on noise levels in saw mills, corn mills and printing houses so as to determine the impacts of noise levels on hearing capabilities of workers in such working settings (Boateng and Amedofu, 2004). The results showed that noise level in corn mills exceed the limiting value of 85 dBA as recommended by World Health Organization (WHO, 1999). This is supported by the study of Stansfeld and Mark (2003) who investigated the non-auditory effects of noise on health and concluded that the effects of environmental noise on health is strongest for annoyance, sleep and cognitive performance.

Table 1: The comparison of Industrial Noise Pollution with National Environmental Quality Standard (Day and Night parameters)

Sr No	Site	Day Readings (dBA)	NEQs Day (dBA)	Night Readings (dBA)	NEQs Night (dBA)
1	Kalash Textile	73.58 c	75	71.518c	65
2	Noor Fatima Textile	86.268b	75	85.868b	65
3	Interloop Textile	75.178c	75	73.365c	65
4	Farooq Spinning	93.547a	75	92.255a	65

Table 2 shows that the maximum noise level for day recorded at Clock Tower and for night was recorded at Koh-e-nor that falls within the NEQs, while on other hand, the minimum noise level for day and night was recorded at Diglus pura and Clock Tower respectively.

The shop owners and customers are generally exposed to high noise level throughout the day. The noise level varied from 53.0 to 80.5 dB(A) during daytime, while it ranged between 55.5 and 81.9 dB(A) during nighttime (Banerjee *et al.*, 2008).

Table 2: The comparison of Commercial Noise Pollution with National Environmental Quality Standard (Day and Night parameters)

Sr No	Site	Day Readings (dBA)	NEQs Day (dBA)	Night Readings (dBA)	NEQs Night (dBA)
1	Clock Tower	67.325a	65	54.727c	55
2	Diglus Pura	64.523a	65	60.450ab	55
3	Koh-e-noor	65.500a	65	62.900a	55
4	D. Ground	66.808a	65	58.533b	55

Table 3 illustrates that the maximum noise pollution on road in day and night was noted at Sargodha road while the minimum noise pollution was recorded for day and night at Khurlianwala Road.

The noise level in Arrabba, a city in Palestine, was found to be 67 dB(A), from 20 measuring points, at 60% of these points, the level exceeded 65 dB(A) (Zeid *et al.*, 2000). On densely utilized roads, the equivalent sound pressure levels can reach up to 75 – 80 dB(A) (Yoshida *et al.*, 1997). In addition, suitable tyre use and the increase in the volume of noise preventive devices, suitable road covering materials, changing road elevation, increasing the public awareness can be mentioned among other noise preventive methods (Uslu, 1995). In particular, many authors have found that the observed sound levels are mainly related to road traffic characteristics and especially traffic volume, vehicle horns, rolling stock, vehicles which have not been properly maintained, etc. (Mansouri *et al.*, 2006).

Table 3: The comparison of Local Roads Noise Pollution with National Environmental Quality Standard (Day and Night parameters)

Sr No	Site	Day Readings (dBA)	NEQs Day (dBA)	Night Readings (dBA)	NEQs Night (dBA)
1	sargodha Road	88.428a	85	84.648a	85
2	Khurlianwal Road	78.330b	85	74.548b	85
3	Narwala Road	85.498a	85	82.308a	85
4	Kanal Road	79.545b	85	77.795b	85

Table 4 describes the comparison of different sited falls in silence zones, it has been found that the maximum noise level for day and night was noted at Allied Hospital which is exceeding the NEQs level, while on other hand, the minimum noise level for day and night was recorded in AUF fell within NEQs.

Several studies have demonstrated that the urban conditions of a given area are also a very important factor influencing the environmental noise levels (Nelson, 1998). Noise pollution has been shown to cause hearing loss, elevated blood pressure, sleep loss, stress, distraction, cardiovascular problems, social behavioral problems and an overall decrease in quality of living (Schomer, 2001).

Table 4: The comparison of Different Silence Zones Noise Pollution with National Environmental Quality Standard (Day and Night parameters)

Sr No	Site	Day Readings (dBA)	NEQs Day (dBA)	Night Readings (dBA)	NEQs Night (dBA)
1	GCUF	51.061b	50	39.963b	45
2	AUF	43.033c	50	39.813b	45
3	Allied Hospital	56.718a	50	45.703a	45
4	DHQ Hospital	51.183b	50	43.290a	45

Table 5 shows the comparison of different residential areas where the maximum noise level for day and night was recorded in Faizabad and which was exceeding the NEQs level while, minimum noise level for day was noted in Liaquat town and for night was noted in Peoples Colony #2 which fell within NEQs. According to World Health Organization (WHO) guidelines, an indoor noise level of less than 30 dB(A) is required to ensure that the restorative process of sleep takes place effectively. The people staying in noisy area especially above 70 dB(A) should take precautionary measures in order to avoid noise induced hearing loss. In Curitiba in Brazil, at 93% of the measurement points, the noise level was over the limit value of 65 dB(A) and it was over high noise level of 75 dB(A) at 40.3% of these points (Zannin *et al.*, 2002).

The outcomes of the study were noise levels were maximum at day time while it was least at night time but even those minimum levels did not comply with NEQs

Table 5: The comparison of Different Residential Zones Noise Pollution with National Environmental Quality Standard (Day and Night parameters)

Sr No	Site	Day Readings (dBA)	NEQs Day (dBA)	Night Readings (dBA)	NEQs Night (dBA)
1	Liaquat Town	49.080b	55	44.393b	45
2	Peoples Colony # 2	50.245b	55	43.912b	45
3	Faizabad	75.280a	55	81.608a	45
4	Peoples Colony # 1	55.743b	55	43.575b	45

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