

## ASSESSMENT OF NOISE LEVEL AT BAU CAMPUS OF MYMENSINGH DIVISION

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### ABSTRACT

Data were collected at two points, one of them is Jobber moor and another of them is Helipad of Bangladesh Agricultural University (BAU) campus of Mymensingh Division in the period of July to October 2018 during class time (9:30 am-5:30 pm) with one hour interval. Jobber moor is crowded place and Helipad is situated near at the middle point of academic and administrative building. The sound level meter which was used the range was 35-130dB. The highest sound level recorded as 88.11 and 87.78 dB and the lowest levels were 66.05 and 64.34 dB at Jobber moor and at Helipad, respectively. This sound level was higher than acceptable level (60 dB, accordingly (ECR, 1997). Maximum frequency distribution level was found 80-84 dB both the two points and found at morning (9:30-11:30 am).

**Key words:** Noise level, environmental hazards, BAU campus.

### Introduction

Noise is becoming an increasingly omnipresent, yet unnoticed form of pollution even in developed countries. According to Birgitta and Lindvall (1995), road traffic, jet planes, garbage trucks, construction equipment, manufacturing processes, and lawn mowers are some of the major sources of this unwanted sounds that are routinely broadcasted into the air. It is, along with other types of pollution has become a hazard to quality of life. Kiernan (1997) finds that an even relatively low level of noise affects human health adversely. It may cause hypertension, disrupt sleep and/or hinder cognitive development in children. The effects of excessive noise could be so severe that either there is a permanent loss of memory or a psychiatric disorder (Bond, 1996). According to the WHO, (1995) around 5% of the world population is facing several kinds of health hazards due to complexities related to noise pollution. Around 11.7% of the populations in Bangladesh have lost their hearing due to noise pollution, says the DoE study conducted in 2017. In order to check noise pollution, the government has introduced Bangladesh Sound Pollution (Control) Rules, 2006. According to the guidelines, exceeding the maximum noise level in a certain area is a punishable offence. In Bangladesh, Bangladesh Agricultural University (BAU) has achieved the top position for three times according to the webomrtrix university ranking. According to a research, students who have high resting blood pressure, high stress levels and also experience reading delays are those who exposed to noise pollution during learning. In addition, students who suffer from noise pollution learn to not pay attention to the lecturer, which hampers their reading and language skills. But in other countries the educational institutes are fully equipped with modern technology to minimize noise from surroundings. Improving areas of education and universities to out of campus can reduce the noise. We know that noise pollution is full of uncertainties, but in order to fully understand this trend of noise, we must look into it more intensely. Effective education and teaching requires keeping classroom noise levels within specific limits (Bulunuz *et al.*, 2017). We would like to add to the research work a way that would help the administration understand the areas that are noisy and need intensive traffic management solution, as noise pollution has most of its roots entangled in traffic. To deal with these drawbacks our study was focused for measuring the sound level at Jobber Moor and Helipad areas of BAU campus in Mymensingh Division and its consequences.

## Materials and Methods

The study area of the research was two points of beautiful campus of Bangladesh Agricultural University (BAU), Mymensingh. The points were Jobber Moor and Helipad (Fig. 1). Jobber moor is a noisy place at this campus. A lot of vehicles are operated from morning to mid night every day. Helipad is an important for academic and officials purposes.

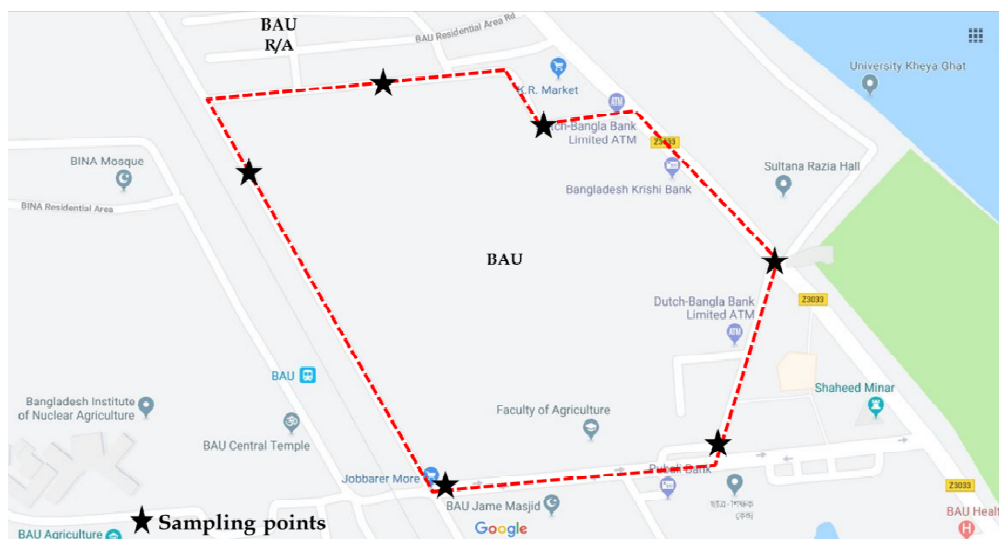


Fig.1 Study area of the research work

The sound level meter used in the study ranged from 35 to 130dB at frequencies between 31.5Hz and 8 KHz. Display with 0.1dB steps on a 4-digits LCD. With two equivalents weighted sound pressure levels, A and C. At the selected sites data were recorded starting from 9:30 am continued upto 5:30 pm with one hour interval on both working days and holidays during the period of July to October 2018. The weather was dry and the wind speed was negligible on those days. After collecting data, those were recorded in a sheet and output was in the form of Microsoft Excel Worksheet. The most basic formula for sound level calculation in dB is comparison of power levels. As might be expected it is ten times the logarithm of the output divided by the input. The factor ten is used because decibels rather than Bels are used. The decibel formula or equation for power is given below:

$$N_{dB} = 10 \log_{10} (P_2/P_1)$$

Where,

$N_{dB}$  is the ratio of the two power expressed in decibels dB

$P_2$  is the output power level

$P_1$  is the input power level

If the value of  $P_2$  is greater than  $P_1$ , then the result is given as an again, and expressed as a positive value, e. g +10 dB. Where is a loss, the decibel equation will return a negative value, e. g. -15 dB. In this way a positive number of decibels imply gain, and where there is negative sign it implies a loss.

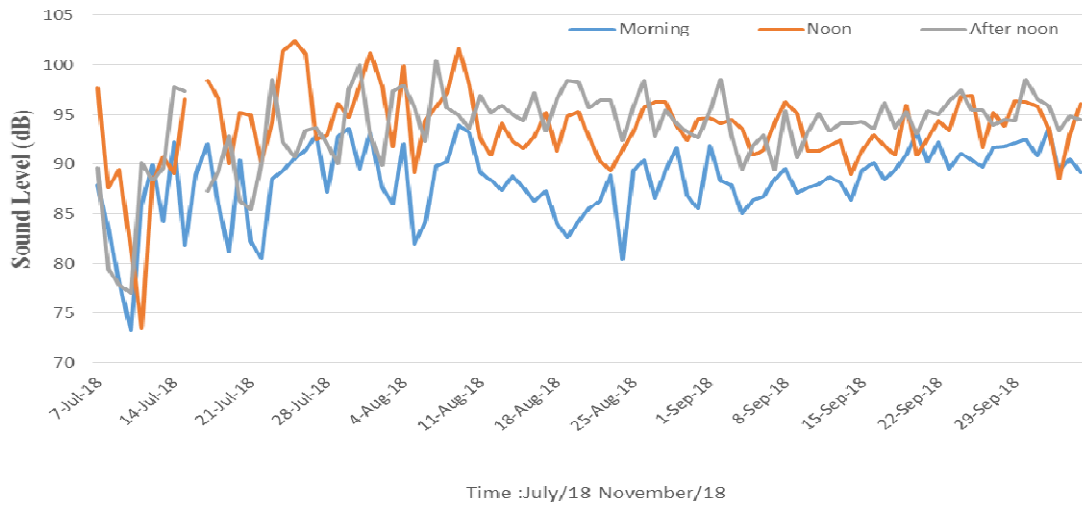
We can get noise climate (NC) by applying the equation:  $NC = L_{10} - L_{90}$

Here,  $L_{10}$ = Peak noise level and  $L_{90}$ = Residual noise level.

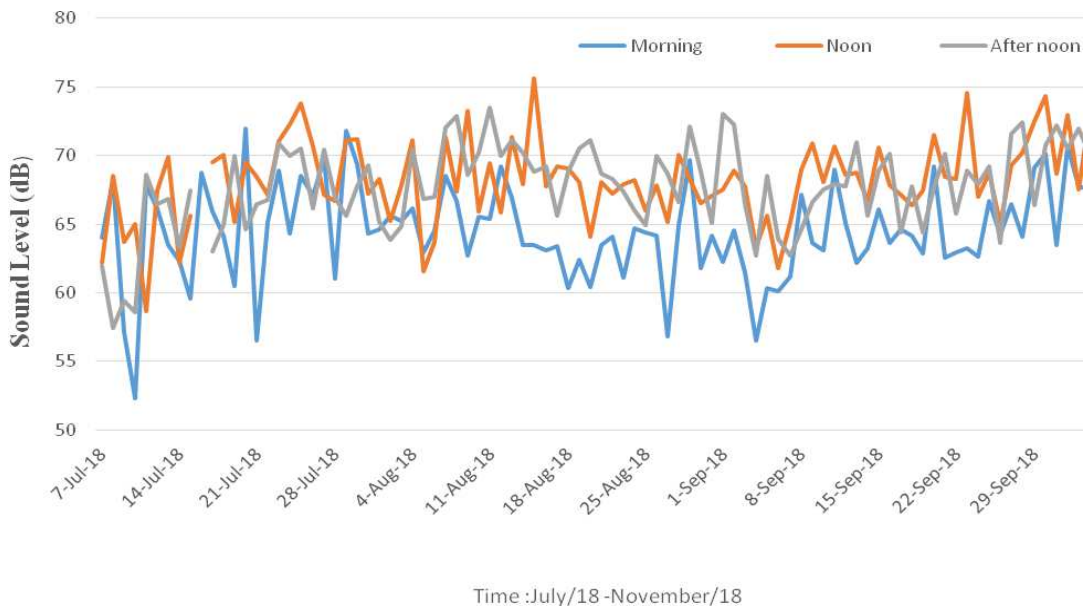
Several sound level data were taken at each location points and then, they were averaged to get the final value of sound level. The data were averaged because the sound level of a place varies due to different types of sources such as traffic signal, honking, crowd etc.

**Results and Discussion**

**Noise level at Jobber moor:** Jobber Moor is a noisy place where different kinds of vehicles are moved such as trucks, buses, trains, CNG operated auto rickshaw etc. From morning to mid night those kinds of vehicles are operated. At this point noise level is high from other points of BAU, Mymensingh. From the present study the average highest value was recorded at noon time that was 102.4 dB and that date was 31 July (Fig. 2). The average lowest value was 73.2 dB that was found at 15 July at morning time (Fig. 3) which exceeded the std. value of ECR (1997).

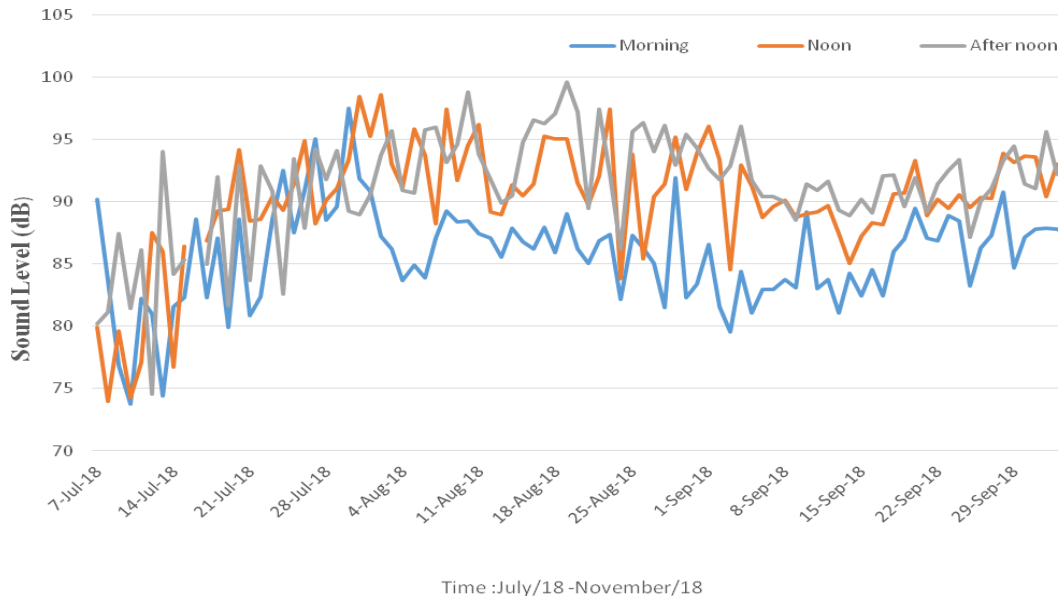


**Fig. 2 Variation (high) of noise level at Jobber Moor**

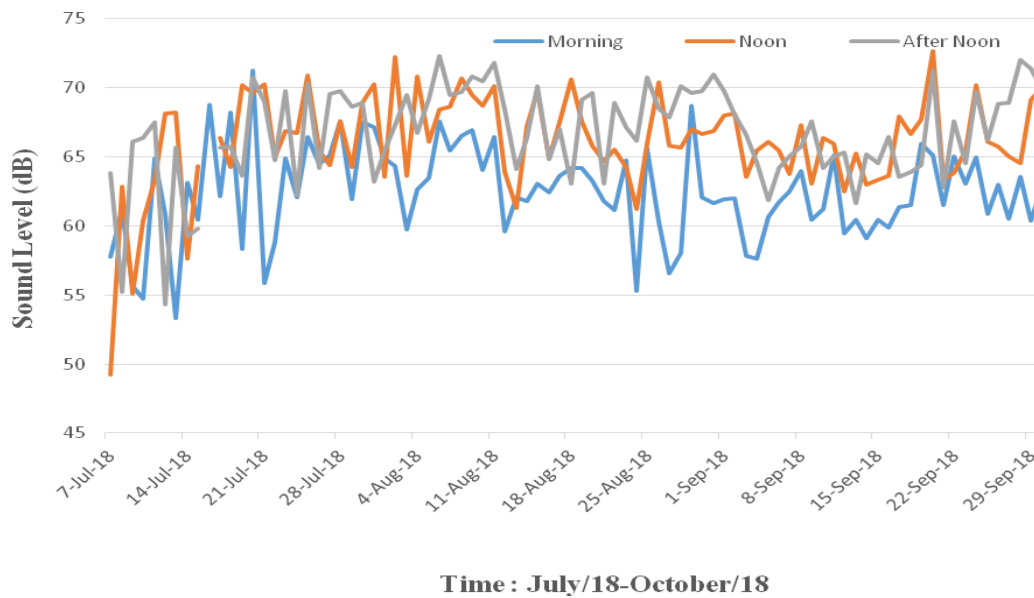


**Fig. 3 Variation (low) of noise level at Jobber Moor**

**Noise level at Helipad:** Helipad is another noisy place at my sweet campus which is situated at the middle point of administrative building, varsity auditorium and TSC (Teacher Student Centre). Various kinds of vehicles are moving at this place. Students play at this place in their holidays. Teachers, students take their breakfast and lunch at TSC. Fig. 4 represents the highest value as 75.6 dB at noon time and the average lowest value is 52.3 dB at morning time (Fig. 4). Fig. 5 represents average the sound level at High sound level range at Helipad. The maximum sound level was 99.633 dB at after noon time the minimum sound level was 74.66 dB at noon time, both readings were exceeded the std. value of ECR (1997).



**Fig. 4 Variation (high) of noise level at Helipad**



**Fig. 5 Variation (low) of noise level at Helipad**

**Trend of noise level:** In the Fig. 6 we can observed that the peak noise level was increased up to 1:30 pm and decreased from 2:30 pm. From 12:30 pm to 1:30 pm the mean noise level was the maximum. Residual noise was increased from 10:30 am to 2:30 pm and from 2:30 pm this level was decreased at Jobber Moor. Exposure to high peak sound levels can be associated with immediate damage to hearing. In the Fig. 7, we observed that peak noise level was high at 12:30 pm. From 12:30 pm the sound level was decreased up to 2:30 pm and from 2:30 pm to 5:30 pm sound level was almost same. At 11:30 am and 2:30 maximum sound level was found, without those times whole day's sound level was almost same at Helipad. Background Noise is the sound level at a given location and time, measured in the absence of intermittent noises, any other extraneous or alleged noise nuisance sources. It is also referred to as the Ambient or Residual Noise. At the time of 12:30 pm this level was minimal, without that time whole day's sound level was same.

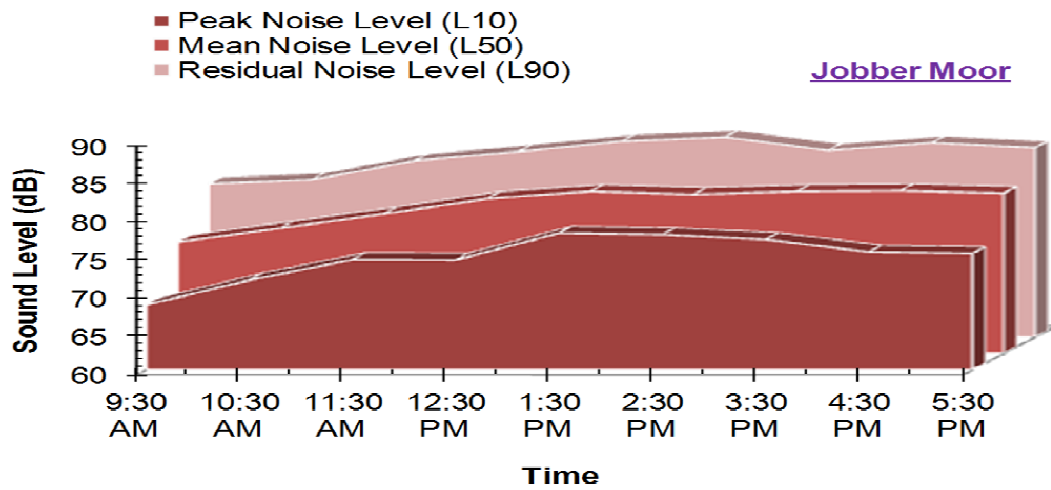


Fig.6 Noise level at one hour interval at Jobber Moor

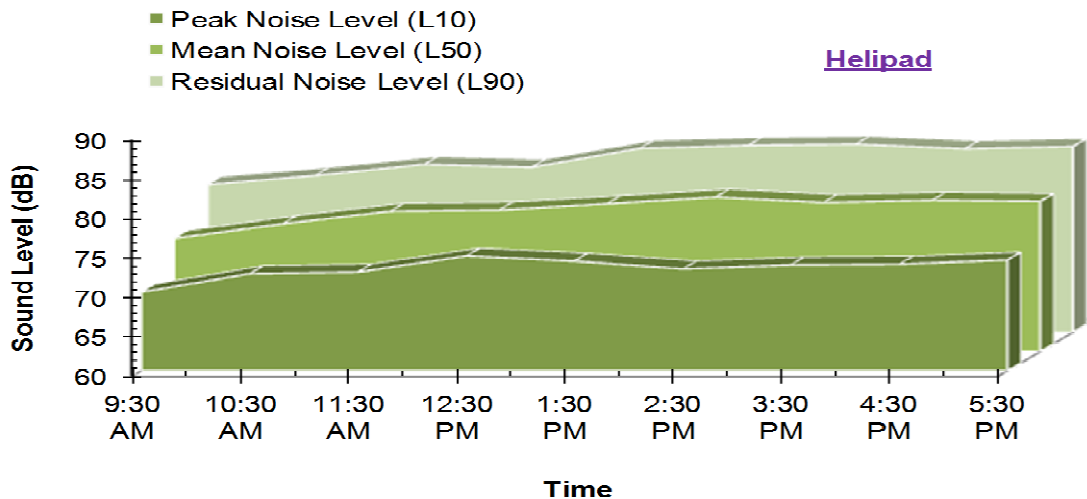


Fig.7 Noise level at one hour interval at Helipad

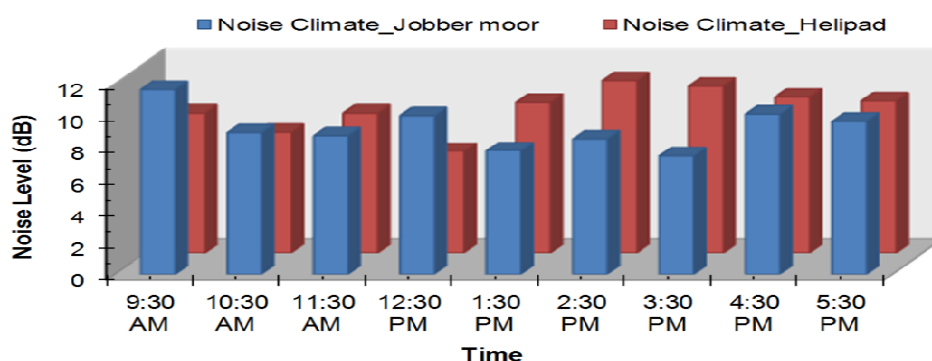


Fig. 8 Variation of noise climate between Jobber Moor and Helipad

The difference between peak and residual noise level is called noise climate. At the time of 9:30 am, 10:30 am, and 12:30 pm at Jobber Moor noise climate was greater than at Helipad and the highest NC was found at 12:30 pm. At the time of 11:30 am, 1:30 pm, 2:30 pm, 3:30 pm, 4:30 pm and 5:30 pm at Helipad noise climate was greater than at Jobber Moor. Maximum difference was found at 2:30 pm (Fig. 8).

Table 1. Standard noise level for Bangladesh (ECR, 1997)

Sl. no.	Parameters	Day times (dB)	Night times (dB)
1	Silent zone	45	35
2	Residential area	50	40
3	Mixed area (mainly residential area, and also simultaneously used for commercial and industrial purposes)	60	50
4	Commercial area	70	60
5	Industrial area	75	70

The maximum and minimum mean noise levels were 88.11 and 66.05 dB at Jobber Moor whereas, 87.78 and 64.34 dB at Helipad, respectively. Highest noise climate recorded at 12:30 pm and 2:30 pm in Jobber Moor and Helipad. In all cases the recorded noise levels were much higher than the std. levels. Noise adversely affects general health and well-being in the same way as does chronic stress. So, BAU authority would alert and adopt essential measures for ensuring the sound and safe environment in the green BAU campus of Bangladesh.

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