ENVIRONMENTAL POLLUTION, HEALTH & SUSTAINABILITY

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ASSESSMENT OF TRAFFIC NOISE LEVEL IN THE SELECTED SILENCE ZONE OF MALAPPURAM MUNICIPALITY, KERALA

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OBJECTIVES

Noise pollution is a serious environmental hazard, about 2/3 of total noise pollution in urban area related to traffic noise (Ashly and Anilkumar, 2016).As a result of urbanization, industrialisation, population growth, technological advancements the number of vehicles is increased and thereby the severity of noise pollution is also increased (Singh et al., 2018). In India there is an increase in the number of vehicles resulting heavy traffic problem in the urban area (Goswami, 2009). Heavy trucks, buses, auto rickshaws, two wheelers (motorcycles) and other automobiles contribute to the vehicular noise in heterogeneous traffic conditions (Cyril and Koshy, 2013). Prolonged Exposure to traffic noise causes short term and long-term health impacts such as physiological disorder, psychological disorder, feeling of annoyance and irritation, disturbances of daily activities and performances, hypertensions, heart diseases, etc (Singh et al., 2016).

The traffic noise depends condition and width of roads, nearby reflecting and absorbing surfaces, trees on the sides, the volume and structure of the traffic, the attitude of the drivers and the horn sounding from each vehicle (Maya and Sreedevi,2015). As per the Noise Pollution (Regulation and Control) Rules, 2000 an area comprising not less than 100 metres around hospitals, educational institutions and courts may be declared as silence area/zone. Numerous studies (Chandran et al., 2022; Ashly and Anilkumar, 2016; Maya and Sreedevi, 2015; Cyril & Koshy, 2013; Sampath et al., 2004) were carried out in Kerala about the traffic noise level intensity. Previous studies show there are no detailed studies carried out in Malappuram area. Hence the present study mainly focused to find out the status of traffic noise level in the selected silence zone of Malappuram municipality.

METHODOLOGY

The silence zone/area selected for the study is in the front of Malappuram Taluk Hospital which is in Kottapady junction (Kottapady ward No.18). The study area lies between 11°02'49" North Latitude and 76°04'23" East Longitude and located 1km from Malappuram city. There is a National Highway 966 passing on the front of Taluk Hospital. Apart from the hospital, there is a vegetable market, Municipal stadium and Government Higher Secondary School is also located in the Kottapady junction so that heavy traffic congestion was occurring sometimes due to the increasing number of vehicles.

The data collection was done by noise level monitoring by noise meter and vehicle count by direct method. The measurement of noise level was carried out in three different sessions during the day time with the help of portable digital sound level meter (Model Meco 970 P). The sound level meter was placed at a height of 1 to 1.2m above the ground level and 50cm away from chest. Data were taken from morning 8am to 9am, afternoon 1pm to 2pm and evening 5pm to 6pm on both non-working day (Sunday) and working day (Tuesday) during the period between 28th July and 3rd August 2023. Continuous data for one hour from each session was collected with an interval of 5 minutes. The obtained average value of maximum (Lmax)and minimum (Lmin) noise level was expressed in decibel units and the data were compared with Central Pollution Control Board's (CPCB) Noise requirements for ambient noise levels, notified in the Noise Pollution (Regulation and Control) Rules, 2000. Besides, the total number of vehicles passing in unit time (one hour period) from each session were counted and recorded.

RESULTS

The results (Figure 1) showed that the average values of maximum and minimum noise level were high in the evening time (82.1 dB) and afternoon time (67.4 dB) respectively on non-working day whereas on working day, the average values of maximum and minimum noise level was high in the morning time (83.5 dB) and afternoon time (66.2 dB) respectively. In the present study, the average value of maximum and minimum noise level was exceeded the prescribed limit of silence zone during day time i.e., 50 dB(A) as per the Noise Pollution (Regulation and Control) Rules, 2000. The study reveals that noise level was high on working day than that of non-working day. The total number of vehicles that passed in three sessions on non-working day and working day are given in Table 1. The study found highest number of total vehicles passed in the silence zone on both non-working day (n=3300) and working day (n=3568) was in the evening time. Among the different types of vehicles passing in the area, motor cycles are the major one in all the time period.

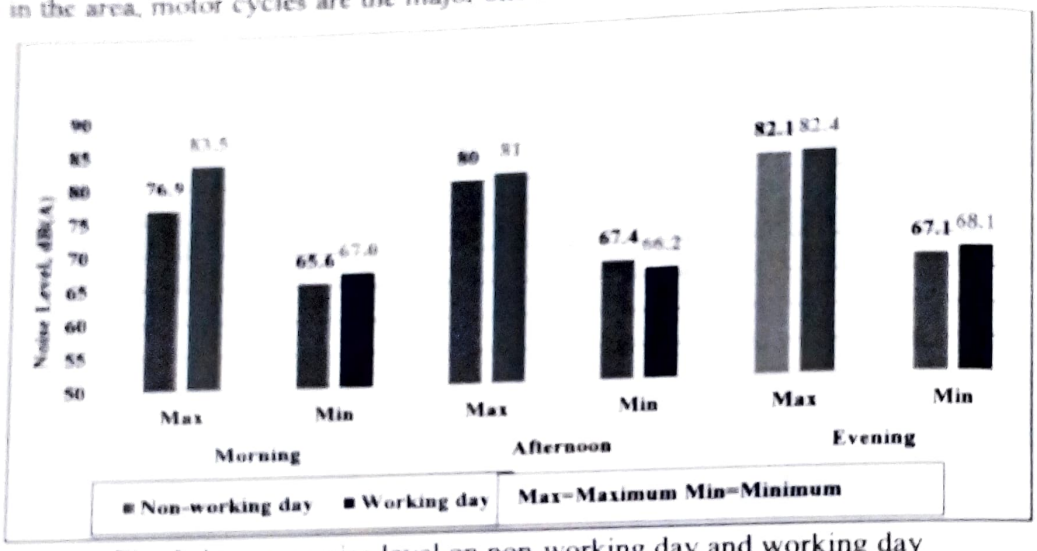

Fig. 1 Average noise level on non-working day and working day

Table 1 Total number of vehicles passing the road in unit time at different times of a day

Day	Morning (8am-9am)	Afternoon (1pm-2pm)	Evening (5pm-6pm)	Total Number
Non-working day	1937	2645	3300	**7882**
Working day	2423	2902	3568	**8893**

While comparing the intensity of noise level with number of passing vehicles shows that as the number of passing vehicles increases in each session, the noise level intensity also increases on non-working day. But there is a slight variation was observed on working day. Similar studies by Bhosale et al. (2010) reported that noise pollution increased with heavy vehicular traffic in Aurangabad city. Sampath et al. (2004) reported that the average noise level in silent zone (hospital) areas of Kochi, Kozhikode and Thiruvananthapuram was higher than the permissible limit. Study conducted on traffic noise pollution at hospital area of Ernakulam city by Ashly and Anilkumar (2016) showed that noise pollution was higher on working days than on non-working days.

CONCLUSIONS

It is evident from the study that traffic noise level at silence zone (front of Taluk hospital) of Malappuram municipality are found to be exceeding the noise limit by CPCB on both working day and non-working day. The present investigation shows a higher noise level was observed on working day than that of non-working day. Therefore, the study recommends continuous monitoring of traffic

noise level should be monitored regularly by competent authority, strictly enforce traffic rules by the public, conducting awareness programme for public and plantation of vegetation on the sides of road to minimize noise pollution in the silence zone of the study area.

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