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STUDY ON NOISE LEVEL IN THE SEBEŞ CITY

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ABSTRACT: *In this study I will present the results of the monitoring of the noise pollution obtained at the six monitoring points in the city of Sebeş. Over the three years, from 2015 to 2018, the noise level in Sebeş increased by an average of 4.7 dB. The most traffic routes in the city of Sebeş have been monitored to identify where the noise level is higher.*

Keywords: *noise pollution; noise; Sebeş;*

1.Introduction

Sound pollution is part of the environmental pollution caused by noise [3]. Noise is an acoustic feeling without defined and constant components. It is disagreeable, aggressive and causes stress in extreme cases. From a physical point of view, it is a disharmonic mixture of vibrations with different intensities. Noise is harmful to all creatures, as well as things like houses, shelters, installations. It is mainly produced by road traffic, construction sites, agitated animals, industrial plants, large fans mounted in enclosed spaces, etc. [1]

Road traffic is the main inside of city noise. Within one day, three peak noise levels are generally recorded at 6-7, 12 and 18-19 hours. Air cooled, high-powered cars, motorcycles, mopeds, and scooters produce the loudest sounds. Braking and starting are the most noisy for all types of cars. Diesel engines are the most polluted sonic. Motorcycles produce between 75 – 92dB, heavy vehicles have a noise level of 75-88 dB, cars between 46-86 and 60 dB.

Exposure to noise pollution greater than 75 decibels for more than eight hours a day over a long period may lead to hearing loss. Dangers increase with increased noise intensity and exposure. Sound that exceeds 150 dB can cause "innitus" (continuous buzz) and can affect hearing permanently. Generally, about 1 percent of the population suffers from noise-induced pollution. [4]

The purpose of this study is to measure the noise level in the town of Sebes in Alba County in two moments of the day (morning and evening), respectively the comparison of the values obtained in 2015 and 2018 respectively. I note that the 6-point noise level in the city was monitored: P1 - Lancrăm area, P2 - Kronospan area, P3 - exit from town to Deva city, P4 - exit from city to Sibiu city, P5 - exit from town to Petreşti, P6 - city center

2. Materials and methods used

For the study we used a precision class integrator sonometer, manufactured by Brüel & Kjær. This type of sonometer has been specifically designed for occupational and environmental measurements in accordance with all national and international standards. It is a robust, efficient, stylish and easy-to-operate device.2250 Light already contains the installed Sound Level Meter software that measures and records all parameters simultaneously - a dynamic range of 120 dB from 16.6 dB. [2] Parameters analyzed are: Laeq - Lcpeak; LAFmax; LAFmin.

At each of the six measurement points, the measurement time was 30 minutes, and the measurements were made within the same time interval. The sonometer was mounted on a support at a height of 1.2 m at

a distance of approximately 7 m from the road axis.

3. Results and discussions

Six monitoring points have been selected in the city of Sebeş, considered the most noisy because of road traffic. These selected areas can be seen in Figure 1. The measurements were made in two moments of the day: morning (08: 00-9: 00) and evening (19: 00-20: 00)

The results obtained from the measurements made at the six points in the city of Sebeş are presented in table 1, corresponding to the first period of the day, respectively in the table 2, related to the second period of the day.

Comparing the values recorded with the sonometer in the years 2015 and 2018 at 6 monitoring points, it was found that in the morning the highest recorded value was 107.4 dB. This value was recorded in 2018 in the center of Sebes. Analyzing the results of the monitoring, it can be observed that in the three years from 2015 to 2018 in the morning the noise level in the town of Sebeş increased by an average of 4.7 dB.

Comparing the LAeq values in 2015, the following ranking was obtained for the most noisy areas of the city: P1, P2, P5, P4, P3 and P6. Applying the same comparison method for the year 2018 we obtained the following ranking: P6, P1, P3, P5, P2 and P4. Comparing the two rankings, it can be noticed that the noise pollution has increased in all monitored areas, but has not increased steadily at all the analyzed points. For example, in the morning, the most noisy point monitored in 2015 is P1 - the Lancram area, and in 2018 the most noisy point is P6 - the center zone. Regarding the quietest area, in the morning, in 2015 it was P6 (center), which proved to be the most noisy working point monitored in 2018.

Fig. 1. The points selected for noise measurement

In the evening the noise level is reduced by about 13 dB in the center of Sebes. In the evening, road traffic is more crowded in P5 and P1 respectively.

The values recorded at point P1 (Lancram) are almost identical to the values identified in P5, from which it follows that the most circulating route is Lancrăm-Sebeş-Petreşti. Figure 2 shows how the noise level evolves during the two monitored years.

Table 1. Results obtained during the first part of the day

Selected points	Measured indicators								Maximum admissible limit
	LAeq		LCpeak		LAFmax		LAFmin		
	2015	2018	2015	2018	2015	2018	2015	2018	
P1	72,8	74,6	108,2	102,7	88,5	85,9	43,8	52,9	70
P2	71,5	72,0	104,6	102,8	85,0	82,1	61,8	59,3	70
P3	67,6	73,3	103,1	105,8	84,1	91,2	40,6	46,7	70
P4	68,1	69,6	98,8	100,8	82,2	86,3	45,9	42,8	70
P5	68,3	73,3	104,7	108,1	85,1	91,8	42,8	55,4	70
P6	65,6	80,7	107,9	113,5	85,6	107,4	42,1	57,6	70

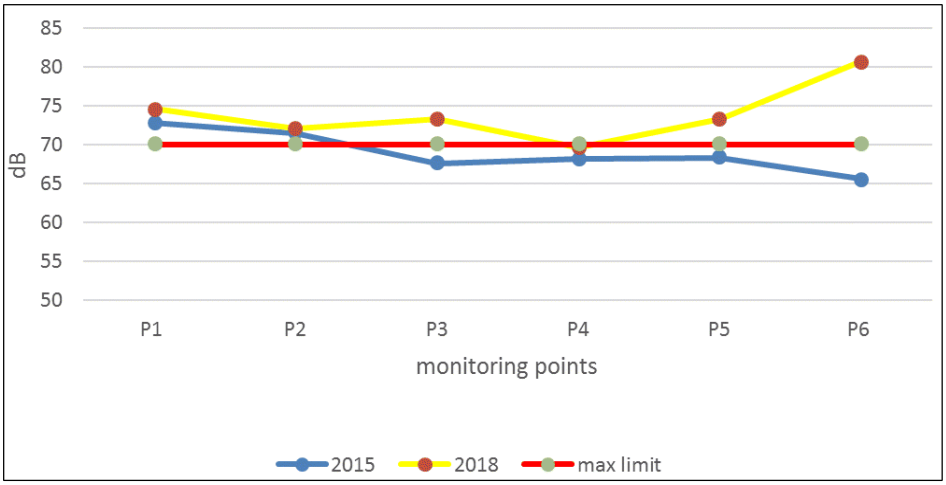

Fig. 2. LAeg - in the morning

Tabel 2. Results obtained during the second part of the day

Selected points	Measured indicators								Maximum admissible limit
	LAeq		LCpeak		LAFmax		LAFmin		
	2015	2018	2015	2018	2015	2018	2015	2018	
P1	68,3	74,6	117,4	106,0	87,7	87,3	38,1	57,1	70
P2	72,9	72,0	103,2	104,5	84,2	86,4	61,9	57,9	70
P3	71,5	71,8	103,2	107,3	84,9	89,7	43,8	42,1	70
P4	68,9	73,0	112,4	106,6	88,7	90,1	46,9	54,2	70
P5	67,8	74,7	117,2	109,8	84,9	94,6	87,6	49,8	70
P6	72,1	67,4	110,8	101,8	95,9	81,4	37,3	52,1	70

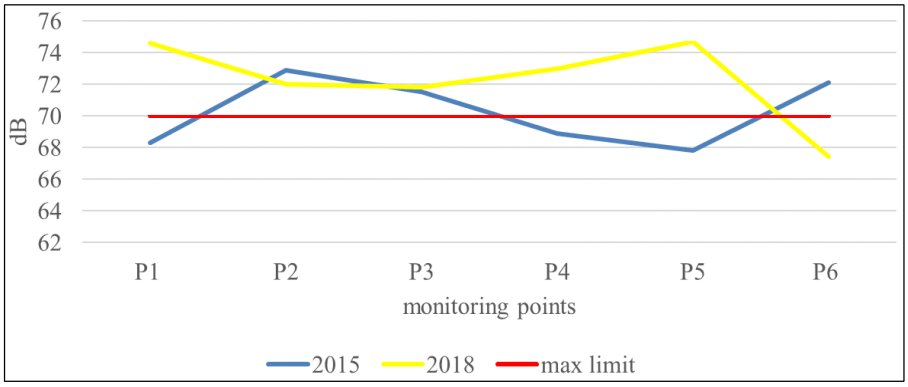

Fig. 3. LAeg in the evening

Comparing the values recorded in 2015, respectively in 2018 it was found that in five out of six monitored points the noise level increased, except the center area. I note that in the center of Sebeş the noise level has probably diminished due to the development of bypass routes. The main reason that has contributed to the increase in noise level is road traffic. The number of cars increased significantly from 2015 to the current year.

Considering the maximum admissible limit of 70 dB, it was found that in 2018 this limit is slightly exceeded in five of the six monitoring points, only in the center of Sebeş Laeq is below the maximum admissible limit. In 2015, the maximum admissible limit was exceeded by only three points.

4. Conclusions

Following this study, it was found that the noise level over three years increased significantly by more than 4 dB, the main reason being the increase in the number of cars. In 2015 the most noisy period of the day was the evening.

In the Kronospan area and the center of Sebeş, the evening was the highest level of noise, and in the morning the sound pollution was more pronounced at the exit from Sebes to Alba in the Lancram area.

Therefore, in 2015, the busiest route in the morning was Lancram-Alba, the E81 road. Almost all traffic coming from A1, DN7, E68, 67C roads moved along the Lancia Alba route via E81, and in the evening the city center was the most polluted sound.

From 2015 to 2018 at all monitored points it was found that the noise level increased by up to 4 dB. In the morning, the center of Sebeş and the E81 area, the Lancram area are the strongest areas, and the Lancram area and the 67C road in the evening are most preferred by drivers.

As a result, the three-year noise level has increased by an average of 4.7 dB in Sebes due to the increase in the number of cars.

The maximum admissible limit is exceeded throughout the day. The population of Lancrám and the city center are the most exposed to this type of pollution.

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