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Fırat Üniversitesi Kampüsünde Gürültü Kirliliğinin Değerlendirilmesi

Nilüfer Nacar KOÇER[1], Barbaros DURMUŞ[2]

[1]Dr. Öğretim Üyesi, Fırat Üniversitesi, Mühendislik Fakültesi, Çevre Mühendisliği Bölümü, [2]Arş. Gör., Fırat Üniversitesi, Çevre Mühendisliği Bölümü, ELAZIĞ

nkocer@firat.edu.tr, barbarosdurmus@firat.edu.tr

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ÖZ

Trafik gürültüsü, insan sağlığını büyük ölçüde etkileyen ve giderek artan bir çevre sorunudur. Motorlu taşıt sayısının hızla artmasıyla oluşan trafik gürültüsü, çevrenin gürültüye maruz kalabileceği kirlilik kaynaklarından biri haline gelerek, kentsel yaşam kalitesini kısıtlamaktadır.

Bu çalışmanın temel amacı Elazığ İli Fırat Üniversitesi kampüsünde gürültü kirliliğinin belirlenmesidir. Bu amaçla trafiğin yoğun olduğu saatlerde günde dört sefer gürültü ölçümleri yapılmıştır. Gürültü ölçümleri sabah 07:00 - 10:00, öğlen 11.00 – 14.00, öğlenden sonra 16:00 –18:00 ve akşam 19:00 – 20:00 saatleri arasında yapılmıştır.

Yapılan çalışma sonucunda üniversite kampüs alanında gürültü seviyesinin en yüksek ve en düşük olduğu kavşaklar tespit edilmiştir**.**

Anahtar Kelimeler: gürültü, gürültü kirliliği, fırat üniversitesi, elazığ.

Evaluation Of Noise Pollution In Firat University Campus

ABSTRACT

Traffic noise is a growing environmental problem that highly affects the health of people. With the rapid increase in the number of motor vehicles, the traffic noise has become one of the main sources of pollution of urban environmental noise pollution that restrict the quality of the urban living environment.

The main objective of this study is to determine the noise pollution on Elazığ city Fırat University campus. For this purpose, noise measurements were carried out four times a day when traffic was intense. Noise measurements were made between 07:00 - 10:00 in the morning, 11.00 - 14.00 noon, 16:00 - 18:00 in the afternoon and 19:00 - 20:00 in the evening.

As a result of the study, the intersections where the noise level is highest and lowest in the university campus area have been determined.

Keywords: noise, noise pollution, fırat üniversity, elazığ.

1. INTRODUCTION

It is one of the most immediate and identifiable environmental problems associated with rapid population growth, urbanizations and industrialization. Because of fast increase of motor vehicles in urbanized regions in Turkey, traffic noise problems take attention from the view point of environmental pollution (İleri vd., 1998).

The effects on the human health that are noisy affecting the efficiency of the work are quite high. For this reason, the "Environmental Noise Assessment and Management Regulation" has been published by the Ministry of Environment and Urbanism in our country. The permissible noise levels according to the Regulation on the Assessment and Management of Environmental Noise, which was prepared on the basis of the European Parliament and Council Directive 2003/10 / EC of 15 February 2003 on the basis of

Directive 2003/10 / EC, were evaluated as the time of exposure to noise (Özyonar vd., 2008; Şensöğüt ve Çınar, 2006; GY, 2003.)

1.1. NOISE POLLUTION and SOURCES

There are varios of noise sources. Most important traffic noise is very effective in the center of cities. One of the important factors in the evaluation and management of urban environmental noise is data collection (Erdogan, 2007).

Noise, by reducing the quality of the environment it affects the human health and climate negatively. Things the ordinary sources of noise pollution that contributed below to climate change are (Balashanmugam vd., 2013; http://www.conserve-energy-future.com/causes-and-effects-of-noise-pollution.php).

a) Noise of Electric Generating Plants

Electric energy receives the top level in energy hierarchy as it finds countless in defensive, industry, agriculture, and homes and of course in many nations, transportation.

b) Noise of Vehicular Traffic

Increase in vehicular traffic is but also a source of noise pollution round the globe particularly in much urban cities on all way the world. The situation is getting seriously with increase in traffic high intensity on city roads

c) Industrial and Construction Noise

To case the demands of the necessary of life, city streets, highways and the construction of buildings cases much of noise.

d) Domestic Noise:

Household equipment's such as mixers, some kitchen appliances and vacuum cleaners are noise producer of the house. Although they do not case too many of problem, their affect of noise remove on human sanitary can't be unregarded (Balashanmugam vd., 2013; http://www.conserve-energy-future.com/causes-and-effects-of-noise-pollution.php).

1.2. IMPACT OF NOISE POLLUTION

Noise is a problems that has physical, physiological, psychological, psychological and affects on work success effects on human Alam, 2011; Durduran vd., 2008). These hazard are:

a) Physical Effects: These effects may condition temporary or permanent hearing loss. Negative affects on sense of hearing.

b) Physiological Effects: Possible results of these affects are irregular heartbeat, increase in blood pressure, stress and insomnia (Alam, 2011; Durduran vd., 2008; Anonymous, 1974; Melnick, 1979).

c) Psychological Effects: Especially results of these affects are horror, behavioral disorder, feel uneasy, mental fatigue, deceleration in mental function.

d) Affects on Work Success: Decrease in working productivity and undesigning voices. It is demonstrated that noise affects labor productivity and performance negatively (Alam, 2011; Durduran vd., 2008; Burns, 1979; Melnick, 1979; Finegold, 1994).

1.3. CONTROL OF NOISE POLLUTION

Noise control is presented out in 3 stages. (Agarwal, 2009);

1. Control at Source: Destruction or reduction of noise source is the most effective way to control noise. To prevent noise at source requires engineering studies.

2. Control in the Environment: The most effective method for noise control is to eliminate or reduced in the source of the noise. In this case, the preventions to be taken should be intensived on the way the voice spreads.

3. Receiver Control: The sound should be reduced on the source and on the way past. If receiving measures are not applied, protective measures must be taken on the persons exposed to the noise.

2. MATERIALS and METHODS

2.1. Material

2.1.1. General Presentation of Fırat University Campus

The Fırat University campus was built on approximately 9,277 hectares of land. The university campus is located in the center of Elazig city center and is a distinguished campus. Access to the university is provided by road. However, there are three routes to the university. These routes are; University Street Entrance, Malatya Street Entrance and Zübeyde Hanım Street Entrance. Public transport has been working regularly on a college campus. Public transport is constantly using the University District entrance to access the university. The average time of transportation from the city center to the campus is 10 minutes. In addition, students and staff provide transportation between the city and the campus by special vehicles. The student and staff tools also use three routes.

Fırat University has 16 faculties, 3 colleges, 1 State Conservatory, 9 Vocational Schools, 4 Institutes, 23 Research and Application Centers. and the developed universities of our country. Fırat University is among the developed universities of our country. Fırat University is continuing its education and training activities with 40.664 students and 1790 academic staff.

Figure 3.1. Pilot Region Satellite Photo

2.1.2. Noise Measurement Points

In this study; Fırat University Campus was chosen as the study area. Noise measurements were made at all intersections inside the campus. For this purpose, 13 different intersections were selected within the

campus. Noise measurements were made between 07:00 - 10:00 in the morning, 11.00 - 14.00 noon, 16:00 - 18:00 in the afternoon and 19:00 - 20:00 in the evening. Measurements were made for a total of 9 hours. Measurement stations identified In Table 3.1, the satellite view of the measurement points at Fırat University is also given in Figure 3.1.

Table 1. The Measuring Stations

THE MEASURING POİNTS	THE MEASURING STATIONS
1	Engineering Faculty Entrance Junction
2	Ataturk Cultural Center Junction
3	Engineering Lodgings Junction
4	Alparslan Turkeş Junction
5	Zübeyde Hanım Street - Aspirin Cafe Entry Point
6	Rector's Building Entry Point
7	Rectorate Lodgings Junction
8	Faculty of Technology Junction
9	Fine Arts Education Department Interchange
10	Animal Hospital Junction
11	Faculty of Humanities and Social Sciences Junction
12	University Hospital Junction
13	Dentistry Faculty Junction

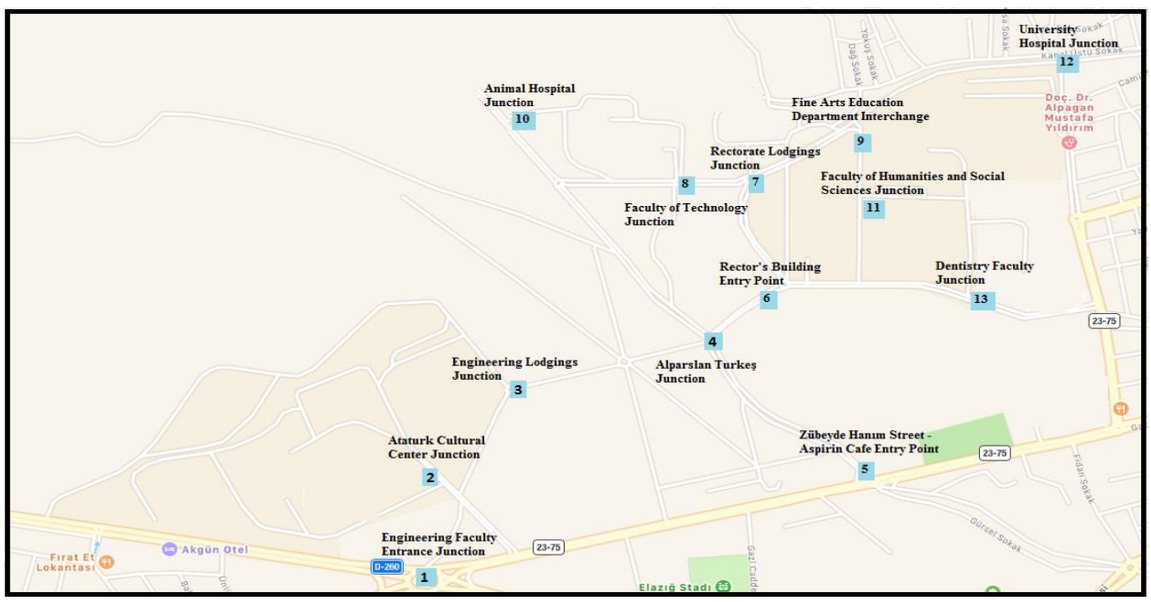

Figure 3.2. The View of Measured Points at Fırat University.

2.1.3. Device Used

Noise measurements were conducted with sound measuring instruments. A measuring instrument of the type DIN 45633 was used during the measurements. The general view of the device used for noise measurements is given in Figure 4. The instrument is calibrated before the measurements. Noise measurements has determined as Lmin, Leq, Lmax.

Figure 3.3. Overall Appearance of the Device Used in Noise Measurements

2.1.4. Making of Noise Measurements

Noise values measured in an open environment were made at a height of 1.5 meters. Care has been taken to avoid noise during measurements. When the measurements were made, the sections of the intersections facing the road were selected.

3. RESEARCH FINDINGS

Noise measurements were made at 13 points determined on the campus of Fırat University. Noise measurements made according to the points in the measured hours of measurement are given in Table 4.1.

Noise values at the measurement points were compared with the Assessment and Management Regulation of Environmental Noise No. 27601 published in the Official Gazette dated June 4, 2010 issued by the Ministry of Environment and Urban Planning.

In the Assessment and Management of Environmental Noise Regulation' areas where there are many training locations for " Traffic Noise " were selected as the basis. Highway Environmental Noise Limit Values as shown in Table 4.1, it is not essential to exceed 65 dB in the daytime, 60 in the evening and 55 dB in the nighttime.

Highway Environmental noise limit values as shown in Table 4.1 it is not essential to exceed 65 dB in the daytime, 60 in the evening and 55 dB in the nighttime.

Table 4.1. Highway Environmental Noise Limit Values

AREAS	PLANNED / RENEW / REPAIRED WAYS			AVAILABLE WAYS		
	Lday (dBA)	Levening (dBA)	Lnight (dBA)	Lday (dBA)	Levening (dBA)	Lnight (dBA)
Areas where education, culture and health care, as well as summer and camping sites are predominantly sensitive to noise	50	55	50	65	60	55
Areas where commercial buildings and noise sensitive uses are concentrated in areas where houses are concentrated	63	58	53	68	63	58
Areas where workplaces are heavily involved in areas where commercial structures and noise sensitive uses coexist	65	60	55	70	65	60
Industrial Areas	67	62	57	72	67	62

As a result of the noise level noise measurements made in Fırat University campus is were found between 57 dB (A) and 102 dB (A). According to the obtained noise data; It has been determined that the noise generated in the campus of Fırat University is the source from traffic.

The lowest noise level within the campus is 57 dB (A) 'and 65 dB (A). The lowest noise level was observed during the daytime in the campus. 'According to the Regulation on the Assessment and Management of Environmental Noise', Atatürk Cultural Center Crossroads (2th Point) is below the stated limit value. In addition, Engineering Lodgings Junction (3th Point), Rectorate Lodgings Junction (7th Point) and Dentistry Faculty Junction (13th Point) have reached the limit value during daylight hours.

The highest noise levels in the campus are 93 dB (A) and 102 dB (A). The highest noise level was also observed during the daytime in the campus. The first one is Zübeyde Hanım Caddesi - Aspirin Cafe Entrance Point (5th Point) and the second is Animal Hospital Crossing (10 th Point).

The reason why the noise is high at 3th point (Zübeyde Hanım Street - Aspirin Cafe Entrance Point) is due to the high traffic density at all hours of measurement. The reason why the measured value increases at the 10th point (Animal Hospital Junction) ıs originating to the working machines working here.

4. RESULTS

In this study, the existing roads within the campus of Fırat University were examined in terms of environmental noise.

The measured noise levels in the university campus were observed the highest in the 5th point (Zübeyde Hanım Street - Aspirin Cafe Entry Point) in day time periods. At this point, the minimum noise level was found to be 65-92 dB (A) and the maximum noise level was found to be 73-102 dB (A).

Between 19.00 and 20.00 hours covering the evening time period, noise sensitive areas were observed to concentrate at a minimum of 70-79 dB (A) and a maximum range of 82-87 dB (A).

The noise levels in the study area were compared with the limit values in Table 1 of Annex-7 to the "Assessment and Management of Environmental Noise Regulation ".

The noise level was below the limit at the 2nd and 13th points between 07.00-10.00 hours in the day time period. At other points, the limit values given in the regulation are exceeded.

The noise level is below the limits in the 2nd and 9th points in the daytime time zone between 11.00-14.00 min. At other points, the limit values given in the regulation are exceeded.

The noise level was below the limit at the 2nd points between 16.00-18.00 hours in the day time period. At other points, the limit values given in the regulation are exceeded.

In the case of noise level evening time, between 19.00 and 20.00 hours, the limit values given in the regulations were observed at all points.

The measured noise levels at Alparslan Türkeş Boulevard passing through the campus during the noise measurements made in the study area were 84-94 dB (A) in the day time periods. At evening time, it was observed to be 71-84 dB (A).

It is seen that the measurements made in Alparslan Türkeş Boulevard exceed the limit values given in the regulations. Campus. The high level of noise on Alparslan Türkeş Boulevard increases the level of noise on the campus. One of the reasons why the noise level on the campus is increasing is that the promenade area is between the rectorate Campus and the Engineering Campus.

Considering the data obtained as a result of the study, it is necessary to make various plans and regulations within the campus area in order to minimize the noise levels because the noise

levels in the areas within the campus are above the stated limit values. For this reason, it is necessary to choose the public transportation vehicles for the restriction of the vehicles entering the campus area and the decrease of the traffic density.

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