

The impact of noise on residents and workers in industrial activities in the city of Najaf

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Abstract

The two questionnaires distributed to the (500) neighborhoods of the city of Najaf revealed that there is a clear spatial discrepancy about the sources of noise in the city, including machines and industrial factories. If we exclude the industrial neighborhoods, we find that they are in the form of four zonal regions within the residential neighborhoods, which are the high regions with high laboratory noise, and it constitutes a percentage of more than 5%. And the second in the south of the city in the neighborhoods of Al-Jadida, the third and the old city. Carpentry factories affect the residents near them, because most of them are located within residential neighborhoods and close to commercial streets, resulting from the sounds of water pumps used to wash cars, and the number of workers in all these shops is (92-184) workers exposed to these loud sounds.

Keywords: loud sounds, workers, pollution, factories, questionnaires

Introduction

Noise is an old problem that has become today one of the most important problems that accompanied prosperity and civilized development, and many negative negatives have emerged because of it, whether psychological, health or mental, and thus affect his performance, a problem that increases day after day, especially in crowded urban areas And wherever it is found and its intensity has increased , there is noise or noise resulting from several sources, most of which are made by humans, and they are different from one place to another. The noise of homes differs

from street noise and from work noise, or the noise may be caused by overlapping sounds in the road when the sounds of cars overlap with the sounds of the sources. the other w ,hatever the case the voices are present in our daily lives and have become a feature of contemporary life that affects the life of the human being who is trying with his capabilities to reduce its impact on him. The noise of major cities from means of transportation such as trains, planes and cars, and what is added to them from the sounds of laboratories, and all movement affects the person psychologically, healthily, and organically, especially the effect of these sounds on the sense of hearing and the resulting anxiety, nervous tension and loneliness in the mood, so that the matter ends with no The contentment and distress that a person shows in the course of his life.

The study Problem

Here, the researcher wonders a bout the industrial sources of noise pollution in the city of Najaf in the following way

What are the industrial sources that affect the occurrence of noise pollution in the city of Najaf?

In order to reach a general answer to the main problem, the following sub-problems come

- 1- What is the impact of noise on residents and workers in industrial activities that emit noise pollution ?
- 2- What are the levels of noise pollution resulting from industrial activity?

Study hypothesis :

- 1- ,There is variation in the impact of noise on residents and workers in industrial activities which results in noise pollution in the city of Najaf from one neighborhood to another.
- 2- There is a discrepancy in the levels of noise pollution from one industrial activity to another, according to the nature of each activity.

Study objective :

The study aims to indicate the industrial sources that have an impact on the occurrence of noise pollution, with an indication of their geographical distribution and their impact on the population and workers in industrial activities within the neighborhoods of the city of

Najaf, and to clarify the levels of noise pollution resulting from them and the extent of their impact on the workers in them and the population close to these activities in order to .clarify solutions and proposals to whom It reduces noise pollution levels

study area boundaries

The study area is represented in the city of Najaf, which is located at the intersection of longitude 44 19 east and latitude 59 31 north. The location of the city of Najaf in relation to the Iraqi Maamour is characterized by that it is located on the southwestern margin of the Maamour, as it is determined at the extreme southern end of the northern section of the Iraqi plain and at the edge of the western plateau at a map .. (1) distance of (11) km to the west of the Euphrates River overlooking the Najaf sea depression (1)

.And as for the relationship of the city's location with the administrative units in the governorate it is bordered to the north by the city of Al-Haydariyah, from the southeast by Abu Sakhir city, and from the east by the city of Kufa, which is now connected to it urbanly after it was 10 km away from it, and it is far from the capital, Baghdad (160) km and the city of Karbala (78) km and the city of Hilla (60) km. The boundaries of the study area include the city of Najaf al-Ashraf with all its (49 neighborhoods, map) (2)

Study structure

The research was divided into several axes :

- 1- Introducing the studied phenomenon
- 2- Industrial sources of noise pollution in the city of Najaf
- 3- suggestions and solutions

Source: Ministry of Municipalities and Public Works, Directorate of Najaf Municipality, Surveying Department, Najaf City Administrative Map for the year 2020

First- Definition of the studied phenomenon :

1- Noise pollution concept

Noise pollution is the result of sounds that negatively affect humans, and sound is defined as those waves that have the character of a harmonious musical arrangement. There is another definition, as an external influence that affects the ear, causing a sense of hearing. The air around it forms waves that spread in all directions. These waves are known as sound waves, and the sound is completely cut off when the vibrating body stops vibrating. It is also known as noise: it is those waves that do not have the character of a ⁽²⁾ unified musical order. Noise is defined as: those unwanted sounds due to their high intensity and intensity ⁽³⁾ and their departure from the normal sounds that both humans and animals are accustomed to hearing. ⁽⁴⁾

Noise is also defined as a type of vibrational air pollution emitted in the form of waves, as the word noise is derived from the Latin expression *nauses*, and there are many different definitions of noise. You define it as ⁽⁵⁾ (unwanted sound)

Noise pollution is defined as one of the sources of environmental pollution, the noise of major cities, where the annoying tools and means of transportation such as cars, trains, and planes, and the annoying roar and It is also defined as: the noise that has increased ⁽⁶⁾ noise in factories and laboratories that accompany them in intensity and intensity and gone out of the ordinary and natural to the extent that causes harm and harm. It can be defined as: are the sounds ⁽⁷⁾ to humans, animals, plants and all components of the environment that are undesirable to be heard, and noise is one of the most dangerous diseases of the age and affects the human ability to comprehend and work, as it exposes him to disturbance. Noise pollution is also defined ⁽⁸⁾ as: sounds that disturb or harm a person, and it is sometimes difficult for people to agree on describing a specific sound as annoying or unobtrusive due to cultural, age or other differences. For example, disco music in Europe is the fun of European youth And unbearable torment for Muslim youth, and when referring to the definition of the “World Health Organization” of human safety, he says that the safety of

human health does not mean that he is free from diseases, but also his social well-being and psychological ⁽⁹⁾ state, and noise can be considered harmful to health according to that definition .

Unwanted sound waves are considered noise because the human ear is very sensitive It can withstand sound waves whose frequency ranges between 20 and 2000 degrees Hertz Hertz is the frequency or number of vibrations per second. And I want to clarify here Not all sounds ^{are} detectable by the human ear ¹⁰

2 - Noise measurement methods :

noise is measured by a unit of measurement known as(Decibel) and this scale starts from zero as the sounds are very faint to 130 dB (as the sounds cause pain . Bell , The term "dB" is used as a unit , of sound intensity, for example 0 dB is a threshold The audible sound, 10 dB represents the intensity of the quiet rustle of leaves, 90-100 dB represents The intensity of the sound of thunder, 130 dB represents the human pain threshold, 140 dB represents the intensity of the sound Launching a rocket into space. The sounds are usually divided into several degrees: audible sounds - very quiet sounds - quiet sounds - medium-high sounds - very loud sounds - annoying sounds, and these last sounds that cause pain when their intensity ⁽¹¹⁾ reaches 130 decibels .

Second - Industrial sources of noise pollution in the city of Najaf and its impact on the population and workers

The city of Najaf is distinguished by its industrial diversity, as the number of types of industries from which noise is produced reached (8) types of industries spread in the city's neighborhoods, as follows :

1 - Spatial distribution of generators in the city of Najaf

The types and sizes of generators vary in the city of Najaf. There are three sizes of generators, which are large generators and are used in hotels, government institutions, and in laboratories, and medium-sized generators are used to feed residential neighborhoods, some restaurants, large stores, industrial factories , and small-sized generators) found in Most of the homes and small shops have sound levels 120-116 -85 88 which is higher than the permissible limits for the three times within the industrial ⁽¹²⁾ decibels 79-77

zones, see Table 1 Therefore, we cannot give an accurate statistic about the number of generators in the city of Najaf, due to the difficulty of fully enumerating them, and we will rely on the available statistical data. It appears from Table 2 that the number of medium-sized generators that feed the residential neighborhoods in the city of Najaf is 551 and the number of these generators varies from one neighborhood to another and depends on the area of the neighborhood and the number of residents. In the number of medium-sized generators, which amounted to 7 while the percentage of generators in Al-Mukarramah neighborhood and Al-Ansar neighborhood was occupied by 6.3 % ,in the fourth new neighborhood, 4%, in the neighborhood of Prince and Zahra 2.9 in the neighborhood of justice and the old city, 2.1 in the neighborhood of al-Quds and al-Ghadeer, 2 in the neighborhood of al-Ghari (1.8) and in the neighborhood of al-Sawaq, al-Thawra, al-Shurta and al-Hindiya and its percentage in Al-Karama, 1.4 and Al-Saad neighborhoods was 1.2 and in Al-Hanana, Al-Hussein and Al-Jadida the third neighborhoods 1 %

Table1 Maximum permissible noise intensity in different areas

Permissible daily rate of sound / intensity decibels	The permissible limit of sound intensity / decibels			Region type
	At night: from pm to 7 am 10	Evening: from pm to 10 pm 6	Day: from 7 in the morning until 6 in the evening	
60-50	55-45	60-50	65-55	Commercial and administrative areas and the city center
55-45	50-40	55-45	60-50	Residential areas with somefactories or businesses or on the public road
50-40	45-35	50-40	55-45	Residential areas of the city
45-35	40-30	45-35	50-40	Residential suburbs with little traffic
40-30	35-25	40-30	45-35	Rural residential areas, hospitals and parks
65-55	60-50	65-55	70-60	Industrial zones, industrial zones and heavy industries

Source: Muhammad Ahmed Khalil, Environmental and Health Engineering Supplements, Scientific Books House for Publishing and Distribution, Abdeen - Cairo, 2010, p. 38

Table 2 The number of generators in the city of Najaf, according to its revival for the year 2020

of the total %	number of generators	District	T
7	39	victory	1
7	37	Association	2
7	36	military	3
7	36	Fulfillment	4
6.3	35	Al Mukarramah	5
6.3	35	Ansar	6
5	28	Birth	7
4.1	23	peace	8
4.1	23	the University	9
4	22	new4	10
2.9	16	the prince	11
2.9	16	Zahra	12
2.5	14	Qadisiyah	13
2.5	14	Al Jazeera	14
2.1	12	old City	15th
2.1	12	Justice	16
1.8	10	the greedy	17
2	10	Quds	18
2	9	Ghadir	19
1.4	8	drivers	20
1.4	8	revolution	21
1.4	8	the police	22
1.4	8	Hindi	23
1.2	7	Euphrates	24
1.2	7	dignity	25
1.2	7	Al-Saad	26
1	6	tenderness	27
1	6	ELHussein	28
1	6	new3	29
0.9	5	housing	30
0.9	5	Al-Imam Al-Mahdy	31

0.7	4	deported	32
0.7	4	Double	33
0.7	4	new1	34
0.7	4	new2	35
0.7	4	teachers	36
0.5	3	Abu Talib	37
0.5	3	Residential buildings	38
0.5	3	socialist	39
0.5	3	Scientists	40
0.3	2	oil	41
0.3	2	the call	42
0.3	2	Abu Khaled	43
0.3	2	precipices	44
0.3	2	poets	45
0.3	2	the health	46
0.1	1	Imam Ali	47
%100	553	total	48

Source: Ministry of Oil, Petroleum Products Distribution Company, Najaf Branch, Distribution Division/Processing Division, Residential Generators Unit, unpublished data, 2020

And in the Al-Iskan and Imam Al-Mahdi neighborhoods (0.9%), and in the neighborhoods of Al-Marhaleen, Al-Muthanna, Al-Jadida, Al-Jadida, Al-Jadida, the second, and teachers (0.7)%, and in the neighborhoods of Abu Talib, the residential buildings, the Socialist and the Scholars (0.5)%, while the percentage in the Al-Naft, Al-Nidaa, Abu Khaled, Al-Shaafa', and Al-Shu`ara neighborhoods reached (0.3)%. Finally, in the Imam Ali neighborhood, 0.1%

This spatial gradation of the number of generators leads to the division of neighborhoods in the form of four regions, which is the extreme high range and includes seven neighborhoods with a rate of 5% or more which are neighborhoods (Al-Nasr, Al-Jami', Al-Askari, Al-Wafa, Al-Makarama, Al-Ansar and Al-Milad), and the second region is the high and includes three neighborhoods with a ratio of (3-4.9%) These are the neighborhoods (Al-Salam, Al-Jamaa and Al-Jadeeda the fourth) and an average region, with a ratio of (19) neighborhoods (1-2.9%) which are the neighborhoods (Al-Amir, Al-Zahraa, Al-Qadisiyah, Al-Jazirah, the Old City, Al-Adala, Al-Ghari, Al-Quds, Al-Ghadir, Al-Sawaq, Al-Thawra, Al-Shurta, Hindi Al-Furat, Al-Karama, Al-Saad, Al-Hanana, Al-Hussein and Al-Jadida the third) and a quiet region and

,includes (17) Neighborhoods with a percentage of less than 1%, which are the neighborhoods of (Housing ,Imam Al-Mahdi, Al-Mahrahil, Al-Muthanna, Al-Jadida, Al-Jadida, Al-Jadeeda, the Second, Al-Moallem Abu Talib, Residential Buildings, Al-Sharki, Al-Ulama, Oil, Al-Nida, Abu Khaled, Al-Shaafa', Al-(Shu`ara, Al-Shu`ara, Al-Imam Ali and Al-Saha

The spatial distribution of the noise source, which is the generators in the form of regions, their distribution agrees with the distribution of the noise regions specified in the spatial distribution of the noise itself

The level of assurance that generators are one of the sources of noise pollution for the year 2020

The questionnaire forms distributed to the city's 700 neighborhoods revealed that there is a clear spatial ,discrepancy about the sources of noise in the city, including generators. With a percentage of (5)% or more it appears in two zones, the first in the north of the city in the neighborhoods of Al-Askari and Al-Makarama, and the second in the south of the city in the third districts of Al-Ansar and Al-Jadida. To the west of the city in the neighborhoods of Al-Jazeera and Al-Nasr and the other in the south of the city in the police district. As for the third region, which is an average region with the noise of generators, it included a number of neighborhoods that amounted to (15) neighborhoods, and their percentage ranged from (1- and it is a dispersed region that included neighborhoods (Al-Wafa', Hindi, Jamiyah, Birth, Old and (%2.9 (New City, first and new, fourth, Revolution, Shafi', Qadisiyah, Zahra, Amir, Jerusalem, Saad and Karama A large number of (24) neighborhoods, with a rate of less than 1%, and they are

Neighborhoods University, Salam, Ghary, Oil, Adalah, Residential Buildings, Al Furat, Al Ghadeer, Al ,Saiha, Poets, Scholars, Al Marahaleen, Al Hananah, Al Hussein, Al Jadeeda Al Thanya, Drivers, Housing ,(Al Socialist, Al Imam Al Mahdi, Al Moalemeen, Al Imam Ali, Muthanna, Abu Khaled and the craftsmen the field study came somewhat close to what the recorded data and numbers came in In government departments about setting up generators in each neighborhood. Note that these generators are of medium size only, in addition to the fact that there are generators that were not registered in the records and include generators of markets and shops

,Noise arises from the sounds of generators during their operation and these sounds vary in intensity depending on the size of the engine. Generators whose engine size is (2-4) (cylinder) are low in noise and are represented by small-sized generators and generators whose engine size is 10-8-6 cylinder They are . high in noise and are represented by medium-sized generators whose engine size is (12-14-16 cylinders . These sounds affect the workers in them primarily⁽¹³⁾ They are large generators and have very loud sounds and on the residents near them, and the more their number increases in residential neighborhoods, the more

Noise increased and the number of workers working in each generator reached two factors, thus the number of workers directly affected by noise reached 22 11 in addition to its direct impact on the population near , these generators

Table 3 Confirmation percentage that generators are one of the sources of noise in the city of Najaf for the year 2020

Percentage of votes out of the total % number of applications	Number of votes for generator	Number of forms (sample)	Mahalla
9.6	48	51	Ansar
7	35	37	military
4.8	24	35	Al Jazeera
5.6	28	32	Al Mukarramah
6.4	27	32	new3
3	15th	30	victory
3.2	16	21	the police
2.2	11	19	new4
2.6	13	17	the prince
1.8	9	16	Association
2.4	12	15th	Zahra
2.8	14	15th	old City
2.2	11	14	Birth
1.8	9	14	precipices
2	10	14	Qadisiyah
1.8	9	11	Loyalty and Hindi
0.6	3	11	ELHussein
2.2	11	11	new1
1.4	7	8	Quds
0.8	4	8	the University
0.8	4	8	Ghadir
1	5	7	Al-Saad
0.8	4	7	drivers
0.4	2	6	the greedy
0.8	4	6	oil
0.4	2	6	Teachers and Imam Ali

1	5	5	dignity
0.8	4	5	new2
0.4	2	5	deported
1	5	5	revolution
0.2	1	4	tenderness
0.4	2	4	Poets and scholars
0.8	4	4	housing
0.8	4	4	socialist
0.6	3	3	Residential buildings
0.2	1	2	Al-Imam Al-Mahdy
0.4	2	2	the health
0.4	2	2	Muthanna Abu Khaled
0	0	1	Justice
0.2	1	1	Craftsmen
0.2	1	1	peace
0	0	1	Euphrates
-	374	500	Total

Spatial distribution of iron factories

In the city of Najaf there are 297 blacksmithing factories scattered in the neighborhoods of the city of Najaf. Table 4 These factories are highly concentrated within the industrial area in the craftsmen neighborhood, as their percentage reached 38 as well as in the industrial district with a percentage of ,% 18 % These laboratories are concentrated in the northern neighborhoods, as their percentage reached 7% in Al-Mukarramah district, 6% in Al-Jazirah district, 5% in Al-Askari district, 3% in Al-Nasr district, and %2.3 in Al-Salam district. The old city with a percentage of (5.3%), and the percentage in the third new %4.7 and the percentage in the police district 3 and in the fourth new 2.3 , and in the neighborhood 1.6 and there are some small factories scattered in some The city's neighborhoods, as the percentage in Al- ,% Zahra' neighborhood reached 1 and the percentage in the neighborhoods of Al-Thawra, Al-Wafa' and ,% Al-Jama'ah neighborhoods was (0.6%) and in Al-Ghari neighborhood 0.4 The number of workers in .% ironfactoriesfactories is 4-9 ,workers, as these factories contain devices for cutting iron called large-sized

, (dB 90-87¹⁵ .((which have noise levels of about 119-125 96-99 ,⁽¹⁴ medium-sized and small-sized (kosrat which is higher than the permissible limits for the three times within the ranges of industrial places Table as these devices emit loud sounds when cutting iron that affect workers in these laboratories, as shown ,1 in the second chapter by measuring the levels of The noise in these laboratories, and if we estimate the number of workers in these laboratories, it ranges between 964-2169 workers exposed to noise, and these sounds also affect the residents near these laboratories, especially if it is known that some of these . laboratories are located within the only residential neighborhood

3 - Spatial distribution of carpentry workshop laboratories

In the city of Najaf there are 167 factories for carpentry factories scattered in the neighborhoods of the city of Najaf Table 4. These factories are highly concentrated within the industrial zone in the craftsmen neighborhood, reaching a rate of 32 and these factories are also concentrated in some northern ,% neighborhoods As its percentage in Al-Nasr neighborhood is (9%), and in Al-Mukarramah and Al-Askari neighborhoods 7.1%, its percentage in Al-Jazirah and Al-Milad neighborhoods is 3 ,and in Al-Salam ,% Al-Jami'a and Al-Jama'ah neighborhoods is %2.3 ,and its percentage in Al-Wafa neighborhood is 1.7% , while the percentage of In the old and third new cities 6 and in Al-Jadida the fourth 5.3%, their ,% ,percentage decreases in the city center, as their percentage in the neighborhoods of Al-Ghadir, Al-Karama Al-Hussein and Al-Adala 0.5-1.1-1.1-1.7 respectively, and it decreases in the southern and southern % neighborhoods Al Sharqiah of the city as it reached the highest in Al-Qadisiyah neighborhood with a percentage of %2.3 and it reached in Al-Shurta neighborhood 2 in the neighborhood of Al-Zahraa ,% %1.7 and in Al-Quds neighborhood 0.5 %

- Variation in the total distribution of iron and carpentry factories in the city of Najaf for the year 2020

The total number of factories and industrial factories (iron and carpentry factories) in the city of Najaf is 464 factories. With a rate of 11.2 it is noted that these factories are concentrated in the northern ,% neighborhoods, as their percentage reached 7 ,in Al-Mukarramah neighborhood % 6 Al-Askari neighborhood, and 5 Al-Jazirah neighborhood, and there is a lower concentration in the neighborhoods Al-Jami'ah, Al-Salam and Al-Jami'ah at 3.4 2- 2.3 - respectively, and there is a concentration of it in ,% the south of the city in the neighborhoods of the old and the third new city at a rate of 5.1-7 ,% respectively, while its percentage in the neighborhoods of the fourth new and the police reached -3.4 %2.5 While its percentage in the neighborhoods of Al-Zahraa and Al-Jami'ah was %1.2 and its ,

The researcher's field study on February 15, 2020 -³
on 11/5/2020 (Digital Sound Level Meter AR824) The researcher's field study using a sound level meter -3

percentage in the Al-Wafa', Al-Milad and Al-Qadisiyah neighborhoods was 1 and in the Al-Ghadir ,% neighborhood was 0.6 and its percentage in the ,% (Al-Thawra, Al-Karama, Al-Hussein and Al-Quds neighborhoods was %0.4 and it constituted a small percentage In the neighborhoods of , Al-Ghari and Al-Adala 0.2 %

And the percentage of blacksmithing factories exceeds the percentage of carpentry factories in the city of Najaf, as iron factories constitute a percentage of %64 while the percentage of carpentry factories is %36 of the total number of factories in Table 4 so it is noted that iron factories are more widespread and , numerous. One of the carpentry factories in the holy city of Najaf

If we exclude the industrial neighborhoods, we find that they are in the form of four zonal regions within the residential neighborhoods, which are the regions that are very high with factory noise and constitute a percentage of more than 5 The Third New and the Old City) Map (6). As for the higher region, which .% has a rate of %4.9-3 it appears in one zone in the south of the city in the fourth new city. As for the , average region in the number of factories and laboratories, which constitutes a ratio in different (%2.9-1 places of the city and in a scattered manner in the neighborhoods Al-Shurta, Al-Salam, Al-Jami'ah, Al-Zahraa, Al-Wafa, Al-Jama'a, Birth and Al-Qadisiyah As for the calm region, which is characterized by . the lack of laboratories and factories , which constitutes less than 1% It included the neighborhoods of Al-Thawra, Al-Ghari, Al-Ghadir, Al-Hussein, Al-Karama, Al-Adala, and Al-Quds .

Table 4 Spatial distribution of iron and carpentry factories in the city of Najaf by shops for the year 2016

The %ratio	total summation	The %ratio	carpentry factories	The %ratio	blacksmithing factories	Mahalla	T
36	166	31.7	53	38	113	Artisan District	1
11.2	52	0	-	18	52	- Industrial District Kufa	2
7	32	7.1	12	7	20	Al Mukarramah District	3
5	23	3	5	6	18	Al Jazeera neighborhood	4
6	26	6	10	5.3	16	old City	5
6	27	7.1	12	5	15th	Military district	6
5.1	24	6	10	4.7	14	new third	7

2.5	12	2	3	3	9	Police District	8
5.1	24	9	15th	3	9	victory	9
2.3	11	2.3	4	2.3	7	Salam District	10
3.4	16	5.3	9	2.3	7	Fourth new	11
2	9	2.3	4	1.6	5	Assembly District	12
1.2	6	2	3	1	3	al Zahraa district	13
1	5	2	3	0.6	2	Al-Wafa neighborhood	14
0.4	2	0	0	0.6	2	Revolution District	15th
1.2	6	2.3	4	0.6	2	University neighborhood	16
0.2	1	0	0	0.4	1	Al-Ghari district	17
0.4	2	0	-	0.6	2	Aden neighborhood	18
1	5	3	5	0	0	birth district	19
0.6	3	2	3	0	0	Al Ghadeer District	20
0.4	2	1.1	2	0	0	Karama neighborhood	21
0.4	2	1.2	2	0	0	Al-Hussein neighborhood	22
0.2	1	0.5	1	0	0	Justice District	23
1	5	3	5	0	0	Qadisiyah neighborhood	24
0.4	2	1.1	2	0	0	Jerusalem neighborhood	25
%100	464	%100	167	%100	297	total	

The level of confirmation that industrial factories are one of the sources of noise pollution for the year 2020

The two questionnaires distributed to the (500) neighborhoods of the city of Najaf revealed that there is a clear spatial discrepancy about the sources of noise in the city, including machines and industrial factories. It appears from Table 5 and Map 7 that the industrial factories appear in four regions, according to what This was confirmed by the questionnaire survey, which is the high region with coefficients. It appears in two bands, the first in the north of the city and northwest of the city in the neighborhoods of ,Al-Makarama

Al-Askari, Al-Jazeera and Al-Nasr and the second in the south of the city in Al-Jadeeda, the third. The second high region with a rate of %4.9-3 appears in the south of the old city. The average of the sources of factories and laboratories, which is 2.9-1 appears in ,% 8 ,different neighborhoods in their places which are the neighborhoods of (Al-Wafa', Al-Hindi, Al-Jami'ah, Al-Milad, Al-Jadida Al-Awwal, Al-Shafa'a, Al-Quds and Al-Ansar. 1 ,percent, which includes a large group of scattered neighborhoods ,which numbered (28), which are the neighborhoods of (Al-Jamea, Al-Salam, Al-Ghari, Al-Naft, Al-Adala ,residential buildings, Al-Furat, Al-Ghadeer, Al-Saha, Al-Karama, Al-Shu`ara, Al-Ul Maa, Al-Murahhelin ,Al-Hanana, Al-Hussein, Al-Sa'ad, Al-Jadeeda, the second, the fourth, Al-Thawra, Al-Qadisiyah, Al-Zahra Al-Amir, Al-Amir, Al-Suwaq, Housing, Socialist, Imam Al-Mahdi, Al-Moalemeen, Imam Ali, Al-Muthanna, Abu Khaled and Al-Harfeen Al-Residential What was confirmed by the survey. The number . of workers in the carpentry workshop laboratories is 10-5 workers. These laboratories contain wood cutting devices and they are of different types, large, medium and small in size, and their sound levels are 109-104 93-88 83-80 Which is higher than the permissible limits for the three times within⁽¹⁶⁾ .decibels the industrial places' ranges Table 1 as they all emit loud sounds that affect the workers in these , laboratories, and the number of workers in these laboratories is 1280-640 .workers exposed to noise Carpentryfactories are intended for residents near them, because most of them are located within residential neighborhoods and close to commercial streets, resulting from the sounds of water pumps used .to wash cars, and the number of workers in all these shops is 92-184 workers exposed to these loud sounds

Table 5 Confirmation percentage that machines, laboratories and factories are one of the sources of noise in the city of Najaf for the year 2020

Percentage of votes out of the total % number of applications	Number of votes forfactories	Number of forms (sample)	Mahalla
2.4	12	51	Ansar
6.6	33	37	military
6	30	35	Al Jazeera
6	30	32	Al Mukarramah
5.2	26	32	new3
5.4	27	30	victory
1	5	21	the police
0.4	2	19	new4

0.8	4	17	the prince
1.2	6	16	Association
0.4	2	15th	Zahra
3	14	15th	old City
1	5	14	precipices
0.2	1	14	Qadisiyah
1	5	11	Loyalty and Hindi
1.2	6	14	Birth
1.2	6	11	new1
0.6	3	11	ELHussein
0.4	2	8	the University
1.6	8	8	Quds
0.2	1	8	Ghadir
0.6	3	7	Al-Saad
0.2	1	7	drivers
0.2	1	6	the greedy
0.2	1	6	oil
0.2	1	6	Teachers and Imam Ali
0.2	1	5	deported
0.2	1	5	new2
0.4	2	5	revolution
0.6	3	5	dignity
0.2	1	3	Residential buildings
0.4	2	4	Poets and scholars
0.2	1	4	tenderness
04	2	4	housing
0.2	1	4	socialist
0.2	1	2	the health
0.2	1	2	Al-Imam Al-Mahdy
0.2	1	2	Muthanna Abu Khaled
0.2	1	1	peace
0.2	1	1	Euphrates
0.2	1	1	Craftsmen
0.2	1	1	Justice
-	256	500	Total

Table 6 Industries and crafts from which noise arises in the city of Najaf for the year 2020

Total	aluminum modulus	Grain crushing factor	Auto repair shops	Alkashi and stiker coefficients	Washing and lubricating shops	industries and a letter Biology
28	10	6	0	12	0	Artisan District
57	8	0	0	49	0	Aden neighborhood
107	0	0	94	0	13	The industrial district of Najaf-Kufa
10	0	0	0	0	10	The industrial district of Najaf-Karbala

- **Alkashi and stiker coefficients**

In the city of Najaf, there are 61 laboratories for the kashi and the sticker, all of which are located in the neighborhood of Aden and the Al-Harfeen neighborhood table 6 and map 8 as there are , 49 of them within the Aden neighborhood and 12 factories in the craftsmen neighborhood, and the sound levels in it are 96-106 decibels ¹⁷ dB which is higher than the permissible limits for the three times within the , zones of industrial places see Table 1 The number of workers in these laboratories is 14-7 workers, the loud sounds from these laboratories are represented by the devices used from the cutting machines And batters and others, and it is estimated that the number of workers in these laboratories is 854-427 workers .exposed to noise.

Auto repair shops auto body repair

In the city of Najaf there are 94 car repair shops, all of them are located in the industrial district of Najaf Kufa. There are different types of devices used for car repair, which are iron cutting devices cousters - of

various types and their sound levels are decibels 114-108 .and hammers of different sizes with sound levels of 117-115 decibels, iron piercings, and sound levels of 94-91 which are higher than ⁽¹⁸⁾ decibels the permissible limits for the three times within the zones of industrial places see Table 1 and all of them , are issued Loud noises as the number of workers in these shops ranges from 9-5 and if the number of , workers in car repair shops is estimated to 470-846 workers are exposed to noise

Grain crushing plants

There are (9) grain crushing plants in the city of Najaf (table 6 and map 8 as there are , 7 of them in the Al-Harafeen neighborhood and 2 of them in Al-Madina Street, and the sound levels in it are 82-87 which is higher Of the permissible limits for the three times within the ranges of industrial , ⁽¹⁹⁾ decibels places is Table 1, and the number of workers is from (3-5) workers, and the noise in these factories is represented by the sounds of grain crushers that emit loud sounds, and the number of workers in these factories 45-18 . workers

- Factories of aluminum

It is higher than the permissible limits for the ²⁰Harfeen neighborhood and (8) in the Aden neighborhood three times within the industrial zones, see Table 1 and the number of workers in these laboratories is from 11-5 workers, and if the total number of workers in these laboratories is 198-9 workers exposed to noise

Third , suggestions and solutions

- 1- That the local, central, religious or social authorities spread environmental awareness and define the dangers of noise and benefit from the educational, media and educational means and the various activities .available in that
- 2- Control of noise emanating from industry and regulating noise sources so that they do not emit as little noise outside as possible by placing noise-emitting devices on insulating floors or placing sound-insulating materials so that sound waves do not spread to the outside except to a limited degree, and noise sources

can be controlled itself by making changes in the engineering of machinery and on workers who work in high-noise factories

- 3- The use of noise-polluted industrial centers as silencers (ear ears) for their own safety
- 4- Organizing special sites for industrial areas, crafts and industrial factories isolating machines in , factories and factories, and fixing them using engineering methods
- 5- All industrial sites that produce loud noises within residential neighborhoods must be removed and isolated within areas far from the city
- 6- Local governments should remove the old generators that produce loud noises by purchasing these generators and selling them to the owners of the old generators
- 7- Industrial complexes must be established outside cities and in designated places, and they must be under the supervision of officials, especially industries that produce loud noises

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