

Chapter 2

Noise





Noise

Introduction

Noise is defined as unwanted disturbing sounds causing nervous tension that may lead to permanent hearing loss at exposure to noise levels above 90 dB (decibels, sound measurement unit) for long years.

Increasing noise levels have been alarmingly detected in large cities and governorate capitals due to overpopulation and relevant activities, lack of unsound urban planning, besides some wrong behaviours such as excessive use of vehicle horns and raising microphone levels.

Studies indicate that high noise levels affect people's health, causing several diseases. Besides impacting the hearing ability, they lead to a series of health problems such as hypertension, peptic ulcer, muscle contractions, sleep disturbance and neuro-psychological diseases. Furthermore, it impacts children and their ability to learn, which can easily be detected in those living near sources of noise such as airports.

Under the National Noise Reduction Plan which EEAA has developed in coordination with all concerned ministries, a noise monitoring network has been established in Cairo Governorate as a first stage. Through network results, main sources of noise have been identified as follows:

Main sources of noise

1- Transportation and road noise:

It is considered to be the main cause of environmental noise in Egypt. Areas lying on main roads are affected by traffic noise due to the annual increase of vehicles; car owners' neglect of regular maintenance which, if done, would reduce pollution—including noise—produced by such cars; and poor road pavement. Furthermore, train noise affect those residing beside railways up till 150 m away, and so does airport noise over urban areas that have sprawled around them.

2- Commercial and human activity noise:

Such noise is produced by shops and all types of commercial facilities and activities, as well as citizens', including peddlers', daily activities.

3- Loud speaker noise

This type of noise results from using loud speakers in open area celebrations, weddings, funeral ceremonies, outside mosques, and for commercial propaganda.



Efforts made to minimize the adverse impacts:

The National Noise Reduction Plan was developed in collaboration with concerned ministries. Following is EEAA contribution to the plan.

1– Establishing the National Noise Monitoring Network

EEAA implemented the National Noise Monitoring Network, consisting of 30 monitoring stations, and started its operation in March 2007 in Cairo Governorate as a first stage. It aims at developing a database and an environmental noise map for different Greater Cairo areas. The results of the network for this year will be the base on which technical studied solutions are proposed to reduce noise levels in Cairo and for consideration of environmental sound planning. This is to be implemented during 2007-2012.

Monitoring started with Cairo's most significant squares and south Cairo. Result analysis during monitoring period from 1/3/2007 to 31/12/2007 showed the following:

- Noise levels monitored in squares (Ataba, Opera, Ramses and Roxi) have not exceeded permissible international standards ranging between 75 and 80 dB, where the Executive Regulations of the Environment Law 4/1994 do not contain noise level standards in squares and on highways.
- Noise levels along the day in areas lying on main roads (Nile Corniche and Autostrad) are higher than standards allowed in the Executive Regulations due to traffic on such roads, especially heavy truck transport.



Pic (2.1) Opera Sq. noise monitoring station



Pic (2.2) Noise monitoring station at the National Population Council

- Peddlers and loud speakers in some locations (such as Helwan underground station and Dar al-Salam School Compound) have led to high noise levels during day and evening periods; however, at night, noise levels have been reduced.



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2– Coordination with the Ministry of Civil Aviation

Coordination was facilitated with the Ministry of Civil Aviation to establish the Airport Noise Monitoring Stations to monitor airplane noise at landing and taking-off in order to identify their impact on neighbouring areas and residents around airports. The network is composed of 22 fixed and mobile stations installed in different locations around Cairo and Sharm el-Sheikh Airports. Indicators of noise pollution resulting from airports are to be developed to stop and impose fines over airplanes causing noise levels higher than the allowed in areas surrounding airports.

3– Plan for assessing and declaring new cities environment-friendly

In the framework of the plan for declaring new cities pollution-free, studies were conducted on noise levels in these cities. Noise levels in Al-Shorouq and Sheikh Zayed cities were monitored by mobile monitoring stations in different locations representing various activities in both cities such as hospitals, roads, commercial and residential areas. Noise sources were identified and measurement results were used in developing technical solutions necessary for

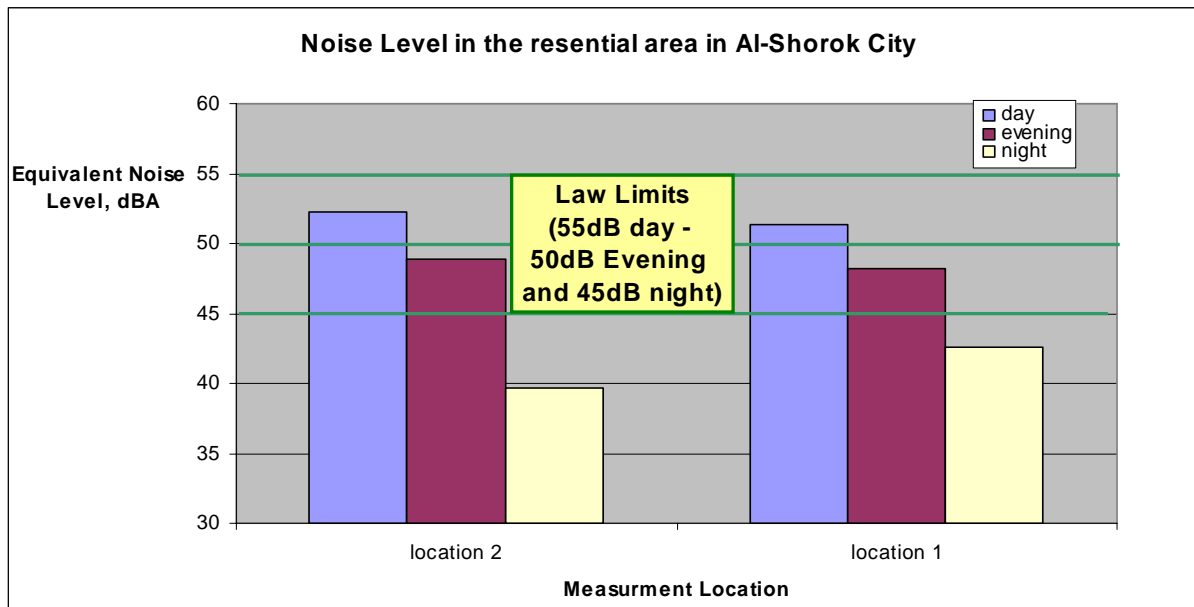


Fig. (2.1) Noise level results in different monitoring locations, al-Shorouq City

reducing noise levels in these cities, as well as appropriate land use planning in projects and different activities distribution.

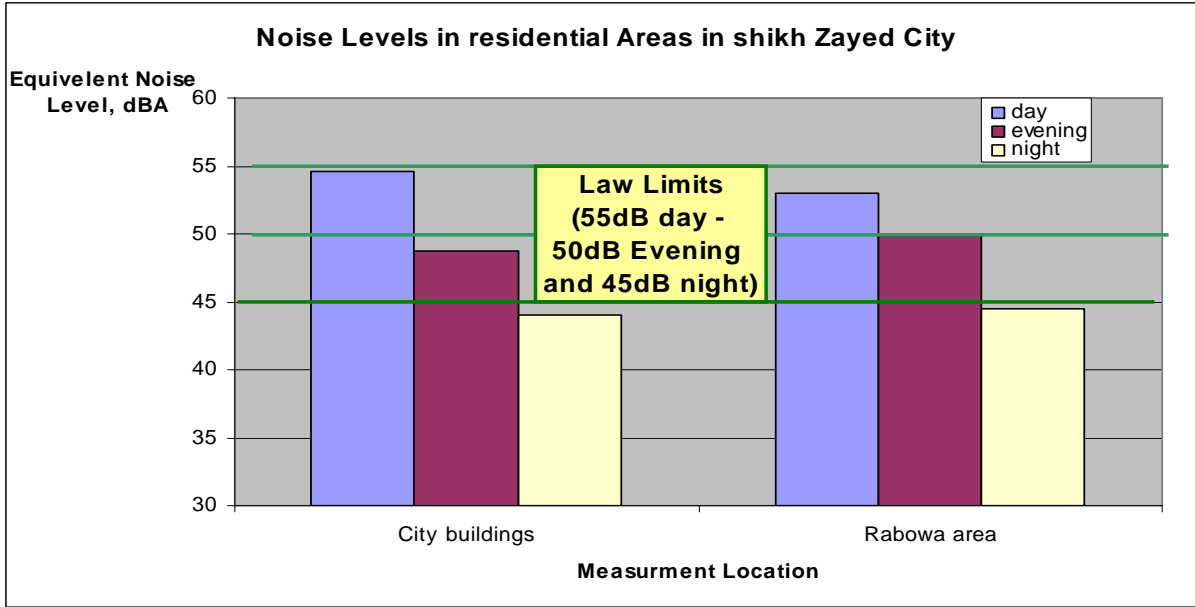


Fig. (2.2) Noise level results in different monitoring locations, Sheikh Zayed

Measurements in both Sheikh Zayed and Al-Shorouq cities showed that noise levels in residential areas were less than the limits allowed by the Executive Regulations of the Environment Law 4/1994; however, measurements were higher in some areas near main roads and commercial and administrative areas.

Noise levels indicators for 2007
First: Noise indicators in south Cairo

1– Noise levels in areas lying on public roads during daytime (L_{day})

Description: The indicator describes average A-weighted equivalent noise level during an interval time according to ISO 1996-2:2007. It is determined as the average L_{day} measurement during daytime all over the year . It expresses disturbance during daytime.

Purpose: Measuring noise levels L_{day} in different monitoring locations along main roads during daytime in order to describe and compare the state of sound environment with the permissible noise limits set forth in the Executive Regulations of the Environment Law 4/1994. According to such indicator, necessary measures are taken to control noise.



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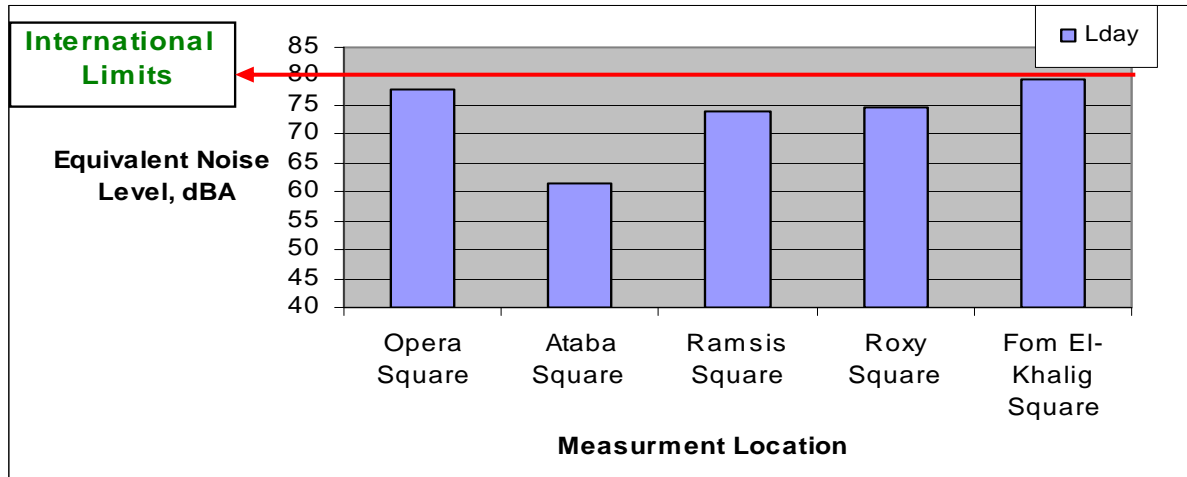


Fig. (2.3) Average equivalent noise level L_{day} in main Cairo squares in 2007

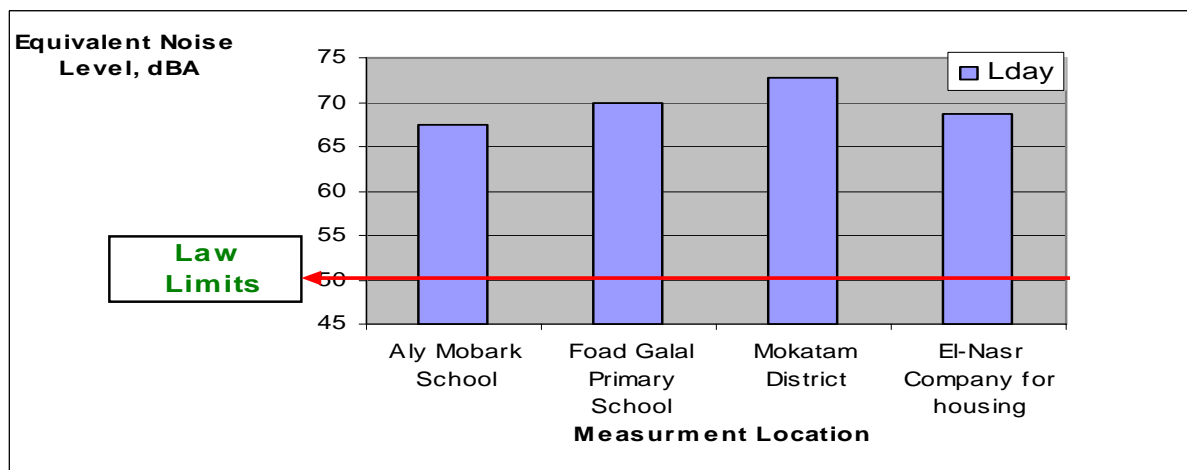


Fig. (2.4) Average equivalent noise level L_{day} in residential low-traffic suburbs in south Cairo in 2007

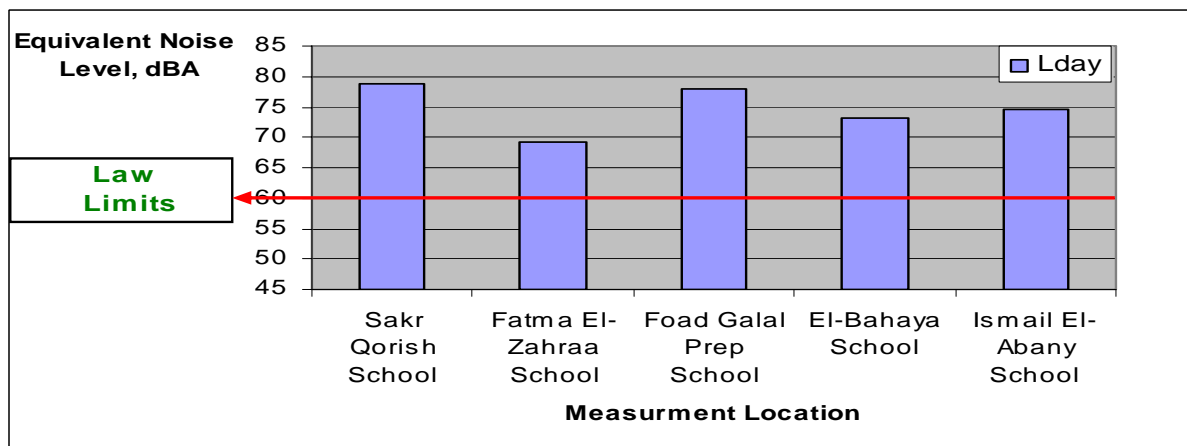


Fig. (2.5) Average Equivalent noise level L_{day} for some schools in residential/commercial areas or along a main road in south Cairo in 2007

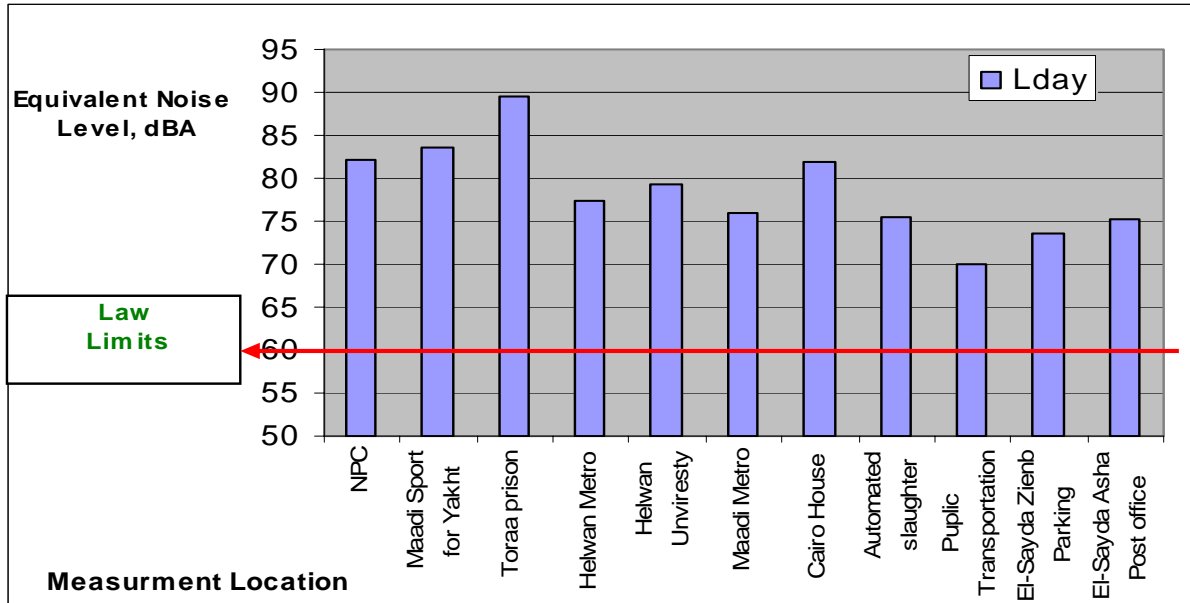


Fig. (2.6) Average Equivalent noise level L_{day} in residential and commercial areas or along main roads south Cairo in 2007

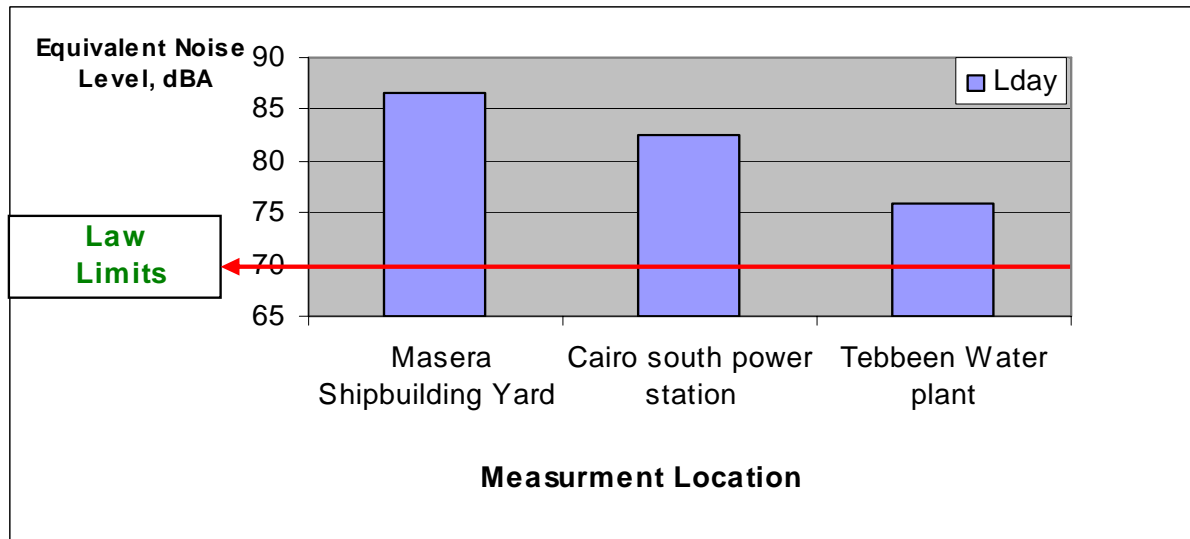


Fig. (2.7) Average equivalent noise level L_{day} in industrial areas in south Cairo in 2007



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2- Noise Level During Evening Levening in Areas Lying on public Roads

Description: The indicator describes Average equivalent noise level during an interval time evening time all over the year . It expresses disturbance during evening.

Purpose: Measuring noise level L_{evening} in different monitoring locations for areas lying on main roads during evening. This measurement describes sound environment state in each area and compares it to the permissible noise levels as set forth by the Executive Regulations of Law 4/1994 on Environment. According to this indicator, procedures required to reduce noise are adopted.

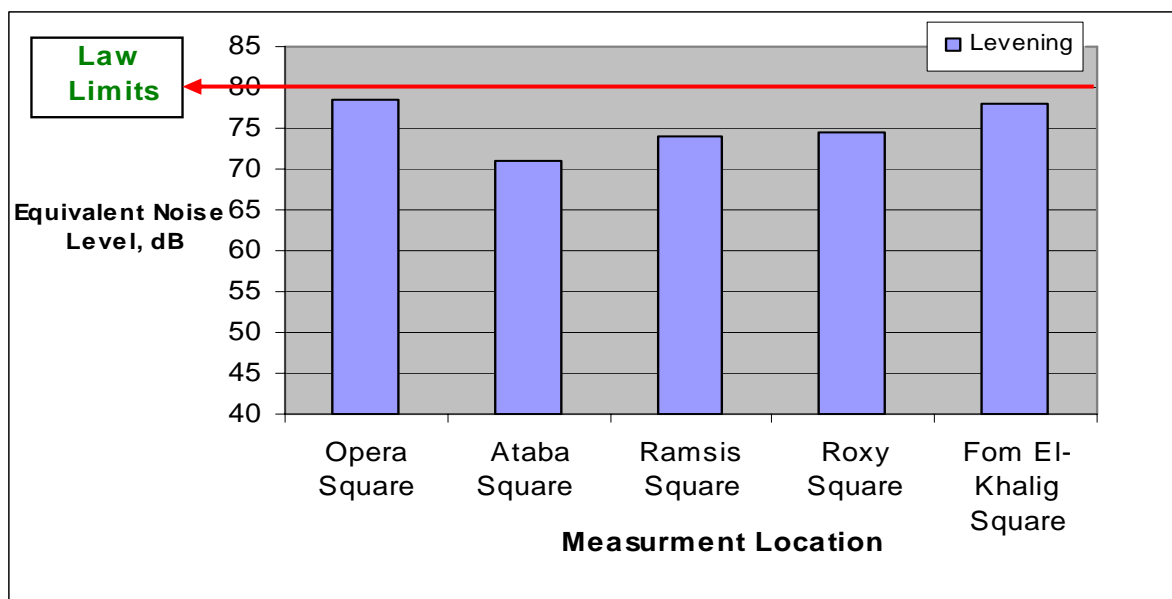


Fig. (2.8) Average equivalent noise levels L_{evening} in main Cairo squares in 2007

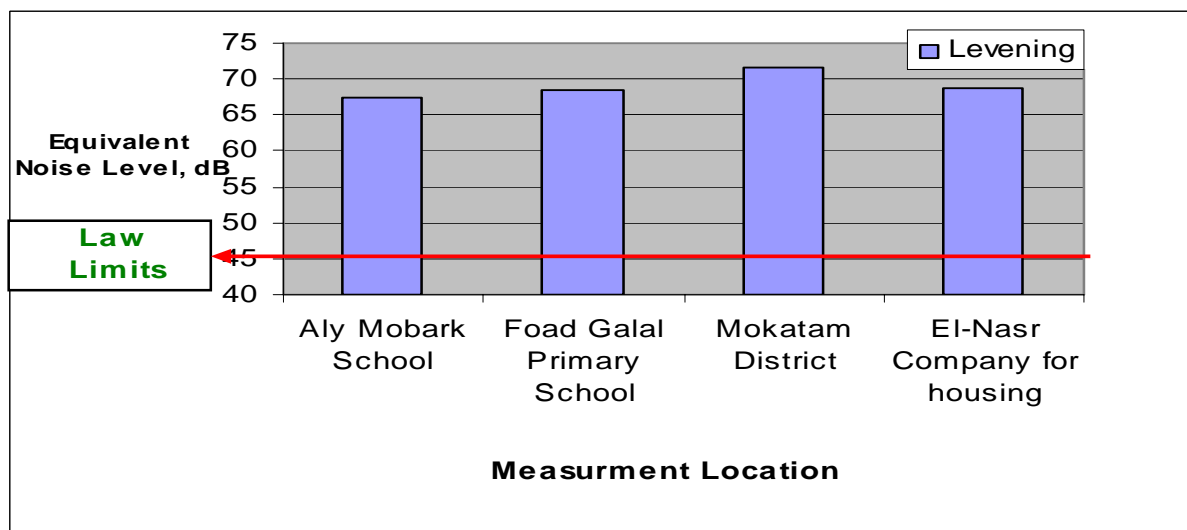


Fig. (2.9) Average equivalent noise levels L_{evening} in low-traffic residential suburbs in south Cairo in 2007

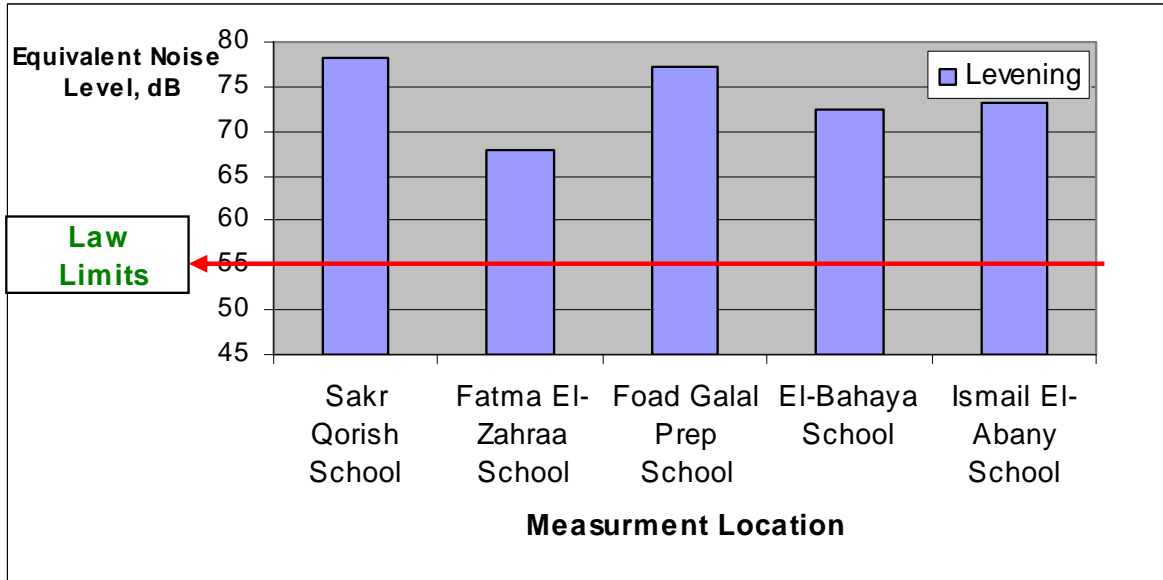


Fig. (2.10) Average Equivalent noise levels L_{evening} in residential and commercial areas or on public roads in south Cairo in 2007

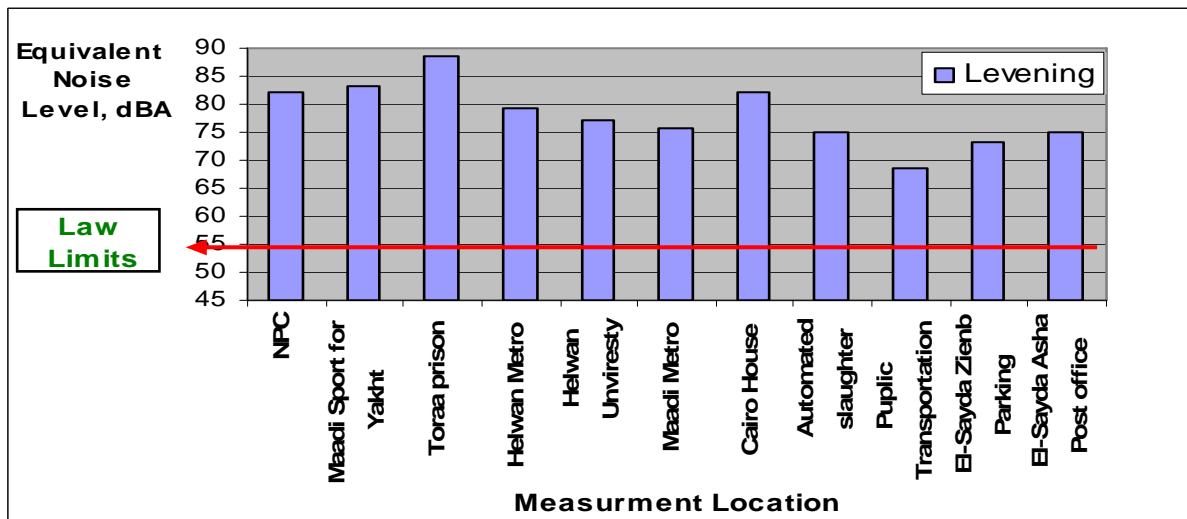


Fig. (2.11) Average Equivalent noise levels L_{evening} for some schools in residential or commercial areas or on public roads in south Cairo in 2007



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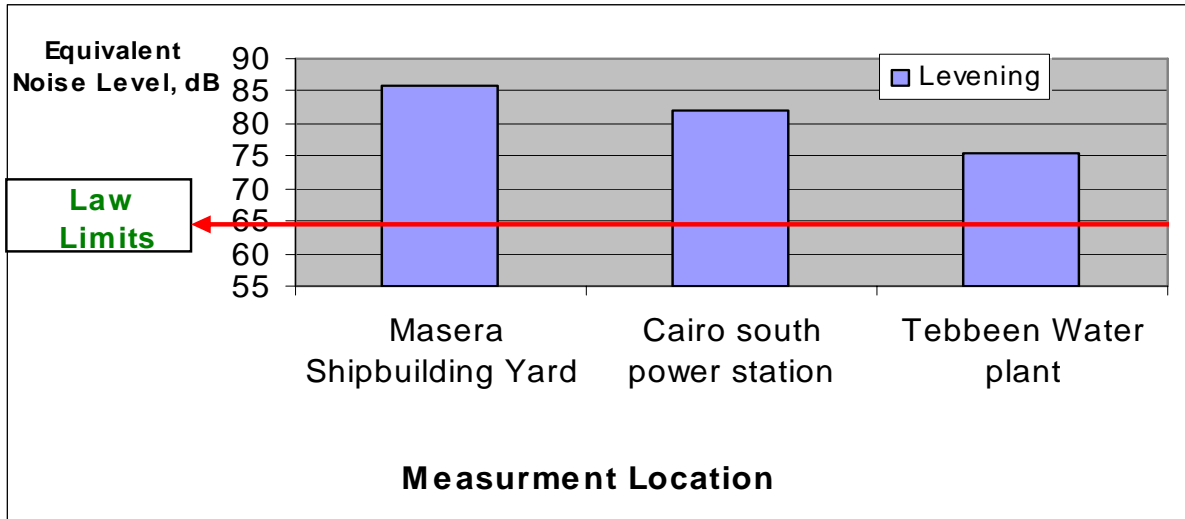


Fig. (2.12) Average equivalent noise level L_{evening} in industrial areas in south Cairo in 2007

3– Noise levels at night L_{night} in areas lying on public roads

Description: The indicator describes A-weighted average equivalent noise level during an interval time according to ISO 1996-2:2007. It is determined as the average L_{night} measurement during night all over the year . It expresses sleep disturbance during night.

Purpose: Measuring noise levels at night L_{night} in different monitoring locations for areas on main roads during the night in order to describe and compare the state of the sound environment in each area with permissible noise levels set forth in the Executive Regulations of the

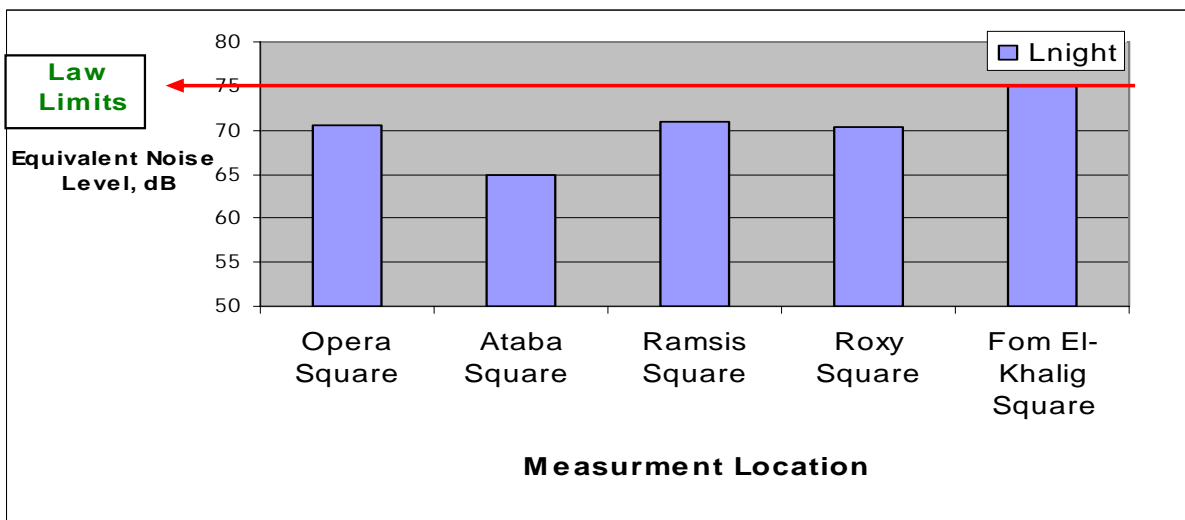


Fig. (2.13) Average noise level at night L_{night} in Cairo's main squares in 2007

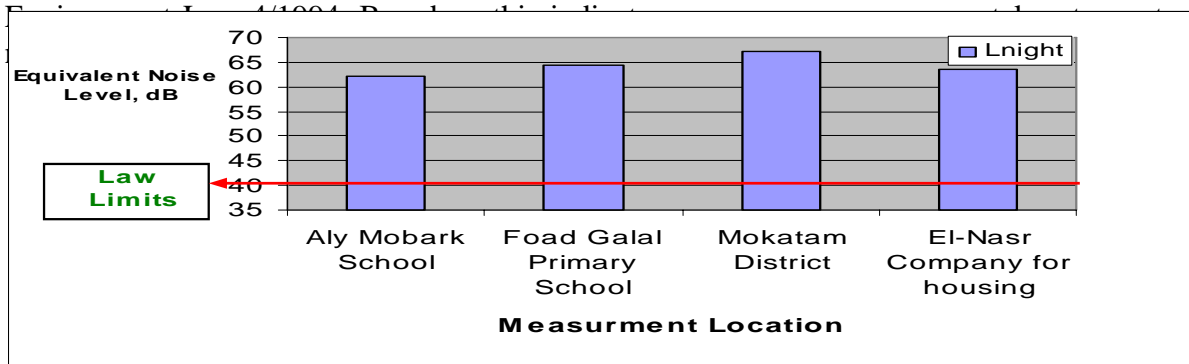


Fig. (2.14) Average Equivalent noise levels at night L_{night} in low-traffic residential suburbs in south Cairo in 2007

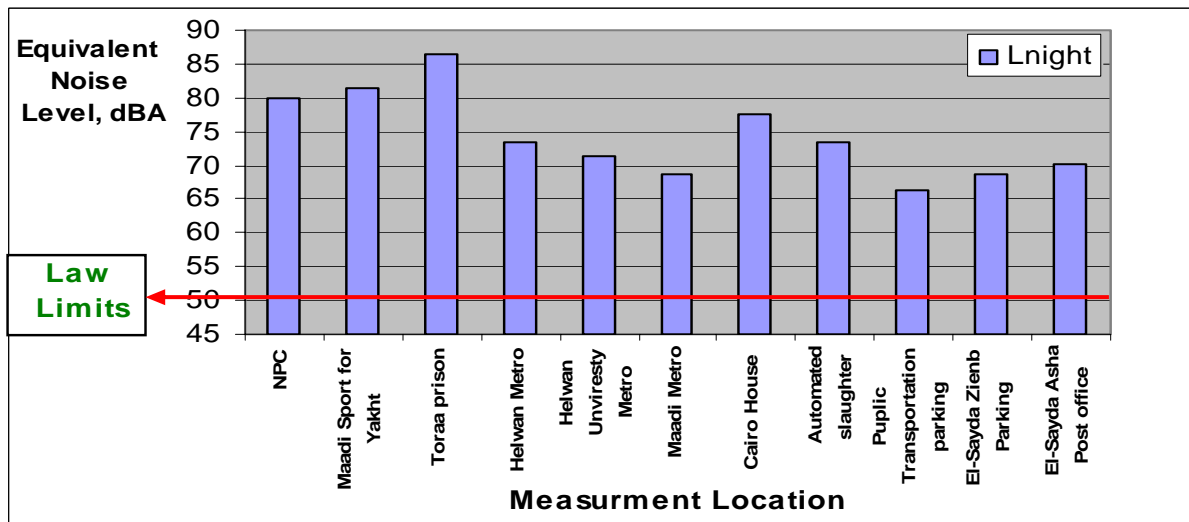


Fig. (2.15) Equivalent noise levels at night L_{night} in residential and commercial areas or on public roads in south Cairo in 2007

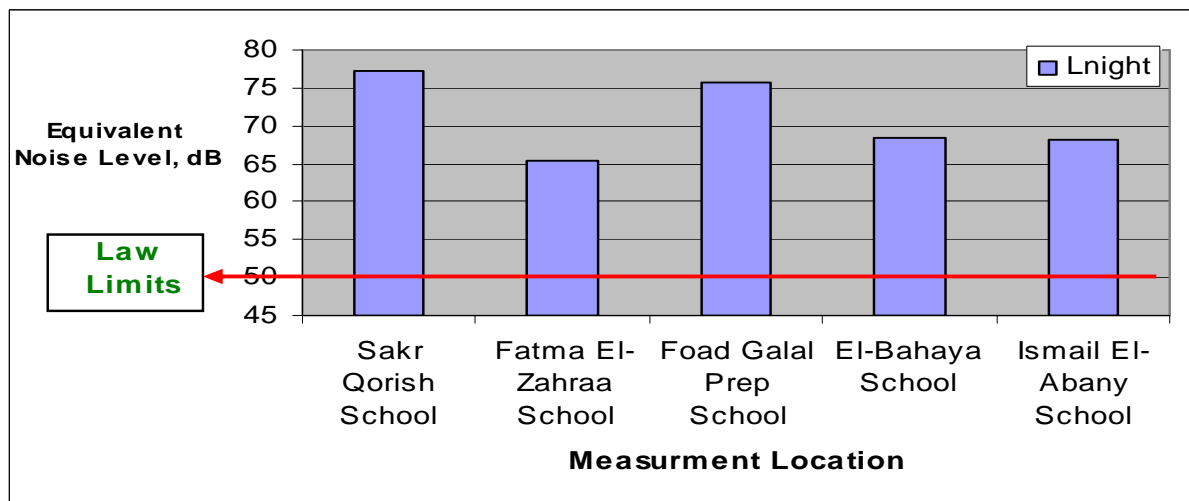


Fig. (2.16) Average Equivalent noise levels L_{night} for some schools in residential and commercial areas or on public roads in south Cairo in 2007



Noise

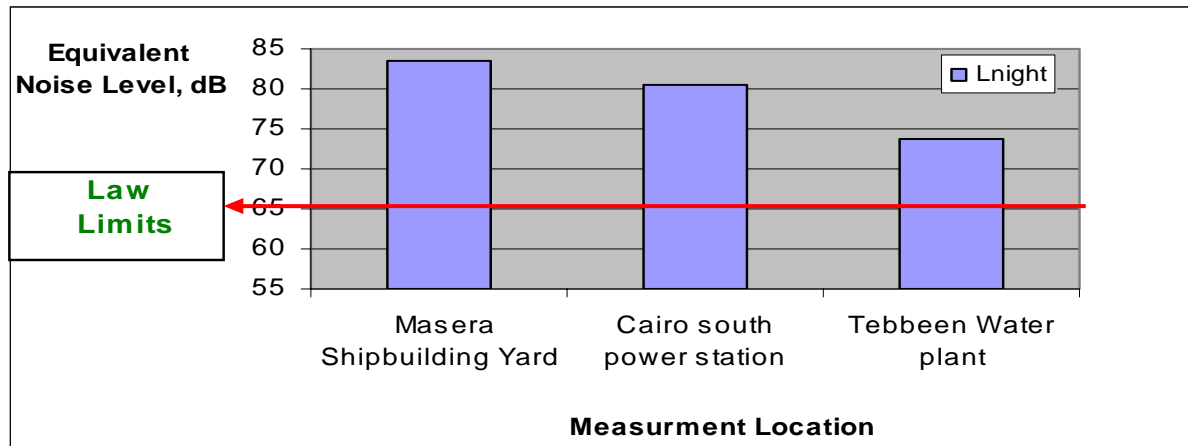


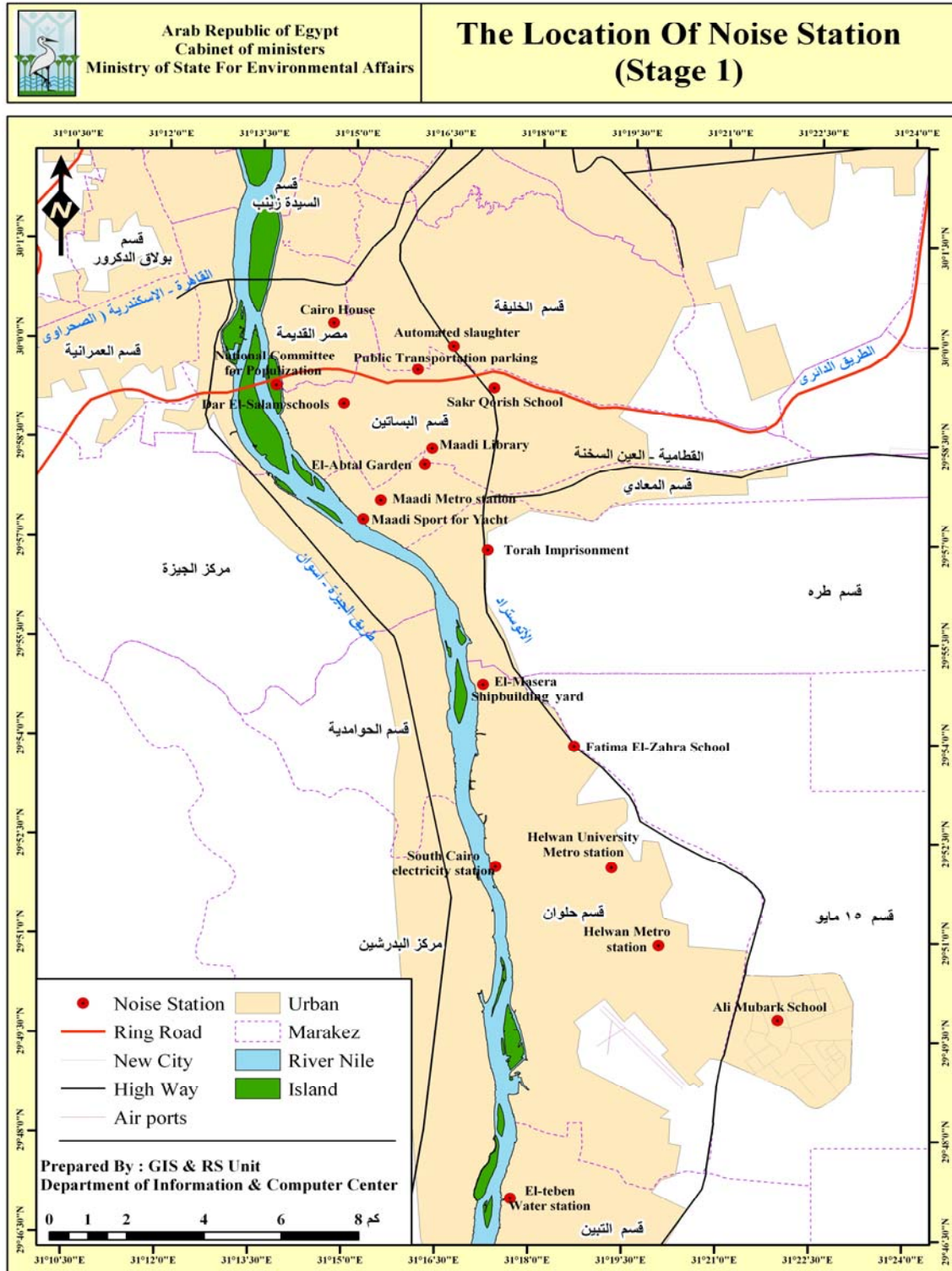
Fig. (2.17) Average equivalent noise level at night L_{night} in industrial areas in south Cairo in 2007

Analysing the three indicators L_{day} , $L_{evening}$ and L_{night} of noise levels in south Cairo in 2007, the following was proved:

1. All noise levels monitored are higher than permissible limits according to the Environment Law all over the day in all locations.
2. Noise levels are very close during day and evening time, while in night time they are 2-5 dB less in all locations.
3. Noise levels in most different areas are close due to the intervention of activities and lack of actual classification of areas according to the Law classifications.
4. High noise levels in the evening and at night are attributed to open commercial businesses even after midnight, which increases traffic and people's presence up till late at night.
5. Noise levels in main Cairo squares are within allowed international standards.

NB:

The Executive Regulations of the Environment Law 4/1994 did not include any noise standards for squares and highways; hence, adopting international standards. Standards for levels of noise produced by vehicles, main roads and highways are currently developed based on the noise monitoring network results and relevant international standards.



Map (2.1) locations of noise monitoring stations in south Cairo in 2007



Noise

Second: Noise indicators for different activities in the governorates

Description: An indicator expressing the levels of noise produced by different activities of public facilities (industrial, tourist, commercial... Etc.) and how far they violate legally permissible limits.

Purpose: Identifying the number of violations of noise levels exceeding the permissible limits in the Executive Regulations across different activities in Egypt. This can be done through inspection campaigns conducted by competent EEAA departments and RBOs in order to take legal measures against violators, so as to attain the permissible limits in the Executive Regulations.

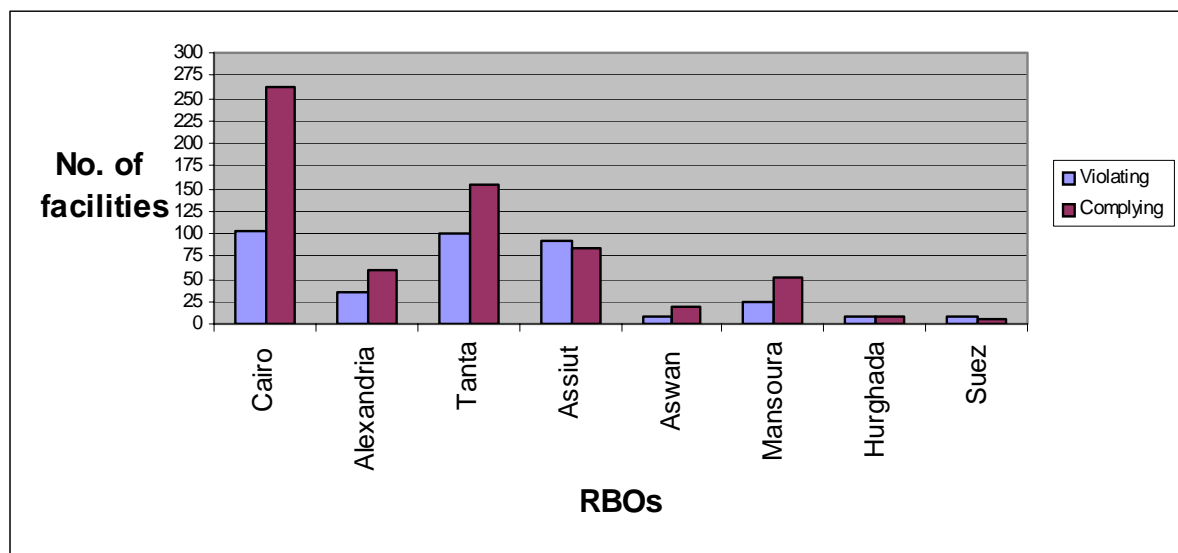


Fig. (2.18) Number of different facilities inspected in 2007 at the level of EEAA departments and RBOs

Source: EEAA (RBOs) and the General Department for Environment and Water Police

The previous results show that total facilities inspected (in terms of noise) by EEAA RBOs in the different governorates in 2007 were 1020, of which 63% were non-violating, and 37% violating (i.e. Noise levels higher than the allowed by the Executive Regulations of the Environment Law 4/1994). Reports were filed against violating facilities and were fined for violations.



Third: Vehicle noise indicators

Description: This is an indicator expressing the number of traffic violations of noise produced by vehicles and how far vehicle owners comply with the Traffic Law in terms of noise.

Purpose: Identifying the number of violations of noise produced by vehicles through traffic campaigns to hold violating vehicles and take legal measures as per the Traffic Law. Fig. (2.19) specifies types and number of violations in 2006 and 2007.

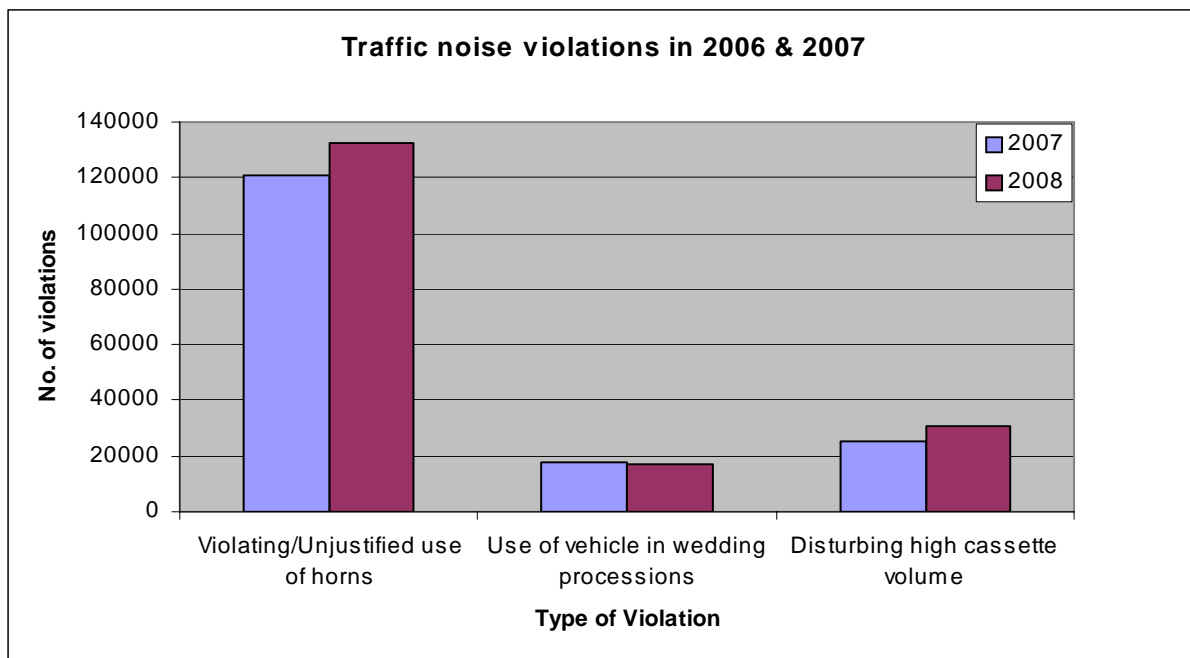


Fig. (2.19) No. of traffic noise violations in 2006 and 2007

Source: General Department of Traffic Police, Ministry of Interior

Future plan:

1. Continuing, developing and upgrading the environmental noise monitoring network, increasing monitoring stations to cover Giza and Qaliubeya as second and third stages, developing and delivering technical plans to control noise based on monitoring results to be submitted to decision makers, and using mobile stations to monitor noise in different governorates.
2. Implementing the National Noise Reduction Plan approved by the concerned ministry representatives by applying procedures of noise reduction and source control through abiding by the respective role of each ministry.
3. Coordinating with governorates on tree-planting road platforms and medians and fixing noise barriers on highways passing through residential areas so as to reduce noise produced by traffic on the roads.
4. Upgrading and continuing cooperation plans with traffic and environmental and water police, intensifying inspection campaigns on noise-producing facilities, and taking legal measures against violators.



Noise

Terminology and Definitions:

Noise	Unwanted sounds
Environmental noise	Harmful unwanted sound produced by all human activities, including noise from transportation, airports, industrial activities and any other activities in the ambient environment.
L_{Aeq}	A-weighted equivalent noise level during an interval time
L_{Aeq}= L_{day}	A-weighted equivalent noise level during daytime.
L_{Aeq}= L_{evening}	A-weighted equivalent noise level in the evening.
L_{Aeq}= L_{night}	A-weighted equivalent noise level at night.
dB	Sound measurement unit.
A-weighted curve	Representation of the response of the human ear.