

# OVERVIEW OF NOISE POLLUTION IN THE METROPOLITAN REGION OF BELÉM-PARÁ IN 2006

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## RESUMO

Os incômodos sonoros têm crescido nas últimas décadas, principalmente nas maiores aglomerações urbanas. Em 2004, Belém foi apontada, em pesquisa realizada pelo IBGE como a capital mais ruidosa do Brasil. Assim com o objetivo de verificar o panorama da poluição sonora no âmbito da Região Metropolitana de Belém-Pará, no período de 01 de janeiro a 31 de dezembro de 2006, realizou-se pesquisa nos arquivos da Gerência de Perícias Tecnológicas, do Centro de Perícias Científicas “Renato Chaves”, onde foram selecionadas. Foram apuradas 80 solicitações de perícias no período estudado, as fontes de poluição sonora contempladas na categoria entretenimento foram as de maior frequência de solicitação de perícia que juntamente com a categoria oficina, ocupam o primeiro lugar, ambas com 22% das solicitações feitas durante o período estudado.

**Palavras-chave:** Poluição Sonora; Impactos ambientais; Belém-PA

## ABSTRACT

Sound disturbance has been growing up for the last decades, mainly in the major urban agglomerations. In 2004, Belem was pointed out in an IBGE research as the noisiest capital of Brazil. Thus, with the aim of verifying the panorama of sound pollution on the Belém-Pará metropolitan region on the year 2006, research was done on the archives of the *Gerência de Perícias Tecnológicas*, from the *Centro de Perícias Científicas “Renato Chaves”*, where the solicitations for sound pollution investigation were selected among all investigation solicited to the *Núcleo de Crimes Ambientais*, for the period of January 01 to December 31, 2006 concerning the Metropolitan Area of Belém, State of Pará-Brazil (RMB). It was collected 80 reports for the studied period, that sources of sound pollution comprised in the category entertainment were the most frequent in investigation reports solicitations, and along with category factory, held the first place, both with 22% of report solicitations made during the studied period.

**Key word:** Sound pollution; Environmental impact; Belém-PA

## INTRODUCTION

In 2004, Belém was pointed out as the noisiest capital in Brazil in one research conducted by the *Instituto Brasileiro de Geografia Estatística – IBGE (FOLHA*

ONLINE). Knowing the reasons of sound pollution may allow the development of actions about population health and promote peoples' life quality improvement. The lack of official data which reflects the real anxiety of population within the metropolitan region of Belém (composed by the municipalities of Ananindeua, Belém, Benevides, Marituba and Santa Bárbara do Para), concerning the sources of sound pollution and the disturbances resulted, points out the relevance of this study that will also contribute to the State seeking for community's life quality improvement, whether in their preventive, or corrective actions.

Sound disturbances have been growing up in the last decades, mainly in the greater urban agglomerations, bringing big physical and psychological damages. Nowadays, the environmental matter leads to necessary responses to the problems of the relationship society-nature (ALMEIDA, 2002). It is not different in Brazil, recently the *Organização Mundial de Saúde (OMS)* showed that the country is a future nation of deaf, situation which justifies all and any study related to the subject (BERGLUND. B E LINDVALL. T, 1995).

It is believed that the lack of knowledge of the population with regard to legislation and the damage that the sound pollution can cause to people's health and the environment, associated with the fear of reprisal from the respondent, the slowness of Justice suggesting impunity, inhibit the action of the community, causing her generally to neglect her own welfare, giving up her most fundamental rights.

According to GRANDJEAN (1982), noise is one complex of sounds which cause discomfort and is still continuously present in human beings' daily life. But ASETTE (1983) defines noise as an unpleasant or undesirable sound, propagated in elastic environment, such as air, water and solid.

According to FERREIRA (1988), noise is the roar caused by the fall of a body, any bang, roar, shake, clash, continuous and prolonged rumor, hustle and bustle. It is the sound made by a large number of acoustic vibrations with amplitude and phase distributed at random. To GERGES (1992), the concept of noise is associated with a sound intensity, while the sound is defined as the variation of atmospheric pressure within the limits of amplitude and frequency bands to which the human ear responds.

Given the party nature of the people for abundant characterized *paraense* festivities, coupled with large amount of sound equipment, it is likely that the most obvious

cause for the problem shown in the metropolitan region of Belém is related to this feature of the local population.

The main objective of this work is to check the overview of noise pollution within the metropolitan region of Belém-Pará, in the year 2006.

## **LITERATURE REVIEW**

It is widely known that is extreme difficult the process of convincing people that a balanced environmental preservation is a priority (ALMEIDA *et all.*, 2001). However, concerning the sound pollution, this convincing was consolidated long time ago, when the Queen Elizabeth during her reign from 1588 to 1603, downloaded a decree about the silence, which "forbids English husbands to beat their wives after the 10:0 pm, in order not to disturb the neighbors with cries ...." (RANGEL H.; A. RABBIT, 2007).

The Code of Postures of the municipality of Belém, established by the Law N<sup>o</sup>. 7,055, 30<sup>th</sup> of December, 1977, already shows the concern of the municipality with the issues involving the environment and the fight against noise pollution.

In Brazil, legislation is so wide when environment preservation and community's life quality is considered, that the Federal Constitution in its articles 23 and 235, establishes the National Policy for Environment, through the Law N. 6.938, of 31<sup>st</sup> of August, 1981, its objectives and mechanisms of formulation and application, aiming "...the preservation, enhance and recovering of the adequate life environmental quality, aiming to assure, in the country, conditions to social economic development, national safety interests and protection of human life dignity...", also constitutes the *Sistema Nacional do Meio Ambiente (SISNAMA)* and establishes the *Cadastro Defesa Ambiental*.

Because it is a diffuse social problem, the sound pollution must be countered by the Government and by society, individually, with lawsuits from every hurt, or collectively, through public civil action (Law 7.347/85 - Discipline Public Civil Action Of Liability For Damage Caused to the Environment, the Consumer, the Rights of Goods Possessing Artistic, Aesthetic, Historic, Scenic and Touristic Value and other matters), for guaranteeing to the public quietness, which is protected by the article 225 of the Federal Constitution.

The CONAMA Resolution 001 and 002, of 17<sup>th</sup> August, 1990 (Silence Program), determines as common jurisdiction of the Union, States, Federal District and Municipalities, the protection of the environment and the combat against pollution in any of its forms including acoustic comfort in the community.

The Law 8.078/90 of the Code prohibits the supply of consumer goods and services potentially harmful or damaging to health (article 10), where may be considered as such ones that produce sound pollution.

The Director Plan of the Municipality of Belém is disposed under the Law 7.603 of 13<sup>th</sup> of January, 1993, which regulates the Development Policy of Belém, where all the sectors are considered, including the environment one, aiming always to maximize the preservation actions, in such way that the municipality urban development does not compromise the ecosystem and all the communities which integrated it.

The Law 9.605/98, which deals with environmental crimes, in its article 54, sets up crime "cause pollution of any kind in such levels that result or may result in damage to human health...", which includes in this tort figure the sound pollution due to the consequences it produces.

The Supplementary Law of Urban Control - LCCU No. 02 of 19<sup>th</sup> of July, 1999, refers to the subdivision, occupancy and use of urban land in the municipality of Belém, serving as a basic tool to guide the policy development and urban sprawl and reflect the guidelines defined by the Director Plan of the Municipality of Belém, in order to regulate the actions of real estate agents for the conditioning of physical expansion of the city to the capacity of infrastructure and environmental quality, aiming at the development of Special Areas of Social Interest - SASI so that the population's quality of life is preserved (source: Revista Meio Ambiente Industrial - May/June 2001).

Law No. 7,990 of January 10, 2000 adopts provisions concerning the control and the fight against noise pollution within the municipality of Belém, banning the sound, the noise and vibrations that exceed the allowed values, coming to harm peace and public welfare. This law determines that the sound intensity levels shall be fixed in accordance with the recommendations of the NBR 10.151 da *Associação Brasileira de Normas Técnicas ABNT* or the one to succeed it. The law considers potentially

polluting activities those which use mechanical instruments or electroacoustic sound or noise propagation or equipment emitting continuous or intermittent noises or sounds.

From the point of view of health, we note that according to studies by the World Health Organization – WHO, the effects of noise are: hearing loss, interference in communication, pain, discomfort, sleep interference, clinical effects on health (cardiovascular and psychophysiological systems), and effects on the performance of duties (productivity), on social behaviour (BERGLUND; LINDVALL, 1995).

## MATERIAL AND METHOD

This work was conducted from research through the archives of the *Gerência de Perícias Tecnológicas*, of the *Centro de Perícias Científicas “Renato Chaves”*, where requests related to sound pollution, from the period of 1<sup>st</sup> of January to 31<sup>st</sup> of December, 2006, within the Metropolitan Region of Belém (MRB), in Pará State, were selected, amongst all surveys requests destined to the *Núcleo de Crimes Ambientais*.

Requests survey made, these were sorted and it was verified how many had been met, those which generated Survey Reports and how many confirmed sound pollution and their generators sources.

Given the diversity of the producers' sources of pollution and due to a didactic matter, such sources were classified per categories, defined by affinities, according to what is expressed in the Table 1:

**Table 1** – Characterization of establishments which generate sound pollution per category.

Category	Type of establishment
Entertainment	Bars, Reception Houses, Show Houses
Workshops	Mechanical workshops, Auto shops, Sawmills, Carpentry
Household	Domiciliar realty
trade	activities not classified in other categories
Church	Church and religious temples
Factories	Factories and industries
academies	Academies of dance, gymnastics, recreational clubs.
Kennel	Domestic animals nurseries

The situations of the surveys requests for confirming the sound pollution were defined according to the coverage established in the Table 2:

**Table 2** – Characterization of the surveys requests for confirming the sound pollution per coverage

Situation	Coverage
Positive	Surveys where sound pollution existence was confirmed.
Negative	Surveys where sound pollution existence was not confirmed.
Nonaccomplished	Surveys that weren't accomplished due to any reasons (waiver, nonfound address, deactivated source).
Misplaced	Survey that were carried through but nonfound report.

Data in hands, risen from the archives of the *CPC "Renato Chaves"* the software Microsoft Office Excel 2003 was used for calculating, in absolute data and percentages, the monthly frequency, the survey requests situation and for confirming the sound pollution in the Metropolitan Region of Belém, as well as the frequency of situations per polluting sources category.

## RESULTS

The Table 3 shows the request frequency, per category, of the sound pollution sources for confirming or not the current pollution, where it was evidenced that the sources comprehended in the categories entertainment and workshop, were the most required, occupying both the first position, with 18 events along 2006.

**Table 3** – Frequency of survey requests for verifying the sound pollution in the Metropolitan Region of Belém per category in 2006.

Source	Positive	Negative	Nonaccomplished	Misplaced	Total	%
Entertainment	11		6	1	18	22
Workshop	17	1			18	22
Residence		1	10	1	12	15
Commerce	9			1	10	13
Church	6	1			7	9
Factory	4	1	1		6	8
Accademy	4				4	5
Construction	3		1		4	5
Kennel	1				1	1
Total	55	4	18	3	80	100

The Table 4 shows the monthly frequency of the surveys request for confirming or not the sound pollution in the Metropolitan Region of Belém, monthly depicting the pertinence or not of such requests, pointing the months of March and September as the ones when there are more disturbances.

**Table 4** – Frequency of surveys request for verifying the sound pollution in the metropolitan region of Belém by month in 2006.

Month	Positive	Negative	Nonaccomplished	Misplaced	Total	%
Mar	8	1	1		10	12
Sep	9			1	10	12
May	6	1	2		9	10
Jun	4	1	3		8	10
Jul	2		5	1	8	10
Aug	6	1			7	9
Apr	5		1		6	8
Nov	5		1		6	8
Dec	3		3		6	8
Jan	2		2		4	5
Fev	4				4	5

## FINAL CONSIDERATIONS

The number of survey requests for confirming sound pollution, raised in archives *CPC “Renato Chaves”* in the year of 2006, totalized 80 requests (Table 3), number this considered low for a region that possesses more than 2.300.000 inhabitants, being considered by the IBGE in research conducted in 2004, as the noisiest capital of the country. It is believed that the lack of knowledge of the population in general, concerning rights as citizens and the possible implications to the health caused by the sound pollution, as well as the lack of credibility in the public power, associated to other factors have contributed for attainment of this result. It must be highlighted that such possibilities deserve specific studies. Educative campaigns, next to the schools and community in general, as well as a bigger spreading of the ample legislation related to the subject would contribute sufficiently for minimizing the problem.

Another studied aspect was the situation of the carried through survey, with the objective to verify the effectiveness of the survey requests, that is, of all the effected requests, the percentage of survey where the existence of the sound pollution was evidenced. In the present study, considering the survey carried through in 2006 and

with available report, a total of 59 surveys were verified, from which 55 (93.2%) had resulted in confirmation of the existence of sound pollution, against 4 (7.8%) where the existence of the sound pollution was discarded (Table 3). These data point with respect to one high effectiveness of the survey requests for verifying of sound pollution.

Additionally, it was analyzed the distribution of the survey requests throughout the months of the year, if evidencing that March and September were the months where the referred survey requests to the sonorous pollution had been more frequent (Table 4). This contradicts the suggestion that the cultural festivities would be the main causes of the sound pollution in the Metropolitan Region of Belém, once these events are more abundant in the months of June and October, when happens the peak of the presentations of folk groups and accomplishment of festive musical events, such as *Quadra Junina* and the Wax Candle of Nazaré. The months where these events have been carried through occupied the 4<sup>o</sup> and 12 place in frequency of surveys request, respectively. On the other hand, the party nature of the *paraense* people was evidenced by the fact that the sources of sound pollution contemplated in the category entertainment had been of bigger frequency of survey request (Table 3), confirming the initial hypothesis of this study.

Such results corroborate with the results found in other great urban centers - as in Saint Andres/SP where the inherent activities to the category entertainment appear with 62% (SEMASA, 2004).

Additionally, Table 3 sample that the sources of the category residence appear in 3<sup>o</sup> place in the frequency of requests. 84% of the sources of this category meet in the not carried through situation of, what it shows clearly the difficulty of action of the responsible agencies, mainly for being about activity of sporadic character, without the regularity that would facilitate the ascertainment (and, therefore, the accomplishment of the survey). In this specific case the action most efficient would be the awareness of the population.

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