

THE SOCIAL-ECONOMIC PANORAMA OF THE ENVIRONMENTAL POLLUTION IN THE CITY OF RIO

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ABSTRACT

During the last years noise pollution in Rio has represented a growth in terms of controversies. Politicians and community's members, both present a group of behavior dichotomies. Divided opinions and no cohesive agreement are pictured on the two divergent postures when subject is noise impact. Recently one of the severe consequences of that situation has occurred during the end of 2001 and the beginning of 2002, when - almost unnoticed by the community - a group of politicians have modified noise upper limits to a higher level in some areas of Rio. This paper is an investigation about the nature of noise sources around the neighborhoods of Rio and why it has so many bottlenecks attached to the subject.

1. INTRODUCTION

Noise was not a burdensome issue at about twenty years ago, in the very city of Rio. Population growth, influx of migrants from other Brazilian cities and consequently the increase of particular questions caused by the rapid pace of urbanization, economical and political changes, have made noise environmental impact become one of the major and paradoxical concern in the neighborhoods and on municipal matters. The urban insalubrious areas – originated by traffic noise and bottlenecks among others – requires some special attention over street alignments, scales, volumetric aspects of construction and highways, mix of land uses and particularly what kind of support is given in terms mass transportation.

Could it be possible at this stage that any profound change could effectively be made in order to protect from further noise environmental degradation? What is the importance of noise environmental issues on each community in comparison to others considering the social disparities of areas? Some of the critical areas in Rio's municipal central surroundings were chosen in order to highlight the arrived questions. Some streets were selected, which were popularly considered to be noisy or with an intense traffic flow, have integrated the

measurements and local surveys, as well as data collected from the Environmental Municipal Secretary.

2. INSIGHTS ABOUT NOISE AND CORRELATED CONJECTURAL FACTORS IN THE CITY OF RIO

The city of Rio de Janeiro, in Brazil, has one strong and remarkable characteristic: social disparities and cultural diversity. Particularly in its central municipal urban area those differences are highlighted together. That fact has its origin on two aspects; the first one due to geographic migration from other areas of Brazil in search for job opportunities at Rio; second, the one generated by the impacts of internal differences due to social-economic disparities. Those distinguished contexts have delineated the nature of perceptual referential of quality of urban life.

The shared space pictures the individual culture, the influence of inter, intra and extra organic culture and concomitantly the conflicts established from urban anthropology and environmental psychology [1]. All of these elements not only have a strong influence on current project proposals, but also, sometimes difficult, because of its diversity, the needed transparency of man-environment relation with salubrious calls for spaces and project demand on certain areas.

Generally, urban noise and its harmfulness is not considered to be the most significant modality of impact, in particularly dealing with the case study areas in Rio, traffic noise has increased in quantitative aspects related to its tentacle characteristic of its spread, the number of vehicles in the streets pictures a lack of investments in mass transportation strategies, besides, the periods by which traffic noise is annoying have also extended its disturbance to additional hours of traffic bottlenecks; for instance, if traffic noise has been a pain mainly in periods which people are going to work or coming back from work, the continued scenario (that means no attitude in order to control traffic noise) – has demonstrated an evident disinterest to effectively reduce it – has pictured a tendency of being progressively deteriorated.

Noise negative impacts in Rio are originated basically by two types of sources: moving ones such as urban traffic in streets; and the other, from stable, fixed sources, like residential, commercial and outside shared public spaces. That modality of impact has shown interesting dichotomies which are mainly originated by local differences on social and cultural referential and behaviors [2].

As noise issues had started to make progress in the city (more intensively on the last five years), with a feedback from communities, the lack of cultural and social cohesion had negative implications towards political decisions. In the area of urban noise impact, while some politicians were working on environmental causes and on the investigation of ways to improve quality of life in the urban surroundings, others were disreputing all the conquests of “Programa Silêncio” (Silent Program), that had for a long run, worked in the direction of improving noise environmental education and perception of noise impacts.

The next picture shows the land use code noise upper limits until January 2002.

Area	Allowed use	Code	Maximum noise level (Day)	Maximum noise level (Night)
RESIDENCIAL ZONE-1	Exclusively residential Single family	ZR-1	55	50
RESIDENCIAL ZONE-2	Multifamily & elementary schools	ZR-2	55	50
RESIDENCIAL ZONE-3	multifamily, commerce & services in edified areas of exclusive use	ZR-3	60	55
RESIDENCIAL ZONE-4	Multifamily, commerce and e services.	ZR-4	60	55
RESIDENCIAL ZONE-5	Multifamily, commerce and services with small industries	ZR-5	60	55
RESIDENCIAL ZONE-6	residential and agriculture services, diversified	ZR-6	55	50
CENTRAL AREA-1	commercial use & multifamily	AC-1	70	60
CENTRAL AREA-2	Services, diversified commercial use	AC-2	70	60
TOURÍSTIC ZONE-1	Multifamily use and commercial tourist related activities	ZT-1	65	60
TOURISTIC ZONE-2	Multifamily and tourist related activities	ZT-2	65	60
HARBOUR ZONE	Wholesaler commercial	ZP	70	60
INDUSTRIAL ZONE-1	Industrial activities compatible with residential areas	ZI-1	70	60
INDUSTRIAL ZONE-2	Industrial with harmful and noxious and annoying activities	ZI-2	70	60
INDÚSTRY & COMMERCE ZONE	Industrial, commercial and multifamily use	ZIC	70	60
SPECIAL ZONES	Especial characteristics for each zones ZE	ZE-S	55	50
CENTRAL NEIGHBORHOOD AREAS	Commercial	De ZR-1	60	55
CENTRAL NEIGHBORHOOD AREAS	Commercial	De ZR-2	65	55
CENTRAL NEIGHBORHOOD AREAS	Commercial	De ZR-3	65	60
CENTRAL NEIGHBORHOOD AREAS	Commercial	De ZR-4	65	60
CENTRAL NEIGHBORHOOD AREAS	Commercial	De ZR-5	65	60
CENTRAL NEIGHBORHOOD AREAS	Commercial	De ZR-6	60	55
CENTRAL NEIGHBORHOOD AREAS	Commercial	De ZT	65	60
CENTRAL NEIGHBORHOOD AREAS	Commercial	De ZI-1	70	60
CENTRAL NEIGHBORHOOD AREAS	Commercial	De ZI-2	70	60

Figure1: upper noise limits tolerated related to land use code in the Municipal area of Rio de Janeiro until January 2002.

The tolerated noise upper limits related to land use code [3] showed bellow has been modified to an increased upper noise level in last January 2002. They have proposed an upper noise limit during day period for 75dB(A) instead. The adoption of a reactive posture such as this one has contributed to a noisy neighborhood, politicians have worked disrespecting the rights and conquers of a minority of environmentally conscious citizens.

How can such degraded referential be the prevalent one? How can the arguments related to traffic noise pollution be highlighted with noisier surroundings? In the central areas of Rio, the basic characteristics of these communities are the predominant multiple and mixed land use, since the city central area priorities were design to attend traffic flow, to introduce a sustainable guideline for urban traffic, not only the aspects of conceiving urban settlements patterns must be improved but the mass transportation system and its technology as well. In table 1 and 2 some measurements are picture related to traffic noise impact on outdoors and indoors residential areas.

J.J. SEABRA Street/ At Jardim Botânico South Zone of Rio				
Thursday				
Environment	hour	Leq	time Leq	maxLevel.
AMBIENTE EXTERNO				
1. On sidewalk, near Caroline Café, at 7 meters from tables, at the sidewalk of residential house.	00:05	68,5	160s	73,4
2. J.J.SEABRA, corner with Jardim Botânico Street	00:07	75,2	160s	85,9
1. Residential houses, restaurants and bars	Observations: 1,2 meters from floor			
2.. Noise emitted exclusively from moving sources since there are no commercial establishments open at this hour on this street.	Measurements courtesy by GROM.			

Table 1: measurements at Jardim Botânico [4]

COPACABANA					
Environment	time	Slow dB(A)	Fast dB(A)	period (Seg)	Peak. dB(A)
Barata Ribeiro Street Number 370					
External area (Near Siqueira Campos street, sidewalk, 1.5 meters from moving sources on street)	11:40	83	95	160	106,8
Internal environment Reception	11:50	76	76	160	96
Inside car (with close windows and doors)	11:55	62,5	63	160	76,8
Internal environment- apartments with open windows					
<u>4th floor</u>	12:00	75,5	77	160	92,5
<u>6th floor</u>	12:05	77,5	77,5	160	97,8
<u>8th floor</u>	12:10	76	76	160	92,2
<u>10th floor</u>	12:15	78,5	78	160	89,8
<u>12th floor</u>	12:20	76,5	76	160	100,5
<u>14th floor</u>	12:25	75,5	78	160	89
<u>16th floor</u>	12:30	80	77,5	160	90,1

Table 2: Measurements at Copacabana.[4]

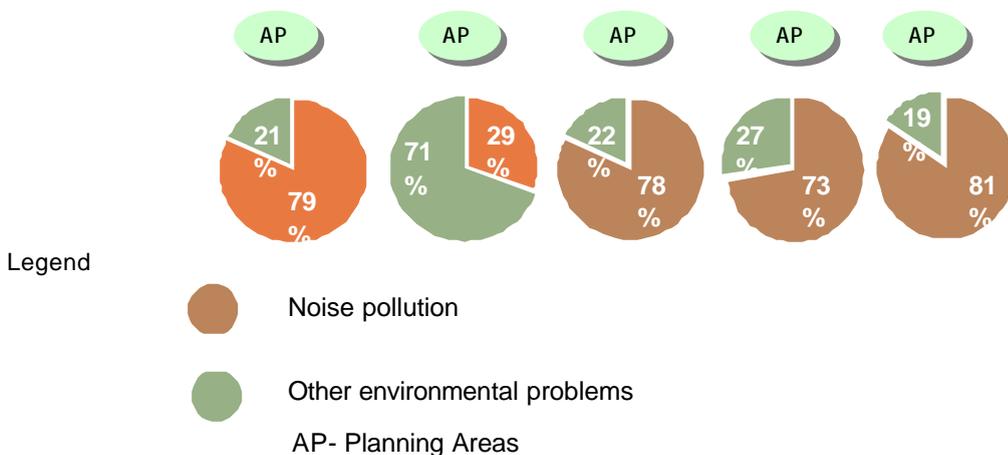
Tables 1 and 2 shows interesting dichotomies related to the complaining in neighborhoods: at Jardim Botânico the complaining about bars and restaurants such as Caroline's Café, are the most frequent among local, residential community, however, the degraded referential of traffic noise does not appear to be a reason of complain, they have no reaction to traffic noise which is higher than the noise from bars late at night.

Also, on table 2, the noise measured was originated by traffic, during day periods. Inside the apartments we had extrapolated the limits stipulated in land use code. The noise inside had about 25 dB(A) more than the tolerated. With the modifications proposed, this noise level is now acceptable, since the new upper limit is 75dB(A). What has the government implemented in order to solve or monitor the traffic noise problem? Since traffic noise the mainly source of annoyance in urban areas, if it decreases quality of urban life, how could it be avoided or controlled? At a municipal level, the instrument available in order to prevent the occurrence and monitor noise impacts is basically the master plan [4], the instrument which has the mission to promote developing policies and urban expansion. In that level, no evidence of noise environmental policy has ever been proposed, and worse, the upper noise limits for stable sources have now a degraded referential.

With the new tolerated value of 75dB(A), all efforts in the direction of noise environmental education have become worthless. The indoors background noise originated from moving sources such as streets traffic, can no longer be a reason of complain, for the indoor noise level from stable sources have the right to increase their values. Community, by law, must be involved and participate through representative associations, but lack of information about the subjects, the schedules and proposals being discussed turns impracticable the effectiveness of such involvement. Besides, whatever has been established in terms of land use code, has not been appropriately accomplished because of missing links between noise sources audit which are specifically related to traffic noise.

3. ADDITIONAL INFORMATION ABOUT NOISE IN THE CITY RELATED TO OTHER MODALITIES OF IMPACT.

The following graphic 1, from the Environmental Municipal Secretary [5] shows the relation of noise impact related to other environmental complaining.



Graphic 1: Noise impact in Rio related to other environmental complaining. [5]

What can be noticed is that were noise impact appears to be the most significant complaining, at AP1,AP2,AP3 and AP5, the nature of activities found in the noise maps investigated by municipal teams pictures the social and economical differences. In the area AP4, the low densities and urban design have minimized the complaining of noise, only 29%; in this percentage of annoyance, 33% of noise impacts are originated from entertainment. In the area AP1, which corresponds to the Central Urban area, with higher densities than AP1, the noise complaining are 44% originated by bars and restaurants, in the AP2, corresponding basically to the South Zone, with the exception of Tijuca neighborhood, in that area the social- economical disparities are very intense, they have the most luxurious neighborhoods besides poverty, like Rocinha, the biggest Favela in Rio, is included in such planning area, they have noise as 73%

of their environmental problems and 39 % of noise is originated from bars and restaurants, followed by 16% of entertainment (outside events) and 16% also from other sources and 16% from sportive activities. The AP3, the neighborhoods are of a lower social-economical level, noise complaining correspond 42% from bars and restaurants, with 28% with live music and 25% with mechanic music, with 9% of complaining, a significant percentage, there are religious ceremonies. They have had an accelerated growth in the city, particularly indoor areas. In the AP5 area, this religious complaining are even higher, 20%, the AP5 is also an area of low social- economical level. In this area also restaurants and bars are on top of the rank, with 39%, the source complaining are 25% amplified voices (that includes religious ceremonies), 25% live music and 24% mechanic music [5].

4. FINAL COMMENTS

Noise impact integrates the individuals mental model image of city perception, however, since traffic bottlenecks were not a subject of political and technical solution, the comfort referential related to noise impact had become deteriorated as an unconscious improvised strategy to survive in noisy streets residential buildings. However, due to the deteriorated acoustic environment, the activities from stable-fixed sources have become increasingly noisy, local, engaged groups, have reacted, while others, of lower social levels, living in degraded urban areas, have not perceived the annoyance and unhealthiness. The social disparities have other implications on noise environmental impact, that modality of pollution is not seem by community as insalubrious as others, and in some situations, like religious ceremonies, bars and restaurants, entertainment events, it is of a paradoxical nature to contest, once cultural behavior tends to support those activities.

Another paradoxical behavior was related to noise impact originated from bars at South Zone of Rio. Some groups migrate during night period in order to get entertainment, abundantly offered at some fashionable high social level streets, One group – the commercial one and the ones who migrate- is asking for an increased upper noise level tolerance, while the others- the residents of those streets, are either complaining, prosecuting or moving to parallel streets of the same neighborhood.

The polemic noise impact and its implicit subjectiveness about the nature of the source, has had some unfortunate implications; instead of improving a better referential with the research of technical solutions, the opposite happened: degraded referential became the pattern to avoid complaining. That reactive attitude was of a prejudice impact for urban sustainability as well as over all environmental education process in urban areas. A more suitable conclusion considering all that has been exhibited in the case-study, would either be a question instead: What urban health and quality of life referential must one community aim?

7. REFERENCES

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