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Urbanization and Sustainability: A Comparative Analysis of Indicators about the Quality of Life in Manaus City – Amazon State (Brazil)

LINDSAY DE OLIVEIRA MESQUITA[1]
Federal University of Rondônia – UNIR (Brazil)

Abstract:

When taking place an analysis about the cities, in a general, it is noticed that in each a particularities that contemplate in your urban space the actions happen accomplished by the man, in the environmental degradation. Aiming to characterize the quality of life of the population in Manaus a case study was accomplished in four neighborhoods different from the city. It was verified that the oldest neighborhoods (Centro [downtown] and Parque 10 [park ten]) enjoy a better life quality. Already the outlying neighborhoods (Novo Aleixo and Grande Vitória) don't enjoy the same life quality, because the population of the same ones doesn't possess access nor to the basic services as sanitation, distribution of water and energy; besides the accentuated environmental degradation. It is considered, the need to rethink which would be really the true priorities of the public power in turning the maintainable city and consequently with life quality of distributed in an equal way.

Key words: Urbanization, Indicators, Life's quality

Introduction

The life in cities necessarily implies the satisfaction of a set of individual needs and collective. The latter are for the most part,

[1] Professor at the Federal University of Rondonia /UNIR (Brazil). Master in Environmental Science and Sustainability in Amazon - CCA/UFAM. E-mail: lindsay.mesquita@unir.br.

the responsibility of public authorities, which, generally, face difficulties in order several, making precarious the care of such needs. The Public intervention is essential in the search for solutions to the problems of environmental character, especially those most directly linked to the quality of life of the urban population (Almeida 1993; Carvalho 1995; Silva 1995). The increase in the population of cities generates problems (housing, lack of sanitation, safety, pollution and other) that worsen to the extent that are deployed new techniques of production and consumption becomes more predatory (Burstyn 1994; Alva 1997). This causes impacts on the environment and on the quality of life of their inhabitants.

These environmental damages has been observed in the city of Manaus since the beginning of the creation of the Free Zone. The problems worsen as a result of the inability of investments in infrastructure and services to compensate for the disadvantages of environments densely populated (Melo 1984; Moura 1990; White 1999). Currently, urban planning and environment are different tasks of the organs of State, giving rise to different public policies. These components in the majority of cases, do not have any kind of involvement with environmental policies that will ensure the effective protection of the environment, health and quality of life of the population (Grippi 2000, Overseas 2001).

Any action promoted for the growth and development of the population manauara[2] is through public and private bodies, it should take into account the sustainability factor. Considered that this is a process to be followed, from environmental and social commitments with the today and future generations.

Methodology

[2] Who birth in Manaus City, a great metropolis localized in Amazon State (Brazil). The word "Manauara" is derived from the extinct tribal people, the Manaós Indians (brazilian Indians).

For the realization of this work were used two sources of information:

- Field Research: were applied 200 questionnaires in four districts (Center, Park 10, Novo Aleixo and Grande Vitória) aiming to investigate the socio-economic profile, in addition to structured scenarios that could help in the search for indicators of a structure capable of overcoming the expectations or withstand the demands for sustainable capacity. Was also examined the state of conservation of other green areas in the city of Manaus.
- Documentary Research: survey data in the Prefecture, Eletronorte and Waters of the Amazonas on percentage of population with sanitation and percentage of the population that has Access to the system for the supply of water and energy.

This study took a qualitative approach in order to bring reflection to population regarding their quality of life.

Diagnosis of the City of Manaus

In 2000 the Municipal Development and Environment - SEDEMA had surveyed only 9 districts, which were located green areas in twenty-seven housing complexes. Until then, this number is considered to be negligible, since by law, the SEDEMA should stimulate the creation of green areas in all the places in the city and take a survey of all these areas.

The "Waters of the Amazon" is responsible for sanitation services in Manaus, since the day July 4, 2000. This date was signed a concession contract, where the waters of the Amazon has made a commitment to work for the improvement of water quality and supply in the city, as well as to offer services of a sewage treatment plant (www.aguasdoamazonas 2002).

The distribution network between 1993 and 1997 had an increase of around 10% to 12% of households (Table 1).

TABLE 1 - water distribution network in the city of Manaus (1993-1997)

Years	Households Benefit from	Consumption m3/day	Network Extension (m)
1993	210,694	105,107	1,562,996
1997	240,304	124,780	1,630,321

Source: Cosama July 1997

The system of water abstraction in capital is mixed (surface and underground), being the capacity of the treatment system to Manaus to 4.58 m2/s, and the total capacity of the reservoirs is 76,300 m3. Although these data have not been obtained during the collection of field, notes that in neighborhoods newly formed as the New Alexis and Grande Vitória the distribution system of water mains in their majority is superficial.

To analyze the data obtained in the IBGE (2000) (Table 2) shows that most of the houses are connected to the system of general network. However, these data do not take into account the special features of these internal areas, when one considers the invasions and blends, as is the case with the New Alexis and Grande Vitória.

The distribution of water (Figure 5) was one of the questions to which the population more complained. In the Center and Park 10 water distribution occurs through the network; the New Alexis 84% of the respondents use wells. However, these wells are drilled in maximum with 20m of depth, compromising the quality of the water. The Grande Vitória water is obtained through the Community well in the location, but was observed on site that some residents use ponds. The water quality was considered poor by the population in the Center and Park 10. The residents complain primarily of color of the water and the sludge that is at the bottom of the tanks. In the New Alexis and the Grande Vitória, the water to be artesian well received approval of the majority of the inhabitants.

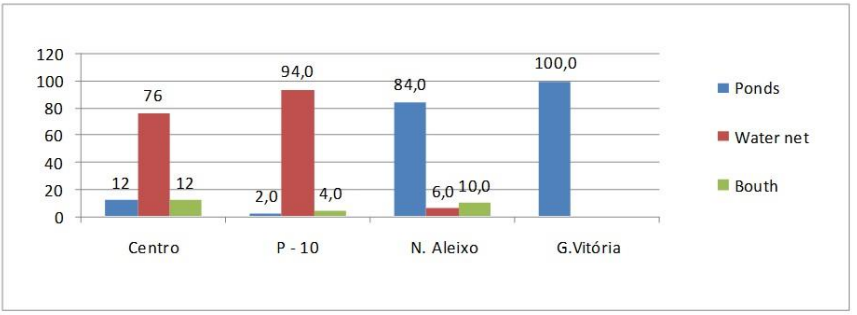

Figure 5 - the Type of distribution of water in the Center, Park 10, Novo Aleixo and Great Victory, in the Manaus City in 2002.

Already the sewer, in habitation is well structured, according to the data in the City of Manaus (2002). However, in the areas of occupation and spontaneous in the central area of the city, there are problems of insufficient or even lack of sewer system or treatment. Most of the times, the fates have been, as a rule, bayous, and rivers that cut through the urban perimeter, as observed in New Town (Table 3) and more markedly in Grande Vitória.

TABLE 3 - permanent private Households, by existence of bathroom or toilet and type of sanitary sewerage in the neighborhoods Center, Park 10 November, Cidade Nova and St Joseph.

Districts	Total	Permanent private Households							
		Had bathroom or toilet							Had not Bathroom Nor Health
		Total	Type of sanitary sewerage						
			General Sewage	Pit Septic	Pit Rudimentary	Ditch	River, lake or sea	Another sinkhole	
Downtown	8 599	8 539	5 706	980	151	82	1 568	52	1 568
Park 10	8 207	8 164	3 841	3 941	36	14	321	11	321
Cidade Nova	46 301	42,824	14 299	16 756	8 017	1 396	1 776	580	1 776
St. Joseph	19 507	17 464	3 477	8 066	4 291	728	652	250	652

Source: IBGE 2000. [Brazilian Institute of Geography and Statistics.], Brazil.

According to the table above, the public authority should be more rigorous in monitoring with companies of cleanings,

avoiding the pollution of watercourses in rivers and creeks, requiring remedial measures and also preventive.

In sewerage service (Figure 6) there is some contrast, as for example, in the Center about 80% of households are connected to sewage system; in Park 10 and Novo Aleixo prevails the septic tank, and in the invasion Grande Vitória, in addition to the septic tank (40% of households) people use the pit dry. In this case the sewage goes directly to the bayou.

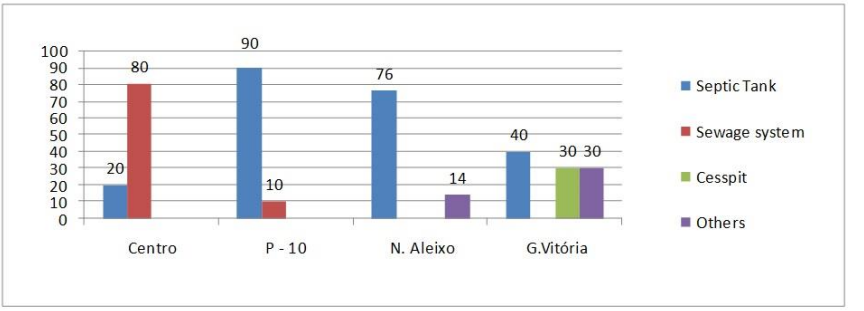

Figure 6 - Type of sewage according to the residents of the Center, Park 10, Novo Aleixo and Grande Vitória, in the city of Manaus in 2002

The data obtained in the Prefecture of Manaus (2002), emphasize that the system of urban cleaning has been expanded and modernized to become ever more efficient collection and final disposal of urban waste and hospital.

The garbage collection grew from 252,622,968t for 351,931,386t; already the hospital collection has had greater increase of 1,636,730 t to 2,950,255 t in the period of 1997 and 1998. These data indirectly reflect the increase of population density as well as the worsening health of same.

The New Alexis and in Grande Vitória the garbage collection does not occur in all homes, mainly due to lack of structures in the streets, that hinder the passage of trucks. This leads people to remove the garbage from their homes, to make clean and throw everything into a nearest street, or playing in creeks or vacant lots.

It was also found that the majority of the population does not know where to go the trash after collected. The New Alexis, 64% of respondents replied that some residents throw garbage in areas close to their streets.

TABLE 2 - permanent private Households, in order for the supply of water in the Center, Park 10 November, New Town and St Joseph

Districts (1)	Permanent private Households											
	Total	Form of water supply										
		General Network			Pit or source (on property)				Another's			
		Total	Piped in at least one room	Directed only at the property or ground	Total	In Channelized At least A room	Directed only at the property or ground	Not Channelled	Total	Channelled into at least A room	Directed only at the property or ground	Not Channelled
Downtown	8 599	8 050	7 522	528	491	449	19	23	58	18	3	37
Park 10	8 207	6 085	5 885	200	2 036	1 921	39	76	86	30	2	54
Cidade Nova	46,30 1	28 354	24 503	3 851	7 586	3 112	1 573	2 901	10 361	1 779	872	7 710
St. Joseph	19,50 7	12 007	9 974	2 033	2 791	1 085	366	1 340	4 709	233	372	4 104

Source: IBGE 2000 [Brazilian Institute of Geography and Statistics], Brazil

The energy supply system in Manaus is hydrothermal, composed of a hydroelectric power plant located in Balbina, in addition to two thermoelectric plants and by four thermoelectric plants of producers (independent). Around 99% of customers of "Manaus Energia" belong to class commercial, industrial and residential, and 1% for the other classes (Rural, Public Power, Public Lighting, Public Services and Own consumption).

According to the records the Manaus Energia, aims to improve the conditions of life of the society, while maintaining agreements with various entities and/or institutions. The company believes that it is essential that the development takes place in harmony with the interests of the community and environment where it is inserted (www.manausenergia, 2002).

The company around to strict care, procedures and preliminary planning when the subject refers to the environment and social impact in the community, starting with the analysis of the location of Power Plants and Substations and the definition of the trace of Transmission Lines. In the

case of the substations are being used armoured equipment, transformers with SF6 (gas found in insulating oil of transformers for low and high voltage), and are being developed projects for Substations Sheltered.

To compensate for the impacts caused by the construction of the Hydroelectric Power Plant at Balbina, "Manaus Energia" keeps in place a Center of Environmental Protection, where Programs are designed Specific Environmental (www.manausenergia , 2002).

In Table 4 there is an energy balance of the city of Manaus, between the years of 1995 and 1999. During this period there was an increase in the demand of 399,583 kw 540,000 kw, but a curious factor observed is that the domestic consumption was reduced from 71,435 kw to 68,621 kw. The maximum demand in kw/h increased from 399,583 to 548,282. Table 5 shows that the number of households assisted with the service of public lighting in two years went from 383,528 to 421,574.

TABLE 4 - Energy Balance of the city in the city of Manaus (1995-1999)

Years	Dem. Max(kw)	Load Factor (%)	Gross Generation	Net Generation	Domestic Consumption	Sales of energy	Losses
1995	399,583	68.66	2,423,988	2,352,553	71,435	1,558,001	668,859
1996	438,655	63.90	2,670,525	2,604,661	65,864	1,811,202	657,117
1997	461,500	76.82	2,933,923	2,861,119	72,804	1,886,776	680,209
1998	525,999	73.41	3,257,916	3,171,295	56,620	1,995,219	784,680
1999	540,000	69.30	3,280,474	3,211,853	68,621	2,286,824	922,277

Years	Gross Generation	Power Inst. (kw)	Dem. Max (kwh/h)	Hours of Operation.
1995	2,424,368	591,093	399,583	24
1996	2,670,897	559,218	438,655	24
1997	2,933,923	673,218	649	24
1998	3,258,938	913,206	526,259	24
1999	3,281,785	1,035,000	548,282	24

Source: Eletronorte , 2002 (Brasil).

TABLE 5 - private Households according to the characteristics of public lighting in City of Manaus (1997-1999)

Characteristics of Home	Private Households Permanent			Residents in households Permanent Private		
	1997	1998	1999	1997	1998	1999
Public Lighting						
Have	383,528	397,919	421,574	1,799,095	1,853,271	1,918,790
Does not have	6,113	2,807	4,785	28,530	10,420	16,750

Source: Eletronorte, 2002 (Brasil).

The New Alexis and invasion Grande Vitória despite the fact that there are streets that do not have electricity (Figure 3), the houses are contemplated, is through the network of regular distribution or through illegal connections allowed or not by the system (Figure 4). An example of this is the Grande Vitória, where 96% of the connections are illegal, however, authorised by "Manaus Energia". Despite the supply, residents complain of frequent interruptions, especially when it rains (leaving two days up to a week without power). It should be emphasized that only the main street of the area has regular distribution.

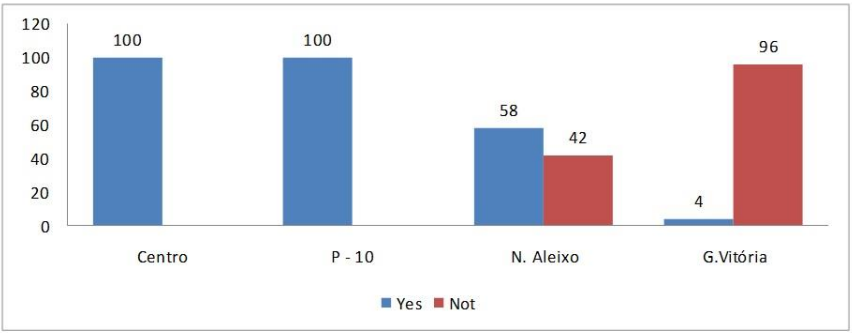

Figure 3 - Presence of public lighting in the Center, Park 10, Novo Aleixo and Great Victory, in Manaus in 2002

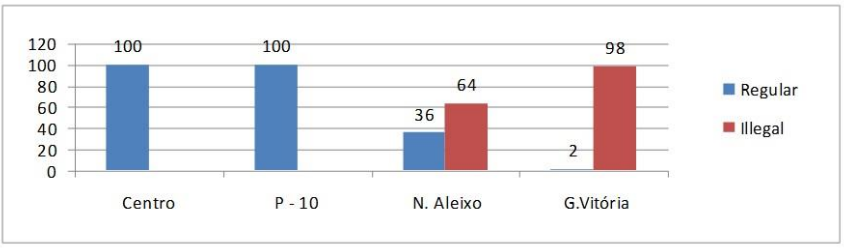

Figure 4 - Type of Distribution in the Center, Park 10, Novo Aleixo and Grande Vitória, in the city In Manaus in 2002

Characteristic of the Population Interviewed

The age of respondents varies between 23 and 32 years, being that, in the New Alexis and the Grande Vitória this variation was that stood out the most (Figure 1). It was found that the majority of the respondents are women. In the Center they accounted for 52 %; in the Park 10 was 62 %; in the New Alexis 90% and in the Grande Vitória 78 %. This result is justified by the fact that the woman is concentrated their work at home.

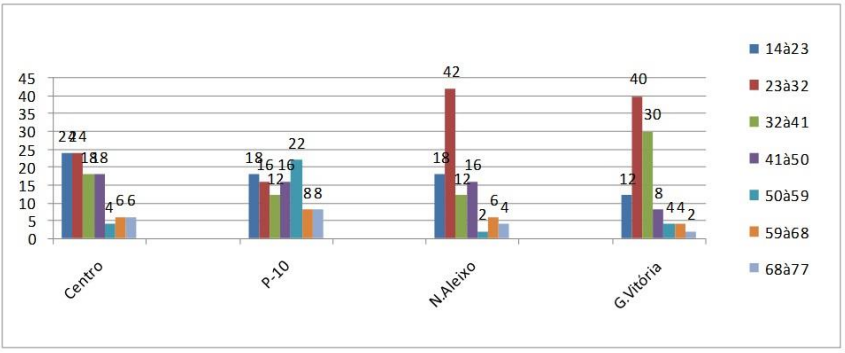

Figure 1 - Age of the interviewees in the areas of the Center, Park 10, Novo Aleixo and Grande Vitória , n the city of Manaus in 2002

In relation to the number of inhabitants in each residence notes that most of the houses there is a maximum of five people. In these houses, the quantity of rooms does not reflect the number

of inhabitants. For example, in Park 10, approximately 28% of the houses have have up to six rooms; already in the Grande Vitória in 28% of cases, the average is two rooms.

With regard to the economic power of the population interview, there is a heterogeneity in their rents. In the Park 10 approximately 50% of the population has income that varies between 2 (two) to 5 (five) minimum wages (Figure 2). The Grande Vitória, 46% of the population that receives 1 (a) minimum wage. Typically, this salary is derived from the work of women.

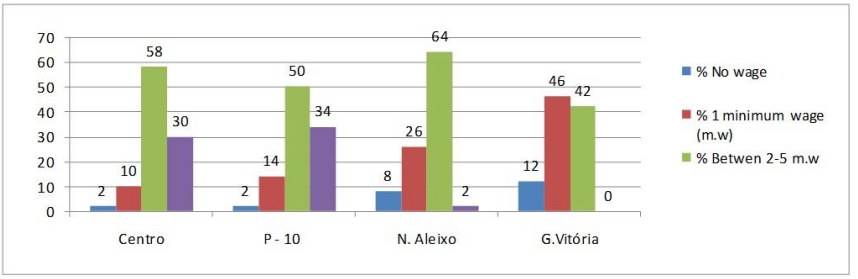

Figure 2 - Income per family of the interviewees from the Center, Park 10, Novo Aleixo and Grande Victory, in the city of Manaus in 2002

As to the origin of the population surveyed in the Center (56 %) and 10 (52 %), the majority was born in Manaus. The New Alexis the difference between those who were born in Manaus and who came from other States is 2 %. The highest percentage of people from other States, especially of Para, was verified in the Grande Vitória (38 %). This can possibly be explained by the fact of being an invasion, where people come in the hope of finding a job for a better quality of life.

The majority of the population in all areas surveyed have their own house, and the majority are of masonry. The New Alexis the brick houses are still in the process of construction, it is observed that many of them have not yet been towed, or painted. The Grande Vitória, even for the fact to be invasion, 96% of the respondents have their own house.

However, these households (56 %) are made of wood with the help of the state government for its survey. This fact evidenced by the presence of a range of State government by donating the material.

In the Center and Park 10 is more of a choice of green area (Figure 7). In the Center there are many squares; in Park 10 there is a Sports Center Social - CSU and the Park of Mindú. The New Alexis and Grande Vitória there are still fragments of green areas that have not yet been deforested.

In the Park 10, about 76% of the interviewees, make use of its green areas. AND only in the Park 10 the population has responded that there is protection for green areas of the district and generally protection is carried out by the city of Manaus.

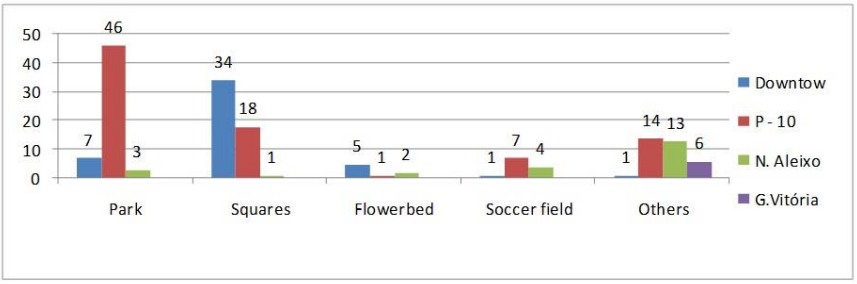

Figure 7 - Type of green area in the district according to the interviewees the Center, Park 10, Novo Aleixo and Grande Vitória, in the city of Manaus in 2002.

What is lacking in green areas? The respondents from Novo Aleixo and Grande Vitória answered the lack of playgrounds and squares. The residents feel the need of places where you can make a vacation with the family, as reported by the majority of the inhabitants of the New Alexis and Grande Vitória.

The green areas more known in the city according to the interviewees are the Park of Mindú, the Woods of INPA and the Ponta Negra. In the Park 10 verifies that the majority knows the Sports Center Social - CSU. The use of these green areas is

more frequent by the residents of the Center and the Park 10. The New Alexis and in Grande Vitória the greatest difficulty faced in attending these places is the transport.

The uneconomic in these areas would be more entertainment options such as bike, playgrounds, sport courts, security. AND in all the areas surveyed the majority of the population says that the more green areas better. According to the interviewees the New Alexis and the Grande Vitória green areas provide more leisure; for the inhabitants of Central greater quality of life. AND for the residents of Park 10 the green areas minimizes the heat.

The places that have green areas (observed and visited) were: the squares of Japiim, Matrix, Police, da Saudade, Congress, San Sebastian, the Santos Dumont, O. D. Peter; the central jobsite Getúlio Vargas; park of Mindú; the Forest of INPA; Campus UFAM; the roundabout at the Park 10.

The service equipment are virtually the same in all the squares: public phone, newsstand magazines, databases, snacks, taxi rank. The square of the Congress is the only one that has mail equipment. However, there is virtually no area of leisure playground for the population.

The streets of San Sebastian and the Police are not in a good state of conservation, there are some finishing touches (such as paintings, monuments, tree pruning, recovery of sidewalks). Already the main square is closed for renovation. Note the presence of garbage in the square of the Police and of nostalgia, this is possibly due to a lack of awareness on the part of the population.

The areas analyzed, the square that has the highest number of trees, especially large and perhaps with primary vegetation is the Matrix. With the exception of squares of Japiim, Santos Dumont and D. Peter, all have historical monuments connected with the history of Manaus.

The central jobsite of Av. Getulio Vargas, has as characteristic only the concrete floor and a row of large trees;

there is no presence of any service equipment or leisure. In spite of presenting these infrastructures, there is garbage thrown by the population, such as: paper, bottle and glass plastic and other.

The Park of Mindú and the Woods of INPA are areas of intense visitation mainly by students of Manaus. These areas are urbanized and have concrete floors in some locations, in addition to trails in bare ground. These locations are found animals of various species, among them the agouti, monkeys, sloths, and others. In addition, feature restaurant that offers including breakfast, as is the case of the Park Mindú. The vegetation of these areas is dense, predominated trees of various species and sizes. The conservation status of these areas is considered to be reasonable, because the trash in some locations is visible.

The roundabout at the Park 10 is a location recently built, with concrete floor and small shrubs and trees planted in the center of the roundabout there is a chafari, which operates mainly in the evening.

It is noted that the majority of green areas are in good state of conservation. However, it is clear the involvement of public authorities in preserving other areas, there is a view in the last two months (September and October 2002) intrusions into green areas on the outskirts of Manaus. Other studies have pointed out the problem of the maintenance of green areas by population and the public authority. The work of BAPTIST (2000) it became evident the lack of green areas in the city of Parintins, as well as its use by the population. The peripheral areas of the city of Manaus, as in Novo Aleixo and the Grande Vitória, also have the same problems.

Thus it is of utmost importance that there is awareness on the part of the population of that green areas are vital components of the social and environmental balance of the city, since its regular use facilitates the social contact between the inhabitants and makes the temperature more pleasant.

Final Considerations

The city of Manaus presents in its urban space the specific situations that have marked its growth over the years. These were carried out in a context where there was a lack of mechanisms for planning. As a result the impacts generated in the accelerated urbanization process, initiated in the golden period of rubber and culminating with the deployment of Free Zone, transformed considerably your environment.

Note the absence of effective instruments of urban management and environmental in Manaus. This is reflected in the quality of life of the population. The vision is that the resident population in the periphery increasingly distancing itself from the minimum standards of quality of life achieved by other residents of neighborhoods more structured (sanitation, water, and energy).

The precariousness registered in outlying areas showed that the services of basic infrastructure are not sufficient to meet the demand population that is installed in the city. The aggravating this situation are environmental problems observed in the absence of sanitation, trash build-especially in vacant lots and creeks (which some disappear due to excessive accumulation of pollution).

As the process of urbanization it is necessary to establish a planning based on social issues, educational and environmental. It is expected that through the Master Plan of the city of Manaus is a better monitoring in process of the occupation. AND that the facts are analyzed interdependently, and comprehensive in order to achieve the recommended Sustainable Development Urban.

Public policies in order to provide a sustainable development, need the participation of the population. Since there is an urban management willing to promote quality of life, the community must interact in this complex challenge to maintain the balance of your environment.

The first step is to make sure that the population is in the awareness that there is no functioning independently and that nature is not a set of isolated events, even within the ecosystem characteristic of the city. There is a need to understand the relation between man and nature to appear sustainable ways of living.

There must be a commitment of public authorities mainly to implement measures that benefit the population as a whole and that the growth of the quality of life is carried out in an equitable manner.

In this sense the importance of the organization of the inhabitants in the search for the right to the city in its broadest sense. It is necessary to rediscover the true meaning of citizenship. IS Mister considers that attitudes have nothing to do with the problems that manifest themselves in the urban context, without a performance full and continuous citizen, imply, in frames of degradation socio-environmental-cultural.

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