Lakes, rivers and cities

M. Fiuza & G. Cartaxo
PPAU — Projects and Researches in Architecture and Urbanism – Brazil
1COPPE-UFRJ-UFC – University of Rio de Janeiro, Brazil
2Environmental Institute of Studies and Consultantship, Brazil

Abstract

This paper is an approach to the reasons that conceive urban occupations apart from the configuration of natural resources in some Brazilian cities.

1. Introduction

The State of Ceará is known by its long drought periods and lack of water. However, some of its municipal districts are rich in water resources, mainly lakes. This fact becomes intriguing by the direction that the urban centers had been formed and develop indifferent to the natural waters. Often, the rivers remain apart from the road system. Even when included in the urban system, the buildings do not face them. The townscape does not enjoy them. The rivers serve as points of garbage disposal and drainage, and therefore fill a critical role in the social segregation. Then, it contributes to social exclusion, instead of being a place of enjoyment and pleasure. Often they are surrounded by the walls of the bordering constructions, making them visible only in some spaces.

Ignored by the city plans as well as in the growth of small urban centers they soon become abandoned places where garbage accumulation and predatory practices of mining desolate the riverine vegetation, which causes erosion, adverse impacts on the environment and blockages.

The point is that urban settlements are often disassociated from the environment. This study investigates the vestiges of such procedures in the history of Brazilian urbanization, and also verifies, in the evolution of the urban and environmental legislation, the rules or the absence of laws that ended in consolidating of this type of urban occupation.
According to Goulart Filho, the prevalence of an occupation model is the result of a tradition or a compulsory planning, or even both factors. As in many small and medium Brazilian cities there is no planning practice, being common the occurrence of spontaneous growth in the urban centers, in what extent the uses given to the lakes and rivers take the tradition of this type of urban configuration apart of its natural resources? The history of our cities, however, presents some likeness in what concerns to the origins of its constitution.

2. The colonial urbanization and the sea

According to some scholars, the primitive settlers in Brasil considered the safety as one of the most important factors when choosing a place to settle in. That was what happened in Rio de Janeiro, Ilhéus, Salvador and Fortaleza, where the first settlements were in hills so that anchored ships could be easily seen. However, we can say that being near potable water was as important as the ships’ security. Cities do not exist without water, said Vitruvius, an roman architect in the first century B.C.

Portuguese people would not get away from the shore, keeping their eyes in the sea. They stayed in the land temporarily, only the necessary time to explore its natural resources which were sent to the Metropolis. Priest Antonio Vieira reported the lack of value of the public goods when he says in his Sermons that the Portuguese did not come to Brazilian lands in search of the welfare but to take the wealth. It was the risk of invasions from other nations that led the Portuguese to settle permanently in Brazil. So, the expansion of the first centers occurred mainly in plane lands, close to the beaches and to the rivers that offered access means and urbanization.

The first urban center, in Rio de Janeiro, was created in Morro do Castelo. Its expansion occurred in the plane area, outlining sandbanks that isolated the chain of seashore hills. For its expansion, it was necessary the drainage of flooded areas and the embankment of several lagoons. The disassemble of the hills were also a constant in that urbanization process. Few cities in the world transformed its natural landscape so much through the times.

In São Paulo the occupation happened in a discontinuous way, avoiding the flooded areas which were gradually invaded by spontaneous occupations, being absorbed later by the urban mesh when already partially or totally converted into land.

In Fortaleza, the occupation occured a little late, due to its open coast, without bays, not very favorable soil for the sugar-cane and to the lack of navigable rivers. The choice of the first ranch, was in the hill close to the river Pajeú, from where the ships anchored in Mucuripe could be seen. Along Pajeú the first urbanization was developed, in a lineal configuration accompanying the irregularity of the river design.
2.1. The four-square design and the natural configuration

The development of most main colonial cities was not spontaneous. The Metropolis had a strong control over it. Everything was controlled through legislation which came from the reign. Such legislation required strict geometric patterns for the roads. In 1575, São Paulo already made use of what they called “arruadores”, men with the duty of designing the roads and controlling the constructions’ alignment. However, the poverty in urban centers as well as the lack of controllers, resulted in difficulties to enforce the laws. In contrast with large urban centers, the little districts, without the Metropolis’ control, had a more harmonious development in what concerns to environment.1

The city plans, as worked out by the Portuguese, ignored the topography and the water resources. The control, however, was less rigid and disciplined than that of the Spanish. The four-square design was the pattern to be followed in Brazilian cities which expanded under the same rationalism. In some of them, like Rio de Janeiro and Salvador, the irregularity of their land led to a variation of that design. In other cities like Fortaleza, the pattern remained. So, the urbanization of the cities occurred ignoring the compatibility with environment, and the rigid form persisted in the pioneers of planning, in the nineteenth century, Silva Paulet and Adolfo Herbster.

The Dutch promoted a different occupation in Recife with more environment concerns. According to Nestor Goulart: “Although there was a difference between the plans and the natural designs, it is clear that the Dutch searched to adapt the qualities of a geometric plan with the advantages of an organic articulation, showing an evident superiority in relation to the Portuguese, for the way they dealt with the problem.”

The beaches, in colonial times, were commercial places, where fish, vegetables and other goods, which came from the farms by boat, were sold. Animals, merchants and slaves could be found there. Animals were killed, fishes were cleaned and wastes as well as the city sewers were thrown in the sea. The constructions of warehouses, the strong smell of fish and the noise contributed to the decay of such areas. Rivers and lakes were also service places. People doing their laundry, cattle drinking water and horses being washed could easily be seen. Although they were the water supply for humans, animals and plants, they were not considered noble public spaces. It was said that near lakes and flooded areas the air was hot and unhealthy.

So, Brazilian cities have grown with an urban design disassociated with sinuous rivers, lakes and seashore.

3. The hygienist urbanization and the sport

Brazilian cities developed, during the colonial period, under precarious hygiene and health conditions, dealing with epidemics like “yellow fever” and “small-pox”, with few or almost no leisure areas. The streets were narrow and the houses were too close and lacked air circulation.
The urban space organization, in what concerns to hygiene and health patterns, appear in the beginning of the nineteenth century, as a result of Europeans’ hygiene theory, mostly in Rio de Janeiro with the arrival of the royal family. The constructions should now consider the necessary position for a better air circulation. According to the new hygiene regulations, the contact with nature has a therapeutic importance like bathing in the sea and the country’s fresh air. The new habits, however, do not change the population’s daily life in their relation with nature, which is still used only as a means of subsistence, and not as leisure and recreation space.

The sports practice begin in the late nineteenth century, and will change people’s posture towards environment. With the sports, which begin to be considered as essential in modern education, families change their habits and aesthetics concepts about the body, whose pattern becomes more healthy and strong. Since sports grew in value, clubs are created and the sea as well as other water resources begin to be considered as good for the practice of swimming, canoeing and other water sports. Sport gives status. It is initially an elite practice which slowly spread through other social strata, but remains as bourgeois habit in some categories such as tennis, swimming, canoeing etc. So, rivers, lakes and the sea remain ignored by most of the population as leisure spaces.

Indeed the urbanization process ignored the importance of rivers, lakes and the sea as leisure spaces or their natural scenery value. Houses had their backs to the sea and to the riverbanks. With the growing awareness of the physical and mental benefits of nature as well as the medical use of sea, in the late nineteenth century, beaches begin to be considered as therapeutic and leisure places. The bathhouses and public booths where people could change clothes appear and real state companies initiate campaigns to valorize investments in the seashore area. So, the roads by the sea in Brazil appear just in the beginning of the twentieth century.

4. Formal and informal space in Brazilian urbanization

Brazilian cities are characterized by the presence of permanent and institutionalized urban spaces, and by transitory and troublesome informal spaces. The permanent are those whose constructions were according to the legislation and were built to last through the years. The transitory, informal and troublesome are the poor areas, peripheries, never conceived as permanent spaces. They are spontaneous occupations in swamp zones and flooded lands where mud delimits a confusing and ambiguous physical space. They are occupations in risky areas like hillsides, riverbanks. They are poor houses in beachside where the interests of real state speculation has not arrived yet. They are the fishermen’s villages where sea is perceived only as subsistence means. They are the spaces which are likely to change along the formal urbanization process.

Although the concepts about the value of the sea have changed, the occupation process of both spaces, through almost the whole last century, continued to ignore the natural scenery value of the environment. The legal space, because of
the priority given to the rational plans of the “four-square” system of roads which is interested just in reducing costs and optimizing the circulation time. The informal spaces, because of their own lack of organization and the survival needs which surpass any conception like natural scenery value. There is too, permeating these two space categories, the planned occupations, legal or not, along the banks of streams and rivers, blocking the access to them.

5. The legislation

The first laws enforced in Brazil, by the time of the discovering, were the “Ordenações Afonsinas” which had their concerns with the forest wealth, like the prohibition of cutting trees. Portugal protected the fruit trees and the brazilwood, mostly because of the need of guaranteeing wood stocks to the expansion of its fleet and the lack of food in the Reign, what caused a constant concern with the forests, the fruits and the hunting, specially with the brazilwood which was a monopoly of the Portuguese Reign.

The “Ordenações Filipinas” from the period of Spanish domination, forbade the use of nets for fishing in some months of the year, as well as pouring out any material that could kill the fishes. In 1760 the captaincies Rio de Janeiro, Pernambuco, Santos and Ceará enacted a legislation to protect the growth of mangroves. The Dutch domination in Pernambuco, contributed to other advances in the environment legislation, like the combat to mono cultivation and the prohibition of throwing sugarcane wastes in rivers.

As we can see, the environment legislation has always been present through Brazilian history without, however, achieving the necessary protection to guarantee a sustainable development.

5.1. The legislation and the rivers

D. Maria in 1797 published several statutes which recommended the protection of forests and trees located along the seashores or riverbanks. During imperial period the “Ordenações” were attentive to fluvial waters. “Rivers and riverine waters can be occupied by private owners and derived by canals, or even be taken for agriculture and industry benefits.” “They are a national domain. §1° The resources of public use, such as (...) navigable rivers, if they are flow, let them flow everlasting (...) (Ordenações, Book 2°, tomo 26, §8°)” The first Brazilian Constitution, 1824, neither mentions fluvial water, nor its sovereignty, what will occur just in the 1934 Constitution, which recommend the protection of fluvial waters e had its concerns about navigable resources. Two factors, however, contributed to the inapplicability of such legislation: the absence of controllers and obscure definition of domain (The 1891 and 1924 Constitutions) and consequent absence of legal procedures for protection.

The “Water Code” and the Constitution considered the waters and their banks as public areas. The “Water Code” classify the waters in common and public, being public the sea, the streams, the canals, ponds and lakes, navigable or floatable. It is important to note that navigable waters receive special treatment, being its
domain clearly defined as public, what makes it possible to control and protect, mostly because of the existence of legal instruments. Such special treatment, among rivers, suggest the different urban planning results in some cities concerning their riverbanks, like Manaus, Porto Alegre e Recife, with the preservation of their banks as public areas. The need of transporting goods which arrived through fluvial ways, led to the construction of roads near navigable rivers, solving the main problem to their preservation, the demarcation of their domain. The public areas were, so, defined, visible to controllers and integrated to gridlock and to the urban routine.

The Forest Code, 1934, creates permanent preserved areas of water resources, including and demarcating strip sides to the water courses.

The preservation areas suffer from continues squatter occupation, at the expense of life and public patrimony. Due to the lack of demarcation, landmarks and control as well as for the fact that they are not inserted in road system. In what concerns to seasonal rivers and lakes, the private housing speculation and the government itself use the drought periods to promote constructions.

The problem of the absence of legitimate actors to defend the environment is only solved during the 80's after the “Ação Civil Pública” Law in 1985 and 1988 Constitution, when environment becomes a citizen’s right, what makes possible that anyone, person, governmental or non-governmental organization, or even the government itself, defend the environment.

6. Conclusion

Although Portuguese legislation has advanced instruments pioneers in Environment Rights, it is clear that the concerns about environment had an economic connotation, without any ecological, scenery or urban concern.

The tradition of urban planning in Brazil apart from the configuration of natural resources is a heritage from the colonial period, when the four-square pattern would not considerate integration with the environment. The cities grew in geometric formats having their continuity interrupted by rivers, lakes, swamps and hills that, since were not considered as formal spaces, suffered spontaneous occupations, what caused the decay of water resources.

Actually we do not have, even nowadays, a Brazilian urban policy which conciliates urban planning and natural, and consider the value of public wealth, scenery and integration to the city. The overprotection, the myth of the untouchable nature, which do not include natural resources in urban daily life, sentence the landscape to be an informal space and consequently vulnerable to malicious degradation.

The idea of demarcating preservation zones implementing an environmental friendly road which integrate such resources to the city and make it possible to use them without the degradation of their banks, was the urban solution proposed to some municipal districts in the state of Ceará which are making their Master Plans for Urban Development. Its is necessary that some complementary actions are taken, such as a strict control of density, permeability taxes, and the legal uses which guarantee the sustainability of the natural patrimony. It is still
early to say that this would be the solution to the problem, but the visibility and
to these natural resources reach, with the creation of environmental friendly
roads, makes possible a control performed by the population and the practice of
an environment citizenship, mostly when the Constitution delegates to all of us
the duty of protecting nature.

"City leaders often promote the notion that roads and highways are the arteries of
urban life, and that the free flow of automotive traffic is the lifeblood of a
healthy urban economy. Yet the policies that facilitate grater flow, like those that
encourage ever more profligate consumption and waste in all its forms, are the
very policies that are poisoning the well for civilization. It is fresh water,
especially the water right under our feet, that is the lifeblood of cities."  
The twentieth century face the road net as the vital system to urbanization. The
great challenge of sustainable planning in the twenty-first century is to rescue the
rivers as the lifeblood of cities.

Illustrations

Figure 1 – Constructions in Salvador city, already presented in 1625 a geometric
configurations, with its linear road system. (Detail of the Letter N°
LXVII in Iconography Catalogue, drawing by Benedictus Mealius)

Figure 2 – Parati’s geometric urban design is an example of the disassociating
with sinuos landscape.

Figure 3 – Fortaleza’s present plan shows that its urban policies have not yet
associate the lakes and rivers design with the city plan.

Figure 4 – Caucaia, a medium-sized city in the state of Ceará – Brazil, also rich
in water resources, has a geometric urban design indifferent to rivers,
lakes and landscape.

Figure 5 – Fortaleza’s downtown plan shows the square pattern’s accuracy.
The Sustainable City

Figure 1

Figure 2
Figure 3

Figure 4
Figure 5

References