

Population Pressure and Environmental Degradation: Facing the Challenges of Urban Changes in the Baixada Santista Metropolitan Region (Brazil)

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Introduction

For centuries Brazil settled along its extensive Atlantic coast in order to establish the territorial occupation. In fact our historical urban experience provides evidence of a spatial production with a little concern about the natural resources or the maintenance of the natural areas. Viewed from a contemporary perspective, such utilitarian appropriation of nature in the urban areas has long tradition, largely incorporated in the major of cities. The urbanization has been developed without any consideration about the environment characteristics as topography, hydrology, soil limitations, vegetation, etc.

Native remains of the forests has been wiped out, rivers has been closed in pipes and covered by roads. Massive urban migration, informal processes of occupation, squatter settlements, extensive land developments and social struggle for the extensions of minimum conditions of urbanity in distant and less valuable places with the worst conditions of infrastructure are some of the various features that contribute to the construction of a specific image of urbanization in large cities and metropolitan regions.

Such image necessarily equates urbanization to a space of low quality and socially unjust. The continuous growth of urbanized areas is very intense in land and natural resources consumption. It changes previous land use, extending land development and triggering land rent mechanisms. It also raises urbanization costs by demanding from the state and developers investments related to services availability, sometimes as a precondition for occupation.

In the specific case of Baixada Santista was supposed that these changes could be provoking different effects, like conflicts between environment and urban structure with risk to population.

Using satellite images, aerophoto and Geographic Information System (GIS) was created a time series of land use with spatial analysis and comparisons between distinct periods. This process contributed for understanding of urban expansion, mainly in terms of

social and spatial dissimilarities and distribution of population as well the urban extension on the areas of environmental protection. Through the geoprocessing techniques was accomplished the integration of data and the implementation of spatial analysis useful to locate the areas of conflict between urban legislation, environmental limitation, population and socioeconomic characteristics that could be associated with some risk situations provoked by forms of occupation. The integrated analysis of these aspects allowed visualizing the global panorama of events and also to understand the diversity of socio and spatial problems of this region.

Objective

The aim of this study was to achieve an analysis of the socio-spatial inequalities and of the environmental vulnerability of the population in the Baixada Santista Metropolitan Region located in the north coast of Sao Paulo State (Brazil). This region is facing an important social challenge of global changes caused by an urbanization process with a significant population growth and the increase of pressures on the environment. The idea was to identify spaces of vulnerability through the environmental risk mapping, for example, people living in areas of flooding or landslide.

Methodology

In the following methodology, Landsat TM and ETM+ images were used to identify different patterns of land use providing a time series classification along the region in order to compare different periods of urban transformations between 1990 and 2005, considering the environmental changes like deforestation, watershed conditions, erosion, etc. In this case it was important to distinguish the processes that provoked significant transformations in the land use patterns caused by socioeconomic and political decisions that might have led to risk situations for coastal population. To identify the characteristics of population in these situations it was considered the census data about head household income and domiciliary infrastructure.

Results

As result it was observed that the metropolitan expansion brings together not just the increasing of urban complexity with the nucleus desconcentration and peripheral extension, but also evidence of an increase of the socio-spatial inequalities that can be observed by the stratification of the space in different social layers where the poor classes were pushed for distant and less valuable places with the worst conditions of infrastructure. Besides, many forested areas were converted in non-forest land for urban and industrial use without any ecological criteria. This region has experienced an unprecedented destruction of its wetlands, Atlantic Coast forests and restinga (type of coastal tropical and subtropical moist broadleaf forest) occupied mainly by residential and industrial expansion. So, it becomes urgent the establishment of strategies for a more efficient occupation of the territory and use of the natural resources seeking to reduce environmental threats that put the coastal population at risk.

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