

Influence of urbanization on the original vegetation cover in urban river basin: case study in Campinas/SP, Brazil

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ABSTRACT: In most Brazilian municipalities, urban development was not based on adequate planning; one of the consequences was the reduction of the original vegetation, limiting the forest formations to scarce and isolated fragments. In Campinas, São Paulo, Brazil, the vegetation fragmentation was mainly related to the expeditions and to the cycles of sugar cane and coffee. In this way, the present study aims to identify, quantify and evaluate the remaining arboreal vegetation spatial distribution in the Anhumas River Basin - Campinas/SP, Brazil. This study was developed with the aid of GIS software and field visits in order to construct a diagnosis of these areas and subsidize future actions required and to discuss the influence of urbanization on the original vegetation cover. The area was initially occupied by the Atlantic Forest (semi-deciduous forest) and drains one of the oldest urban occupation areas in the municipality; according to researchers, based on the water and geomorphological conditions of the basin, it can be subdivided into high, medium and low course. With a total area of 156,514 km², only 16.74% are classified as green areas; where just 1.07% and 6.17% of total area represents forests and reforestation areas, respectively. The remaining green areas consists of: wetlands close to water bodies, but with no presence of trees and shrubs (area of 0.12% of the basin); urban green space, including parks and squares (2.19%); and natural field, constituted by natural non-arboreous vegetation (7.18%). In a scenario like this, a characteristic situation is the forest fragmentation; this process results in native vegetation remnants, isolated and more susceptible to external interference, coming from, for example, the proximity to agricultural areas or others land uses. The ecological knowledge of the remnants and their correct management can not only make it possible to diagnose current problems and to estimate future influences, but also to point out the necessary changes to maintain the environmental balance. In the Anhumas River Basin were identified 128 forest fragments, including remnants of natural vegetation and also from successful reforestation. Most of them, 112 fragments, have an area between 1.0 and 20.0 ha; There are only 7 fragments with area lower than 1.0 ha and 9 fragments greater than 20 ha. Furthermore, most of them are located in the lower course, covering an area of 652.23 ha, 4.17% in relation to the total area of the basin; in the middle course are 216.61 ha occupied by fragments, encompassing 1.38% of the total area; and finally in the upper course, the most urbanized region of the basin, there are just 133.26 ha of fragments, representing only 0.85% of area. One may observe that the number of the forest fragments and their areas are getting smaller as they approach the urban perimeter; this fact shows a direct link between urbanization and the significant loss of vegetation cover, resulting in negative effects on the life quality and urban environmental balance, such as the reduction of soil infiltration, the water runoff increased, the urban temperature increase, urban heat island, floods and other associated problems. These analyzes, therefore, contribute to help the environmental management in an appropriate way, considering the demands and potentialities of the region.

Key words: River basin, forest remnants, environmental quality.