

Alternative strategies for vegetation implementation and integration within the urban context: the case of Bogotá.

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Capital cities in developing countries deal with such a fast rate of growth that their sustainable development can be hindered. Bogotá, the capital city of Colombia, has a deficit of housing and public space; nevertheless, land is acquired predominantly to solve the insufficiency of housing. Architecture concentrates predominantly on economic utilities as the price of land rises and determines the projects feasibility. This situation leads to budget reduction for green initiatives, and especially for the inclusion of vegetation into the urban landscape. This reality is driving Bogotá towards an aggressive and fast-growing urban development while eschewing the need for vegetated spaces within the city and within these housing complexes.

The lack of vegetation affects several aspects of the environmental and experiential realms, such as air quality and social interaction in collective and public spaces. For instance, Bogotá exceeded the PM10 levels permitted by the World Health Organization (WHO) during 40% of 2011. It has been documented that vegetation can aid to reduce the concentration of pollutants and consequently the impact on human health (BECKETT, 1998). Another benefit is that vegetation would enhance the lives of urban residents and affect their relationship with the community and the city by promoting social interaction as a preventive measure to interpersonal violence (MATSUOKA, 2008). According to the balance of the Security Observatory in Bogotá, the first trimester of 2012 showed that interpersonal violence continued to increase at a rate of 4% compared to the same period in 2011. However, it is necessary a new perspective based on a sustainable vision of the city. Understanding Bogotá as an urban ecosystem with a capable population to mediate the city's construction towards a sustainable path, offers the opportunity to act as leaders towards designing strategies for the implementation of vegetation with a positive social, economic and environmental impact (United Nations, 2001).

This paper presents alternative strategies for vegetation implementation and integration at the urban ecosystem of Bogotá. The qualification of *alternative* is important as it differentiates these strategies from past governmental initiatives related to the green and blue network reinforcement within the city. At the urban scale, the strategy provides spaces for learning experiences associated to vegetation benefits. In parallel, the strategy at the architectural scale, aims to open productive areas within housing projects for the implementation of vegetation and creation of green spaces. Subsequently, from the moment urban residents have increased their awareness and claim vegetation as an essential part of their ecosystem, they will claim the space to do it, implement the integration of vegetation within their built environment and find new functions for an element considered as purely ornamental before.

At the urban scale, new foodsheds could develop throughout the city to promote and share the experiences and associated benefits of integrated vegetated spaces. This urban food network can acquire a pedagogic character through a greenhouse network developed with private and public collaboration. Agricultural knowledge coming from the country's internal and employment-seeking migrants could reinforce Bogotá's urban foodsheds. Consequently, people from the rural areas who find themselves as non-productive members of the urban society, could become leading actors in the implementation of sustainable structures for the city and its population. In terms of the

architectural scale, the proposed strategy includes modifying the existent construction regulation in order to open productive green areas within housing development projects. Bearing in mind that Bogotá's weather condition allows food production throughout the year, this modification promotes the creation of spaces for intensive green roofs and vegetable gardens. Social housing in Bogotá should demonstrate an inherent component for economic productivity in response to the families' economic difficulties. Thus, urban agriculture can be considered as a viable activity for families and as having a multiplicative factor for the greening of the city. The proposed strategies benefits are extended throughout Bogotá's outskirts, as they are part of the Bogotá-Region system. As new architectural developments would have a place for vegetation inside the city, there would be a reduction in the invasion of productive agricultural lands in the Bogotá's savannah. As well, an adequate agricultural flow of large scaled production coming from the rural areas with localized distribution spots inside the city could be integrated within this scheme.

In conclusion, the actual development in Bogotá does not include a sufficient percentage of vegetation in the city. The increase of green spaces can act as agents for improving air quality and social interaction. The new proposed perspective includes considering Bogotá as an urban ecosystem with a strong capital of capable inhabitants driving the city towards a sustainable path. Order and scale of strategies are fundamental in ensuring positive results in the short, medium and long term and for this proposition to be successful in impacting the triple bottom line.

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