



## **Vertical gardens and variability of environmental conditions in wetland areas: A first step towards green growth in urban areas in Bogotá (Colombia)**

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The aim of this paper is to analyze the changes that have been produced in the temperature, humidity, precipitation, and edaphic parameters due to the presence of vertical gardens in the wetland "La Vaca" in Bogotá (Colombia). There are some conflicts in this wetland regarding the uses of the land due to the illegal urbanization settlements in flood-prone zones; to which a loss of the natural space of the wetland and the effects of climate warming is added. For this reason, vertical gardens are presented as an alternative for the solution to the aforementioned problems, since their implementation can act as a control barrier to possible floods considering their properties of water retention and temperature control. This work also sets its sight on knowing what changes have been produced in the environmental variables mentioned before with the presence of vertical gardens, and also on studying its temporal and spatial variability in the environment of the study area. The investigation begins with the installation of three vertical gardens with floating vegetation systems, installation of drip irrigation, and organic fertilizer built from the invasive vegetation of the wetlands. Subsequently, in the absence of vertical gardens, control areas are proposed for comparison with climatic and edaphic measurements. Finally, different statistical analyzes are performed, such as the comparison of means with parametric and non-parametric tests, among others, to determine spatial differences, and the changes that have been produced in time series. Vertical gardens are an alternative of "green growth" that make it possible to restore green areas and Riparian Buffer Zones in wetlands, using the resources of the environment to reduce costs in possible floods and the effects that are generated by climate change.