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Soil-water interactions: implications for the sustainability of urban areas

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Cities have become recently the home for more than half of the world's population. Cities are often seen as ecological systems just a short step away from collapse [Newman 2006]. Being a human construction, cities disrupt the natural cycles and the patterns of temporal and spatial distribution of environmental and ecological processes. Urbanization produces ruptures in biota, water, energy and nutrients connectivity that can lead to an enhanced exposure to disruptive events that hamper the wellbeing and the resilience of urban communities in a global change context.

And yet, mankind can't give up of these structures one step away from collapse. In this paper we visit the ongoing research at the Ribeira dos Covões peri-urban catchment, as the basis to discuss several important processes and relations in the water-soil interface:

A] the impact of the build environment and consequently the increase of the impervious area on the generation and magnitude of hydrological processes at different scales, the impact on flash flood risk and the mitigation approaches.

B] the pollutant sources transport and fade in urban areas, with particular emphasis in the role of vegetation and soils in the transmission of pollutants from the atmosphere to the soil and to the water processes.

C] the use and the environmental services of the urban ecosystems (where the relations of water, soil and vegetation have a dominate role) to promote a better risk and resources governance.

D] the special issue of urban agriculture, where all the promises of sustainability and threats to wellbeing interact, and where the soil and water relations in urban areas are more significant and have the widest and deepest implications.