

## Analysis of the paradigm shift in urban stormwater management: political, institutional, regulatory, public health, and economic aspects

### Summary

Urban stormwater drainage and management services are essential for city life and since cities have been places where people meet and transact, the city has dealt with rainfall in a variety of ways. As the number of people increases so does the complexity of infrastructure required to meet the social, economic, and environmental demands of the territories. Management also becomes more complex and requires different ways of dealing with stormwater drainage and management systems accompanied by the costs associated with each option. These require the increasing consideration of items that were previously overlooked due to ignorance or disregard, such as pollution and the prevention of extreme events of water scarcity and abundance, respectively, as well as externalities.

The evolution of mankind, in all aspects, has been a determinant of the problems, but also of the solutions presented and for these, technology and knowledge have been present as contributors to the improvement of urban services management. The incessant demographic and physical growth of cities, combined with all kinds of changes, of which climate change appears as the main determinants of the way of life to which city dwellers must submit, has caused institutions and organizational structures to be put to the test, requiring, not infrequently, the creation of others, better adapted to the new reality.

Social, economic, and environmental aspects are different in quality and magnitude, requiring a paradigm shift, embodied in various aspects such as the consideration of stormwater as a useful resource for urban functioning and no longer as a nuisance to life and health of urban inhabitants. Thus, instead of driving it away as quickly as possible, the recent mentality points to the most diverse ways of using it, making its coexistence extend for as long as possible, so that benefits can be extracted.

This study aims to address this paradigm shift, still incomplete and therefore in progress, so that through the analysis of various aspects and examples, relying mainly on critical reflection on these, it can be given relevant contribution to the development of the subject that has not been focused with the intensity understood as necessary due to the importance and effects it produces on urban life.

Thus, without exhausting the subject, after a brief literature review, the political, institutional and regulatory aspects (PIR) involved in the paradigm shift are addressed, followed by a study of the interrelationship between urban drainage and public health, using the case study of Dengue, Chikungunya, and Zika in Brazil as an approach. This is followed by an analysis of ways in which economic and financial support for urban stormwater management systems can be provided, exemplified by the case study on the application of Stormwater Utilities in the USA, and concludes with a presentation of examples of private sector participation (PSP) as one of the mechanisms used for change in several countries.

### Keywords

Public policy, public health, socio-economic-institutional shift, stormwater management, urban governance transition, utility services regulation.



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