

MSc

Title and Author

Gestion et modélisation des eaux de pluie en milieu urbain. Application au cas de la ville de Belo Horizonte, Brésil.

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Abstract (~500 words)

Stormwater management in urban areas has increasingly gained importance over the last decades, in particular in developing countries which experienced a lack of urban development strategy, and a strong urban population growth. Brazil has been chosen as a case study as it underwent through similar development trends. Being a tropical country, there is an additional problem linked to the high variations of rainfall between winter and summer. These inequalities of rain distribution have led to many difficulties for the dimensioning of the rainwater drainage system, being either under-dimensioned during storm events, or too large during dry weather.

To be able to better grasp the type of problems which appear in Belo Horizonte, and to get a better understanding of the interactions related to stormwater management, a model of the city center was done. The main objectives of this study were in two spans. First of all, the focus was to try to understand and find solutions to the problems of stormwater management which would appear in the future. The second aim was to assess the capacities of the use of such a model as a decision support tool.

The analysis of the present situation of Belo Horizonte led to the observation of many problems of excess of water loading in the river rainwater drainage system, and the appearance of many overflows. Taking this into account, the development of a future scenario was done, taking into

account the potential impacts of climate change and urban development, and introducing the implementation of various best management practices (BMPs). The results obtained showed a net decrease in the volume of rainwater drained, and of the pollution loads in the runoff. However, it also appeared that these BMPs were not sufficient to completely solve the problems related to stormwater, and that more important measures should be taken at the level of the city planning. It is at this level that the potential of using such a software as PCSWMM can be of use as a decision support tool, especially for strategic decisions, by comparing the efficiency of various BMPs proposals.

SWITCH Deliverable Contribution

n.a.

Description of how PhD contributes to goals/objectives of deliverables

n.a.