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Quantitative potential for stormwater control measures

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Rainwater in the urban context is both a resource for e.g. recreational and amenity purposes and a potential problem due to e.g. pluvial flooding. In Denmark municipalities are increasingly trying to handle rainwater in both everyday and extreme situations using other techniques, here referred to as Stormwater Control Measures (SCMs), than traditional sewers as a means of climate adaptation (Copenhagen Municipality, 2012). This study provides a new framework to communicate the potentials for SCMs taking into account the properties of rainfall making it both a problem and a resource. The quantitative potentials of SCMs are calculated in relation to the municipal water balance (figure 1 left) and the Three Points Approach (Figure 1 right, Fratini et al., 2012). Different SCMs where rainwater is infiltrated or harvested are used to illustrate the tool. The potentials are calculated for the two largest municipalities of Denmark: Copenhagen and Aarhus. The Three Points Approach is used to distinguish between different rain domains, and to subdivide the quantitative potentials accordingly. This analysis shows that designing SCMs for larger return periods than 5 to 10 years, and thus making them attractive for flood protection, result in a very marginal increase in the rainwater these systems will actually handle compared to systems designed for less severe events and result in heavily increases in the size of the SCMs.

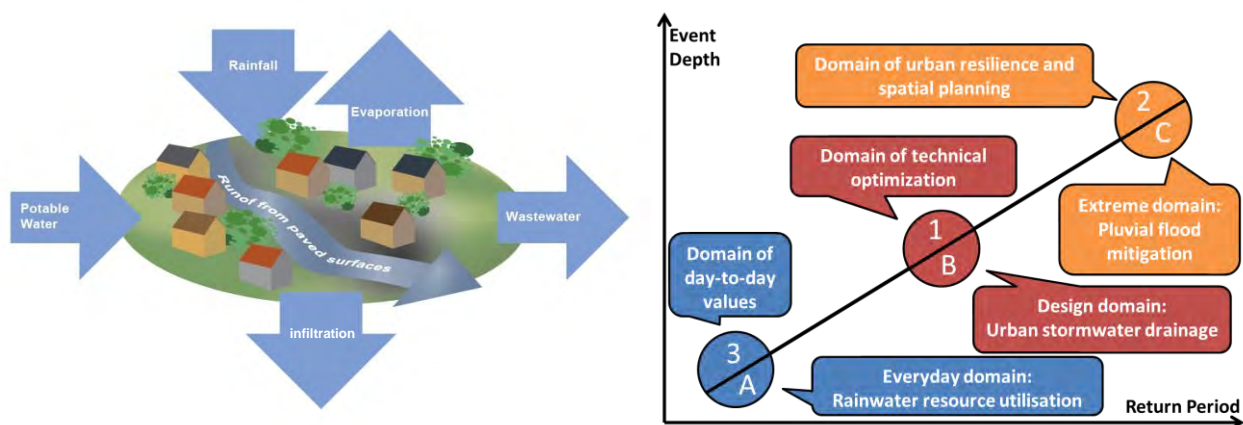


Figure 1 Left The most important flows in a municipal-wide water balance. Right: Delineation of the Three Points Approach.

Copenhagen Municipality (2012) The City of Copenhagen - Cloudburst Management Plan 2012.

Fratini, C.F., Geldof, G.D., Kluck, J and Mikkelsen, P.S. (2012) Three Points Approach (3PA) for urban flood risk management: A tool to support climate change adaptation through transdisciplinarity and multifunctionality. Urban Water Journal, 9(5) pp. 317. doi: 10.1080/1573062X.2012.668913.