

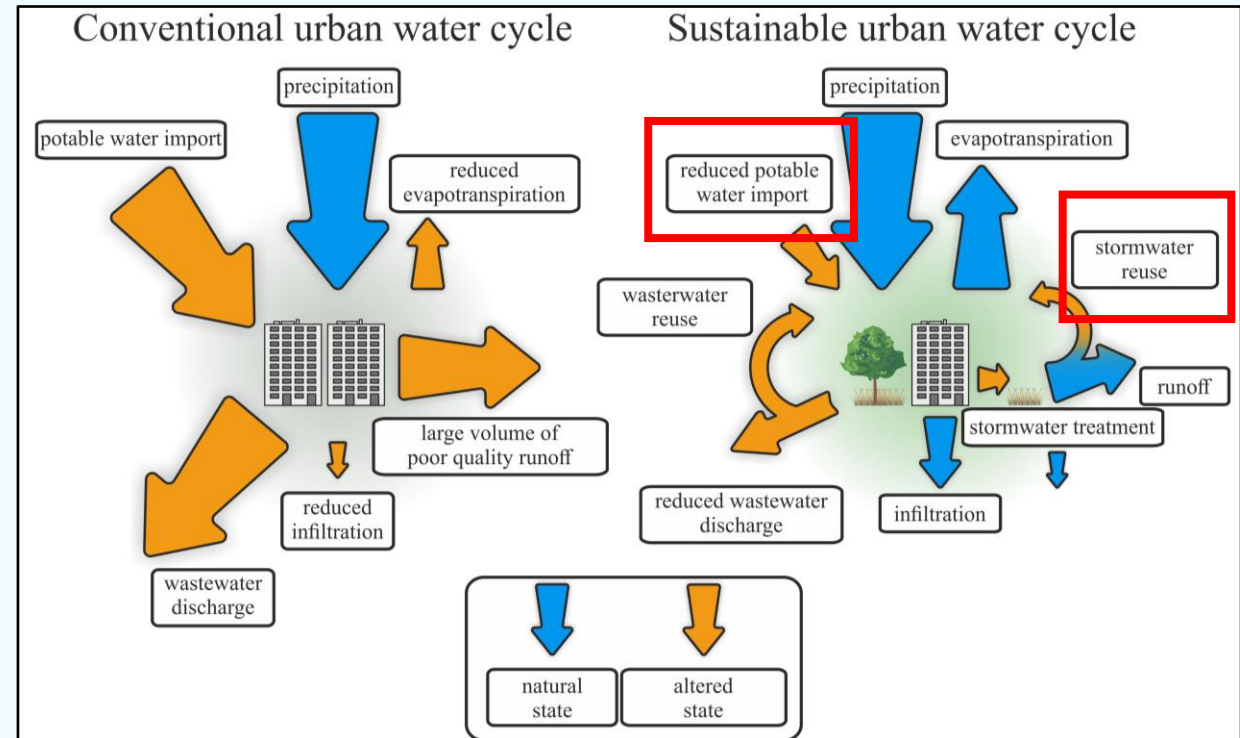
# Mapping of rainwater harvesting potential derived from building data-based hydrological models through the case study of Szeged, Hungary



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- **Climate change**
  - Drought exposed region in Southern Hungary
  - **Urban water cycle**
    - Artificially changed
    - Urban vegetation requires irrigation (especially in drought exposed areas)
    - The source of irrigation:
      - Potable and groundwater
- ↕
- Collected rainwater (sustainable solution)



(based on Hoban and Wong 2006)

(Hoban, A., and Wong, T.H.F., (2006) "WSUD resilience to Climate Change" 1st international Hydropolis Conference, Perth WA, October 2006.)

This research was supported by the Blue Planet Foundation.

Supported by the ÚNKP-20-3 - New National Excellence Program of the Ministry for Innovation and Technology from the source of the National Research, Development and Innovation Fund.

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## Rainwater harvesting

- Important role in sustainable urban planning
  - *Preparing for the uncertainty caused by climate change*
  - *Changed precipitation distribution*
- Can be a key element in sustainable stormwater management systems
  - *Low Impact Development (LID)*
  - *Water Sensitive Urban Design (WSUD)*
  - *Sustainable Urban Drainage Systems (SUDS)*

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## Material and methods

- Building database from Szeged
- Hydrological modelling
  - EPA SWMM
- Buffer zones around roofs
  - Different buffer zone distance: 10 m, 20 m, 50 m
  - Information about vegetation (NDVI)
  - Calculation of available irrigation water of each buffer zone



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## Results

- Runoff, evaporation, collectable rainwater per subcatchment
- Rainwater harvesting potential of Szeged
- Which areas can be irrigated by the collectable rainwater from roofs
  - Based on buffer zones:
    - Area
    - Proportion of vegetation (NDVI)
    - Quality of vegetation (NDVI)

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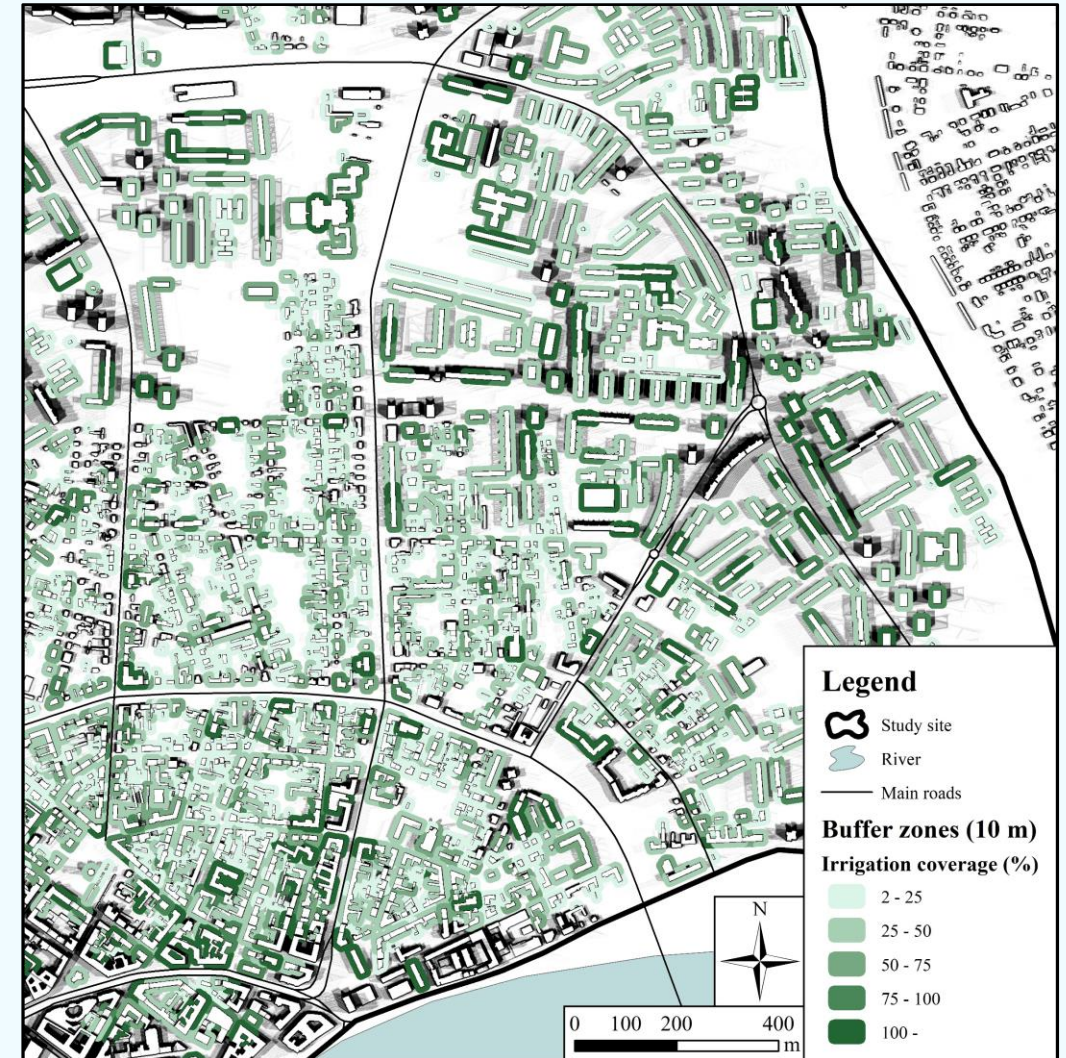
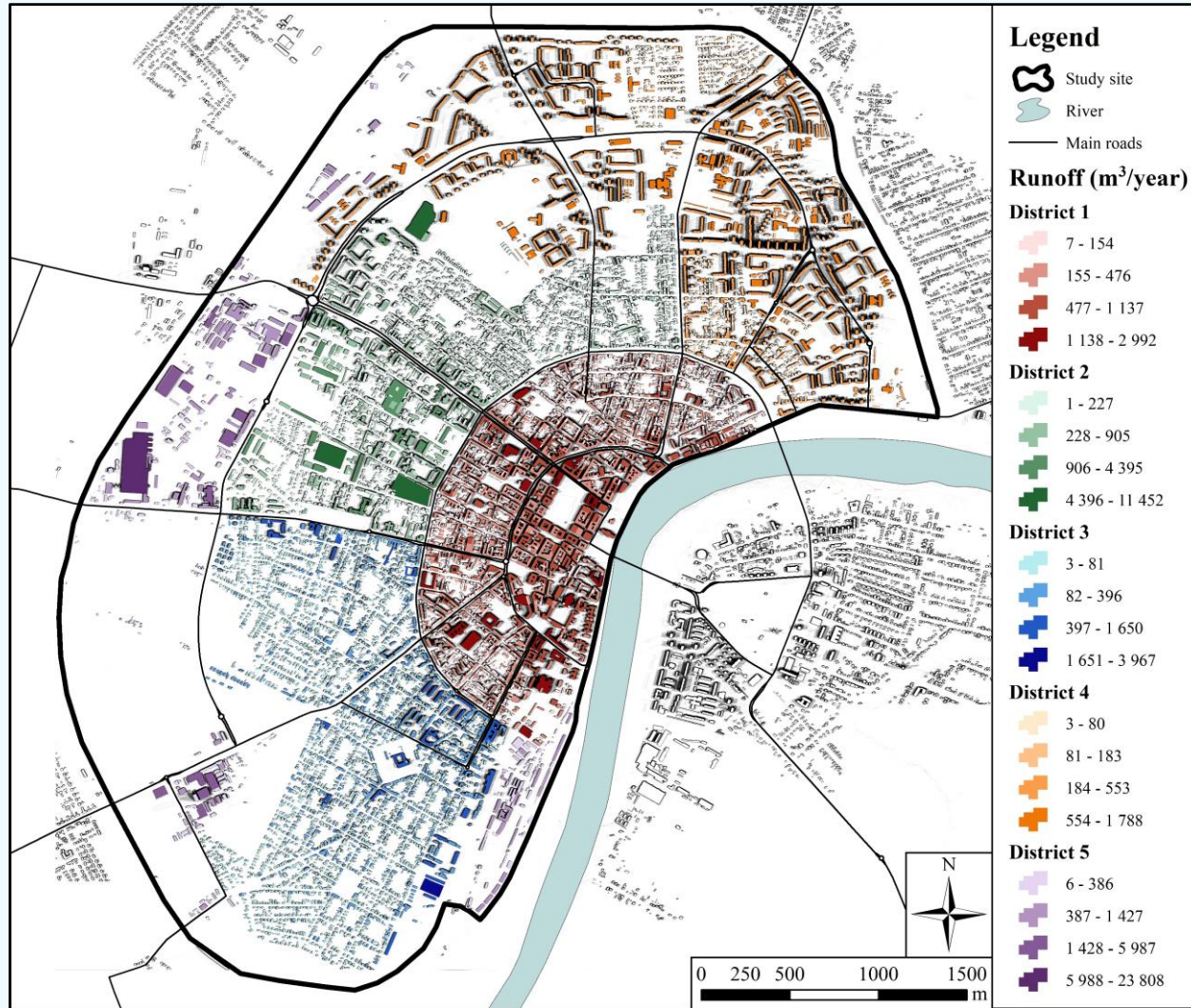
## Vegetation within buffer zones:

- Different buffer zones distance: 10 m, 20 m, 50 m
- Two vegetation category:
  - 1: all vegetation within the buffer zone
  - 2: vegetation with the highest NDVI values (represent the finest quality vegetation) within the buffer zone
- The proportion of these categories within each buffer zones
  - 0-35%
  - 36-50%
  - 51%-

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