SUSTAINABLE URBAN DRAINAGE SYSTEMS:

The LIFE UrbanStorm project in a nutshell

The changing climate, or why we did the LIFE UrbanStorm project

According to the 2021 report of the Intergovernmental Panel on Climate Change (IPCC), the average global temperature has increased by 1.1 °C since the pre-industrial era. This leads to rising sea levels and an increase in the frequency of extreme weather events such as torrential rains, floods, storms and heat waves.

According to the future climate scenarios prepared for Estonia (Estonian Environment Agency 2015), we can expect:

- rainier winters without permanent snow cover, but more temperatures close to 0°C (alternation of thaw and frost, formation of ice) and occasionally frosty and snowy winters;
- warmer and longer summers, more frequent and longer heat waves and droughts, more frequent extreme weather events (torrential rains, hail, storms);
- an increase in annual mean temperature up to 4.3°C, an increase in precipitation up to 19% and an increase in wind speed up to 18% by 2100.





Flooding after rain. Haabneeme, Viimsi. Photo: Erki Tammleht

Climate change is a reality that causes the most problems in urban areas with dense population, many heat-absorbing and impermeable surfaces, and little green space.

The aim of the LIFE UrbanStorm project was to increase the capacity of Estonian municipalities to adapt to climate change, especially in managing the floods caused by torrential rains.

Adaptation to climate change

It is now clear that it is not possible to completely prevent climate change. Therefore, solutions must be found to better cope with future weather conditions, i.e. to adapt to climate change.

There are many ways to do this, for example:

- establishing/maintaining a coherent and diverse green infrastructure;
- creating stormwater models, introducing smart stormwater management systems and establishing sustainable urban drainage systems;
- identifying and implementing the possibilities of using rainwater as a resource (e.g. for irrigation or as flushing water in toilets);
- consideration of the flood risk and application of the Green Factor or the minimum required percentage of greenery in urban planning;
- increasing the climate resilience of buildings and other facilities;
- developing the street condition monitoring system and increasing the responsiveness of road maintenance;
- introduction of electronic traffic signs and weather-related traffic management;
- preparation of crisis management plans and adoption of emergency notification systems;
- installation of drinking water taps in public places;
- raising residents' awareness of risks related to climate change and their mitigation.

In the LIFE UrbanStorm project, climate change adaptation plans for Tallinn City and Viimsi Municipality were prepared, as well as a toolbox for local governments (urbanstorm.viimsivald.ee/tooriistakast), which contains guidance and information materials for developing climate change adaptation plans, as well as the climate plans for Tallinn and Viimsi.





Urban greenery is our ally in adaptation to climate change. Photo: Heiko Kruusi

Solutions to avoid storm water problems

More frequent and intense torrential rains force the search for new solutions, as the capacity of the existing stormwater pipeline is insufficient and its increase is costly. It is often more beneficial and cost-effective to use nature-based solutions that mimic natural ecosystems in stormwater drainage by collecting stormwater and slowing its flow rate, allowing the water to infiltrate into the soil and evaporate, while cleaning the water of pollutants. Sustainable urban drainage systems (SUDS) include for example green roofs, green walls, pervious pavements, filter strips, soakaways, infiltration trenches and basins, swales, rain gardens, stormwater planters, ponds and constructed wetlands.

The LIFE UrbanStorm project dealt more thoroughly with finding solutions to floods caused by heavy rains in urban areas and identifying sustainable urban drainage solutions suitable for Estonian conditions. The activities and outcomes of the project included:

- study tours to Copenhagen, Malmö, Helsinki and Manchester;
- 3 publications about sustainable urban drainage systems:
 - a leaflet for the general public "A guide to sustainable stormwater systems",
 - a slightly more detailed brochure "Stormwater management techniques suitable for Estonian climate conditions" and,
 - a handbook for specialists on SUDS suitable for Estonian climate conditions (in Estonian): "Eesti kliimasse sobivate säästvate sademeveelahenduste käsiraamat";
- establishment of SUDS pilot areas in Viimsi Municipality: Viimsi Manor Park and parking lot in Haabneeme, Karulaugu tee 16;



Rain garden in the parking lot in Viimsi (Randvere tee 18). Photo: Merle Kuris

- development of a design project for building SUDS in Trummi area in Tallinn and a reconstruction project with SUDS for a parking lot in Viimsi Municipality, Randvere tee 18 (construction work was done outside the project);
- seminars and trainings on SUDS for local government specialists, engineers, designers and planners;
- establishment of a smart stormwater monitoring and management system for Viimsi Municipality;
- analysis of the strategies and legal acts related to the stormwater management;
- development of a proposal for methodology for stormwater management fee for Tallinn City.

The reports of study tours, presentations of trainings and seminars, publications about SUDS as well as other documents prepared during the project can be found on the project website urbanstorm.viimsivald. ee/?lang=en in the sections "Infomaterials" and "Pilot areas".

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The total project budget: $1\,957\,843\,\epsilon$, including 60% ($1\,011\,654\,\epsilon$) the LIFE+ programme of the European Union. Project duration: 1.9.2018 - 28.2.2023

The project was implemented by Viimsi Municipality (the lead partner), Baltic Environmental Forum Estonia, Estonian University of Life Sciences and Tallinn Urban Environment and Public Works Department. Compiled by Merle Kuris, Baltic Environmental Forum Estonia Design: Disainiosakond

The contents of this brochure reflect the views of the project partners only, not the European Commission.



More information on the LIFE UrbanStorm project:

urbanstorm.viimsivald.ee













Parking lot with permeable pavings in Haabneeme (Karulaugu tee 16). Photo: Viimsi Municipality



Reconstructed stormwater ditch in Viimsi Manor Park. Photo: Merle Kuris

The schemes of the LIFE UrbanStorm pilot areas



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Sidewalk