



Nature-Based Solutions for Water Management in Estonia

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Stormwater management

Climate change impacts in Estonia

- Reduction in the duration of snow cover
- Changes in water regime of rivers
- Reduction in surface water content

Multi-year drought 2014-2018

Extreme drought 2022

Intense downpours (over 30 mm per day)

Extreme short-term rainfall events

Exceeding the critical flow rate of stormwater infrastructure:

- flooding additional hydraulic loads on wastewater treatment plants via combined sewerage,
- emergency overflows, environmental pressures.

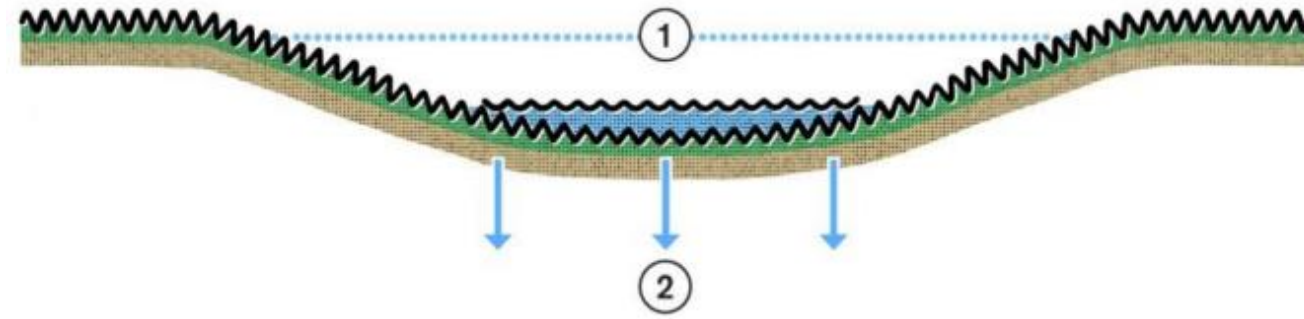


Sustainable Urban Drainage Systems

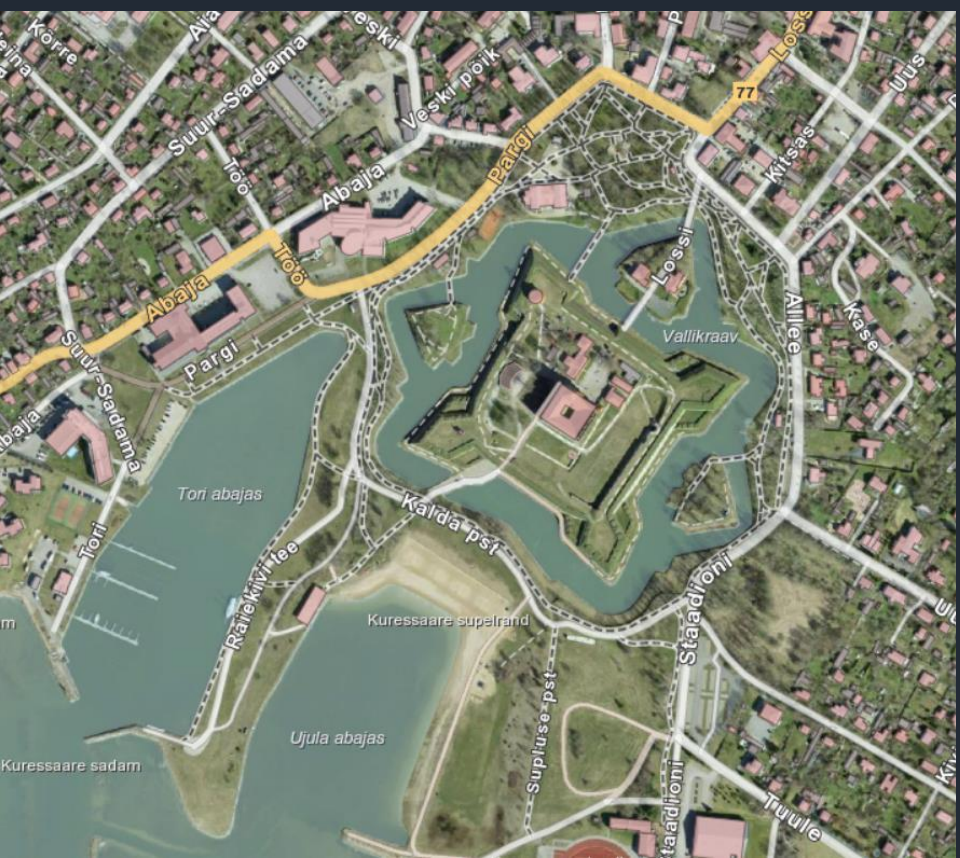
- Grants for municipalities and water utilities
- Budget from ECF 25 M€
+ 40–60% own contribution

Guidances for target group:

- Recommendations and guidelines for designing stormwater solutions
- [Annex 1. 2. 3. Recommendations and design guidelines](#)
- [Annex 6. SUDS drawings and photos](#)
- [Krasnikova, A. \(2022\) Planning flood risk mitigation measures for urban stormwater systems. Master thesis. Tallinn University of Technology.](#)



Reconstruction of stormwater drainage systems in the city of Kuressaare

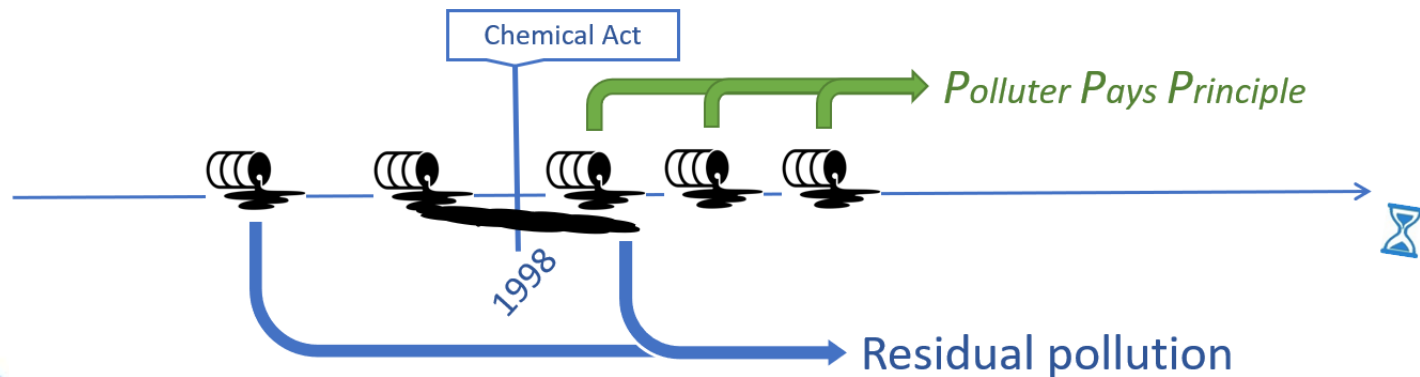


- Stormwater run-off regardless of sea level
- 0.42 M€ investment, grant for 0.3 M€
- 2021–2022

Residual pollution

Historical origin from Soviet era and early independence years

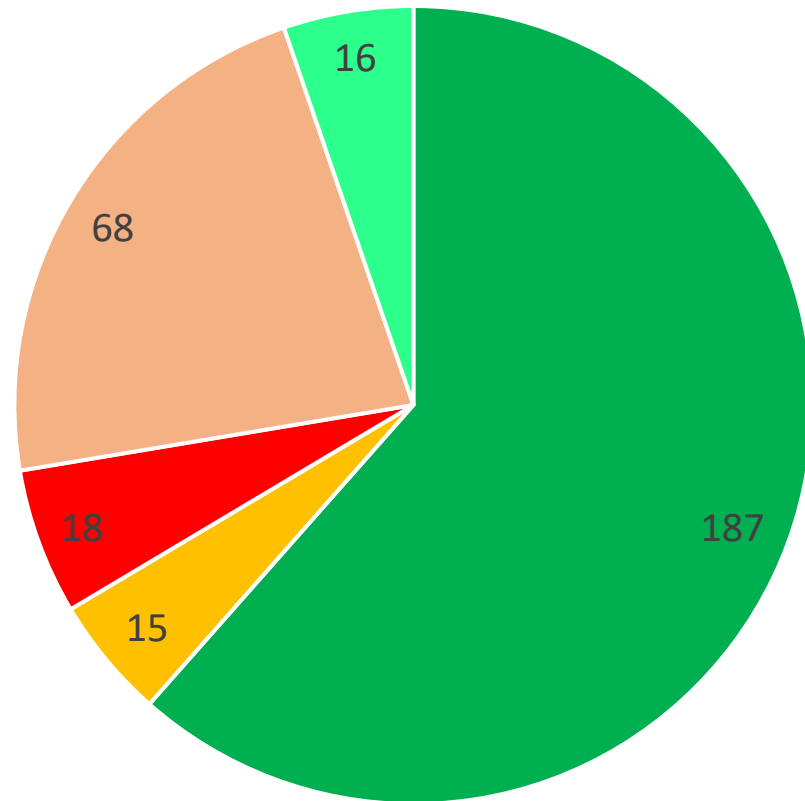
- Background data collection, sampling and analysing on more than 300 objects, pollution characterisations, risk assessments
- 82 prioritised objects of national importance
- More than 225 polluted sites of local importance



Number of sites according to LSI003



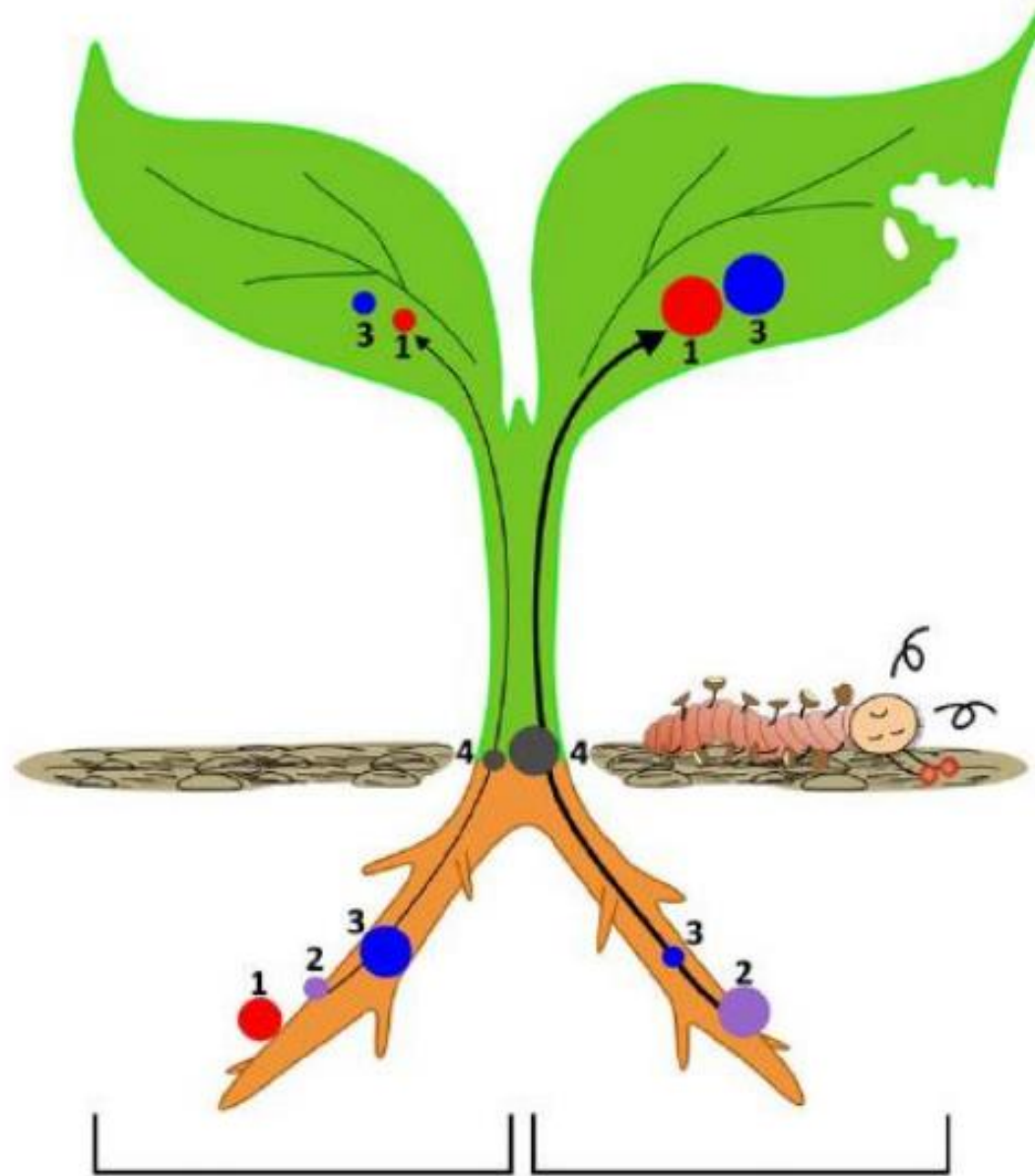
Status of sites of residual pollution, Y 2021



- Remediation finished
- Remediation ongoing
- Sites in need for remediation (pollution amounts are measured)
- Expectedly in need for remediation (estimation)
- no need for safety measures (meets the requirements or there are no risks)







Tolerance

Hyperaccumulation

N. Rascio, F. Navari-Izzo (2011) "Heavy metal hyperaccumulating plants: How and why do they do it? And what makes them so interesting?," *Plant Sci.*, 180 (2), 169–181



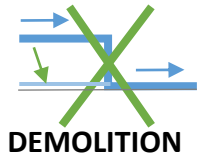
Combined interventions





SOLUTIONS FOR FISH MIGRATION

PROS AND CONS OF THE SOLUTIONS



DEMOLITION

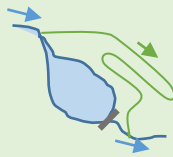
- + Eliminates all negative impacts of the dam
- + No need for maintenance in the future
- + Natural look
- Sometimes it is not acceptable to lower the water level

CLOSE TO NATURE FISH PASSES



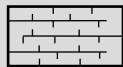
RAPIDS IN THE MAIN BED

- + Suitable for lots of fish species
- + Rich habitat itself
- + Natural look
- + Low cost for maintenance in the future
- Higher need for surface of the land



RAPIDS IN THE BY-PASS

ARTIFICIAL FISH PASSES



SLIT RAMPS



FISH LIFT

- + Can be built on a small surface of the land
- Does not act as a habitat
- Selective, suitable for few species
- Higher costs for maintenance and operation
- Artificial look

In the period of 2010–2018 in total of 100 investments by public funding have been made in Estonia to solve fish migration issues.

The type of fish pass	Number of dams solved	Investment, €
Close to nature fish passes	69	17 688 883
Demolition of the dam	22	2 514 223
Artificial fish passes	9	2 050 070
TOTAL	100	22 253 176



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Nature – an instrument or a partner?

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