

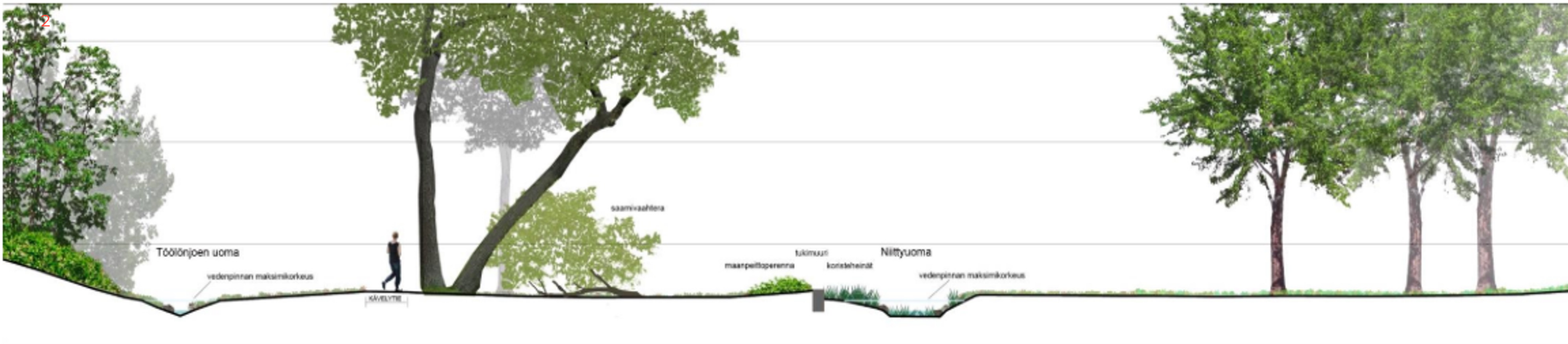
A lush garden scene featuring a stone-lined stream or water feature. The stream flows through a dense bed of green plants, including tall grasses and various leafy species. The water is clear and reflects the surrounding greenery. The stream is bordered by smooth, light-colored stones. In the foreground, there are large, vibrant green leaves, possibly from a bush or tree. The background shows a wooden fence and more greenery, suggesting a well-maintained garden or park setting.

**Flood prevention through retention &
natural stormwater management**

Elisa Lähde

Flood prevention through retention & natural stormwater management

1. Concepts: WSUD and Ecosystem Services
2. Tools for natural stormwater management
3. Some examples



Concepts: WSUD

A land planning and engineering design approach which **integrates the urban water cycle**, including stormwater, groundwater and wastewater management and water supply, **into urban design** to minimise environmental degradation and improve aesthetic and recreational appeal.

Similar concepts:

LID Low Impact Development

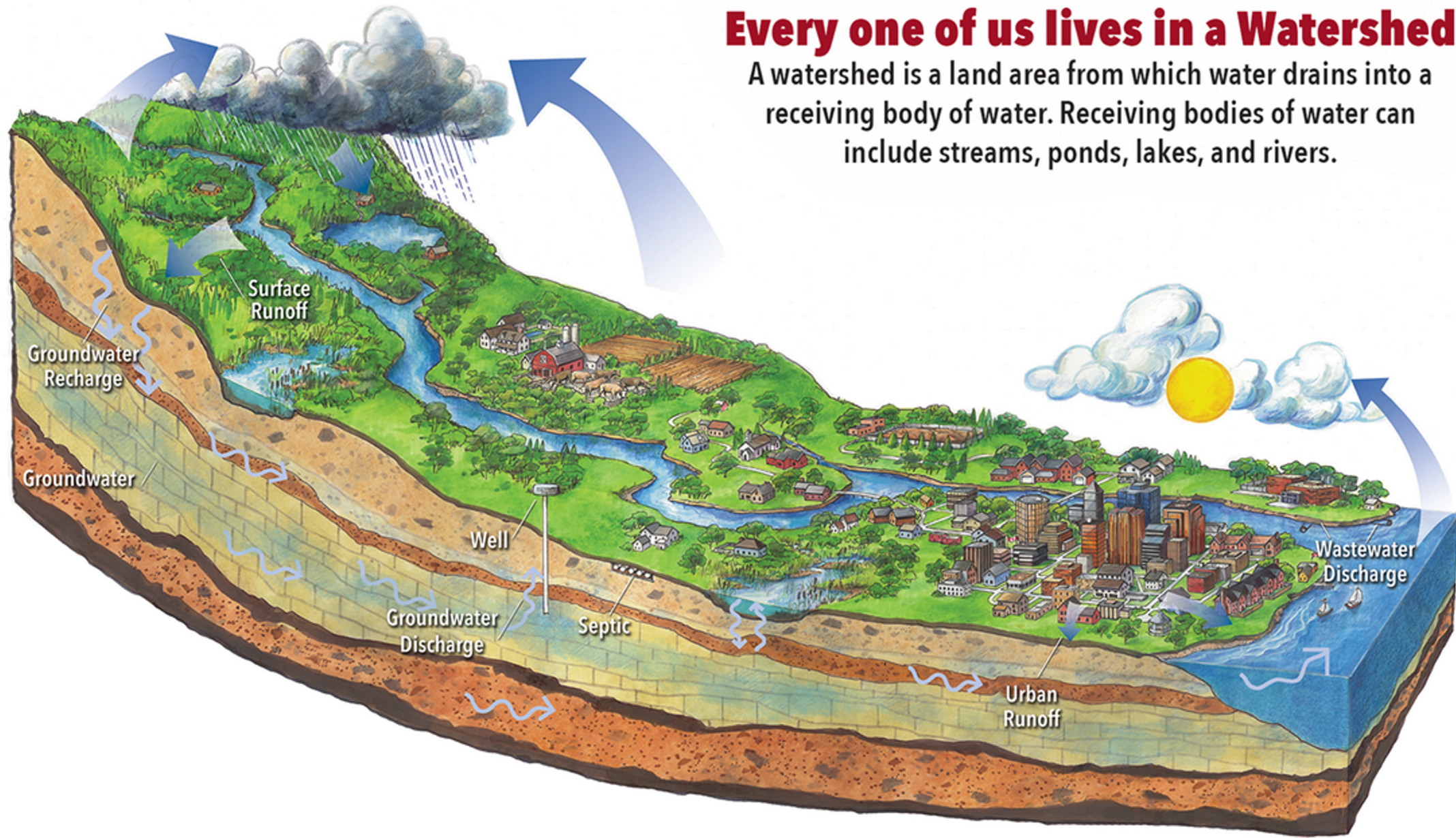
GI Green Infrastructure

SUDS Sustainable Urban Drainage Systems

NBS Nature Based Solutions

Every one of us lives in a Watershed

A watershed is a land area from which water drains into a receiving body of water. Receiving bodies of water can include streams, ponds, lakes, and rivers.



2. Tools

Runoff Reduction

Rain garden

Rainwater harvesting

Permeable Paving

Vegetated roof

Bioretention cell

Infiltration Structure



Tools

Peak flow reduction

Vegetated detention basin
Wet pond



Pictures: Low Impact Development: Opportunities for the PlanET region by University of Tennessee

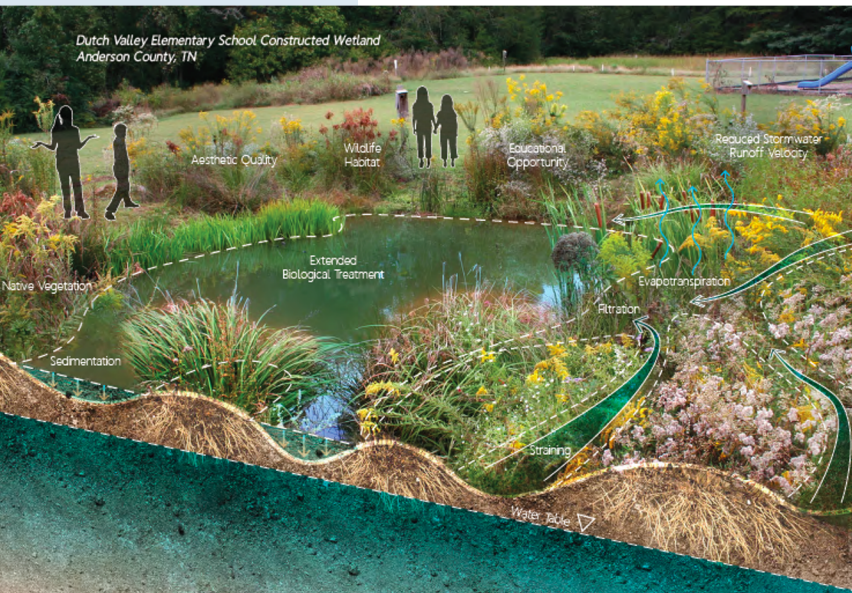
Tools

Improved water quality

Constructed wetland

Vegetated swale

Filter strip





DETENTION
POND



PLANTING

MEADOW

PATH

DETENTION
POND

TREES



PLANTING

Erosion prevention

Maintenance of genetic diversity

Local climate regulation

Pollination

Aesthetical experiences

MEADOW

Habitats for species

PATH

Recreation and mental and physical health

DETENTION POND

Hydrological regulation

Carbon sequestration

TREES

Air quality

3. Examples: Kirstinpuisto

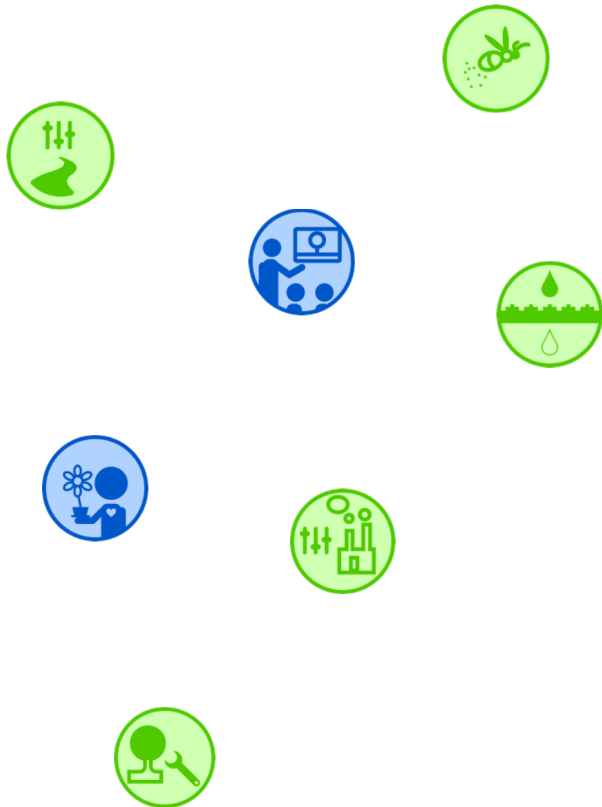
- Residential area, where internal park area is used for water detention
- Water quality management with vegetated structures

Additional benefits:

- regulating and supporting services: increased urban biodiversity, improved microclimate and erosion control
- cultural ecosystem services: recreational values created for the residents, new identity and image for the site, education and science possibilities

Kirstinpuisto





Vauhtitie Stormwater Wetland

- Large stormwater wetland in the middle of Helsinki
- Main function is to improve water quality by phytoremediation

Additional benefits:

- regulating and supporting services: increased urban biodiversity, improved microclimate and erosion control, pollination, carbon sequestration
- cultural ecosystem services: recreational values, new identity for the site, tourist attraction, education and science possibilities

Vauhtitie Stormwater Wetland



Multiple benefits and values

Economical benefits

- Increased security
- Resilience & Climate adaptation
- Increased real estate values
- Increased employment rate

Societal benefits

- Health benefits through increased mental and physical health
- Biodiversity hypothesis

Ecological values

- Local biodiversity
- Local hydrology



Thank you!

Elisa Lähde

Picture: Visit Finland Mediabank