

SUSTAINABLE URBAN DRAINAGE SYSTEMS

COMPLEMENTING GREY WITH GREEN FOR IMPROVED ADAPTATION

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Image credit @ susdrain.org

Gathering the evidence base

- ▶ RECREATE - “Research Network in Climate, Resource Efficiency and Raw Materials’ (FP7; 2013 - 2018)
- ▶ Developed series of narratives, e.g. nature-based solutions
- ▶ **Goal:** market potential and economic benefits of SuDS (e.g. effectiveness and costs / benefits compared to traditional engineered solutions); scope of uptake; barriers to wider use
- ▶ **Approach:** literature review, feedback from DG Environment, two strategic workshops, expert interviews

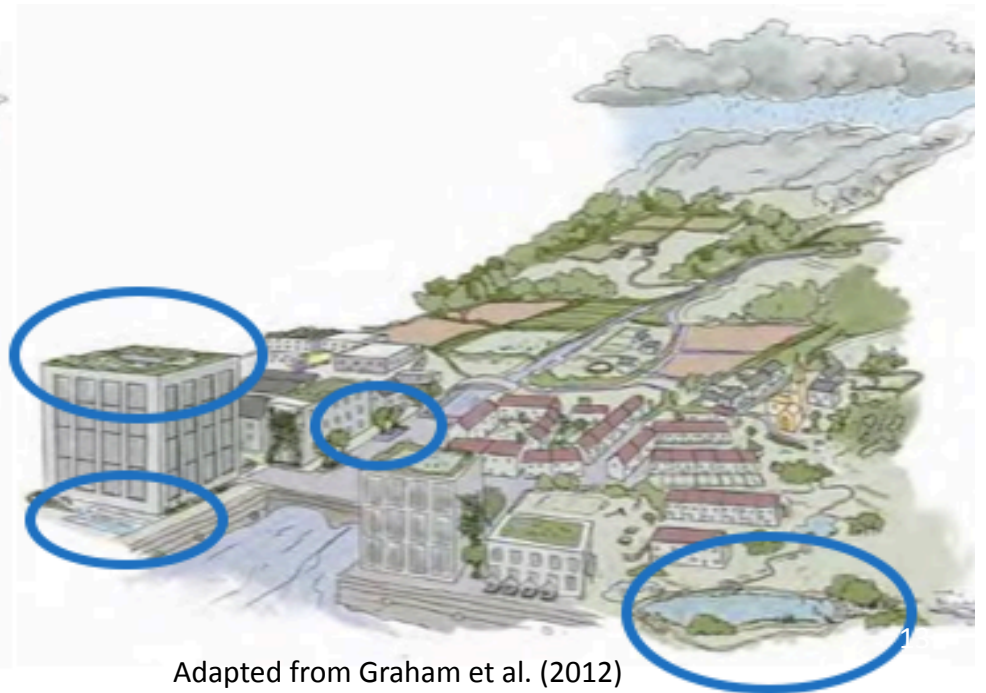


Urban flooding – what's the threat?

- ▶ Increase in intensity and frequency of (urban) flood events
- ▶ Most widespread European natural hazard in terms of economic losses
- ▶ Traditional management with grey, piped drainage systems
 - Single-objective designs with insufficient capacities
 - Inadequate discharge of excess water to regional water system
 - Increase of pollutants and algal blooms from run-off
 - Property damages and financial losses incurred
 - Potentially high construction, maintenance and repair costs

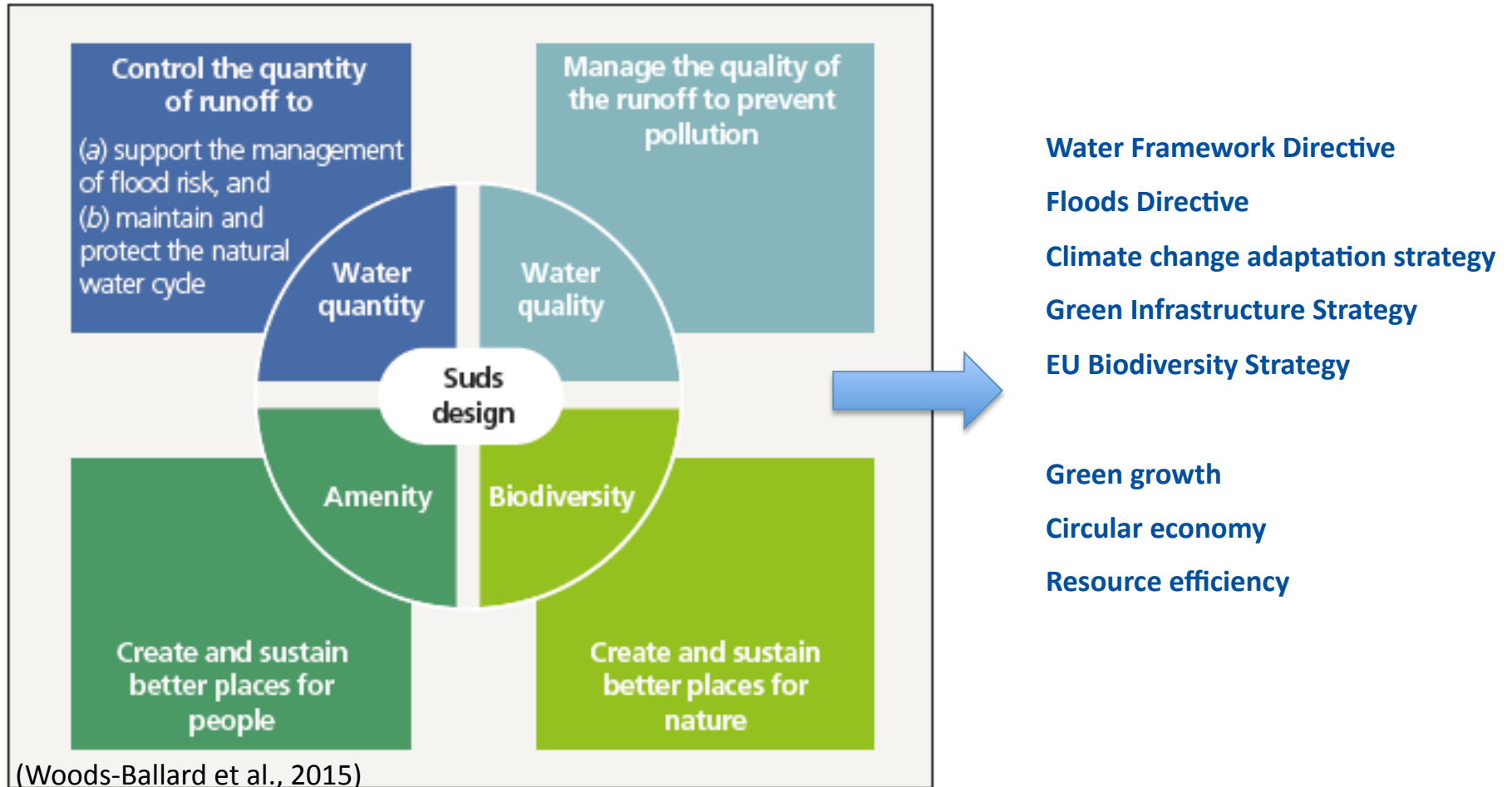
SuDS as a promising nature-based solution

- ▶ Adaptable flood risk management tool: surface water drainage discharge; address water quality and environmental enhancement
- ▶ Reliance on natural processes and green/blue infrastructure



Adapted from Graham et al. (2012)

Co-benefits and multifunctionality



Potential barriers to implementation and uptake

- ▶ Skepticism of general public **
- ▶ Potentially high land requirement
- ▶ Lack of diffusion across institutional and stakeholder networks, creating knowledge and capacity gaps
- ▶ Site-specific, preventing 'one size fits all' solutions
- ▶ Lacking standardized tools for measuring performance and costs/benefits



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Potential impacts of SuDS on other urban components' functioning

(Hoang and Fenner, 2015)

Urban components	Services	Potential disruptions
Water supply (sources)	Trap pollutants, reduce water treatment need and can release water back to the water system and underlying ground	Become a pollutant source if not treated properly
Wastewater (conveyance and treatment)	Provide local solution for wastewater treatment	Tree roots can damage sewer pipes
Food and agriculture	Reduce pollutants and provide pollination and grazing sites	Pest and disease hotspot if not maintained properly
Transportation	Traffic calming, traffic noise reduction	May block views if trees are too high, risk of branch and leave falling in strong wind
Energy	Urban cooling from heat island effect, carbon sequestration which might reduce climate change impacts fuelling energy demand	May require energy to maintain such as pumping water
Communication	n/a	n/a
Ecology	Provide corridors and habitats for wildlife species	May host pests and pollutants
Health	Provide spaces for physical activities and relaxation, improve air quality	Pollen allergy, may host disease vectors
Social	Provide space for socialising; crime reduction	May create opportunity for crime at night due to reduced vision, may be aesthetically unpleasant
Buildings	Provide shading (green roof) and reduce carbon footprints via carbon sequestration	Might increase water-related risks around the building and loads on the structural strength of the building
Economic	Provide services that might have economic values such as carbon sequestration	May incur costs for maintenance and cleaning

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Where to go from here?



European research & innovation policy

- Funding for long-term research
- Showcase results and best practices
- Highlight synergies with existing policies
- Policy framework supporting NBS over grey solutions

National policy frameworks

- Involve wider range of stakeholders
- Use standardized monitoring and reporting processes
- Decision-making criteria that reflect cross-sectoral goals and priorities
- Regulation fostering SuDS as 'business as usual'

Supportive actions

- Strengthen 'business case' for value of SuDS
- Public-private partnerships
- *Increase knowledge basis, perceived legitimacy, awareness*

Thank you!

Any questions...?

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