Policy and Regulatory Perspective on Urban Water Runoff

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waterun

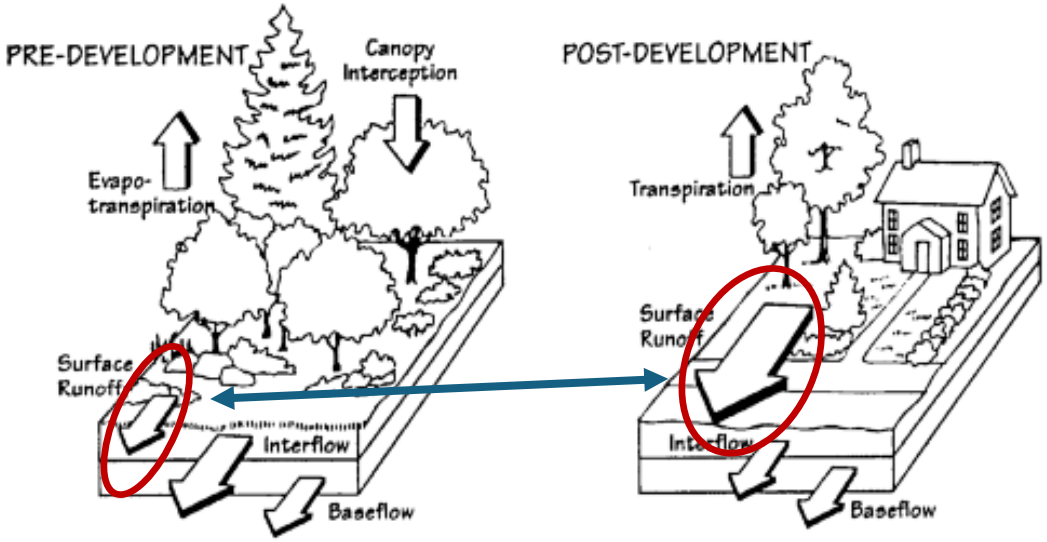
- Horizon Europe funded project to develop **innovative methodology to implement urban water runoff management plans** based on Water-Sensitive Urban Design concept.
- CS: Århus (DK), Santiago de Compostella (SP), Amman (JOR)

- Preventive & mitigation solutions, and best management practices
- Global approach - from source identification to decision making
- With early involvement of urban water management and governance actors (co-creation process), ensuring a wider and faster adoption.

Urban water runoff - Definition

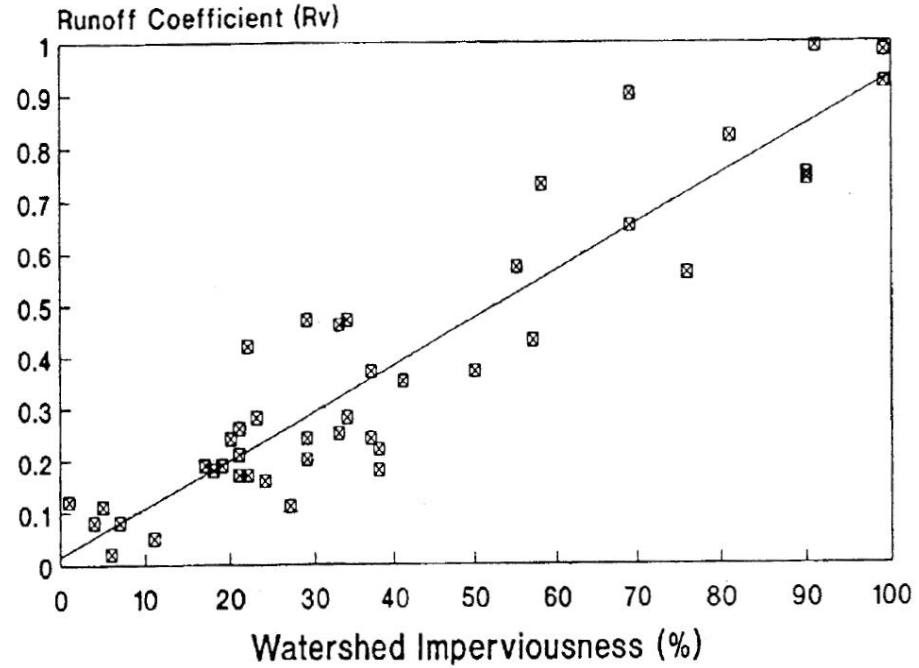
What are we talking about?

Precipitation flowing over urban surfaces rather than infiltrating



- Generated by roofs, pavements, roads, compacted soils and atmospheric deposition
- " *urban runoff* means precipitation in agglomerations collected by combined or separate sewers"
- Precipitation: rain, snow or meltwater

Urban water runoff



Why does it matter?

- Flooding: flash floods, property and infrastructure damage, public services disruption

- Pollution: carrying urban diffuse pollutants into water bodies => nutrients, heavy metals, pathogens, microplastics, etc. => harming ecosystems and public health.

- Urbanization and climate change exacerbate runoff, reducing further infiltration and increasing pollutant load.

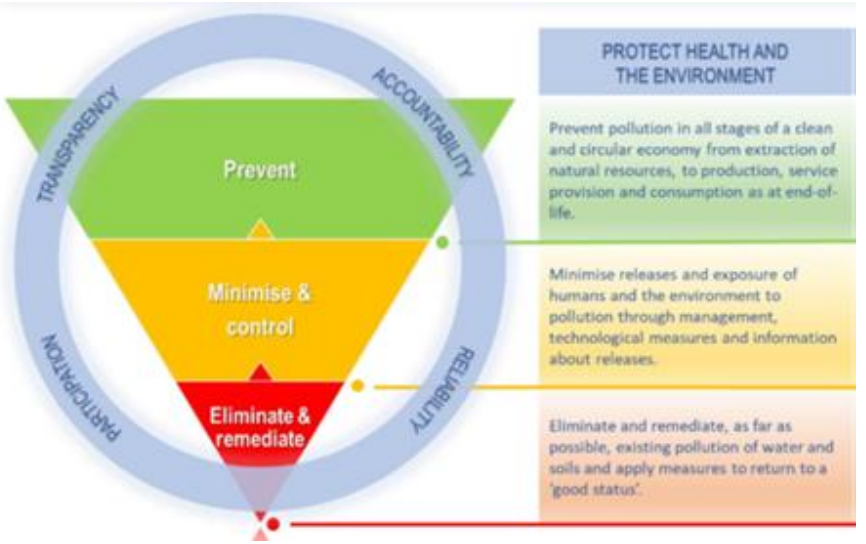
Urban water runoff - Governance

Fragmented governance of urban water runoff management

- In many countries, managed at local level => municipalities, inter-municipal entities, metropolitan authorities, water authorities, etc.
- Multi-level governance, involving national and regional stakeholders; need for coordination.
- Funding mechanisms: local taxes, levies, stormwater fees/taxes, property taxes, developer-contractor fee.
- Not always earmarked.

Urban water runoff – EU legislation & policy

- **WFD**: identify & address urban diffuse pollution to reach GES of WBs.
- **Zero Pollution Action Plan**: "pollution hierarchy" emphasizing prevention, source control and polluter-pays principle.

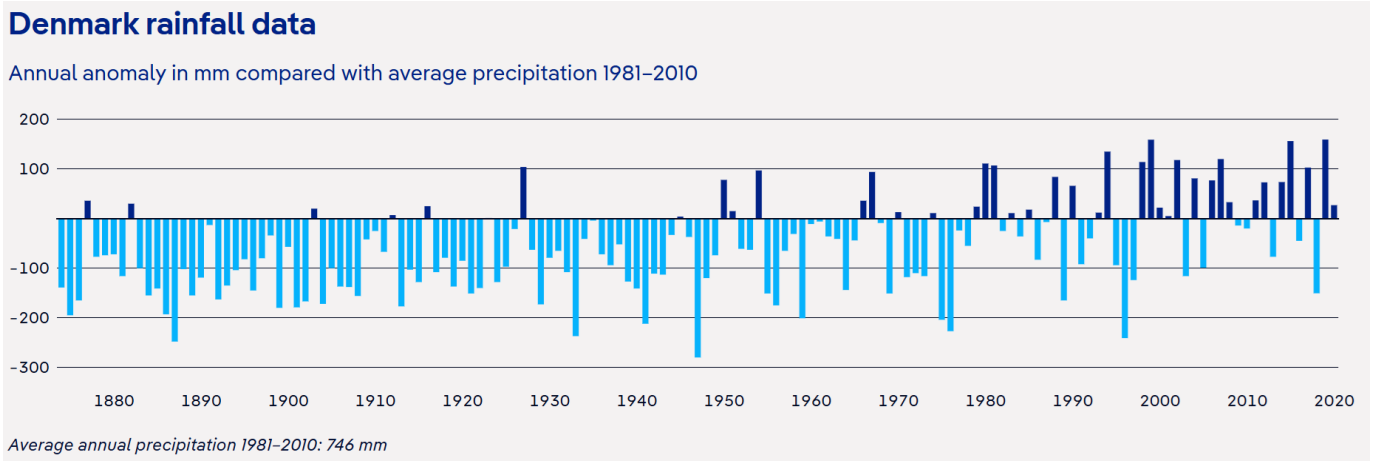


- **UWWTD recast**: managing and preventing discharges from stormwater overflows and urban runoff (integrated urban wastewater management plan); prioritize blue-green infrastructure; monitoring obligations.
- **Water Resilience Strategy**: water retention through ecosystem-based approaches and development of "sponge cities."

Urban water runoff – Sponge cities

Sponge city design uses natural landscapes to catch, store and clean water through hydro-ecological and green infra. (parks, green roofs, permeable pavements) to:

- manage stormwater, absorb runoff
- mitigate flooding, water scarcity, urban heat islands
- enhance biodiversity, water storage and resilience.



Urban water runoff - grey-blue-green solutions

Shifting to grey-blue-green solutions

⇒ more sustainable, city-wide water runoff management strategies integrating blue-green infra. to mitigate runoff impacts & enhance urban resilience, biodiversity, and quality of life.

Cost-effective hybrid UWR strategies

⇒ Traditional grey infra. space-intensive & costly.

⇒ Combination of grey infra. with decentralized blue-green solutions more efficient and cost-effective, improving retention and reducing pollution.

Cloudburst Management Plan
HOFOR & City of Copenhagen

2011 flood €0,8B
UWR plan €1,5B

Legal framework;
Financing entities

Urban water runoff - grey-blue-green solutions

Barriers

governance fragmentation, socio-cultural resistance, limited knowledge, technical constraints, funding challenges

	Total costs (€/year)
Storm water and urban runoff	430.072.648

Enablers

stakeholder engagement, leadership, and effective communication => *Waterun co-creation meetings*

Co-creation process & WATERUN Framework
related to WP1 activities

- WATERUN Co-creation process
- Requirements, specifications and architecture of WATERUN

Urban water runoff – Policy & Regulatory tools

- Stormwater has increasingly become a resource [14] and not a flood or pollution problem, but change brings management risks and responsibilities [15]. The city of Salisbury in Australia manages flood risks and generates a profitable business from the storage of run-off water. This is a successful example of taking care of risks and seizing opportunities within the concept of Water Sensitive Urban Design/Low Impact Development WSUD/LID sponge city. Recycled stormwater, currently used for non-potable purposes, may soon, with advances in knowledge, be used for potable purposes. Industries such as Water-Sensitive SA, together with federal and local governments, have established an integrated system as a commercial business supplying recycled water for non-potable and industrial uses.

Urban water runoff – Policy & Regulatory tools

Policy & regulatory tools to manage urban water runoff & promote GI

Stormwater Fees (Runoff-Based Charges)	Tariff charged to property owners based on impervious surface area owned (roofs, parking lots). **Incentive to reduce impervious surfaces** and install GI.	**Berlin:** Runoff fees ("Niederschlagswassergebühr") differentiated by surface characteristics, encouraging green roofs and infiltration.
Green Infrastructure Mandates/ Standards	Requirements embedded in construction codes to include GI in new developments or major renovations. Ensures **baseline adoption of GI** across the urban fabric.	**Copenhagen:** Mandates blue-green solutions in new districts as part of Cloudburst Management Plan. **Paris:** Requires green roofs or solar panels on all new commercial buildings.
Stormwater Retention Standards (Performance-Based Regulation)	Developments required to **retain a specific rainfall amount on-site**. Developers can choose any GI solution that meets the performance target (flexibility).	**Rotterdam:** Flood-resilient new districts must meet multifunctional stormwater storage requirements.

Urban water runoff – Policy & Regulatory tools

Policy & regulatory tools to manage urban water runoff & promote GI

Development Impact Fees / Stormwater Offsets	**Fees charged to developers for additional runoff burden created**; can avoid or reduce fees by installing GI. Encourages low-impact design and funds public GI in disadvantaged neighborhoods.	**London:** Developers contribute to sustainable drainage (SuDS) retrofit funds.
Tax Incentives, Rebates, and Grants	Local governments offer **financial support for GI installation**. Increases uptake among homeowners, businesses, and community institutions.	**Toronto:** Green Roof Incentive Program provides CAD 100/m^2 for installations.
Zoning and Land-Use Planning for Sponge City Design	Urban zoning codes that reserve land for multifunctional **blue–green corridors**, floodable parks, wetlands, and infiltration zones.	**Rotterdam:** "Water plazas" and blue–green streets embedded in city zoning.

Urban water runoff – Policy & Regulatory tools

Policy & regulatory tools to manage urban water runoff & promote GI

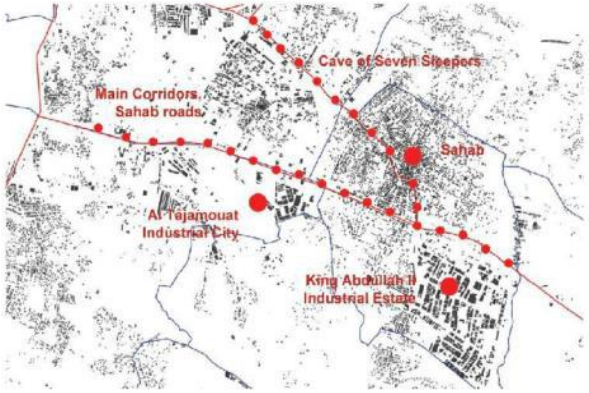
Insurance and Risk-Based Instruments	Using **insurance pricing or risk-sharing mechanisms to reward properties that reduce runoff-related flood risk**. Links GI to reduced premiums and long-term resilience planning.	**Copenhagen:** Flood-risk maps and insurance data to guide neighborhood-level GI investment. **Zurich:** Property insurance incentivize permeable surfaces and improved drainage.
Digital Regulation and Real-Time Control	Policies that **require or reward smart sensors use** and controlled drainage systems. Optimizes storage capacity and protects downstream areas.	**Barcelona :** Smart drainage network integrated with green corridors.
Urban Resilience Bonds / Green Municipal Bonds	**Bond instruments earmarked for large-scale GI** or integrated stormwater systems. Attracts investors and reduces upfront fiscal pressure.	**Gothenburg:** Green bonds financing integrated blue–green climate adaptation projects.

Thank you

Waterun – Case Studies

Århus (DK)

Amman (JOR)



Santiago de Compostella (SP)