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*circular by nature*

# **Trends and opportunities of nature-based solutions for climate change adaptation in cities**

Maria Wirth  
alchemia-nova GmbH

# Major climate risks in cities



Sea level rise and coastal flooding



Inland flooding and hydrological hazards



More intense heat waves



Extended droughts



Storms

These changes **affect human health, infrastructure systems** (including water and energy supply, sanitation and drainage, transport and communication), **services** (including health care and emergency services), the **built environment**, and **ecosystem services**.

## Definition of NBS by the European Commission:

*Nature-based solutions (NBS) are 'Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'.*

# NBS widely applied in cities



Trees



Extensive green roofs



Sustainable urban drainage  
systems

These have been among the most attractive actions because of their **impact** on reducing risks and their **feasibility**.

[Report by C40 Cities Climate Leadership and McKinsey \(2021\)](#)

River catchment  
management,  
e.g. floodplains

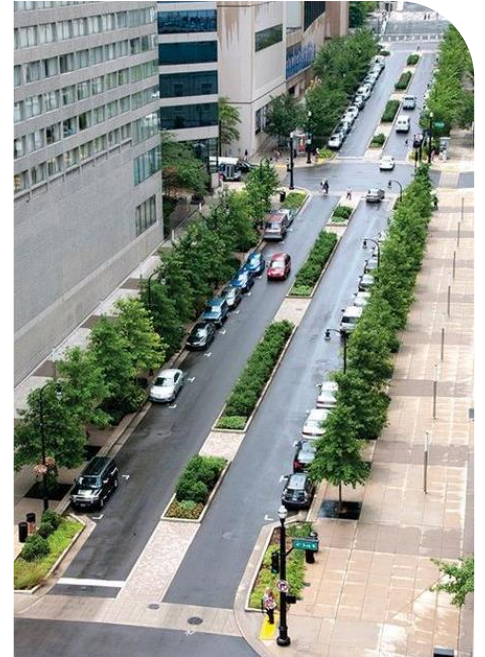


# Challenges driving change

- Multiple challenges: Heat, drought, flooding
- Extended droughts: No green without blue.
- Trade-offs between low-maintenance and impacts
- Shifts in maintenance practices are slower than climate change
- Equity element to climate-risk adaptation



- NBS are gaining popularity in the water and adaptation communities.
- Enhanced, synergistic design (e.g., transport, energy)
- Improved maintenance (huge cost argument)
- Alternative water sources: rainwater, greywater, wastewater
- Enhanced technologies: Green walls, intensive green roofs



# Trends driving NBS deployment

- Policy: Climate-resilience strategies and plans, permits regulating discharge to sewers
- Institutions: Chief Resilience Officers, interdepartmental entities to implement strategies
- Equity element to climate adaptation → wider spread across cities
- Citizen engagement:
  - › Co-management (e.g., urban farming, tree sponsorship)
  - › Citizen initiatives reporting trees under stress, irrigation

Citizen co-managed greywater treatment and reuse system  
(alchemia-nova GmbH, VBAU  
Architektur AG)

Urban farming plots for  
citizens in Vienna



Greywater-fed  
facade panels  
with edible  
plants  
(alchemia-nova  
GmbH)



Dream - Plan - Implement - Celebrate



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