NordForsk

SMARTer Greener Cities

Make your solutions do more – connecting smart technology to nature-based solutions

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Finnish Environment Institute

THE NEW SCHOOL
URBAN SYSTEMS LAB

Rationale

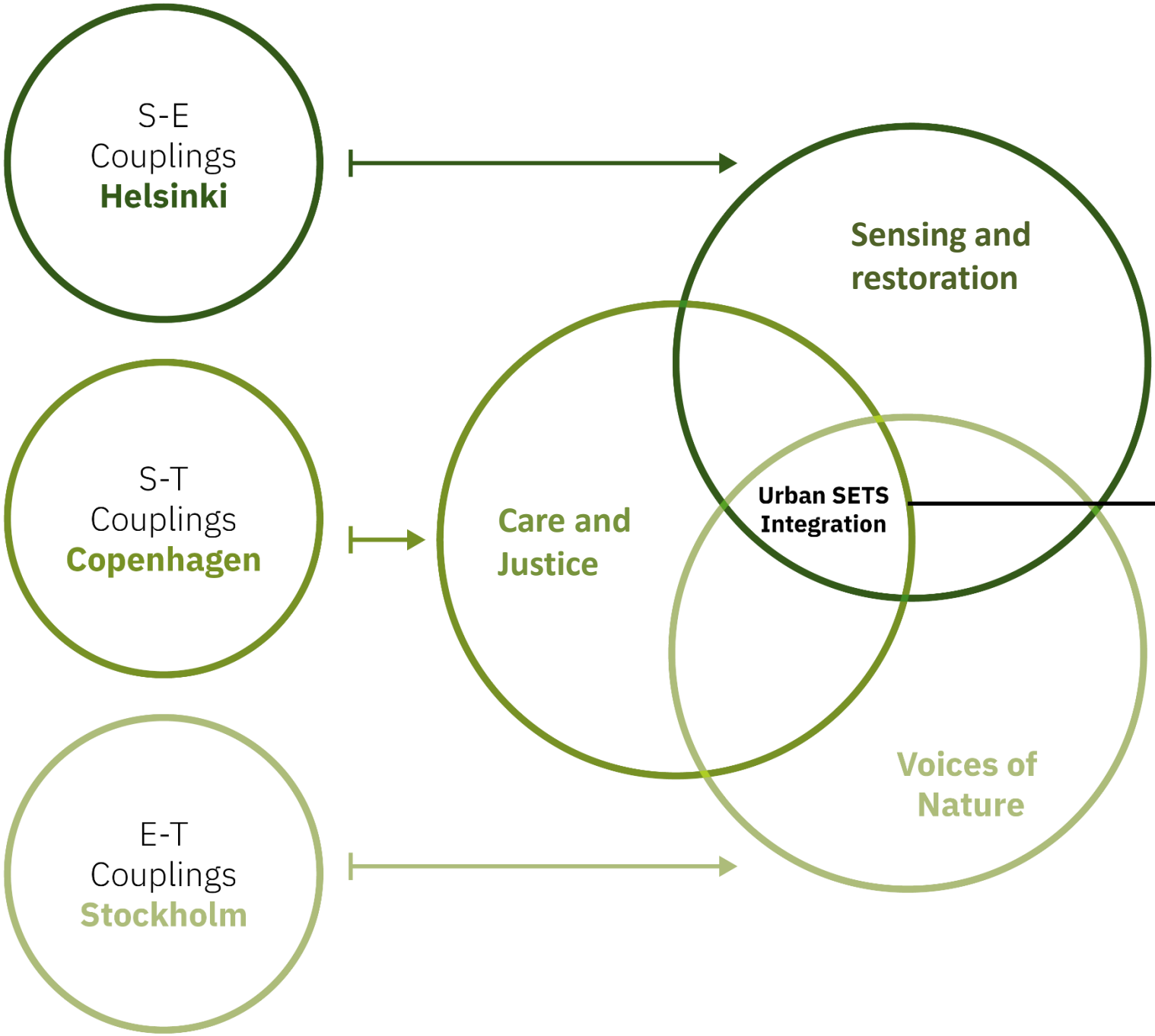
- Much discussion about SMART Cities across the Nordic region and how to scale-up existing climate solutions
  - Strong emphasis on digital solutions and energy efficiency
- OR Green cities and the role and use of Nature-based Solutions

- But how do we make cities SMARTer by integrating digital and nature-based solutions?

SGC objectives

- **Develop an urban systems science for sustainability** by linking the Smart and Green city agendas through SETS
- **Conceptualize and engage with** challenges and solutions for sustainable cities
- **Explore SETS framing in 3 case sites**:
  - Social-Ecological – Helsinki
  - Social-Technological – Copenhagen
  - Ecological-Technological – Stockholm
- **Share knowledge and learning** across Nordic cases and actor communities

SMARTer Greener Cities



Governance
Institutional Transformation

Resilience
Ecosystems,
People, Infrastructure

Awareness
Consequences, options
and oppotunities

Learning
Reimagining the city
and smart citizens

Shifts
Baselines of smart cities

Smart Futures
Tensions and trade-offs

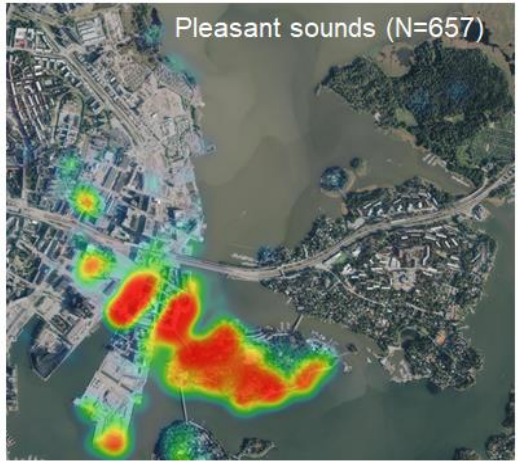
Helsinki

- **Challenge:** how smart technologies and NbS can enhance (or hinder) the potential of different types of urban green spaces to promote psychological restoration
- **Objective:**
  - Map the social-ecological structure and the distribution of remnant, hybrid and novel NbS in two rapidly changing areas (Kalasatama and Kuninkaantammi)
  - Develop new methods to better understand how citizens perceive and experience their everyday living environment through different senses (using PPGIS surveys and multisensory walks)

Examples from Helsinki's SMART neighbourhood - Kalasatama

GIS bio-physical mapping

PPGIS landscape and soundscape mapping



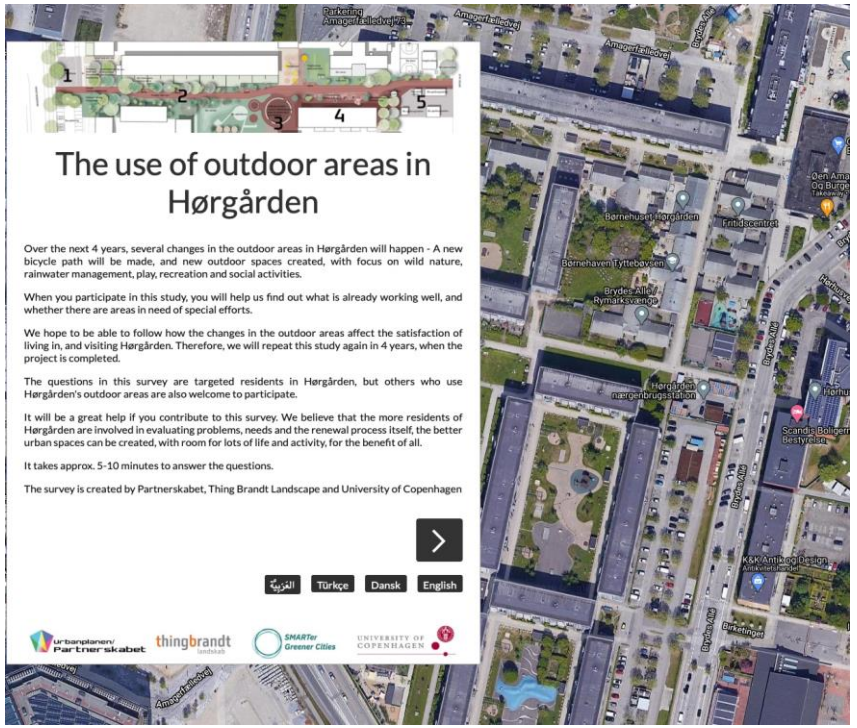
In-situ multisensory mapping in relation objective and subjective restoration

Copenhagen

- **Challenge:** How to design and manage just, safe and secure cities through SMARTer technology?
- **Objective:** to better design and manage inclusive, greener, and more equitable cities
- Technology, justice, and care in focus

Copenhagen case area, ‘Hørgården’

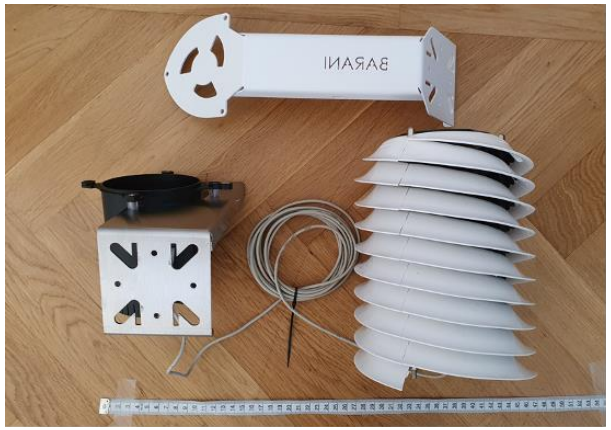
- Re-authoring of Hørgården
- Improved basis for care-full justice-based transformative change
- Investigate if new voices in caring for urban green are empowered by online participatory mapping of the outdoor areas

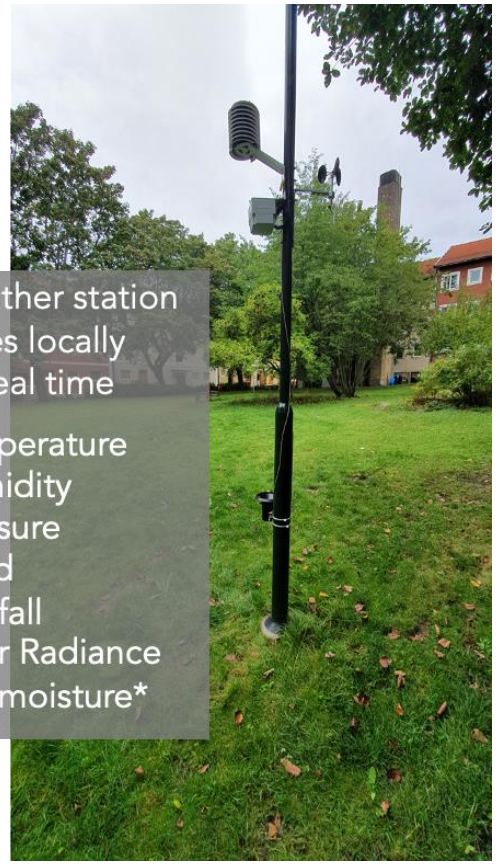


Focus in Stockholm

Use IoT sensors to capture “voices” of urban nature

- Measure the performance of NbS and their resilience against environmental stressors
- Improve climate resilience by updating and continuously informing management strategies and managers themselves





The weather station measures locally and in-real time

- Temperature
- Humidity
- Pressure
- Wind
- Rainfall
- Solar Radiance
- Soil moisture*

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Stockholm Resilience Centre
Sustainability Science for Biosphere Stewardship

Stockholm University

On the ground in the Royal Seaport, Stockholm

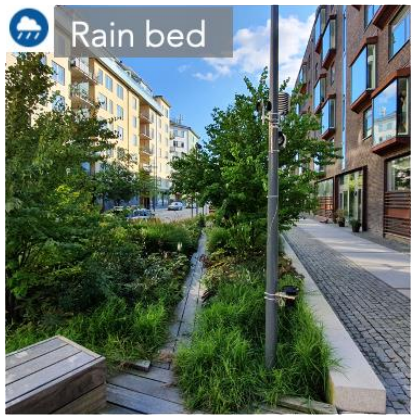
Experimental design
with 18 weather stations

Spatial and temporal variability

- See the map, reading every 10 min

Varied 5 types + reference site

- Old courtyards, lawns, forest parks, raingarden, green roofs



Communication objectives

Increase awareness of SET thinking in urban planning

Share knowledge and promote new types of learning alliances

Strengthen engagement with stakeholders and local residents

Continuous cross case connection

Task 6.1. SMART collaboration and engagement

- **WHY?** Strengthen co-creation of policy recommendations with communities, entrepreneurs, and citizens.
- **HOW?** Regular meetings (every 6th month), researchers visits and local showcases (e.g. walking workshops) will be conducted to promote cross-case activities and connections between partners and key stakeholders.
- **QUALITY CHECKED?** Interviews with local key stakeholders to ensure the findings of each case application
- **FOR WHAT?** Synthetize results in a way that make sense for citizens, policy-makers and practitioners to support SMARTer greener solutions.

Tier 1: Partnership – close collaboration with key stakeholders

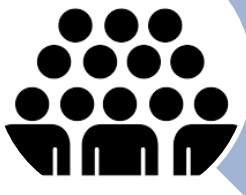
- City planners, developers, private businesses, communities
- Regular meetings, email discussion, walking workshops, test beds, local knowledge alliance, Living Pavillion,

Tier 2: Strategic stakeholders for knowledge exchange

- Local businesses, NGOs, academic and professional experts, practitioners
- Interviews, focus group meetings, presentations in internal meetings, test beds, workshops, local knowledge alliance, Living Pavillion

Tier 3: Local actors for collecting information and experiences

- Local citizens, communities, NGOs
- Interviews, observations, surveys, questionnaires, workshops, Living Pavillion



Tier 4: Public audience

- Anomymous, non-identified general public or audience (academic, business, professionals, citizens)
- Blog writings, articles, video clips, public events, Living Pavillion

Living Pavilions

- Plural framings and approaches to an issue
- Listening in
- Stockholm October 2021 – giving voice to urban biodiversity

Joint events (?)

- Stronger impact by working together
- Outreach and engagement 2021-2023 – not so many detailed plans yet, happy to talk

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2020-2023

www.smartergreenercities.com

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