To Ally Technology, Nature and Society for integrated urban water management - ATENAS

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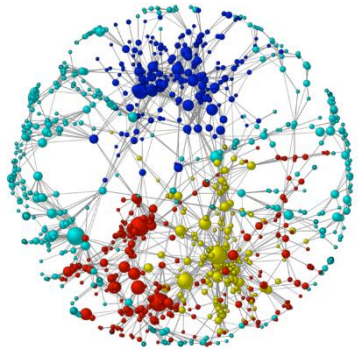
European Regional Centre for Ecohydrology PAS

URBAN WATER MANAGEMENT AS A WICKED PROBLEM



CRITICAL CHARACTERISTICS

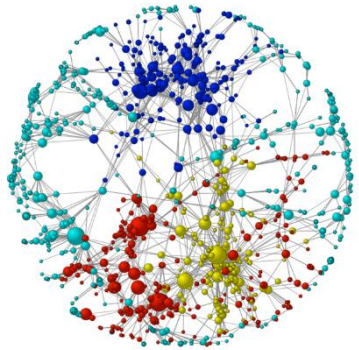
VALUE / PERCEPTION CONFLICTS
among multiple stakeholders involved in the problem, land use nexus

KNOWLEDGE UNCERTAINTY
not even scientists agree on causes and effects of the problems, neither the ways forward

NO FINAL SOLUTION
problems evolve faster than solutions, solutions are part of the problem, the problem creators are the same as the problem solvers

NO TESTING
short time horizon for resolution, too many layers, scales

URBAN WATER MANAGEMENT AS A WICKED PROBLEM



CRITICAL CHARACTERISTICS

VALUE / PERCEPTION CONFLICTS
among multiple stakeholders involved in the problem, land use nexus

→ DIALOGUE TO REACH CONSENSUS OVER IMPERFECT SOLUTIONS

KNOWLEDGE UNCERTAINTY
not even scientists agree on causes and effects of the problems, neither the ways forward

→ LONG-TERM DATA SERIES; SOCIO-ECOLOGICAL INFORMATION IN PLACE; LOCAL KNOWLEDGE & EXPERIENCES

NO FINAL SOLUTION
problems evolve faster than solutions, solutions are part of the problem, the problem creators are the same as the problem solvers

→ READINESS TO CHASE MOVING TARGET; RESILIENCE; TRANS-SECTORAL COLLABORATION; TRANSDISCIPLINARY RESEARCH

NO TESTING
short time horizon for resolution, too many layers, scales

→ CROSS-SITE LEARNING; LEARN FROM THE HISTORY OF NBS FAILURES TRUST ON RESILIENCE OF NATURE; ALLOW NATURAL REGENERATION TO HAPPEN OR STIMULATE IT

THE SOURCE

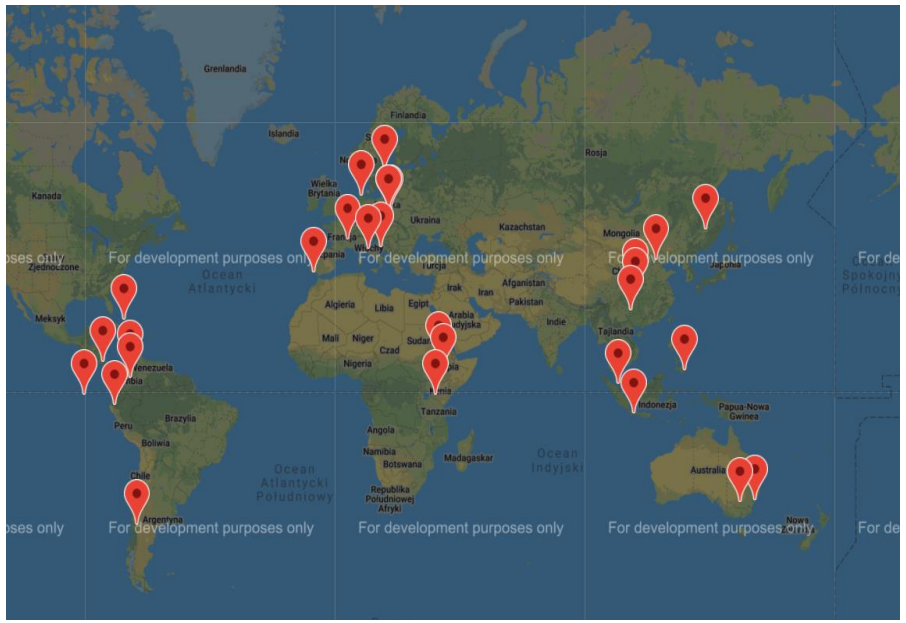
THE TRANSFER

THE ENABLING ENVIRONMENT

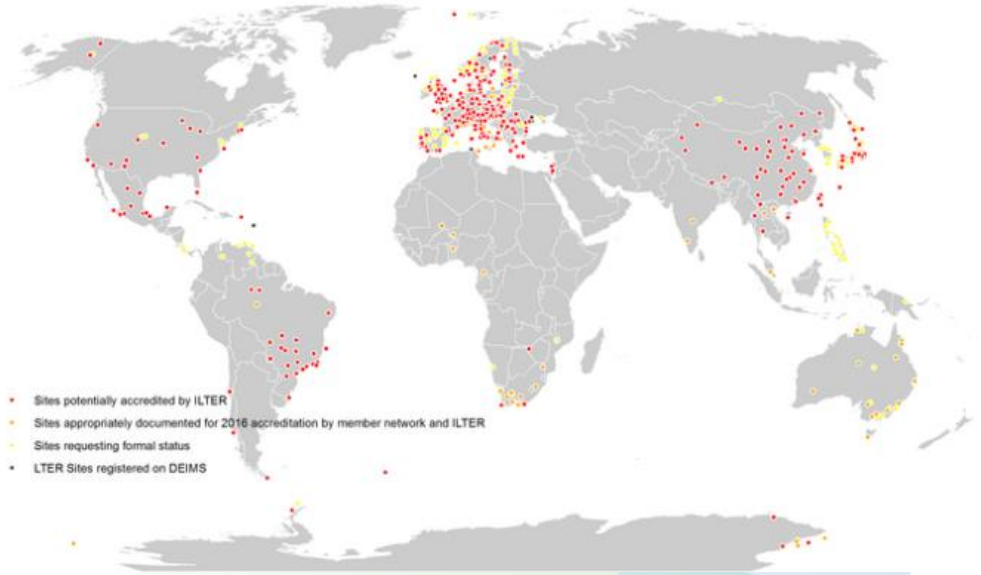
WATER
SPACE
TIME
SOCIETAL CHOICE

pct. source unknown

ATENAS CAPITALIZES ON EXISTING EXPERTISE, RESEARCH & DATA OF ILTER AND EH IHP NETWORKS



IHP ECOHYDROLOGY PROGRAMME DEMOSITES NETWORK



INTERNATIONAL LONG-TERM ECOLOGICAL RESEARCH NETWORK: LTSER PLATFORMS

United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme

ecohydrology programme

ILTER

PROJECT OUTLINE

- WATER JOINT PROGRAMMING INITIATIVE - WATER CHALLENGES FOR A CHANGING WORLD
- 2018 JOINT CALL: **Closing the Water Cycle Gap**

- **Partner institutions: ERCE, FPP Enviro, SYKE, IRSTEA / INRAE**
- **Three demo sites**: Łódź, Helsinki, Lyon
- **Three challenges**:

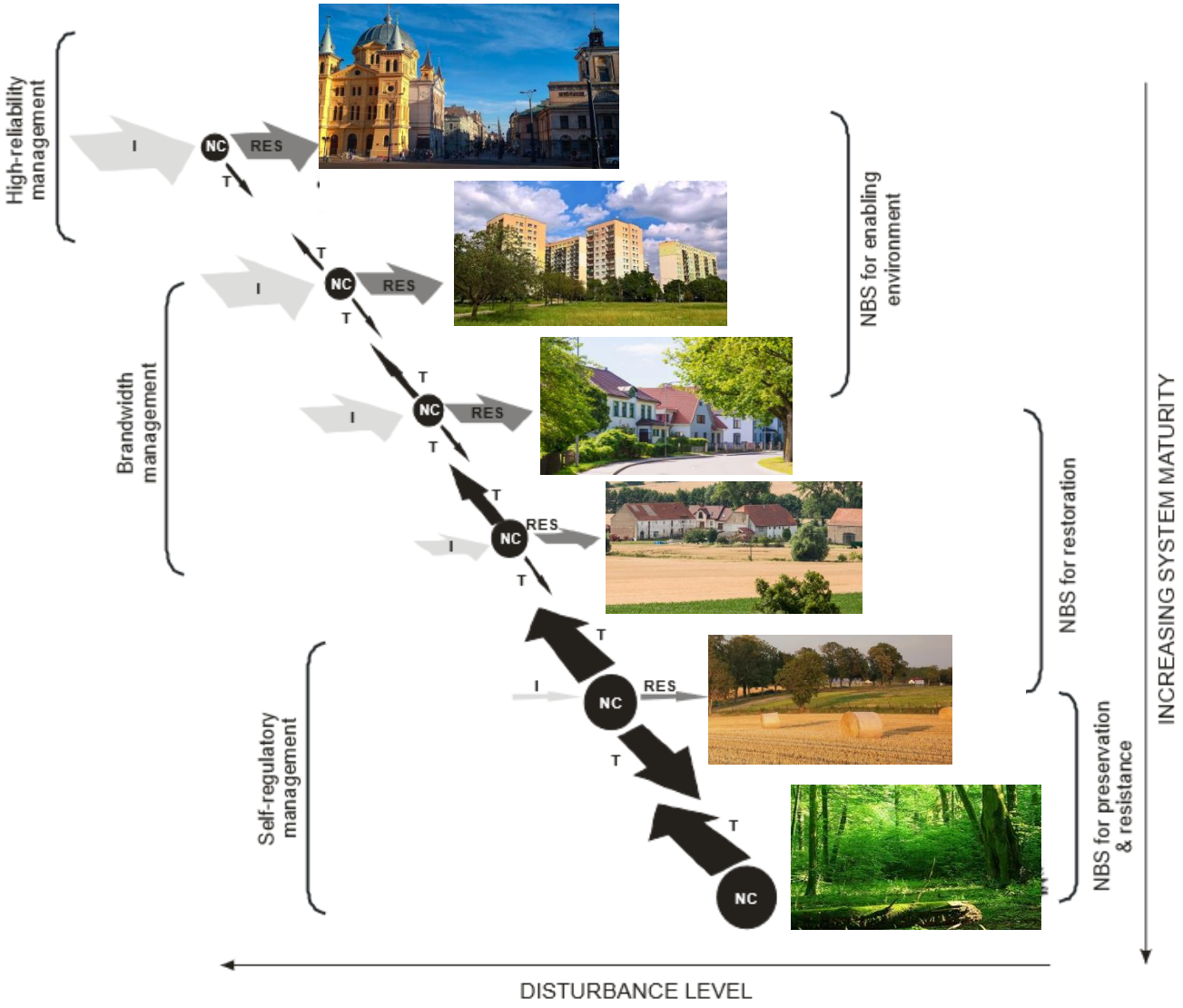
  - Lyon: water quality in suburban zone

  - Helsinki: urbanization and densification vs water cycle

  - Łódź: sustaining rivers and greenery under groundwater drop

- **Three flexible approaches – reversed butterfly effect**

ES TRANSFER RULE FOR REGULATORY SERVICES




Climaponds, retention basins and rainwater gardens, swales (FPP Enviro, E. Urbaniak)





Water-purification ramps, restoration of valeys and riv. beds (P. Breil)



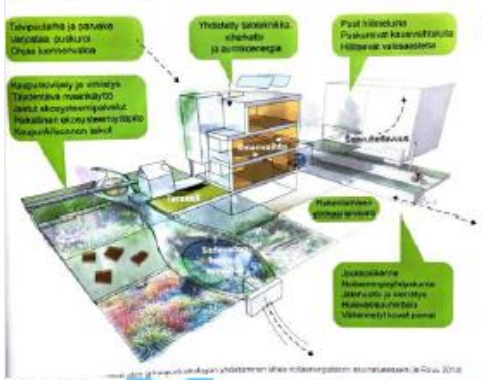
Denitrification walls + buffering zones (K. Izydorczyk)

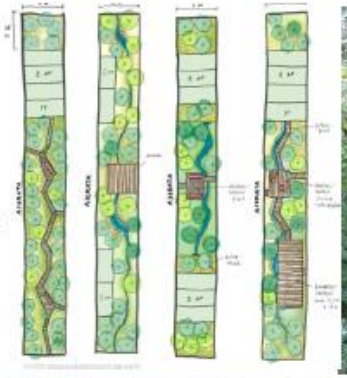
NO SPACE FOR WATER: KIVISTO & VANTAA (HELSINKI REGION)

NEWLY SET UP RESIDENTIAL AREAS - LID

- Stormwater parks and retention ponds
- Blue-green elements in streets and squares
- Multi-criteria assessment of NBS options
- Workshops with city planners and stakeholders

GREEN FACTOR = 1





NO SPACE FOR WATER: KIVISTO & VANTAA (HELSINKI REGION)

MULTI CRITERIA DECISION ANALYSIS – LIVING LAB APPROCH

- ❑ Considering of nature values and resources
- ❑ Collaborative identification of the needs of society
- ❑ Expert assessment of the risks and options for development
- ❑ Climate change mitigation potential
- ❑ Economic assessment (cost / benefits)

Two alternatives

- For the workshops, two planning alternatives were created:
  - ALT A: Ecological, green resource-wise
  - ALT B: Functional / active
- Both alternatives need to fulfill certain requirements for stormwater management

ALT A

ALT B

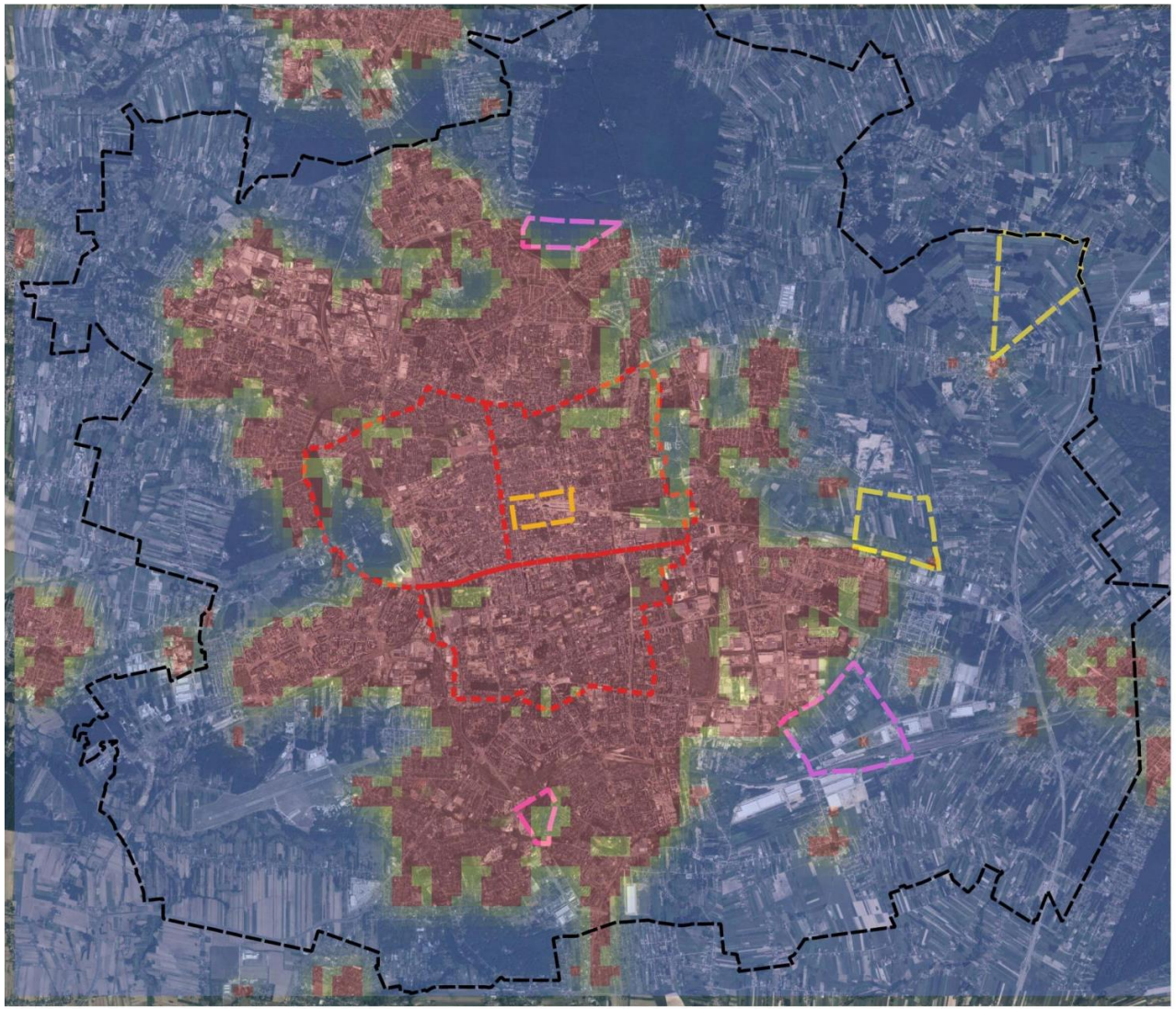
NO SPACE FOR WATER: KIVISTO & VANTAA

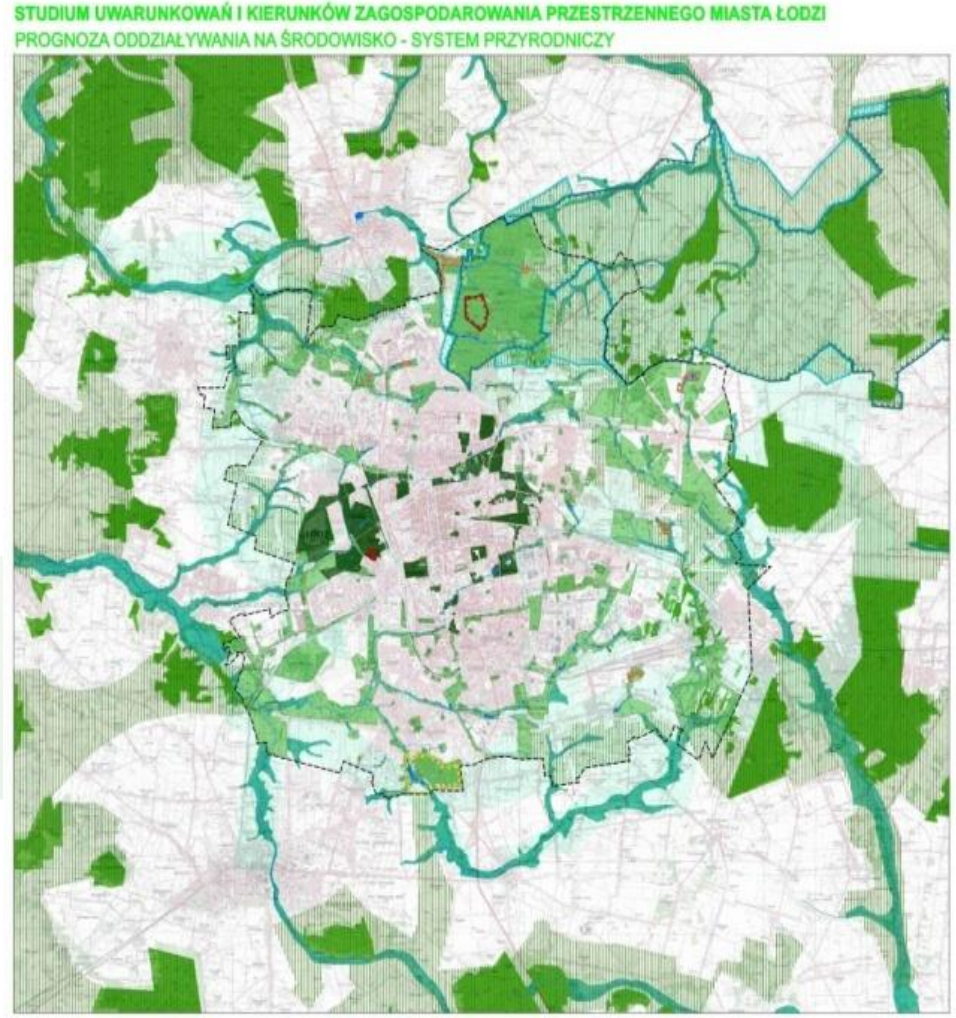
Spatial planning for water management

Spatial planning for social networking

COOLING EFFECT OF CITY ECOSYSTEMS IN ŁÓDŹ – MODEL INVEST

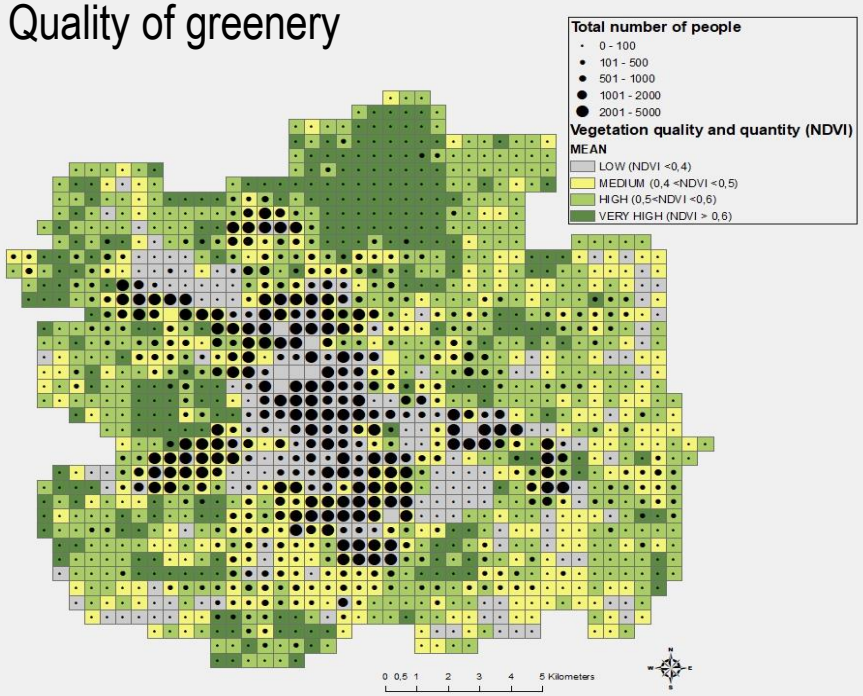
EXISTING OLD INFRASTRUCTURE, PLANNING AND INFRASTRUCTURE MALFUNCTIONS



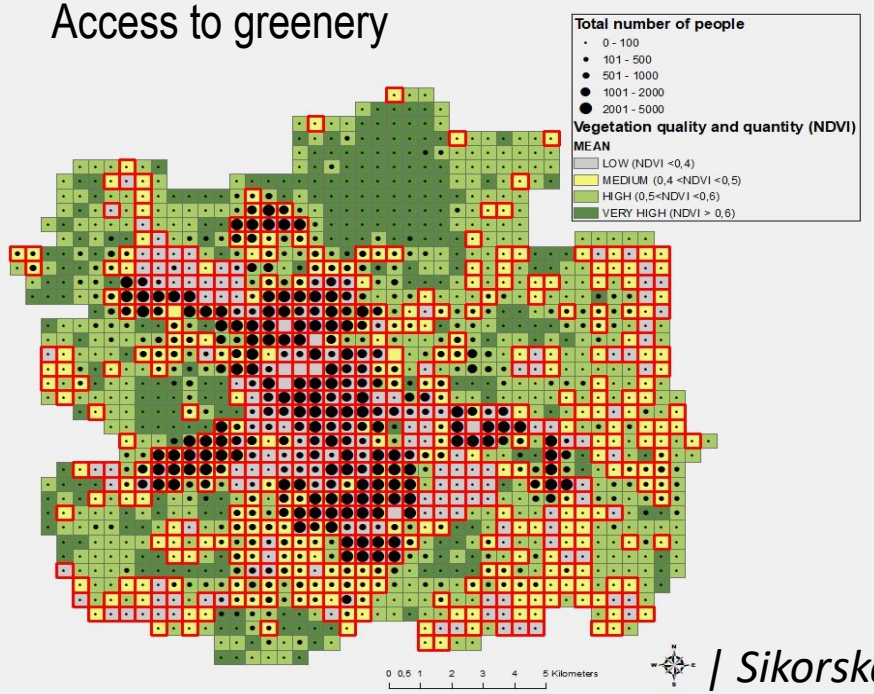


THE BLUE-GREEN POTENTIAL VS DEMAND

Quality of greenery



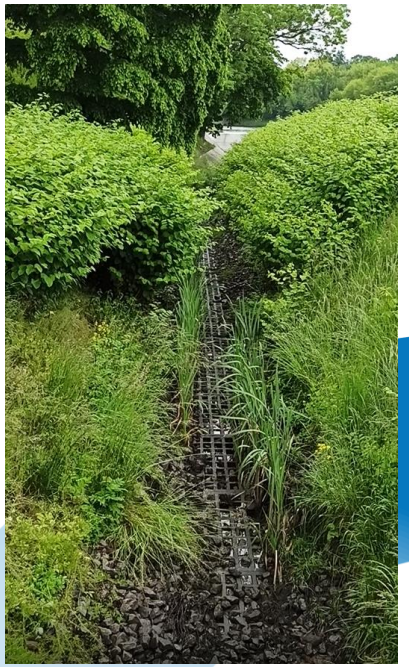
Access to greenery

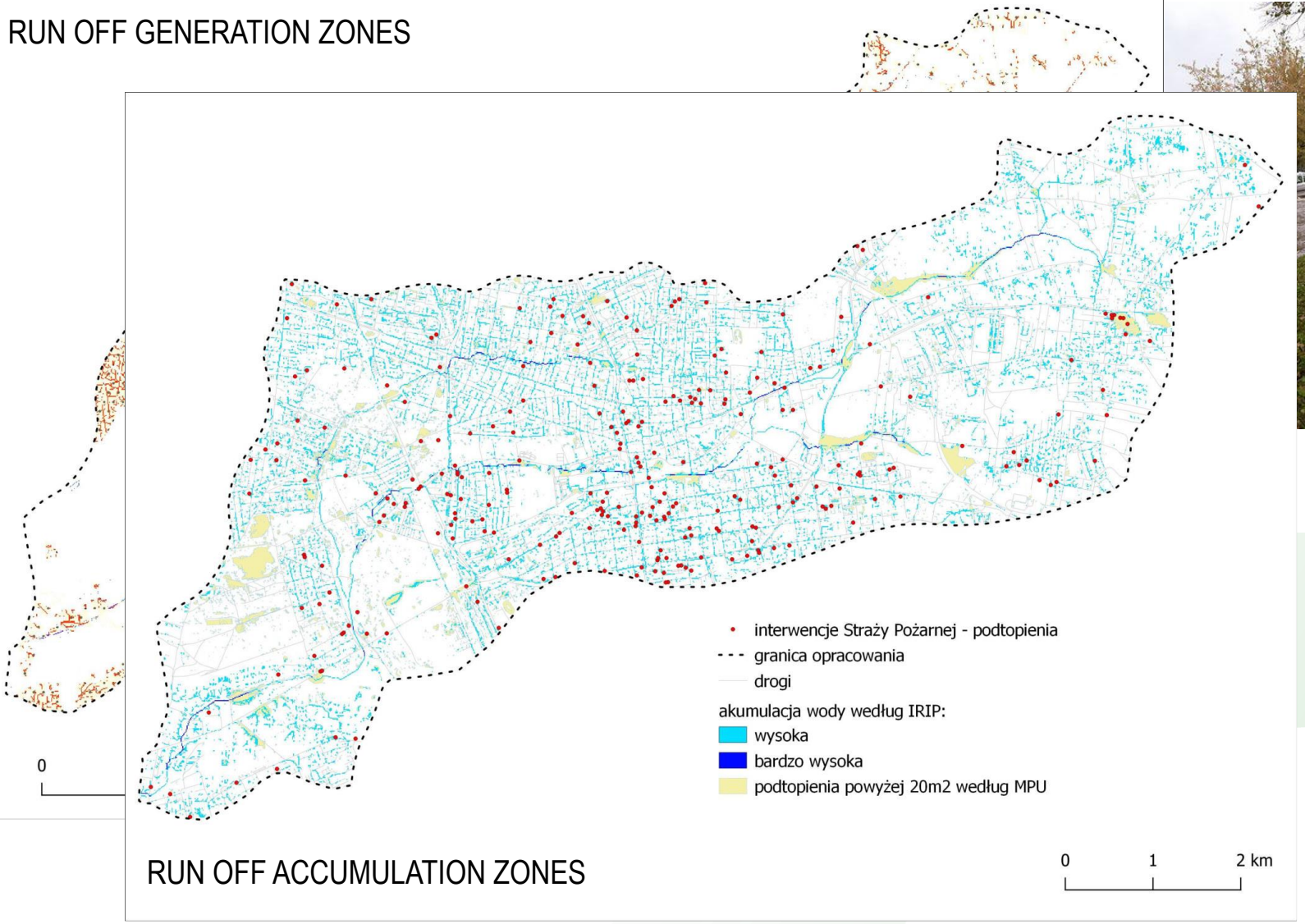


| Sikorska, 2018

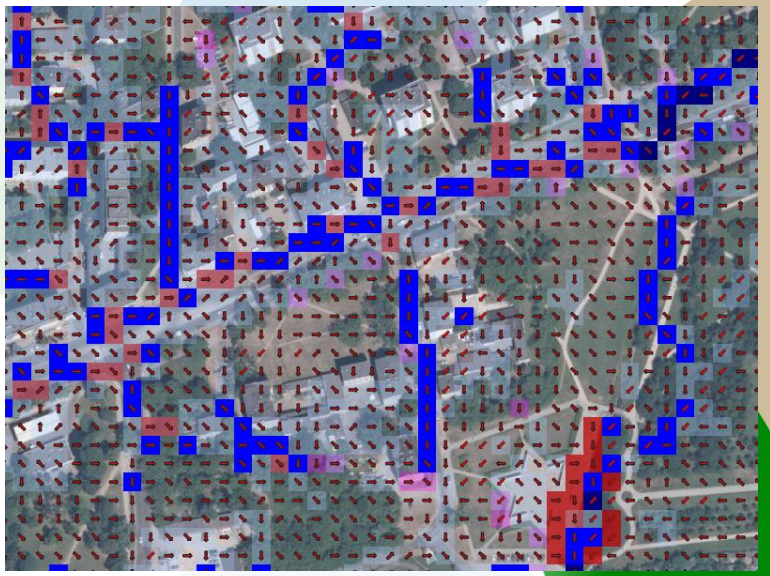
WATER SCARCITY & PLUVIAL FLOODING: ŁÓDŹ

RUN OFF GENERATION ZONES





RUN OFF ACCUMULATION ZONES



WATER SCARCITY & PLUVIAL FLOODING: ŁÓDŹ

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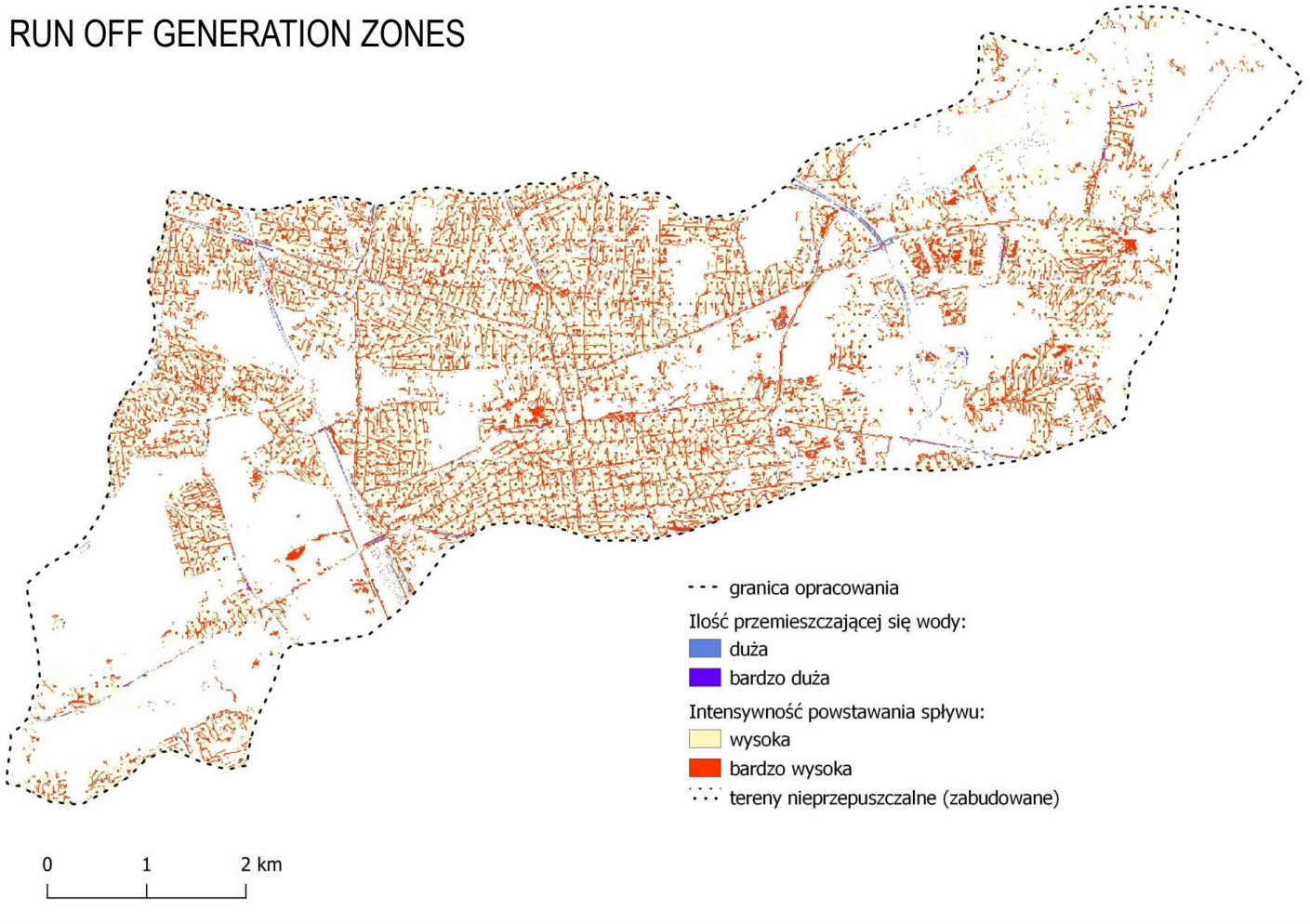

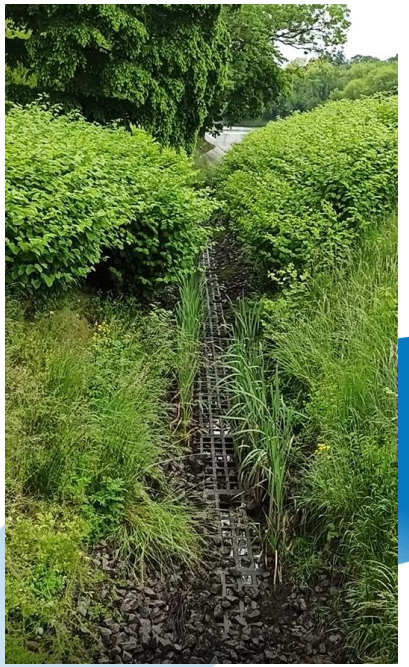

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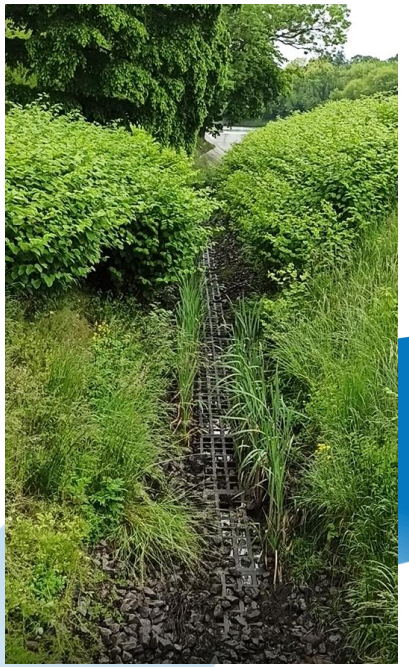

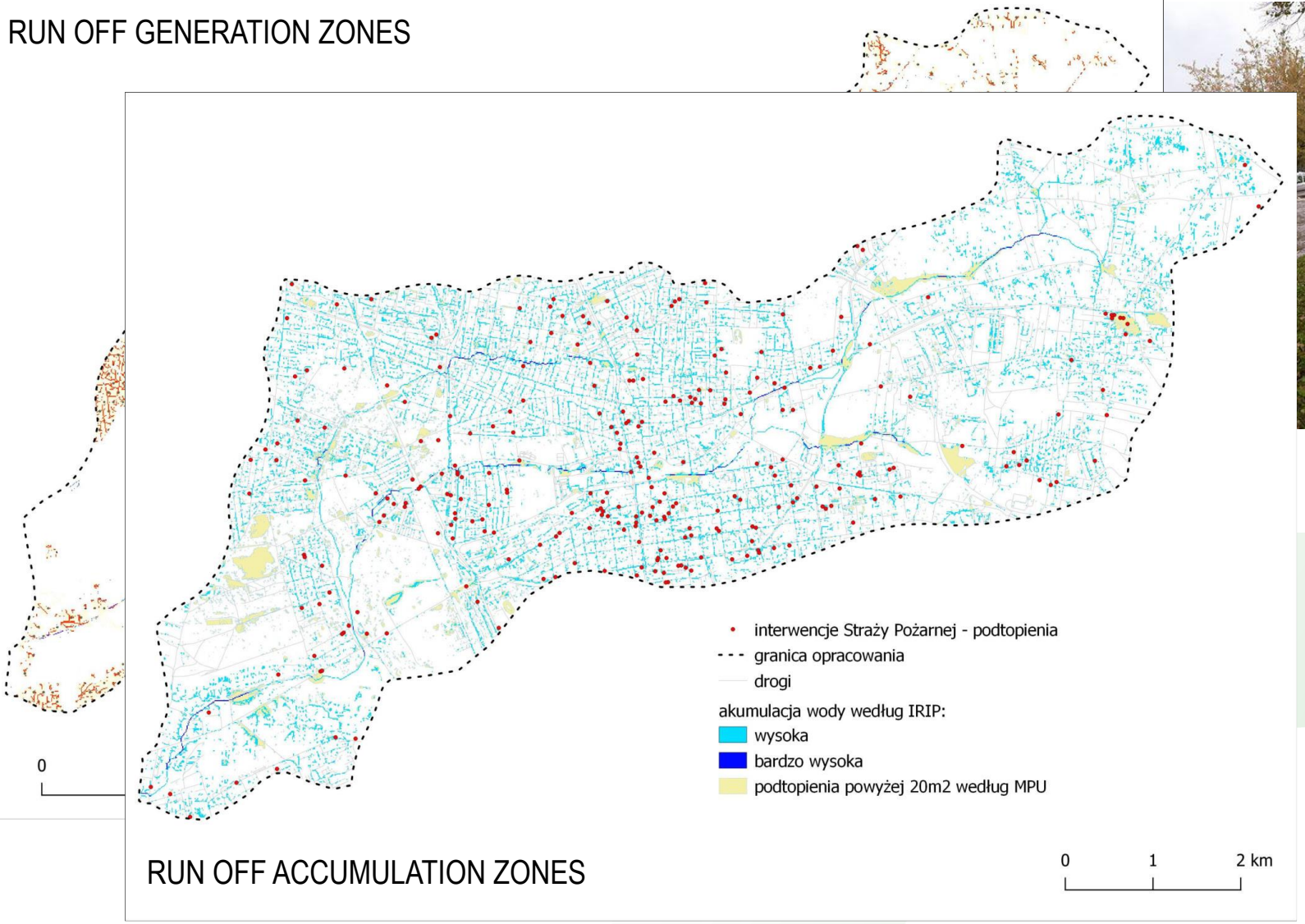

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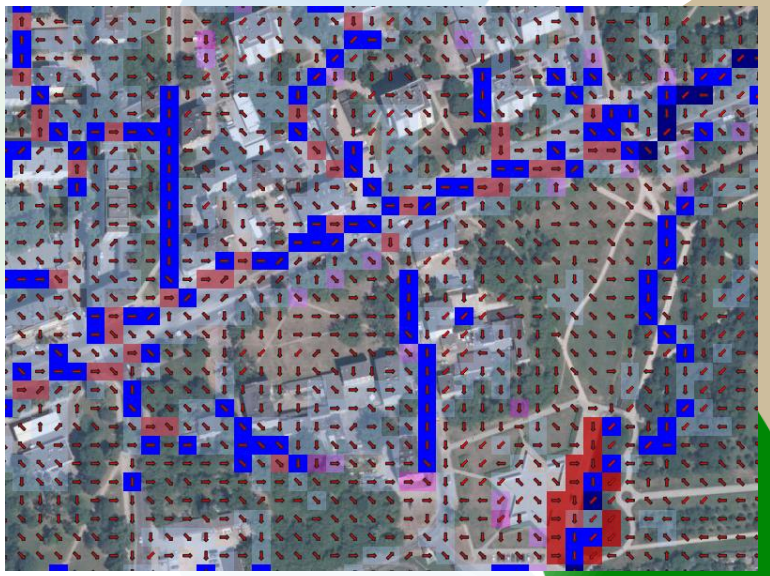


CO-DESIGN IN COVID ERA

1. Behavioural mapping
2. Ranking the square elements
3. Re-design
4. Collaborative implementation

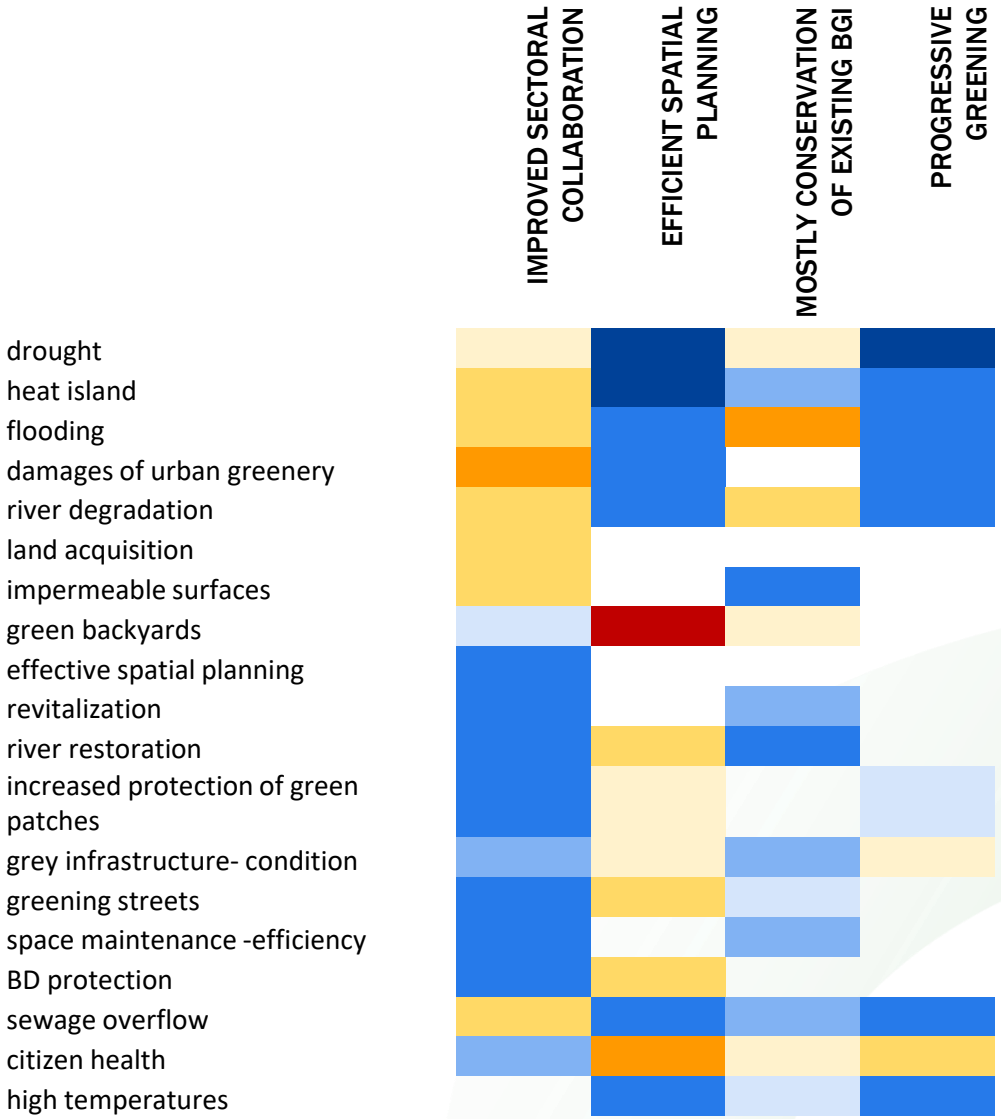
CO-DESIGN IN COVID ERA

WATER SCARCITY & PLUVIAL FLOODING: ŁÓDŹ

HAPPY TO BE WHERE WE ARE:

- ❑ we created a living lab and an inclusive process UNDER COVID – creating dialogue
- ❑ we were able to develop NBS alternatives, discuss design and implementation designs – got accepted by stakeholders and enjoying their dedication and engagement – already existing LTSER platforms
- ❑ we reached implementation level of very pilote solutions (trans-sectoral collaboration) despite the circumstances, however actions are still piloted by the cities,
- ❑ we linked up with business partners, cities' syndicates and innovators to support our work conceptually – learning from experiences
- ❑ we hope to have a permanent care takers of our solutions among stakeholders – as it looks like now, still wondering where the local leaders are…. **BUT**

IMPACT OF MANAGEMENT DESICION ON FINAL OUTCOME – UNEXPECTED RESULTS

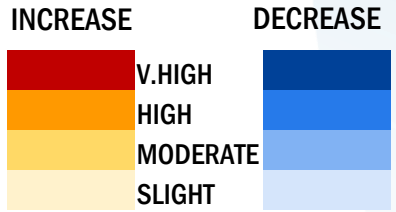


MOSTLY CONSERVATION

Citizens and NGOs often focus on protection of individual patches of greenery, without considering city development & following impacts

PROGRESSIVE GREENING

Ecohydrological approach based on preservation of regulatory ecosystem services through development of BGN and systemic implementation of NBS



2.5 YEAR LATER – NONE OF THE OPTIONS IS FAIR PRICE TO BE PAID FOR BEING DEMOCRATIC

ALT A

Stormwater reservoir is designed to be a wetland (partly)

ALT B

Stormwater storage reservoirs are designed to work as places for outdoor activities (when not inundated)

THE TEAM






FPP ENVIRO


SYKE


INRA