Smart and sustainable cities with nature-based solutions

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ALMANAC workshop:

M2M Network Infrastructures for Massively Distributed Smart City Applications

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Cities of the Future

- **The Juncker Commission's priorities**

- **EU's urban agenda**

- **Open Innovation, Open Science, Open to the World**

Complex challenges

Cities of the future must answer to complex challenges in the nexus of

- **Energy**
- **Water**
- **Food**
- **Health and well-being**

as well as deliver sustainable jobs and growth.

The past: a focus on urban challenges
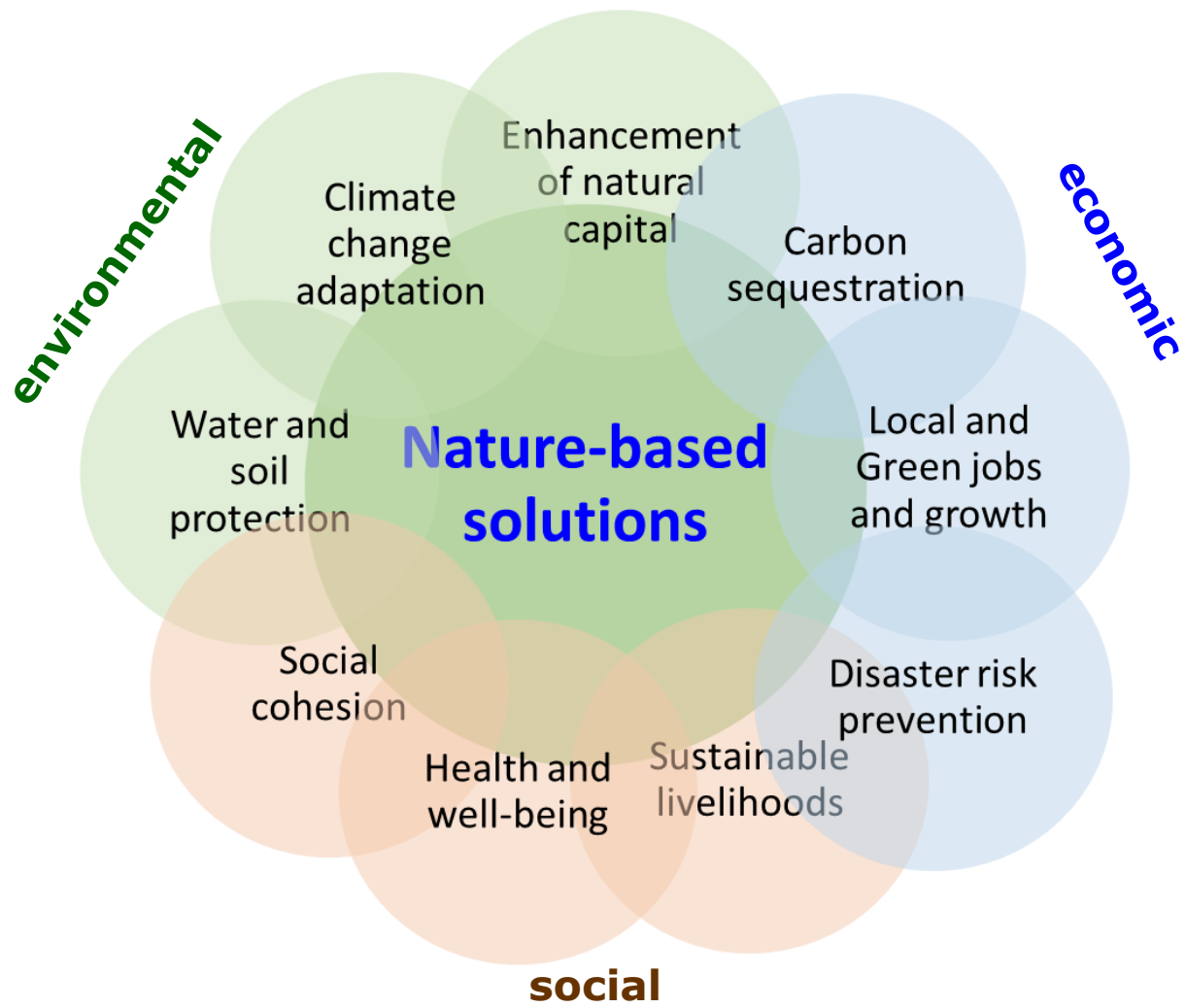ex.: floods, soil contamination, air pollution

The future: focus on solutions to challenges

- Changed context and goals for EU R&I

- European Commission priorities, notably 'A new boost for Jobs, Growth and Investment' and 'A resilient Energy Union with a forward looking climate change policy'

- EU Research and Innovation Framework Programme, Horizon 2020, 2014-2020

- New orientation of EU R&I policy to promote **nature-based solutions** to societal challenges and corresponding **markets**

Nature-based solutions for smart, green and inclusive cities

- ✓ inspired or supported by nature

- ✓ economic, social and environmental benefits and resilience

- ✓ systemic, resource-efficient locally adapted interventions

- ✓ more nature and natural features into cities and landscapes

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Nature-based solutions

- environmental
- economic
- social

Climate change adaptation · Enhancement of natural capital · Carbon sequestration · Water and soil protection · Local and Green jobs and growth · Social cohesion · Health and well-being · Sustainable livelihoods · Disaster risk prevention

https://vimeo.com/38736492

Smart and sustainable Cities and Nature-based Solutions

"Nature-based solutions need data too"

- **Smart sensors and monitoring schemes for ecosystem services**

  Function, effectiveness, efficiency, maintenance, education, awareness raising

- **Hard impact assessment of "soft" solutions**

  Insurance value, health effects, social benefits, investment effectiveness to build business cases and support cross-sectorial and public-private partnerships

- **Big Green Data**

  Meta-analysis including green indicators to facilitate social innovation and new business opportunities

Our main objectives...invest in solutions

Widening the solutions portfolio beyond technological innovation → foster social innovation

Providing systemic, scalable, integrated nature-based solutions at landscape & city level

Fostering the co-design, co-development, co-implementation of solutions

Leveraging of investment (public & private sector)

Supporting replicable solutions towards the market (performance, governance, incentives)

Horizon 2020 work programme 2016-2017
Call: Smart and Sustainable Cities
Part: Sustainable cities through nature-based solutions

Demonstrating innovative nature-based solutions in cities:

2016:

- Demonstrating innovative nature-based solutions for climate and water resilience in cities

- Budget: 40 mio. €
- Deadlines: 08/03/2016+06/09/2016

2017:

- Nature-based solutions for inclusive urban regeneration

- Budget: 40 mio. €
- Deadlines: 07/03/2017+05/09/2017

https://ec.europa.eu/programmes/horizon2020/en/draft-work-programmes-2016-17

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Large-scale demonstrators in Cities

- **Deployment of nature-based solutions or optimal combinations of nature-based solutions with other technologies/interventions**

- **Front-runners – followers' approach to enable replication & uptake**

- **Trans-disciplinarity and multi-stakeholder approaches**

- **Co-design, co-development and co-implementation**

Ruhr, Arnsberg, Germany

2007:
- **Artificial river banks**
- **Flooding**
- **Insurance damages**

2009:
- **Natural restoration of river banks**
- **No insurance damages**
- **Boosting the whole city**
- **Public awareness and ownership**

Seoul, South Korea 2000:

Elevated highway (1968) covering the Cheonggyecheon creek

2005:
- **Traffic underground**
- **Creek restored**
- **Prevents flooding**
- **Reduced heat by 5,9 degrees C.**
- **Green mobility**
- **Biodiversity and less pollution**
- **Tourist attraction**

THANK YOU !

Any question, comment or inspirational thought is welcome!