



Towards Water Smart Cities

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Water is essential for life in cities



Water challenges in an urbanizing world

- 1 billion people live in flood prone areas
- 1 in 9 people lack access to safe drinking water
- 3.6 billion people live in areas that are potential water scarce
- Water pollution is a growing threat
- Increasing demand for water, food and energy
- Cities vulnerable for climate change: sea level rise, pluvial floods, droughts and heat waves

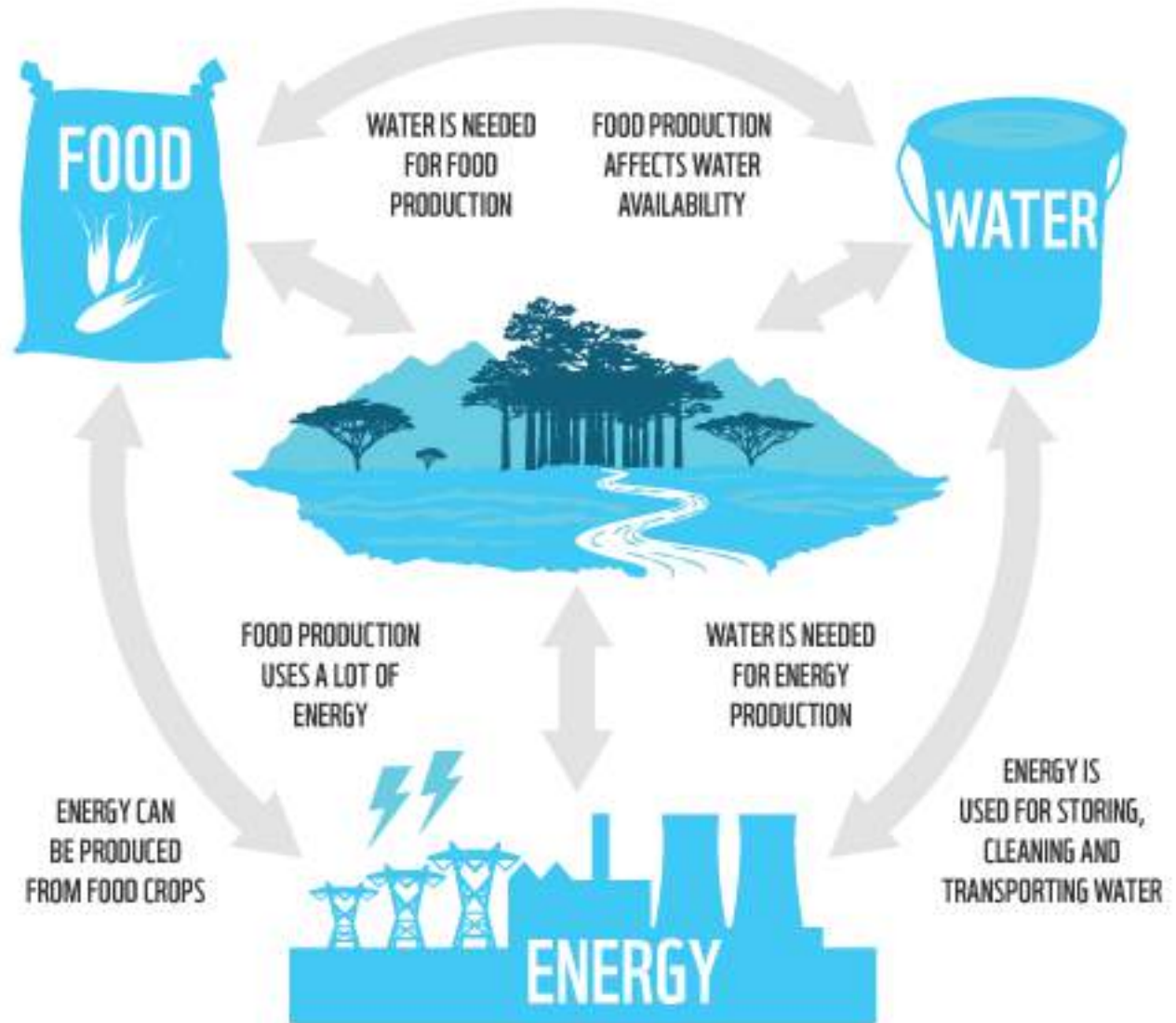


The image is a composite. The background is a clear blue sky with scattered white clouds. In the middle ground, a city skyline is visible, featuring several tall, modern skyscrapers. The most prominent building is a tall, thin tower with a grid-like facade. To its right is a large, blue, angular building with a distinctive archway. The foreground is a vast, flat expanse of dry, cracked earth, with the cracks forming a complex, polygonal pattern. The text "One in four world's largest cities already water stressed" is overlaid in white, sans-serif font across the middle of the image, positioned over the cracked earth and the lower part of the skyline.

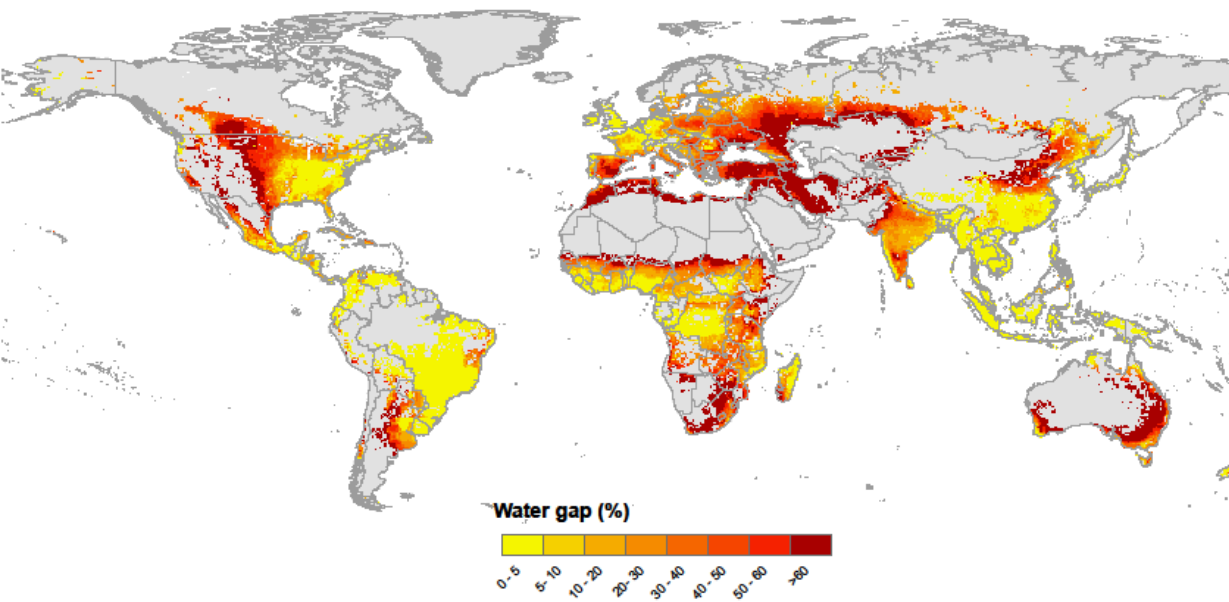
One in four world's largest cities already water stressed

Increased demand for water, food and energy

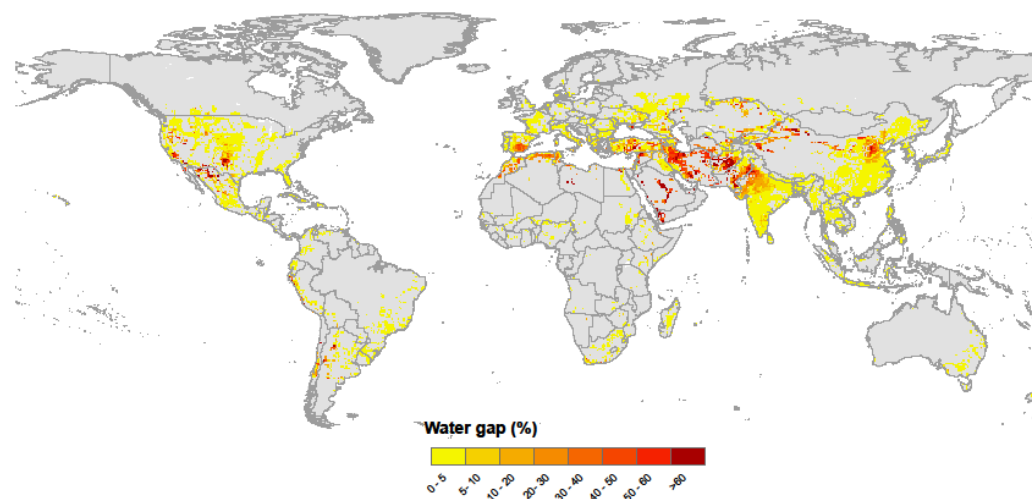
Demand for water is expected to grow by 25% by 2050



Rainfed water gap 2050s SSP2



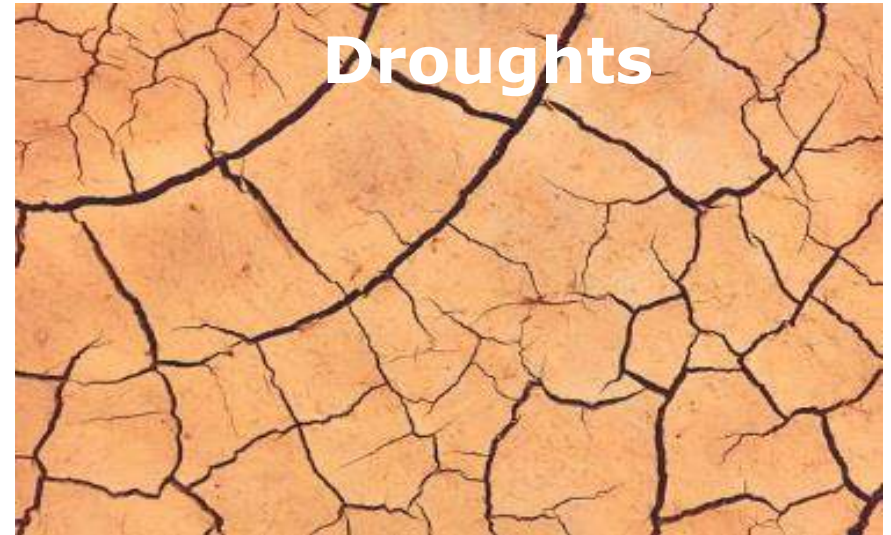
Irrigated water gap 2050s SSP2



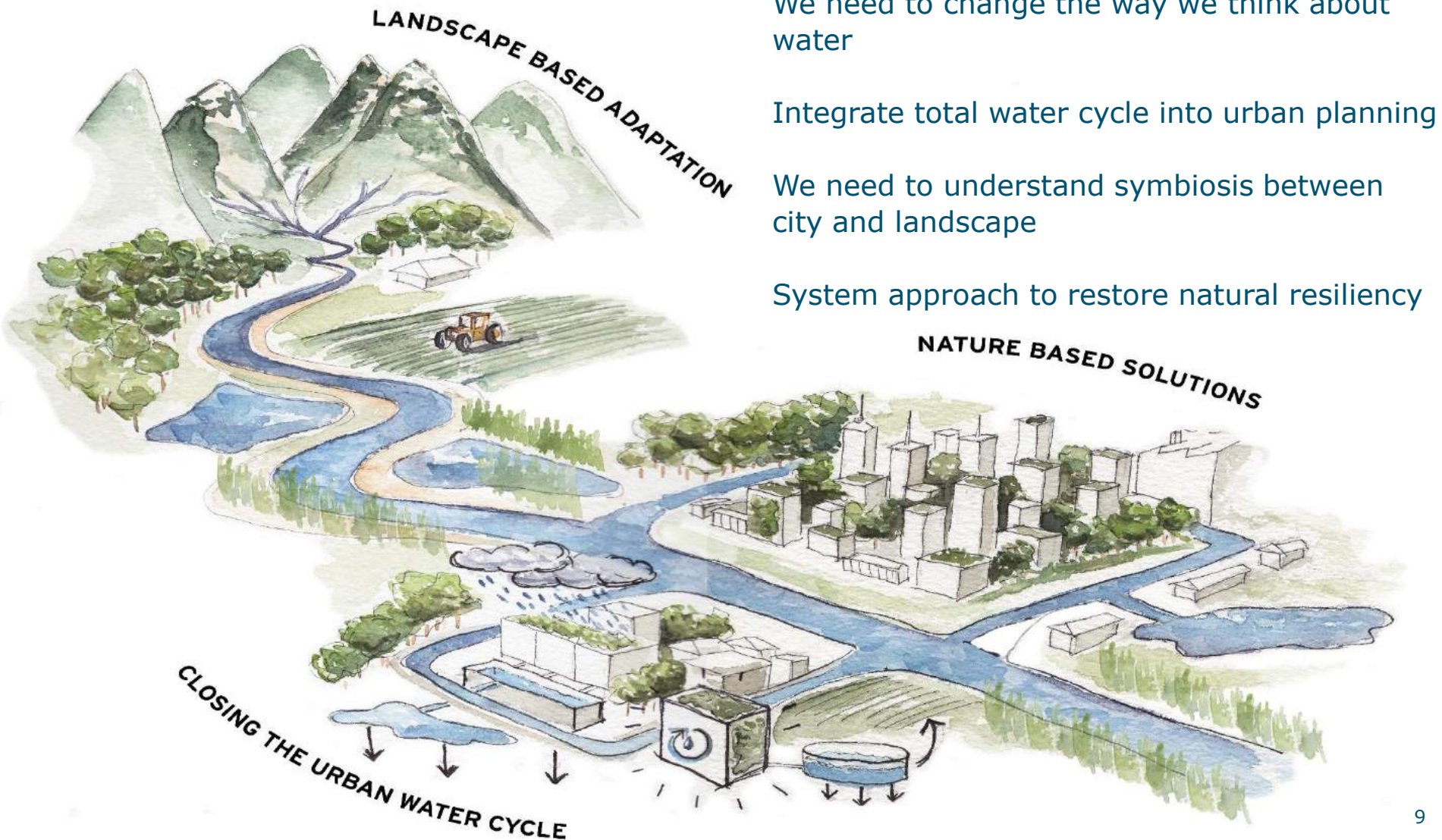


Worldwide damage by urban floods
> 30 billion USD per year

Climate change will increase the risk for floods, droughts and heat waves



A Nature Based approach for Water Smart Cities



A system approach towards Water Smart Cities

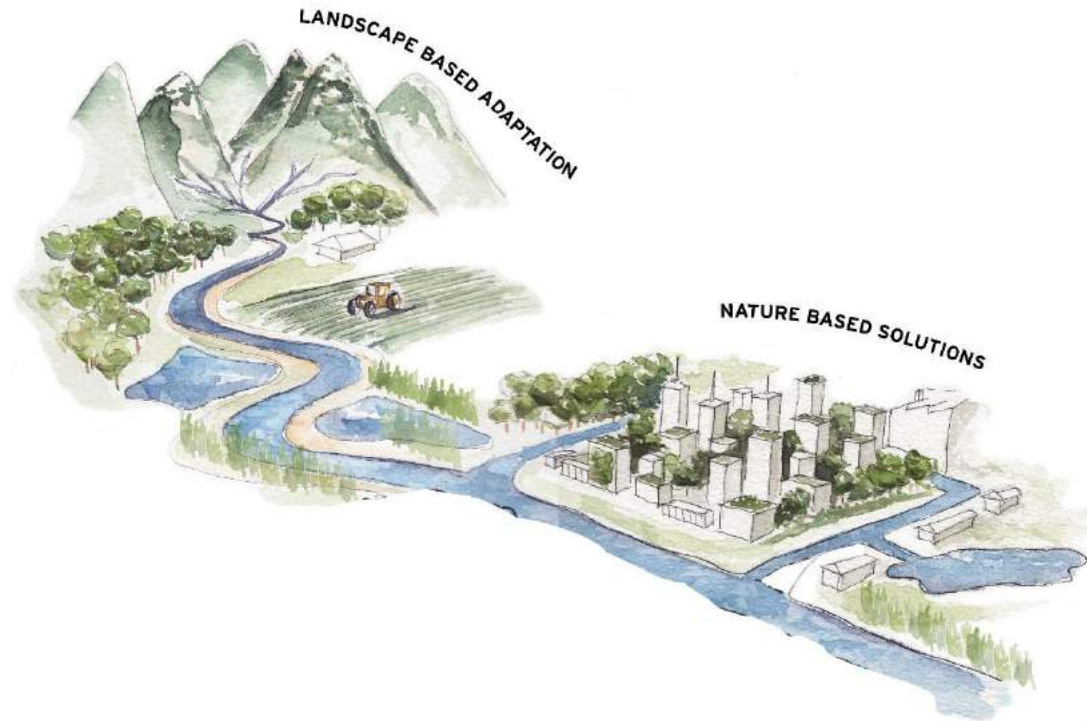
1. Landscape Based Adaptation:

Restore degraded ecosystems in natural surroundings of cities, system approach to connect cities to river basins



A system approach towards Water Smart Cities

- 1. Landscape Based Adaptation:** Restore degraded ecosystems in natural surroundings of cities, system approach to connect cities to river basins
- 2. Nature Based Solutions for cities:** Restore the natural drainage/sponge capacity and improve liveability of cities



A system approach towards Water Smart Cities

- 1. Landscape Based Adaptation:**
Restore degraded ecosystems in natural surroundings of cities, system approach to connect cities to river basins
- 2. Nature Based Solutions for cities:** Restore the natural drainage capacity and improve liveability of cities
- 3. Closing the urban water cycle:**
Reduce water use and treat water as a resource: reduce, re-use, recycle



1. Landscape based adaptation

- Climate Smart Forestry (re/afforestation, forest conservation)
- Reconnect rivers to flood plains / Renaturalizing river basins
- Climate Smart Agriculture
- Wetlands restoration / conservation

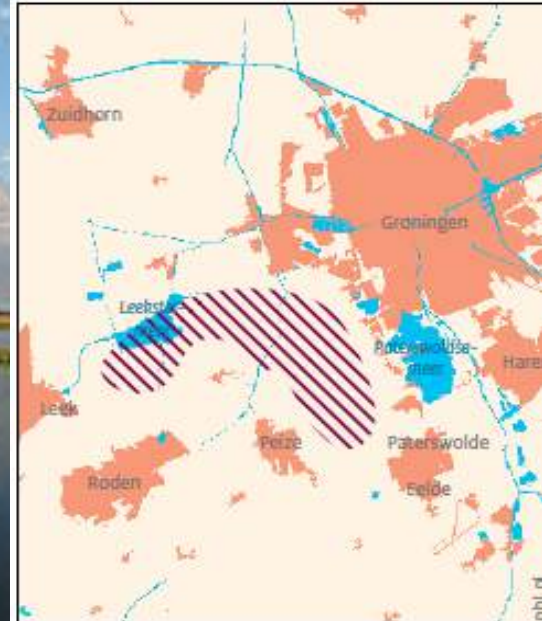


Room for the river programme



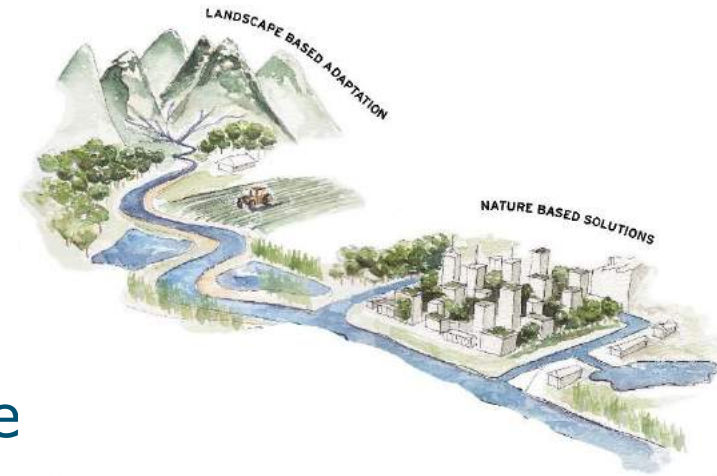
De Onlanden: Wetland restoration in peri urban area

- 2200 Ha wetland prevents city of Groningen for floods
- Costs: € 40 million
- Traditional civil engineering approach: € 115 million



2. Nature Based Solutions for cities

- Urban forestry
- More green space
- Green corridors in/around cities
- Green roofs/green walls
- More open water for water storage



Benefits of Nature Based Solutions

- Green solutions for storm water management
- Water quality improvement
- Moderating air temperatures and improving air quality
- Enhance biodiversity
- 5 – 30% higher property value
- Improved quality of life



3. Closing the urban water cycle

- Reduce water use - awareness
- Water efficient buildings
- Harvesting and reuse rainwater
- Natural waste water treatment
- Reuse of grey waste water in buildings and for irrigation



Transition towards WSC creates business and opportunities for smart innovations



Roadmap Towards Water Smart Cities



Living Labs – create evidence base



Transition towards green, circular and resilient cities

- Cities face great challenges with water, either too much or too little
- We have to redesign our cities, adaptation is urgent
- A system approach is required. We need to restore the natural resilience of cities and their surrounding landscape
- Nature based adaptation is a huge opportunity to improve quality of life
- Create evidence base in living labs and exchange best practices
- Urban (re)development programmes offer large opportunities for co-creation. U\$ 3 trillion invested in urban infrastructure

To explore the potential
of nature to improve the
quality of life

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