

# Urban Waters

## Ecosystem Services, Design and People's Perception

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**Urban Development – Not without nature!**





Pilgrimage to urban water nature – Shanghai Geopark

# The Society for Urban Ecology has five goals...

- 1. **Develop** an understanding of the structure and function of urban ecosystems;
- 2. **Advance** a balanced interaction between humans and their environments in cities and towns;
- 3. **Foster** and develop knowledge and implementation of urban ecology;
- 4. **Strengthen** contacts and enrich the dialogue between researchers, practitioners and teachers;
- 5. **Make** the collective expertise of urban ecologists available.

Urban Ecosystems - our flagship journal



# S|U|RE

[www.society-urban-ecology.org/](http://www.society-urban-ecology.org/)



## Society for Urban Ecology





## **Cities and Water – Conservation, Restoration and Biodiversity**

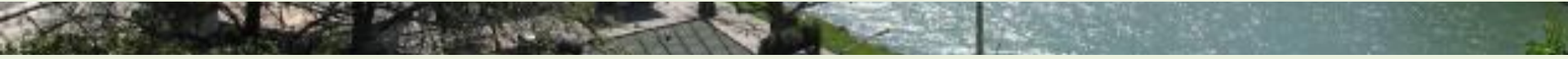
**Urban Biodiversity** – Biodiversity of urban areas, not primarily of political defined territories..

**Urban Biodiversity** can't be reduced to native species only. This would exclude a big part of urban species.

Many **urban ecosystem services** (e.g. regulation services) are not based on biodiversity as diversity of species, but on vegetation areas and water bodies in cities. They provide the services. Urban ecosystem services are not for free but result of management connected with costs. We should be carefully plan and locate them where we need them.

**Conservation and restoration** should target in urban areas to support the contact of people with nature of any kind, not primarily to rare or endangered species.

**Urban nature restoration** must be human oriented to reduce risks by nature processes and to improve the contact of people to nature. It should not be the idea to restore something what is by changed land use already gone. Cities are mostly no museums but developing living spaces for people.



**Urban Waters** are key elements of biodiversity, conservation and restoration. They bring nature into cities and support a sustainable urban development.



**Three key message:**

1. Show the importance not just the beauty of nature in cities.
2. Creating new and enlarging green areas of different types of nature where they are needed for people.
3. Manage risks caused by nature and make urban nature to learning places for kids and adults.

**Urban waters (connected with urban green) are excellent addresses for all these messages !**



Newsday, Darcy

,No fear my darling, it is called TREE!'





- **Urban Waters** – Structures, Functions, Changes
- **Ecosystem Services** - How can people benefit from urban water ecosystems?
- **Design** – Worldwide examples
  - **Renaturalization** (Munich, Germany)
  - **Risk Management** (Dresden, Germany)
  - **Urbanization** close to protected areas (Linz, Austria)
- **Peoples Perception**
  - Buenos Aires, Argentina
  - Together with Prof. Ana Faggi, Universidad de Flores, Buenos Aires





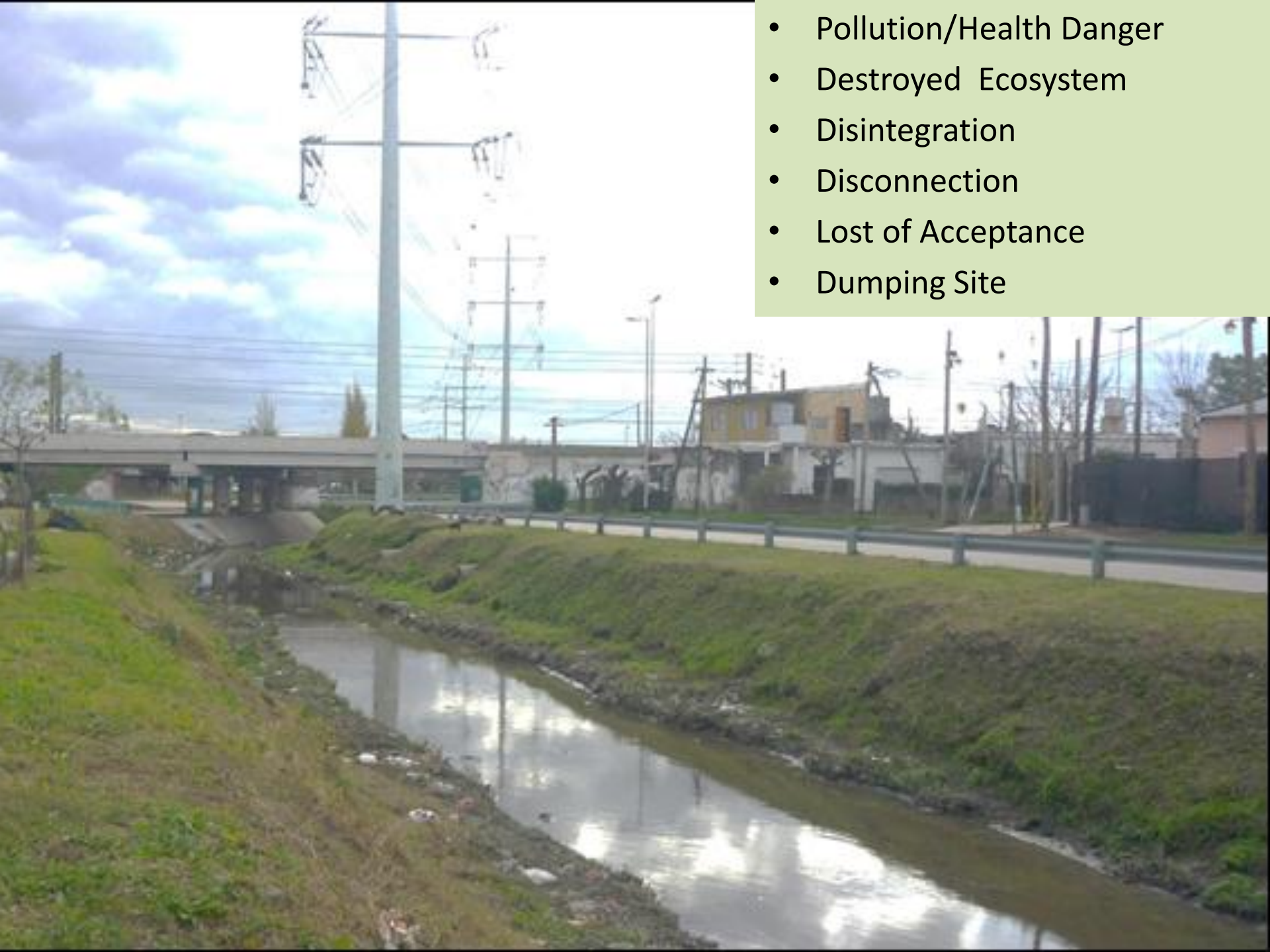


## Urban Waters – Diversity of ecosystems



***Flowing waters*** (rivers, streams, canals), ***Standing waters*** (lakes, ponds, basins)





- Pollution/Health Danger
- Destroyed Ecosystem
- Disintegration
- Disconnection
- Lost of Acceptance
- Dumping Site

# The Potentials: Ecosystem Services

Reduction of risks by regulation,  
Improvement of potentials for cultural and habitat services

Sustainability dimension	Urban Ecosystem Service	Quality of life indicator
Ecology	Air filtration <b>Climate regulation</b> Noise reduction <b>Rain water drainage</b> <b>Water supply</b> <b>Habitat service</b>	Health (clean air, protection against respiratory diseases, protection against heat and cold death) Safety <b>Drinking water</b> <b>Food</b>
Social sphere	<b>Harmonious Landscape</b> <b>Recreation</b> <b>Cultural values</b> <b>Sense of identity</b> <b>Nature experience</b>	<b>Beauty of the environment</b> <b>Recreation and stress reduction</b> <b>Intellectual endowment</b> Communication Place to live
Economy	Provision of land for economic and commercial activities and housing <b>Food production</b>	Accessibility Income

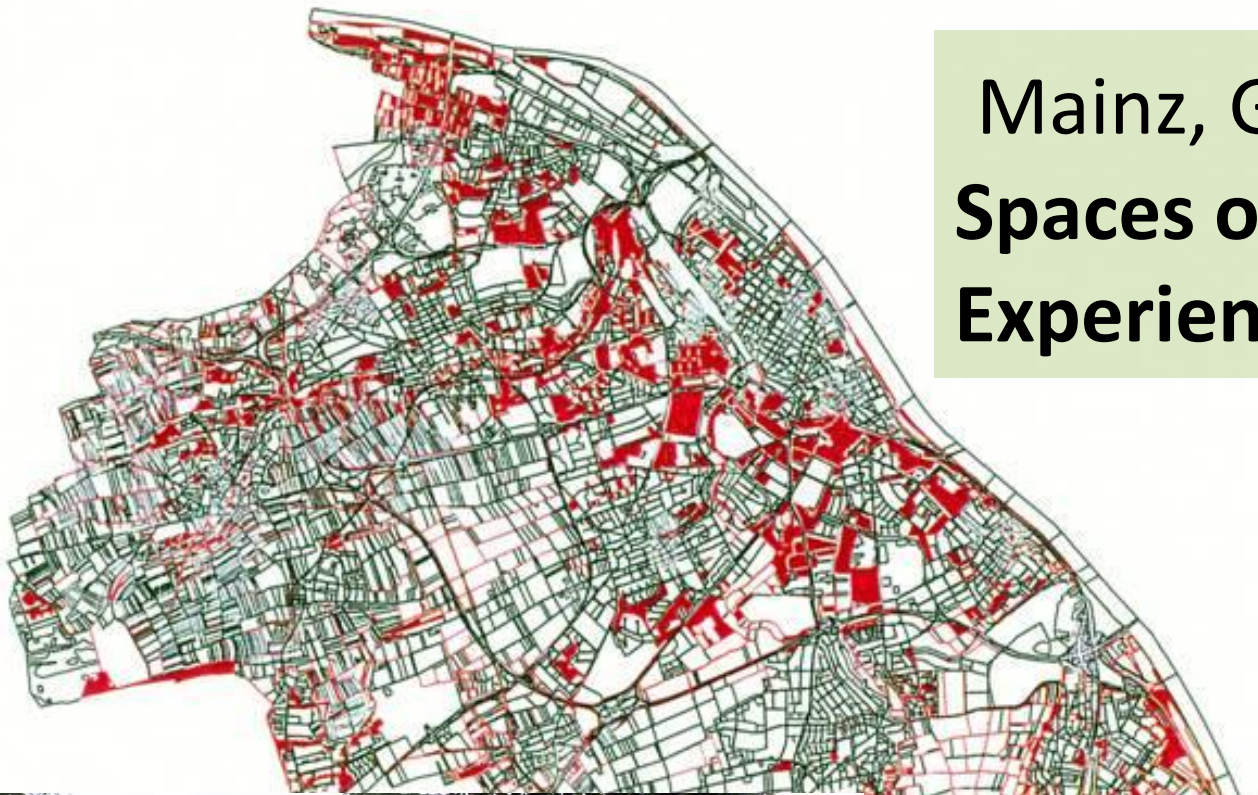






# Mainz, Germany

## Spaces of Nature Experiences

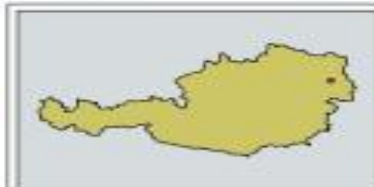


- The function of nature conservation in the city is... maintenance of species and biocenosis' **as a basis for direct contact of the citizens with the natural elements** of their environment (Sukopp & Weiler 1986, p. 25).

Maßstab 1 : 100.000

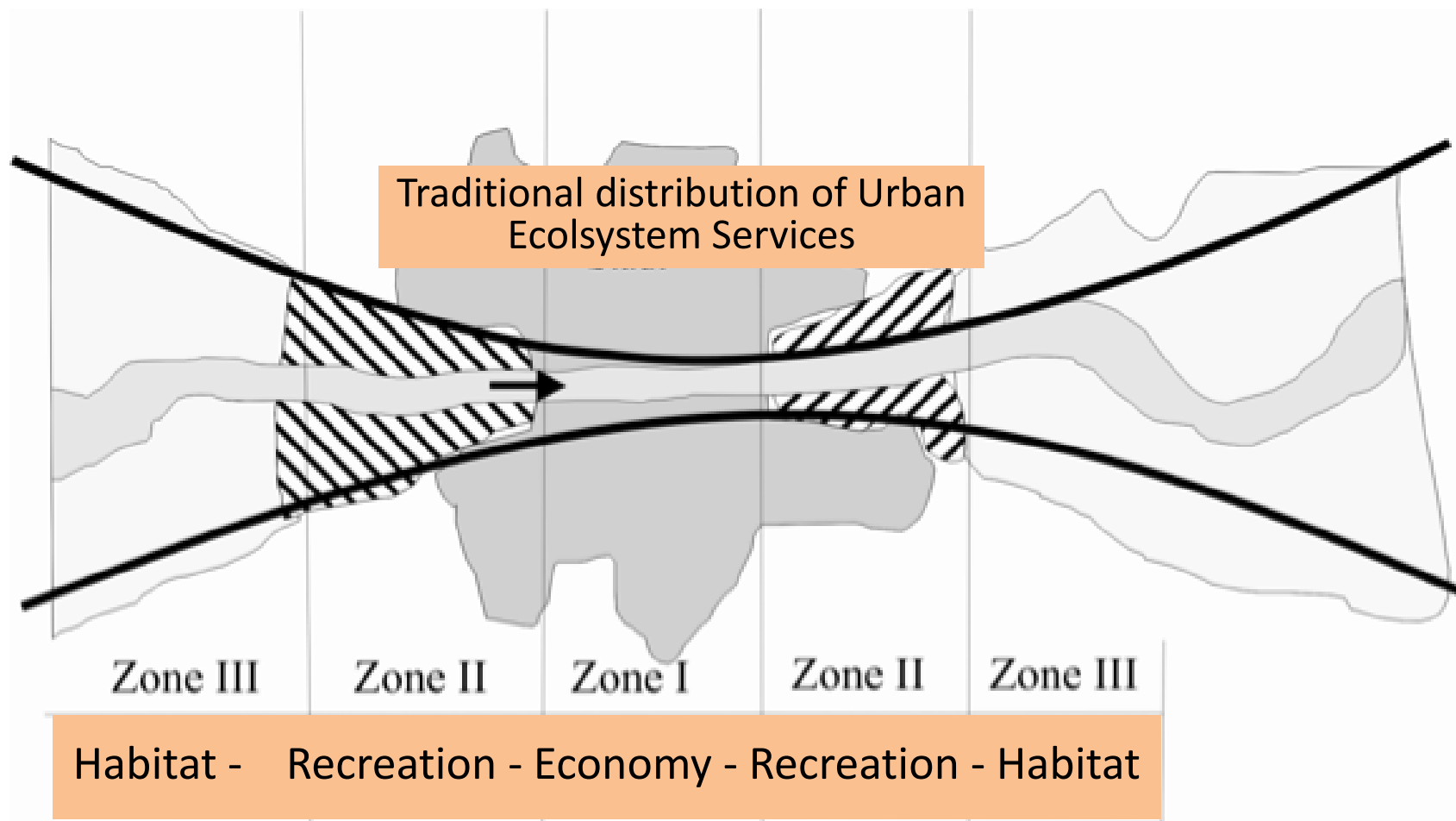


# Habitat for native species



**National Park Donau-Auen**

Antegrund, OR 30





# Design Intervention

## Targets

- Cleaning
- Modernization
- Aesthetical improvement
- Acceptance rising
- Recreation
- Risk reduction
- Habitat provision?



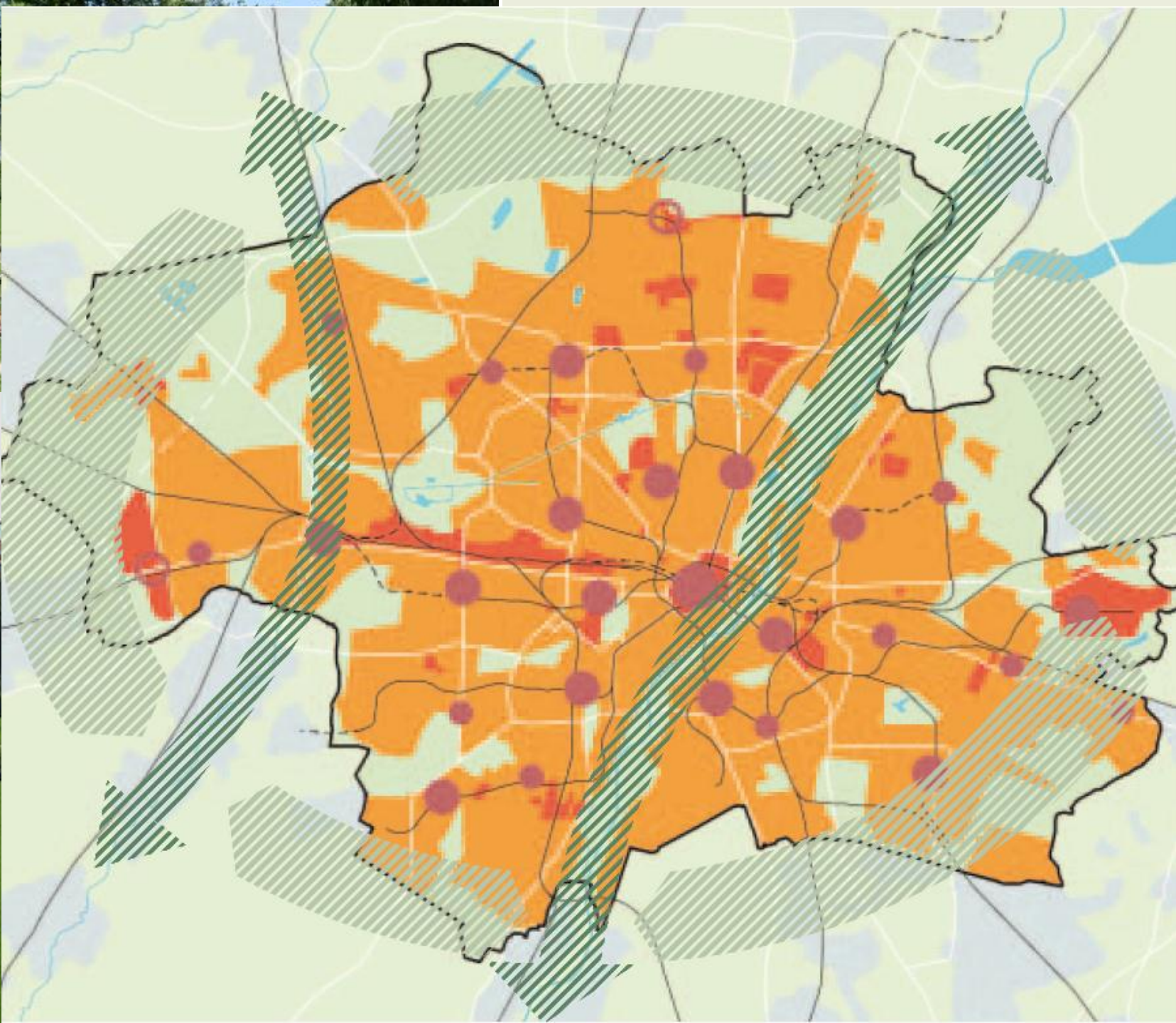


An aerial photograph showing the Munich Isar River Corridor. The image captures a dense urban landscape with a grid of streets and buildings. A prominent feature is a large, rectangular green park area in the center, which is the Isar River Corridor. The river itself is visible as a dark, winding line through the city. The surrounding area is a mix of urban development and green spaces.

**Renaturalization  
River Isar Restorati  
2000 – 2011, Munich**

**Munich Isar River Corridor**











## Planning and execution 2000 – 2011 (flood protection and restoration measures)

- 8 river kilometers,
- Water quality improvement
- Widening of the riverbed
- Reduction of flood risks
- Bringing nature in the city
- Biodiversity improvement
- Recreation and nature protection can go together
- The costs for the project: 35 Mio. Euros





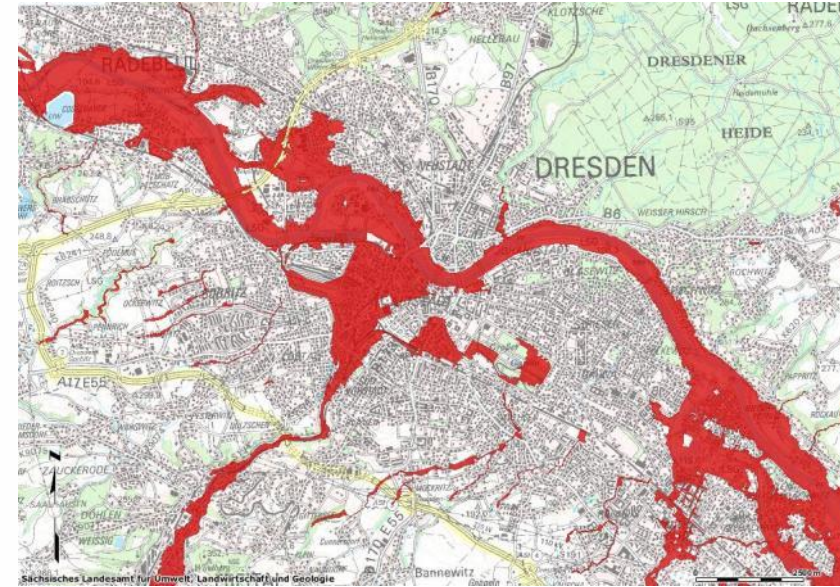
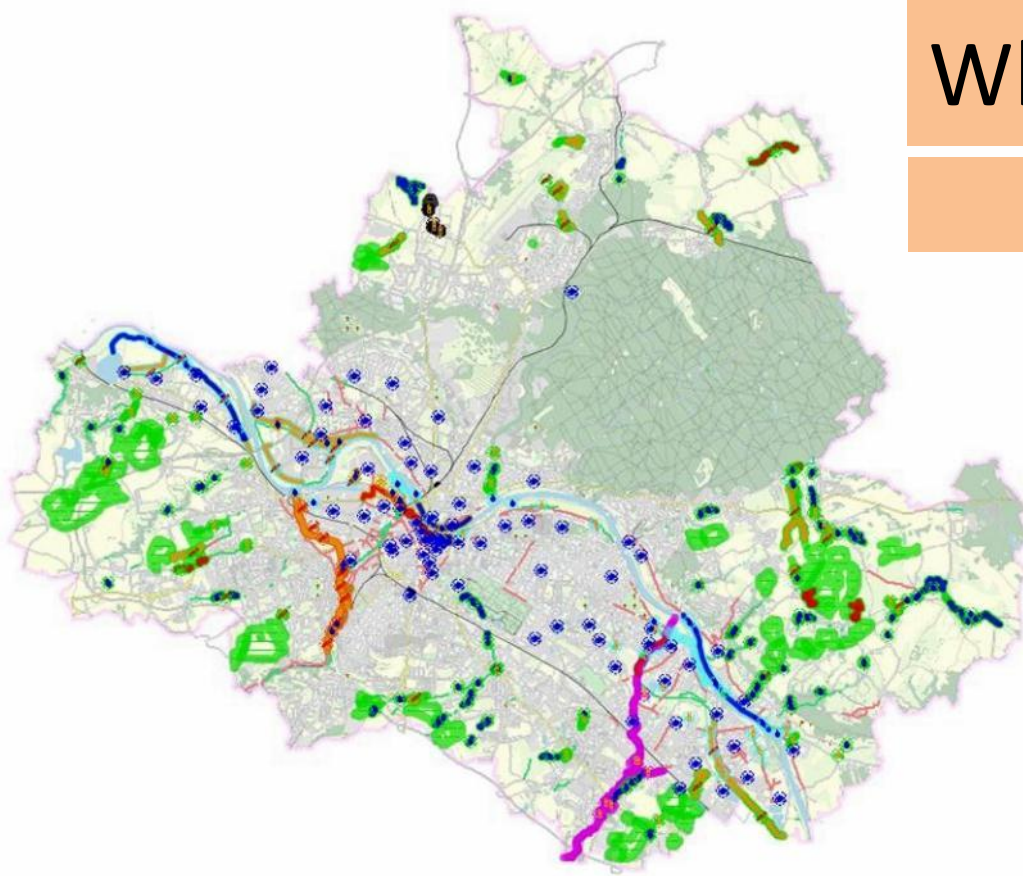


The Dresden Flood 2002



# What has been learned?

## Dresden Flood Protection Measurements 2009



## Integrative flood risk management

- 650 ha retention areas new developed, 513 km levees improved and repaired
- 1 billion € invested in flood prevention 2002 – 2009 only along river Elbe (50% EU support!)
- 300 areas had been declared as **flood risk areas** – 76,000 ha!
- 50% of population is now protected (2002 - 5%), planned 2020: 100%
- On the way from purely technical flood management – to an integrative risk management, including population and prevention?

# „Green Rivers“ - More space for rivers

- Integrate flood prevention into land use development
- „Stretchable“ flood plains
- Connection of landscape protection and flood protection concepts
- No new buildings in flood prevention areas!
- Monitoring and modeling





# Combination of ES Biodiversity and Recreation

Example: Visitor Management in the Nature 2000 Area Alluvial Forest of Danube/Traun („Enjoying nature without disturbing nature“)

Sports, Playing, Swimming

Solar City Pichling (3 500 inhabitants)

Eco-Recreation-Area

Hiking-Trail Alluvial Forest of the River Traun - Weikerl Lake

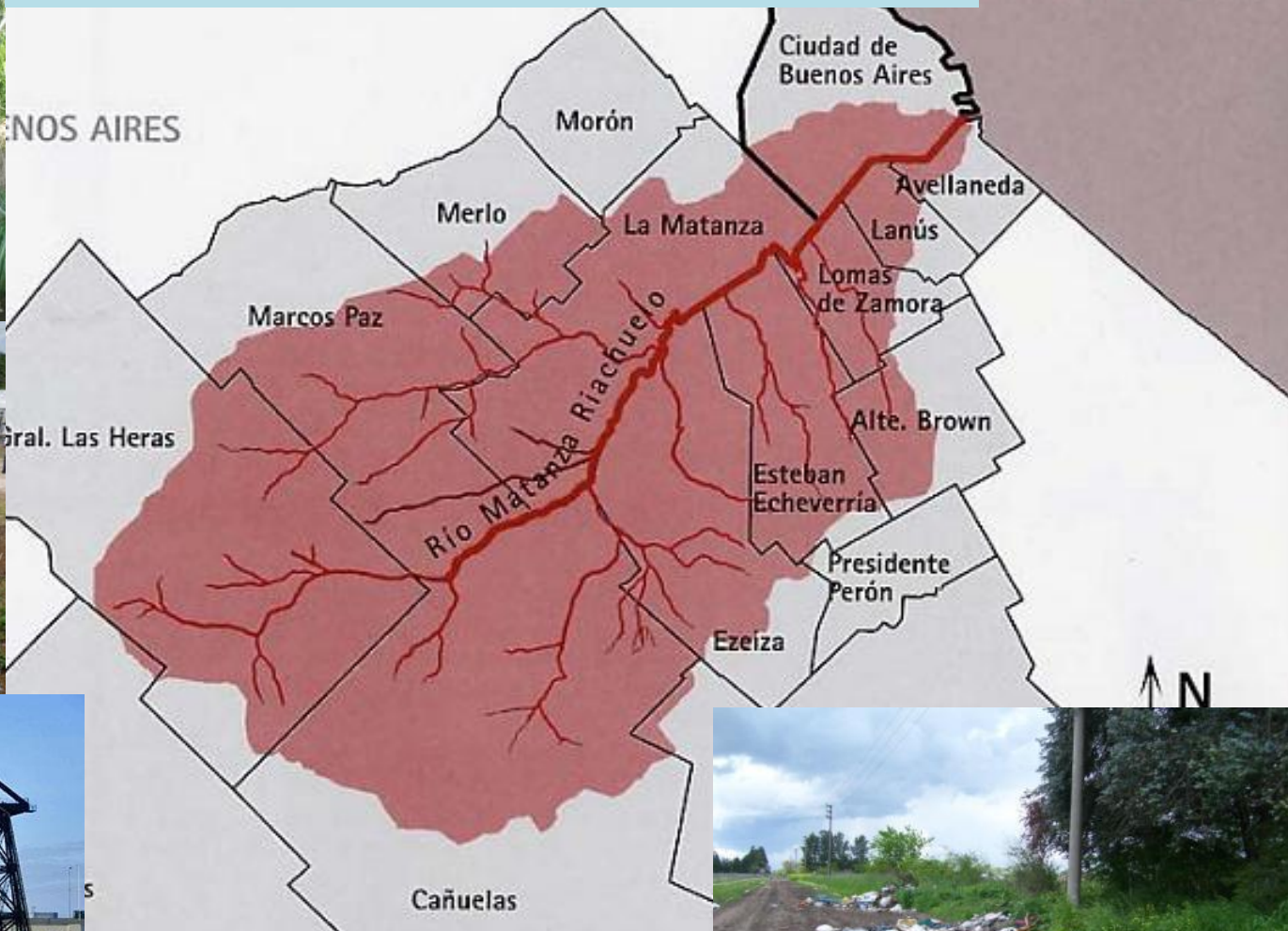
voest Alpine Enterprise - Iron and Steel-Industry





One of the most polluted watersheds in the world.

RÍO DE LA PLATA

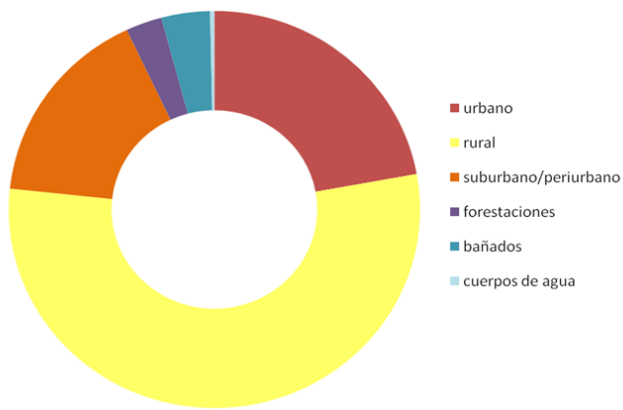


4.000 industrial sites  
 200.000 ha area  
 8. Mio inhabitants



# Matanza-Riachuelo watershed in Buenos Aires, Argentina





The sub-urban sector:  
 Flooding, water and soil pollution,  
 waste dumping



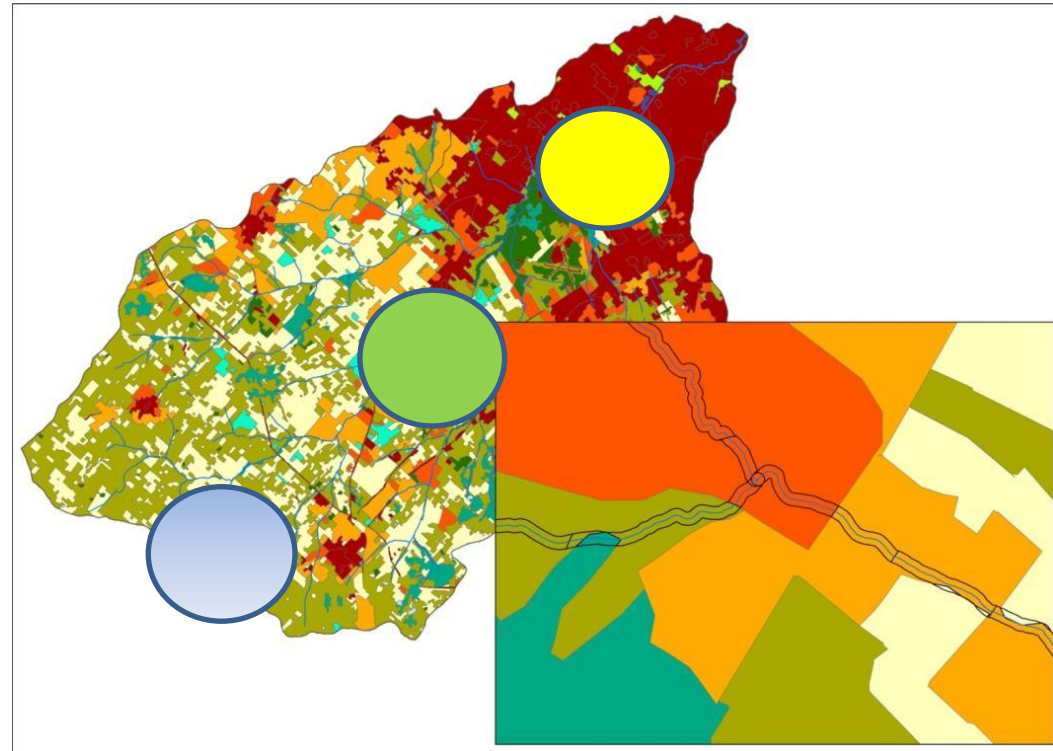
(Cooperative partnership with Ana Faggi, UFLO-CONICET, UNLZ )

# Whats peoples' view on a polluted urban river?

Is it depending from

- settlement location in zones
- distances of homes to the river banks?

What types of improvements people prefer?



## Methods

- Households interviews
- 1 - At the regional level (rural-urban)
- 2 - local level (276 interviews of people living within 100m (16%), 100-500 m (49%) and 50-1000 m (35%) distance.



Most disliked

48 %

Insecurity

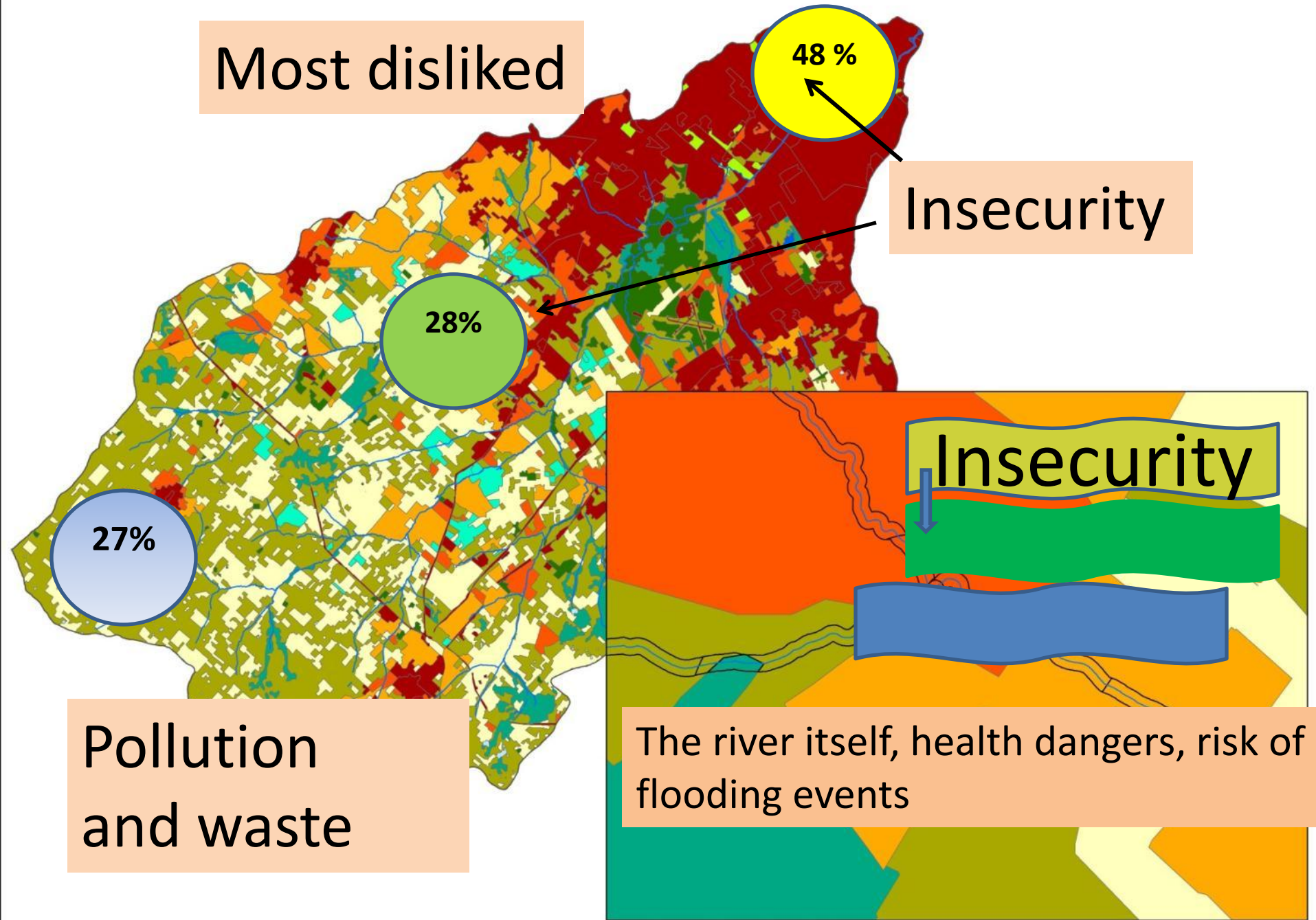
28%

27%

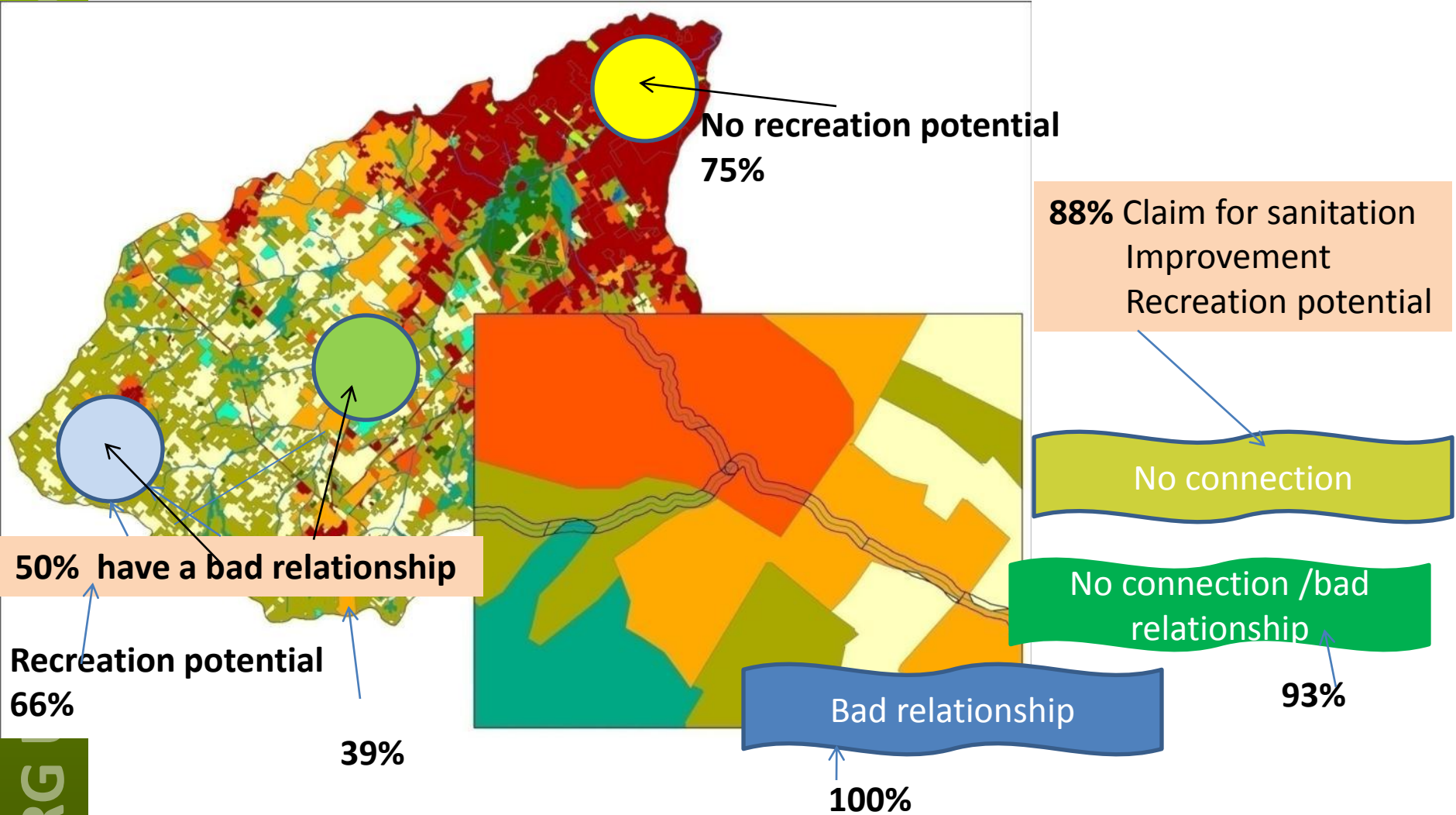
Pollution  
and waste

Insecurity

The river itself, health dangers, risk of  
flooding events

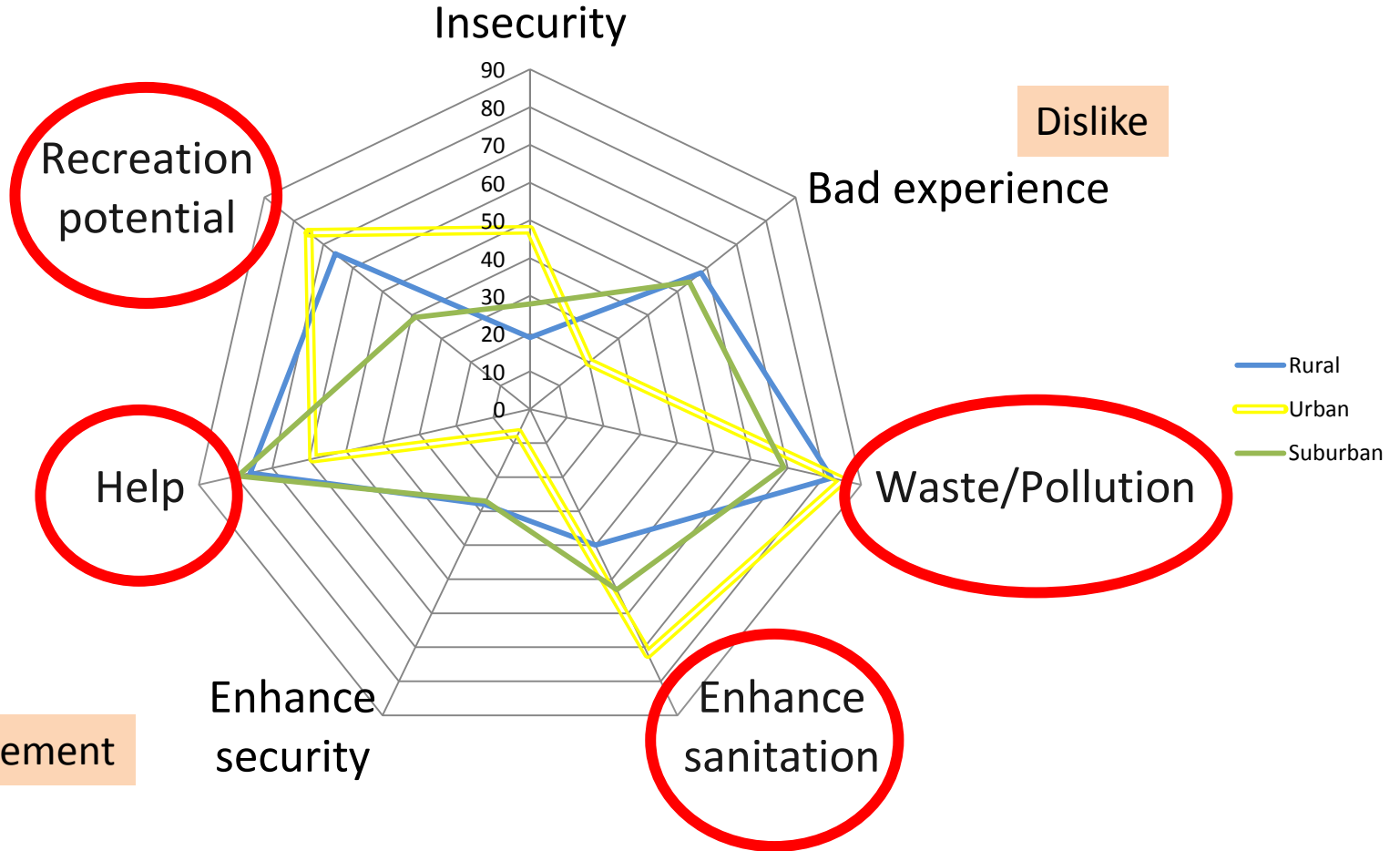


# Are there development potentials?

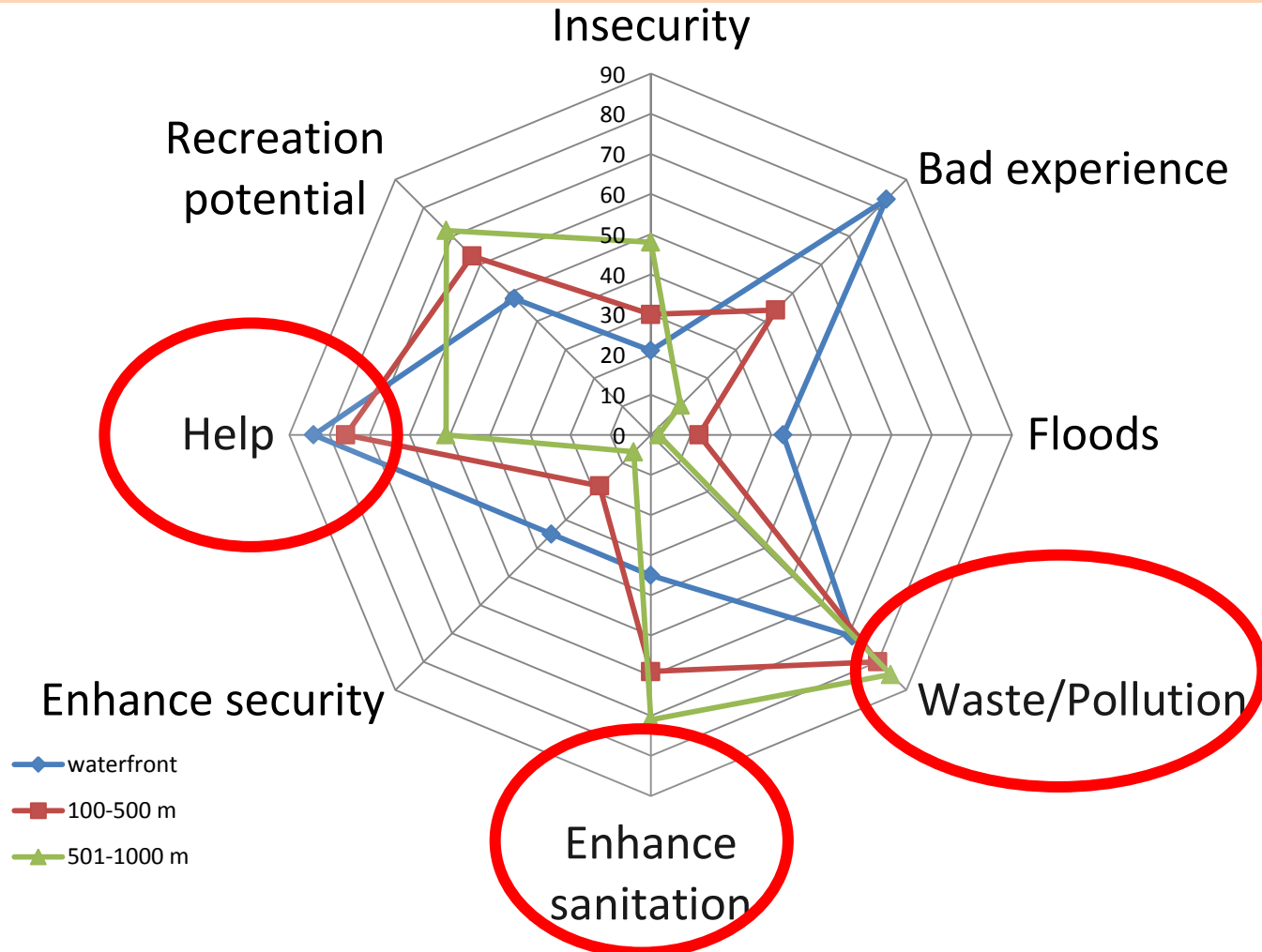




# The regional perspective

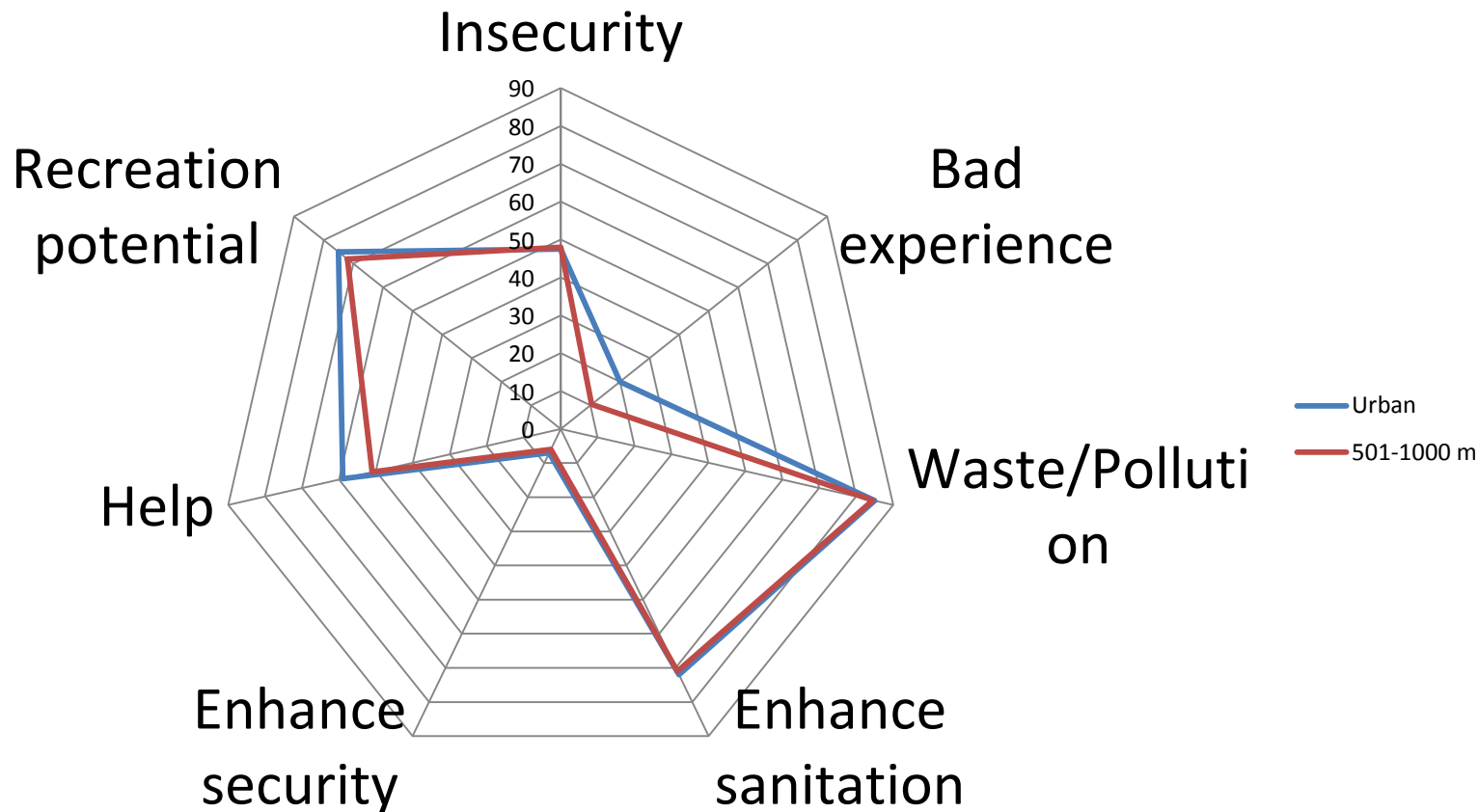


# The local perspective -Waterfront-Hinterland





# Urban and hinterland



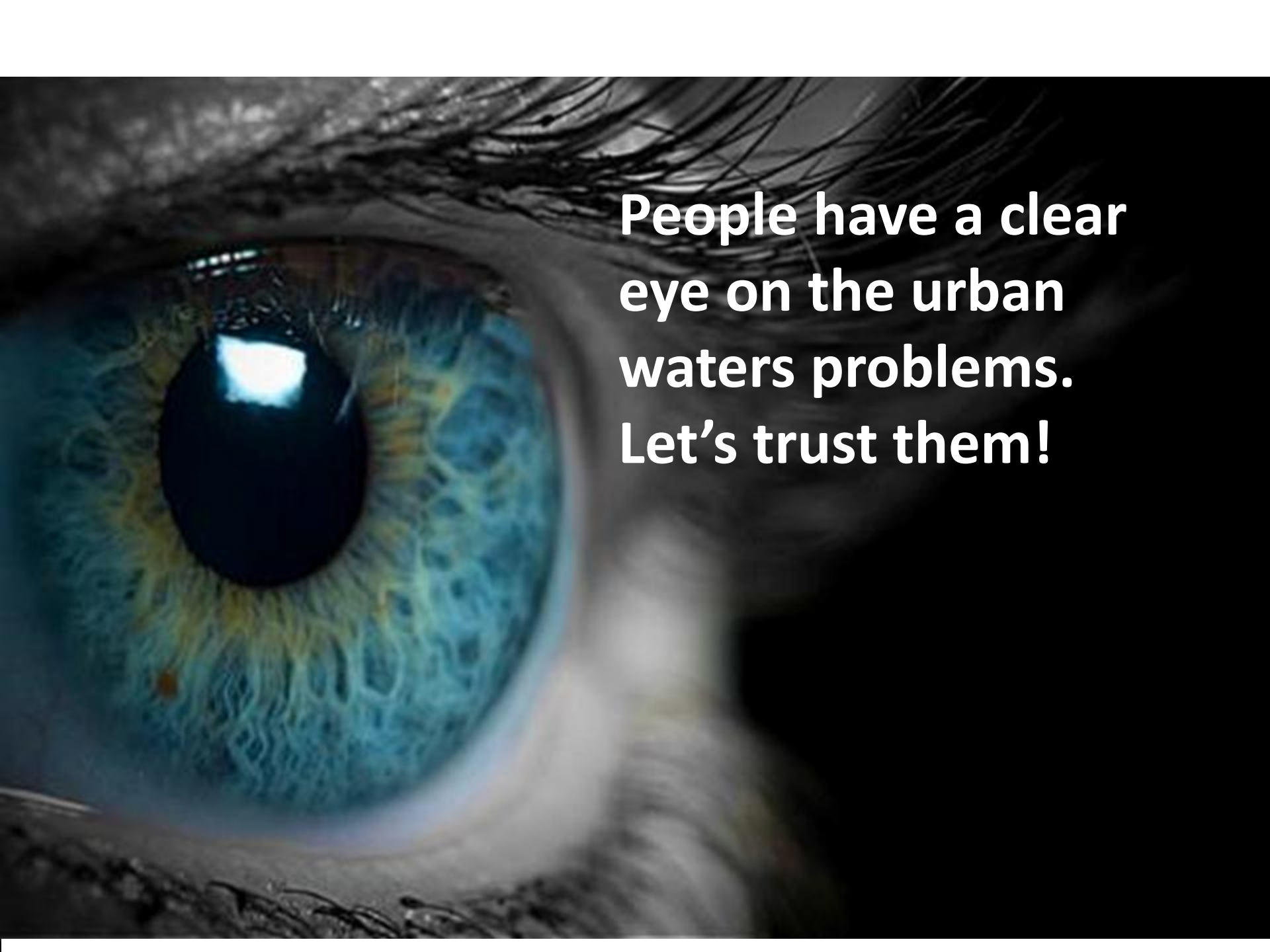
**Location on the watershed and distance to the river shore influenced people's views.**

Adriano E. Madrid

The kids perspective  
The view for kids to the  
polluted river is very  
clear!







**People have a clear  
eye on the urban  
waters problems.  
Let's trust them!**