



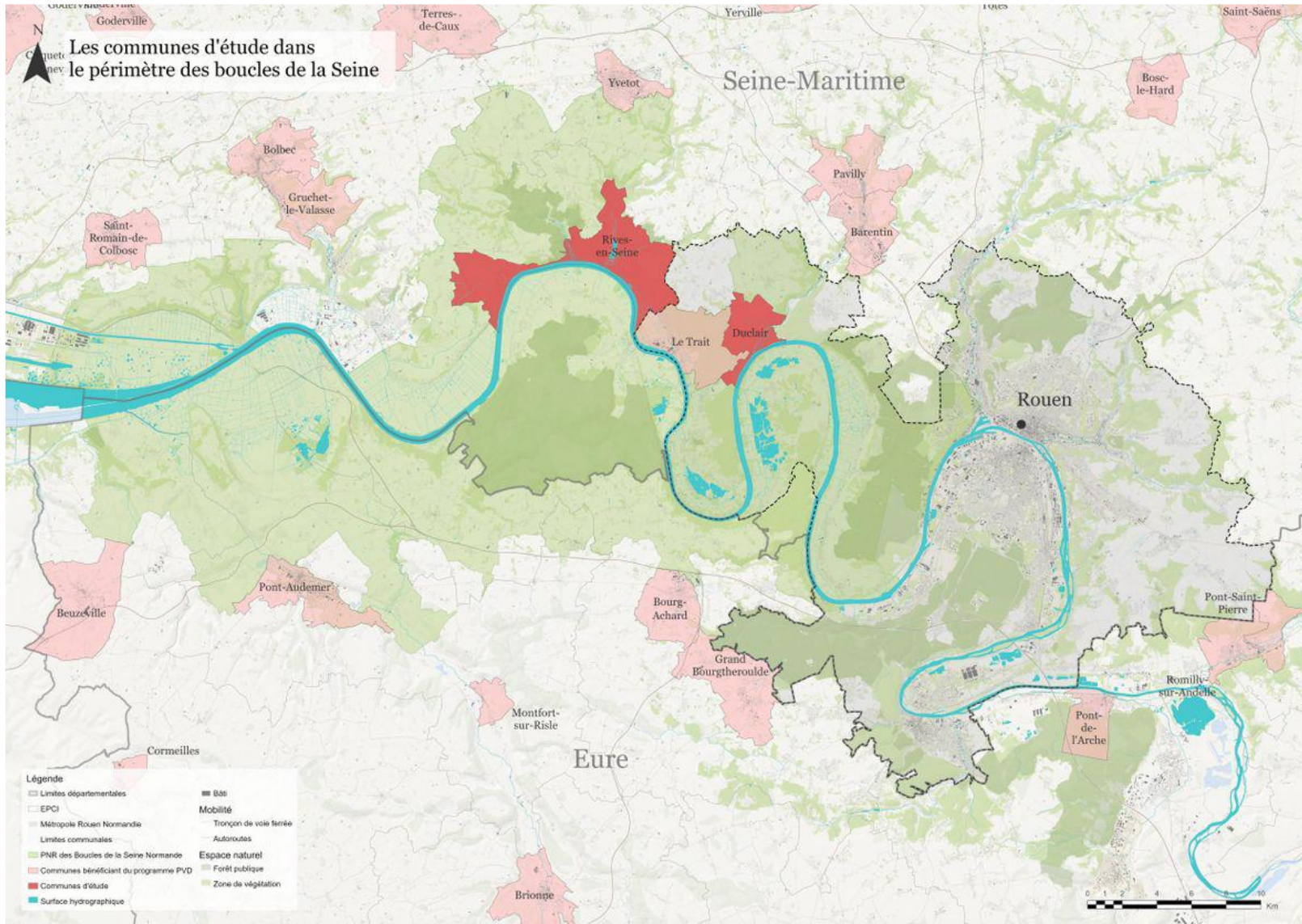
# Community resilience to climate change in small towns. Evidence from the Seine Valley in France

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# Small towns: laboratories for experimenting communities' resilience to climate change



- Significant interfaces between 46% of the world population living in rural areas and 35% living in cities (Roberts, 2016)
- Subject to increasing **threats posed by climate change** (Bush & Doyon, 2019)
- Little work is done to support small towns' **preparedness and resilience**.
- Need for re-embedding urban areas in their surroundings: « *urban bioregions*. » (Fanfani, 2018)
- Significant potential in building resilience through understanding and developing capacities within the community (Kelley, 2015).

# Rives-en-Seine (4148 inhabitants. in 2019) & Duclair (4073 inhabitants in 2019)



A rich cultural history, natural resources, and landscapes

Part of the governmental program: **Small Towns of Tomorrow**



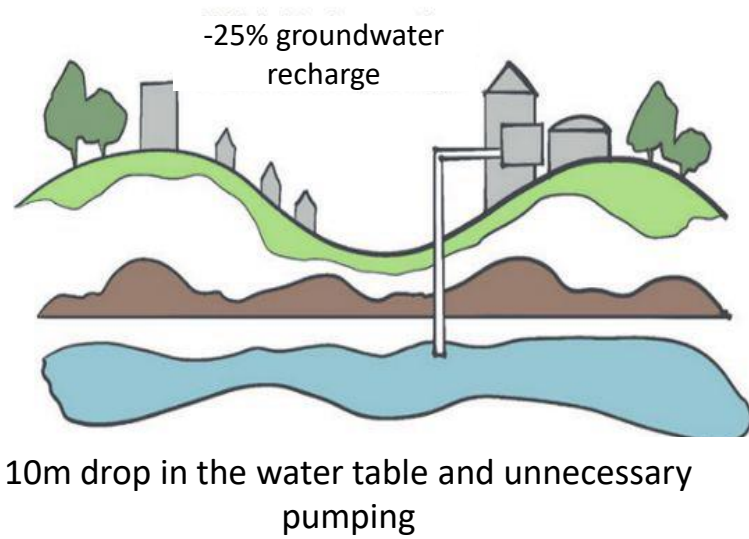
RIVES-EN-SEINE



DUCLAIR

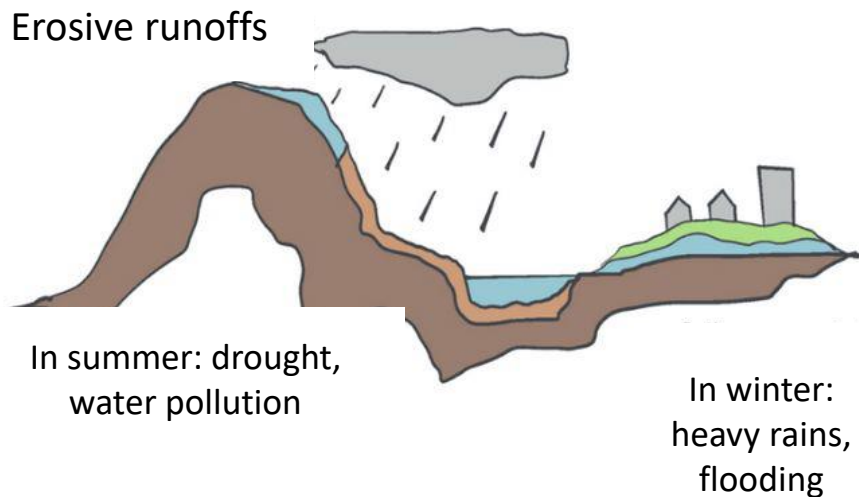
**Shocks:** short-term floods events immediately impacting the inhabitant areas' safety

**Stresses:** occurring over a longer time frame: risk on the housing markets prices and insurance pricing, crop failure, and food prices rise.



## Drivers of vulnerability

- Intensive farming practices on the plateaus
- Excessive drainage of wetland
- Habitats fragmentation
- Lack of vegetation
- Soil artificialization
- Rising levels of the Seine River



**Risks: flooding, urban heatwaves, and erosive runoffs**



## Main focus

### Community Resilience in Small Towns

The ability of community members to develop and utilize **their resources** to flourish in an environment that is constantly changing, uncertain, unpredictable, and full of surprises (Magis, 2010, p. 402).



Applying a conceptual approach that draws on **social-ecological resilience theory** to propose a set of **connections between ecological assets that help strengthen resilience to climate change** and its outcomes **at the community levels** (Carabine et al., 2016)



# Hypothesis

## Ecological assets in Small Towns can:

1. Help build capacities and resources that minimize the impact of shocks and stresses on people's lives and livelihoods (water resources, soil resource quality, air quality, fauna and flora, health, and food security) (Narayan, 2017)
2. Improve resilience through community engagement and participation in the management of natural resources and risk (Biggs et al., 2015)

# METHODOLOGY: A socio-ecological system-based approach

**Outside the Walls Workshop:** interactive group workshop involving the national school of Architecture and The Earth and Life Science Polytechnic Institute UniLaSalle.

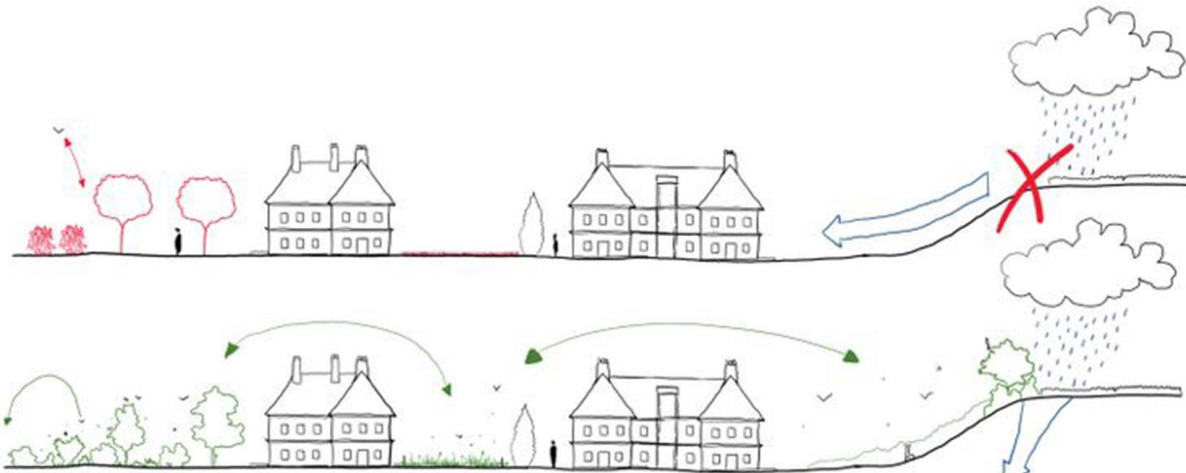
**Scoping phase:** risk characteristics assessment, risk governance characteristics, ecological assessment

**Focus groups, interviews, and surveys** with residents and local stakeholders (The regional natural park of the Boucles de la Seine Normandes, Public Land Management Establishment, Mayor, and municipal team, etc.)



# Ecological Land Use Complementation: a driver for building community resilience in urban ecosystems in Rives-en-Seine

- Land uses in urban green areas could **synergistically** interact to support biodiversity when clustered together in different combinations (Colding, 2007)



Re-thinking the green spaces management

Containing erosive runoff from agricultural plateaus to protect urbanized areas

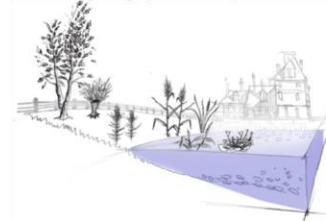
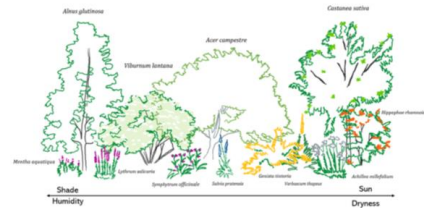


Re-creating and valuing wetlands as everyday public spaces

Reinforcing the ecological corridors in the town's centre as support for urban uses

Regreening waterways improves biodiversity and the quality of public spaces.

Rethinking the urban plant strategy





## Urban Agriculture a tools toward building resilient communities – Duclair.

### *Gourmet trail: connect different spots of local food growing*

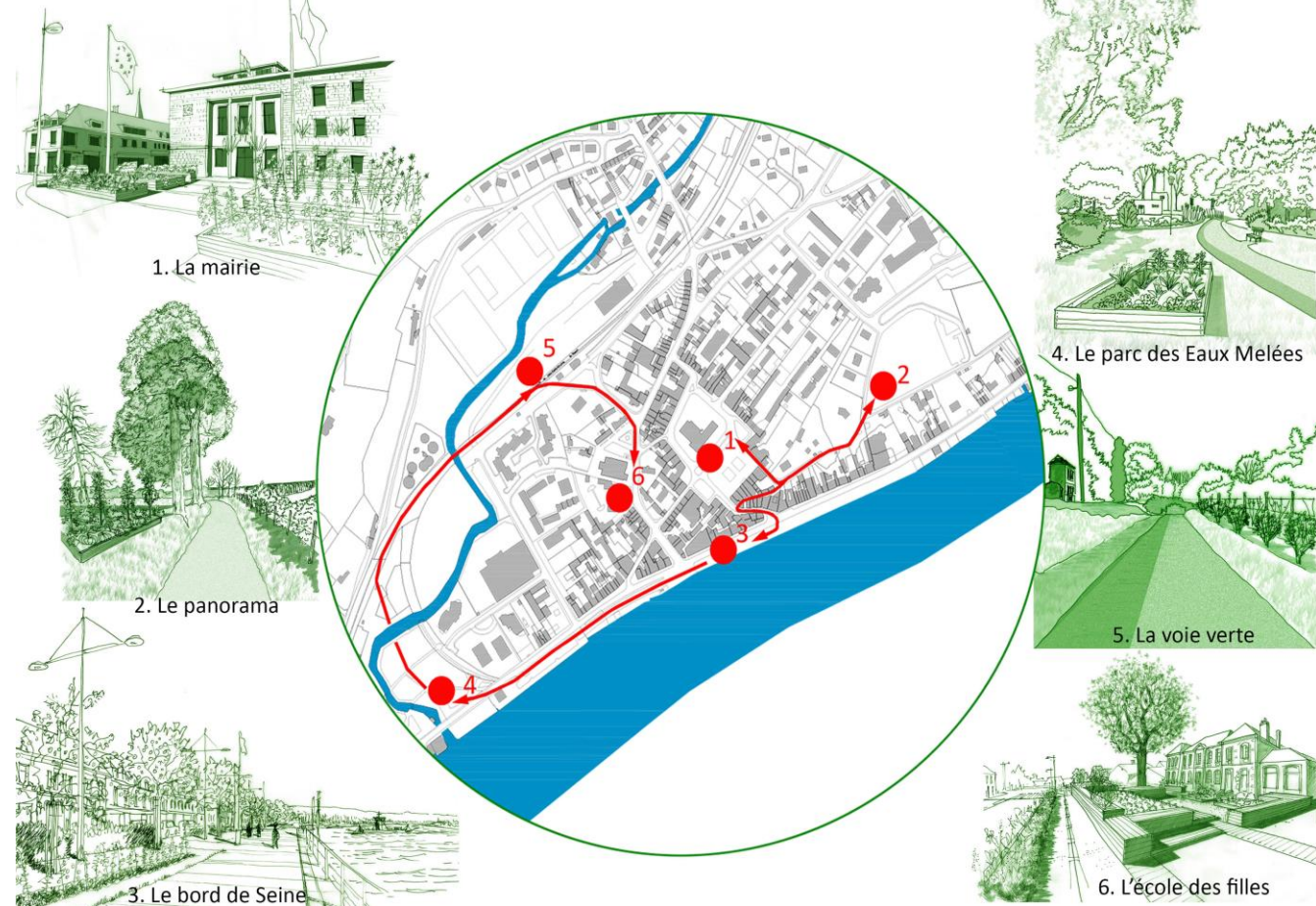
-> A pivotal role in implementing circular economy, closing water and mass loops – use of grey water - while contributing to restoring natural cycles and ecosystems' environmental services.

### *Community gardens*

-> A social inclusiveness solution that improves local food access

### *Edible forests: urban food trees, orchards, tiny permacultural systems, etc*

-> A *leitmotif* to implementing new education, participatory, and citizenship strategies



# Small Towns: laboratories for experimenting with new approaches to resilience

Small towns are favorable to

- **grassroots participatory** process that will create new forms of **involvement and commitment** with the potential to target the entire urban population, allowing the deployment of **green nudges strategies to shape behaviors**;
- the development of new approaches using **decentralization and systemic thinking to eco-innovation based on the circular economy, green infrastructure, an urban ecosystem's environmental services**;

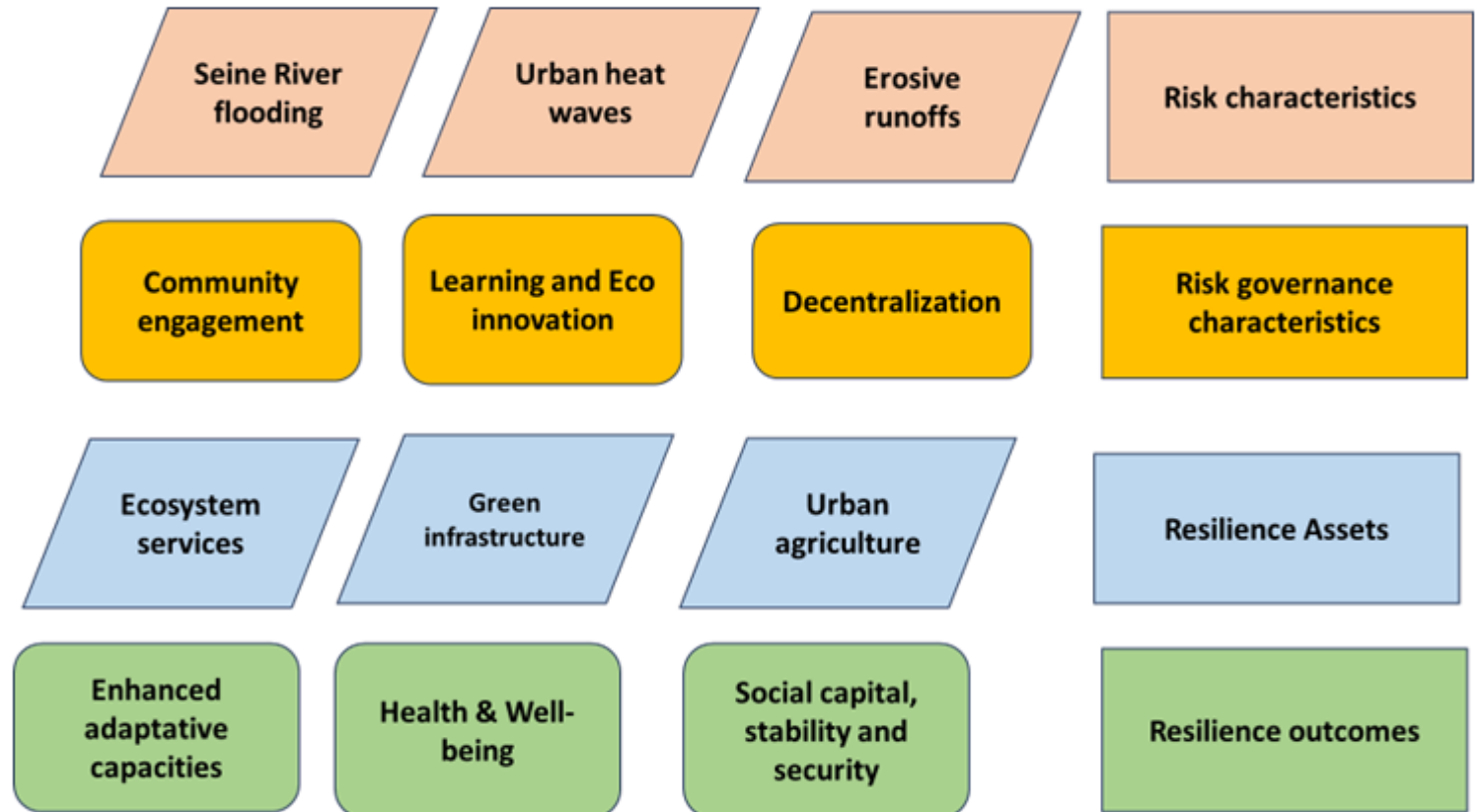


Figure – A framework for communities' resilience in small towns from risks characteristics to resilience outcomes (source: the authors)

THANK YOU

