Operationalizing resilience in urban planning and water management: examples from the Netherlands, Germany and the UK

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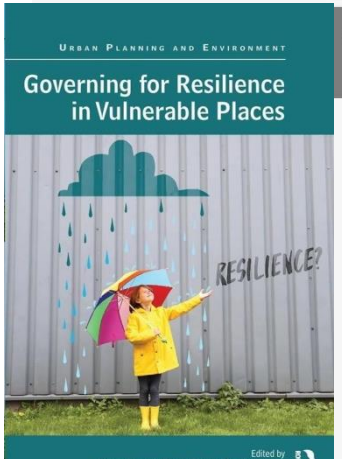

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Making Resilient Places

Research article

Between adaptability and the urge to control: making long-term water policies in the Netherlands

Britta Restemeyer, Margo van den Brink & Johan Woltjer

Download citation | https://doi.org/10.1080/09640568.2016.1189403

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Abstract

Triggered by recent flood catastrophes and increasing concerns about climate change, scientists as well as policy-makers increasingly call for making long-term water policies to enable a transformation towards flood

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Experiencing local community resilience in action: Learning from post-disaster communities

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Routledge

Resilience

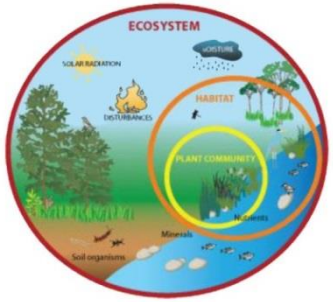
International Policies, Practices and Discourses

ISSN: 2169-3293 (Print) 2169-3307 (Online) Journal homepage: http://www.tandfonline.com/loi/resi20

Resilience: Just do it?! Governing for resilience in vulnerable places, University of Groningen, 9–10 October 2014

Gwenda van der Vaart, Elen-Maarja Trell, Britta Restemeyer & Melanie Martijntje Bakema

Resilience in Spatial Sciences / Planning

objects/ material	ecosystems	groups/ communities	social-ecological systems
			
ability of objects to spring back after bent or stretched	ability of ecosystems to absorb changes and still continue	ability of groups or communities to cope with and adapt to stress	ability i) to absorb disturbance ii) of self-organisation iii) to learn and adapt
mechanics	ecology	social sciences	system's theory

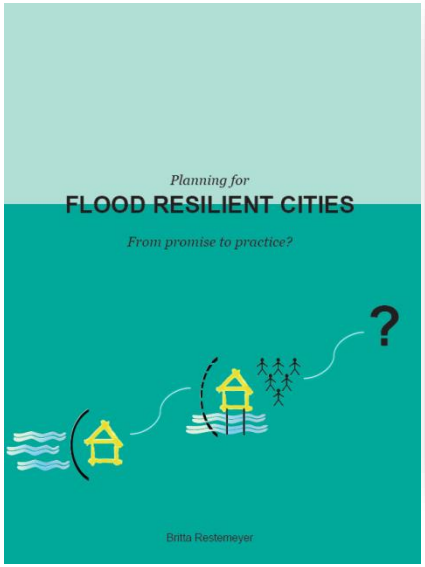
'Evolution' of the concept

Example 1: Flood resilient cities

Robustness, Adaptability, Transformability

❖ **Britta Restemeyer, b.restemeyer@rug.nl, University of Groningen, NL**

- PhD research on: integration of urban planning and flood risk management (in Hamburg, Rotterdam, London)



"a measure of the **persistence of systems** and of their **ability to absorb change and disturbance**" (Holling, 1973)

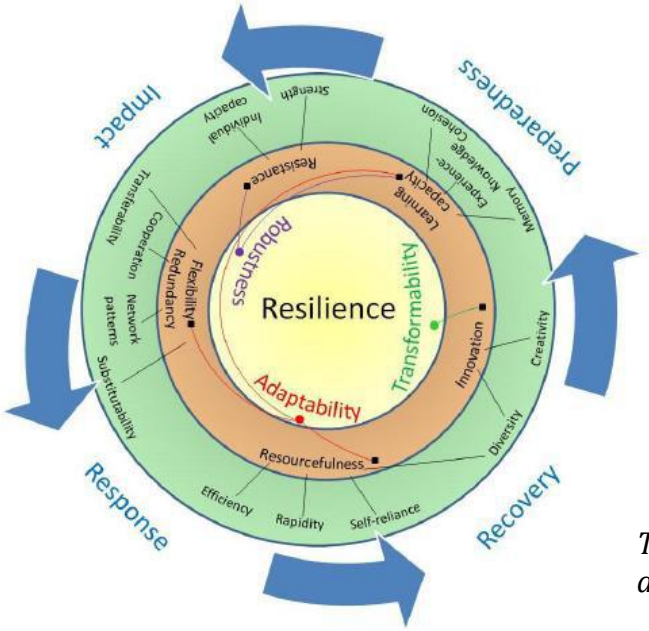
"Such [resilient] cities would be capable of **withstanding severe shocks** without immediate chaos or permanent harm. Designed in advance **to anticipate, weather, and recover** from the impacts of natural or terrorist hazards […]. Composed of networked social communities and lifeline systems, **resilient cities would become stronger by adapting and learning from disasters**." (Godschalk, 2003)

Resilience refers to the ability of social-ecological systems **"to change, adapt, and, crucially, transform in response to stresses and strains"** (Davoudi, 2012)

"The ability of a system, community or society exposed **to hazards to resist, absorb, accommodate to and recover** from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions." (UNISDR)

"the capacity of linked social-ecological systems to **absorb recurrent disturbances** such as hurricanes or floods so as to retain essential structures, processes, and feedbacks. Resilience reflects the degree to which a complex adaptive system is **capable of selforganization** (versus lack of organization or organization forced by external factors) and the degree to which the system can **build capacity for learning and adaptation**." (Adger et al., 2005)

Resilience in Spatial Planning



The ring-model of resilience by Galderisi et al. (2010)

- Various competing definitions of **resilience** exist…
- …but recently, more consensus that resilience comprises three key dimensions: **robustness, adaptability and transformability** (Galderisi, 2010; Davoudi, 2012; Scott, 2013)

"Resistance" vs. "resilience" strategies

Simplified!

minimize probability

minimize consequences

Traditional flood control vs. resilience

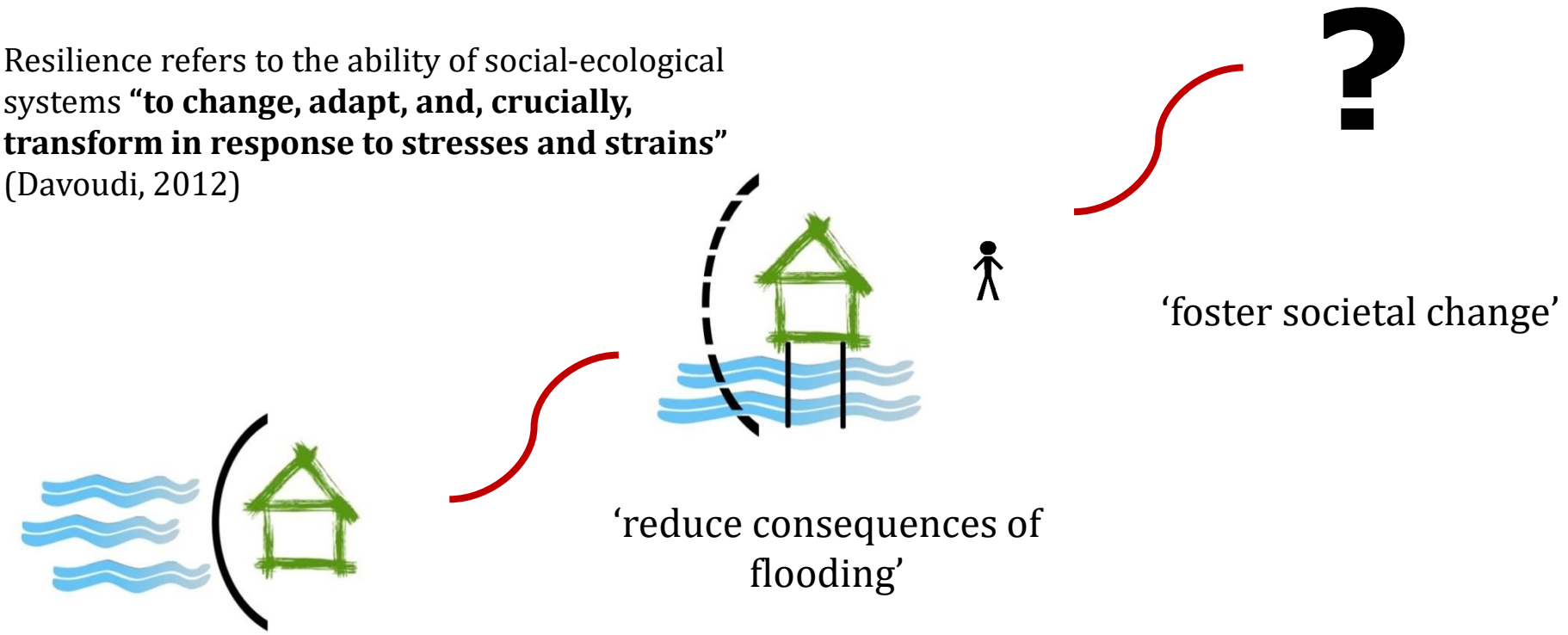
› flood risk = probability x consequences

Traditional flood control approach

Resilience approach

Operationalizing flood resilience:
robustness, adaptability and transformability

Resilience refers to the ability of social-ecological systems **"to change, adapt, and, crucially, transform in response to stresses and strains"** (Davoudi, 2012)



Operationalizing flood resilience: robustness, adaptability and transformability

- ***Robustness:*** ability to persist, absorb disturbance or withstand shock (e.g. Holling, 1973; Godschalk, 2003, Davoudi, 2012)

- ***Adaptability:*** making adjustments within the system to make it less vulnerable (e.g. Walker et al, 2004; Folke et al. 2005)

- ***Transformability:*** transition to a new system when ecological, economic, or social structures make the existing system untenable (e.g. Walker et al, 2004; Folke et al. 2005)

Operationalizing flood resilience:
Robustness – 'reduce flood probability'

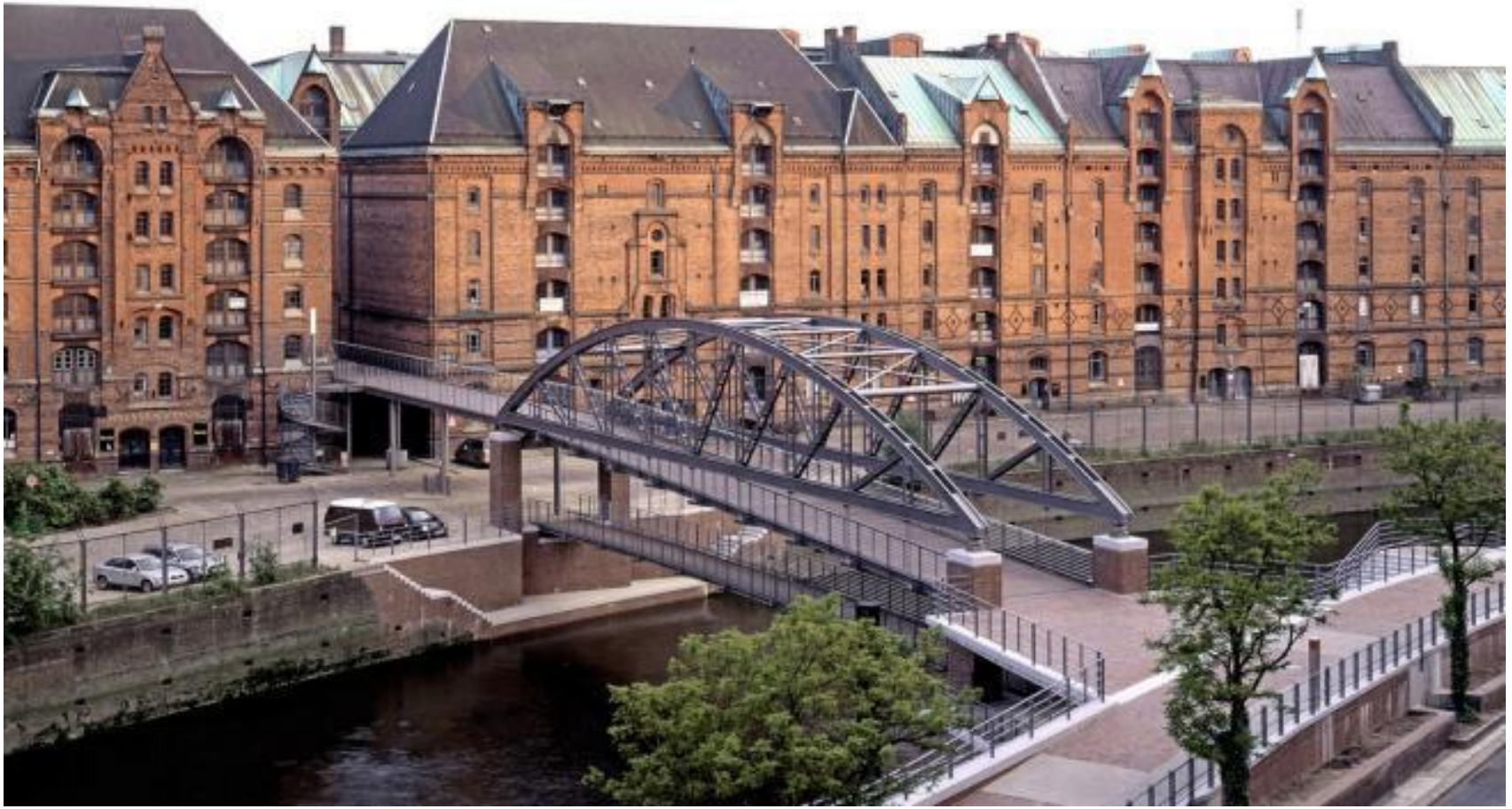
Technical measures

Spatial measures

- requires a strong water management sector and expert knowledge in engineering and planning
- social acceptance and a strong political and financial support for big structures

Operationalizing flood resilience:
Adaptibility – 'reduce consequences of flooding'

Operationalizing flood resilience:
Adaptibility – 'reduce consequences of flooding'



Operationalizing flood resilience:
Transformability – 'foster societal change'

- Risk communication and awareness raising among:
- *private stakeholders* (e.g. brochures, public campaigns, early education in school)
- *public stakeholders* (e.g. consensus-building, partnership practices, decision support tools)

- *Requires creativity and openness towards new knowledge*
- *new interdisciplinary networks and learning organizations (e.g. LAA)*
- *change agents / leadership*

Implications of a resilience approach for strategy-making in flood risk management

Restemeyer et al. (2015)

- Resilience implies a **broadening of responsibilities:**
  - From: Technical engineering -> joint effort of water management, urban planning and disaster management
  - From: State's task -> societal task

- Resilience requires **building up new capacities** among public and private stakeholders for creating and implementing innovative solutions

- At present: adaptation measures only considered within the strict framework of robust technical measures and top-down control

Reflecting on the resilience concept

On the one hand…

- Resilience – a promising concept to include **risk and uncertainty** into planning (White 2010; Davoudi et al. 2012; Scott 2013)

On the other hand…

- Challenges of translating the resilience concept from the natural to the social world (Davoudi, 2012)
- Resilience – to what ends? -> might lead to government's retreat / neoliberal policies
- Resilience of what to what? -> risk of vulnerability transfer
- Resilience for whom? -> raises questions about power relations, social justice and fairness
- Resilience vs. quality (of life)?

Questions?

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Example 2: Community resilience to flooding in the UK

❖ **Steven Forrest, s.a.forrest@rug.nl, University of Groningen, NL**

- PhD research on: community resilience to flooding (in the UK and the Netherlands)

Decentralising FRM in the UK

- Increased involvement of civil society
- Community role; local knowledge and expertise
- Flood Wardens, Emergency Volunteers and Flood Groups
- Flood Resilience Community Pathfinder Scheme – UK Defra

National Flood Forum

FLOODING ON THE LEVELS ACTION GROUP flag

Research Questions

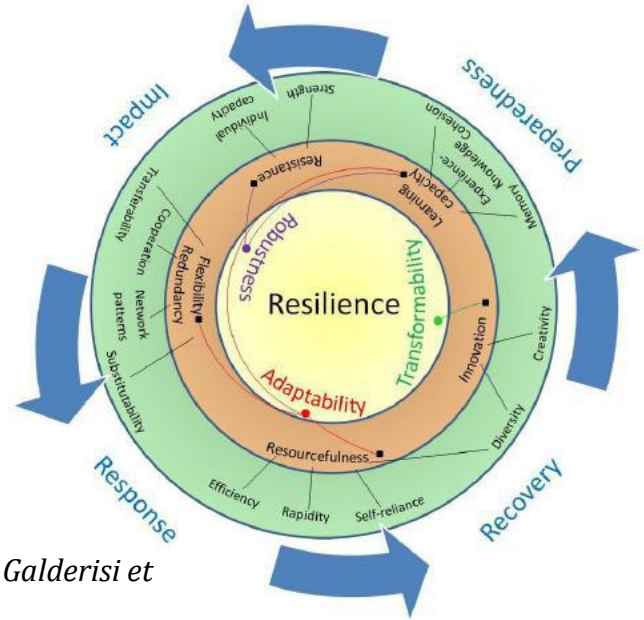
- In what way do civil society actors influence local level flood resilience (in the Upper Calder Valley, UK)?

(1) Which civil society actors and groups take an active role in flood risk management (during different phases of the disaster)?

(2) How can their contributions to flood resilience at the local level be analysed and evaluated?

Flood resilience

"The capacity of actors at the local level to mitigate and prepare (pre-flood), to resist and respond (during the flood), before being able to recover from, adapt to, and transform after a flood event (post-flood)." (Forrest, Trell & Woltjer, 2017)



The ring-model of resilience by Galderisi et al. (2010)

Local level flood resilience (assessing the role of civil society actors)

Pre-Flood

No Imminent Danger

- Mitigation
  - Pro-Action (spatial planning measures)
  - Prevention (permanent and temporary physical barriers)
- Preparedness (flood risk awareness and readying resources/planning)

Flood Imminent

- Mitigation (temporary barriers)
- Preparedness (moving assets, PLP, warnings)

During Flood

Withstanding Floodwater

- Robustness
  - Monitoring barriers and reinforcing them against failures

Response to Defence Failures

- Response
  - Reacting to immediate dangers of floodwaters
  - Safeguarding people
  - Limiting asset losses

Post-Flood

Immediate Recovery

- Recovery
  - Reducing the immediate impacts of floodwaters (cleaning/decontaminating/ repairing)

Longer-term Recovery

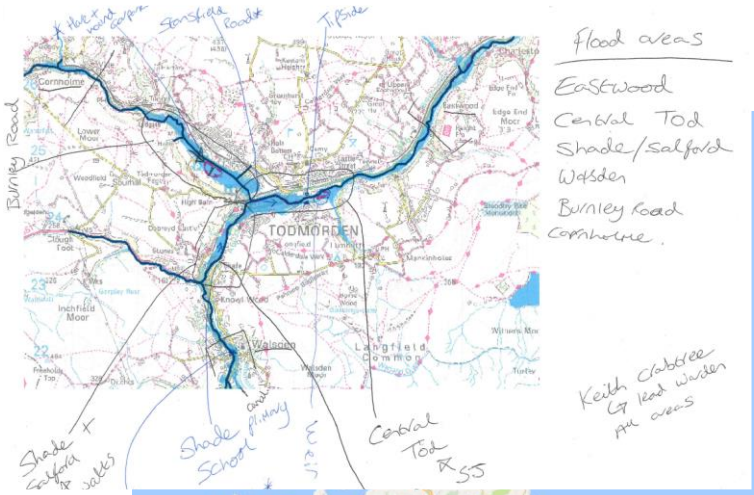
- Adaptation (small shifts in existing practices) /Transformation (larger shifts in practices/ perceptions/social networks)

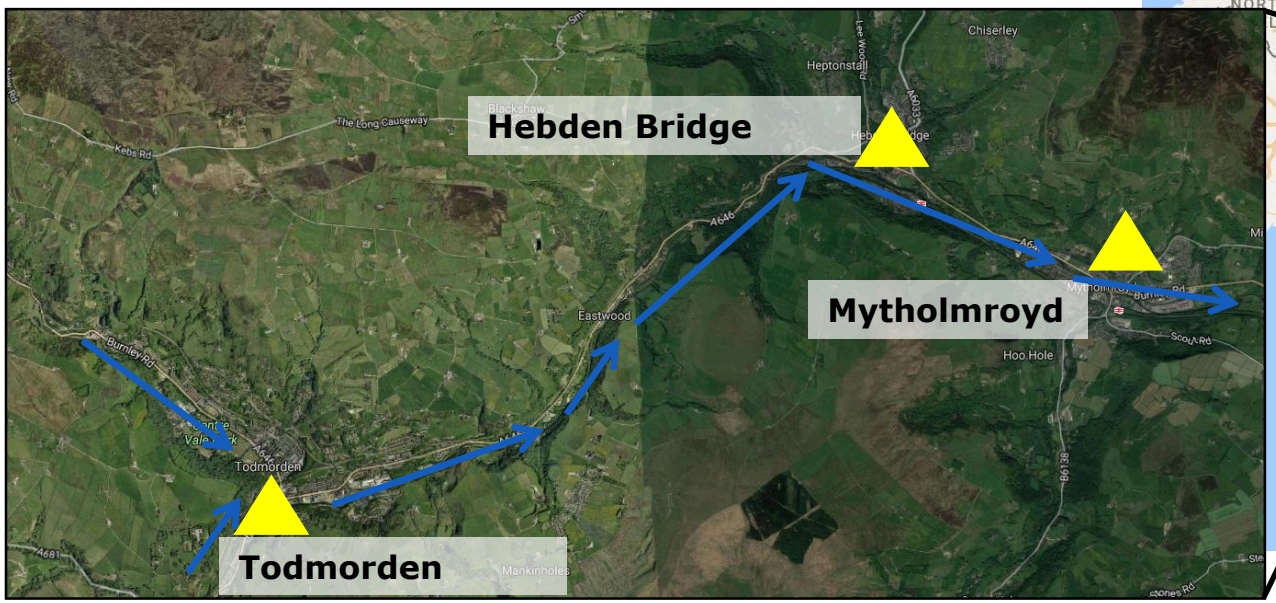
Ongoing Changes

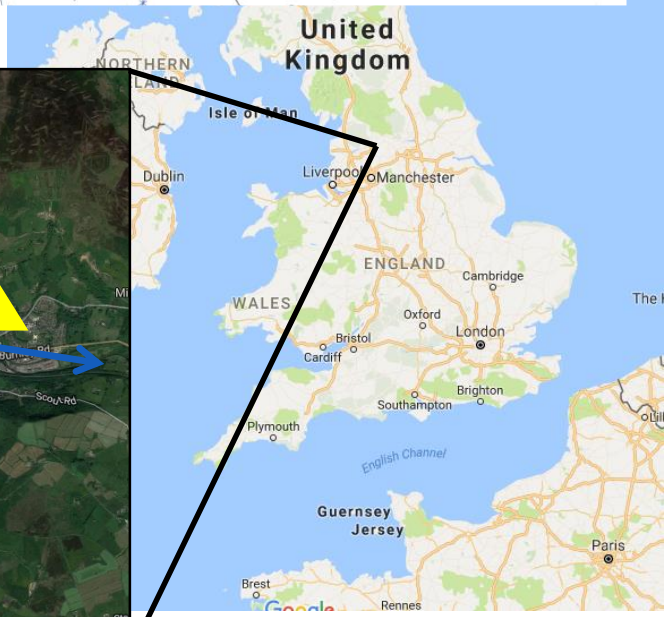
- Mobilising and organising resources (human, physical, financial)
- Developing human capital and community cohesion, and creating/activating/ changing social networks
- Potential learning and social innovation

Context & methods

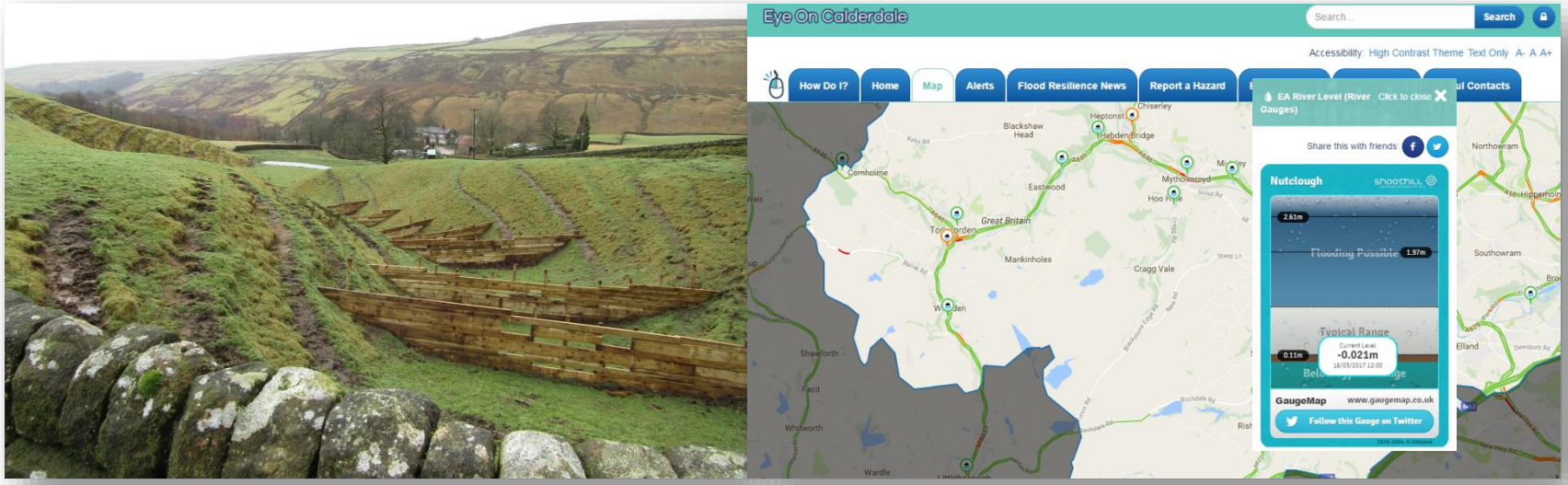
- Upper Calder Valley (flooded in 2015)
  - River and rainfall flooding
- Semi-Structured Interviews
  - 9 (2015), 17 (2017)[ATLAS.ti]
- Participatory Mapping







Main Findings: Pre-Flood



- Civil society actors: Flood Wardens, Local Flood Groups
- *Mitigation:* Arranging floodable area; temporary barriers
- *Preparedness:* Flood risk communication, PLP uptake, creating and stocking flood stores; door-knocking with warnings and encouraging PLP action

Main Findings: During-Flood

- Civil society actors: Flood Wardens, Local Flood Groups
- *Robustness:* Monitoring, reinforcing and adding temporary barriers
- *Response:* Accessing flood stores, Reducing losses

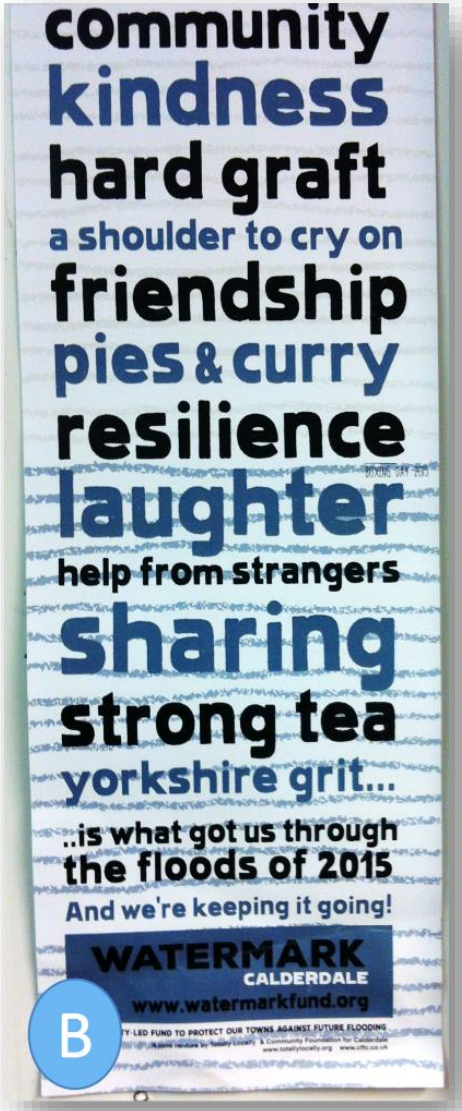
Main Findings: Post-Flood

- Civil society actors: Local Flood Groups, Flood Hubs
- *Immediate Recovery:* Cleaning and clearing out affected properties, Relief items from flood stores, Supporting emergency centres, Restoring utilities/services

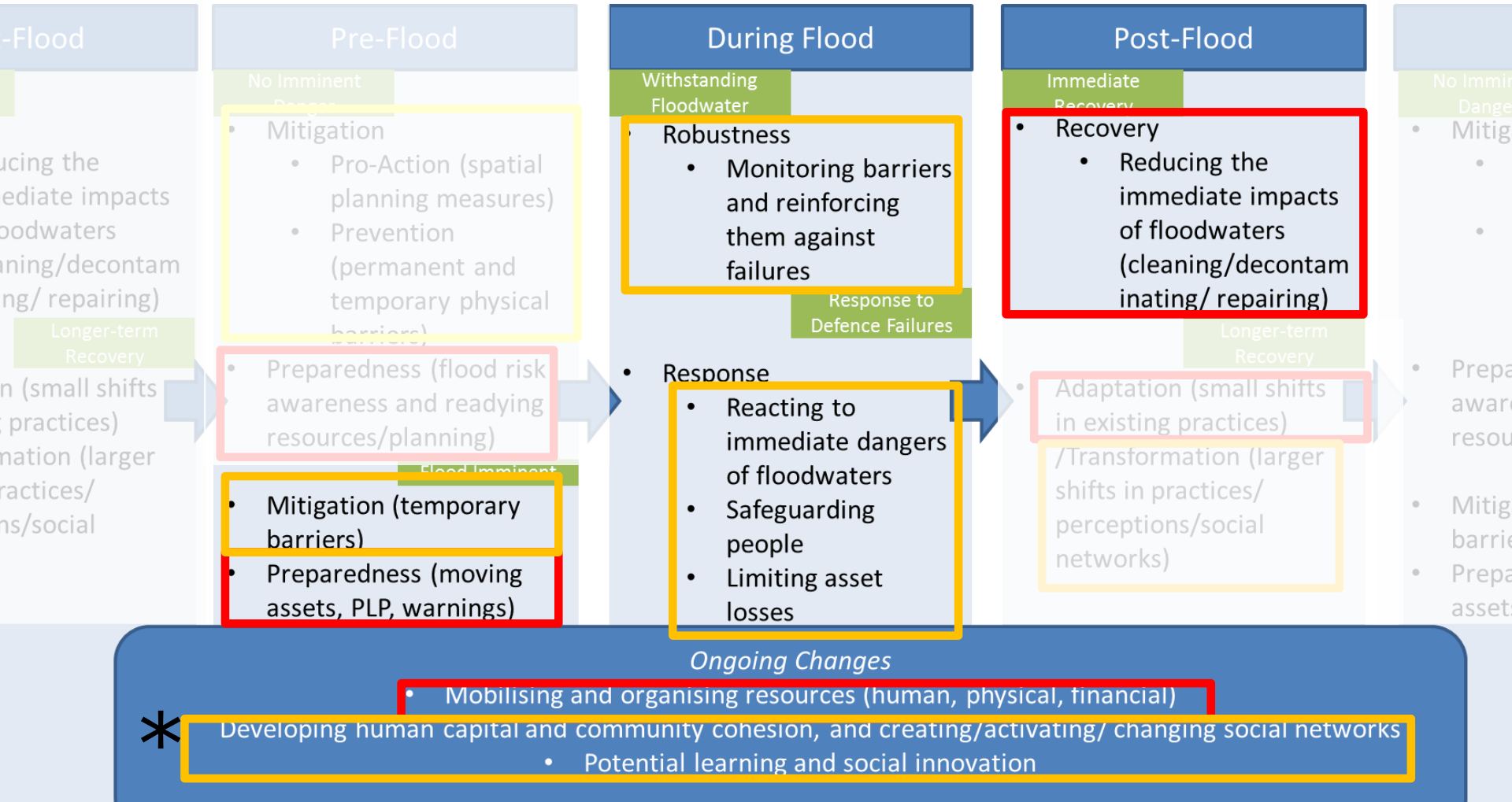
Main Findings

- Adaptation: Resilient household measures, PLP uptake, Flood Hubs
- Transformation: Shift in perceptions and involvement in civil society actors (temporary?)

- Developing/activating social networks
- Knowledge exchange
- Learning (e.g. walkie-talkies)



Conclusions



Local action / Flood Groups: All Problems Solved?

- Representation of community
  - Who is included/excluded?
- What is the purpose of their activities, who benefits and who decides?

- Sustainability/durabilty
  - Apathy, active forgetting, volunteer burnout
  - New/existing groups (coordination and potential conflict)
- Empowered Civil Society vs. Retreating Government
- Promising but not perfect