

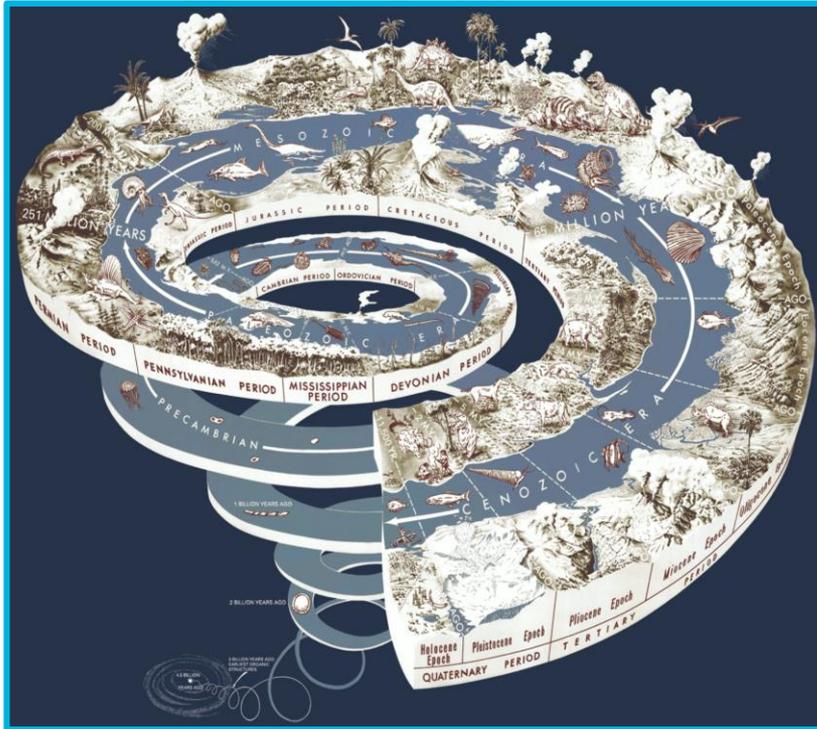
Sustainable Water Pathways: Urban Resilience through Design and Governance

*Workshop on UK-Brazil collaboration for
investigating the nexus between water, health
and urban resilience*

Dr Jonathan Clarke – April 2019

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Overview of Lecture

- About me;
- Urban water challenges;
- Urban Resilience;
- Resilience and Urban Design;
- Integrated Governance;
- Sustainable Pathways;
- Imagining Urban Futures.

About Me

- Based at the University of Warwick's Department of Global Sustainable Development;
- Teach a range of sustainability focussed modules, including 'Living with Water';
- Over 10 years of Interdisciplinary practice experience in planning, landscape architecture and urban design;
- Chartered Member of the Landscape Institute (CMLI) and Licentiate of the Royal Town Planning Institute (RTPI);
- Design Expert for MADE – West Midlands Centre for Architecture and Place Making;
- Strong connection to practice in the region;
- Significant experience of large research projects.



Research Experience

- **Designing Safer Urban Spaces (DESURBS):**
- Analysed past disruptive events to identify ‘design weaknesses’, the elevation of which can be used to enhance resilience.
- **A Holistic Approach to Resilience and Systematic Actions to Make Large Scale Urban Built Infrastructure Secure (Harmonise):**
- Outlined state-of-the-art in urban resilience and devised thematic framework for accessing resilience support.
- **Realising European Resilience for Critical Infrastructure (RESILENS):**
- Production of European Resilience Management Guidelines (ERMG) that promote the transformation of CI from risk management to resilience;
- **Urban Living Birmingham (From Citizen to Co-innovator, from City council to Facilitator: Integrating Urban Systems to Provide Better Outcomes for People):**
- Prompted integrated governance approaches for the provision of urban services.



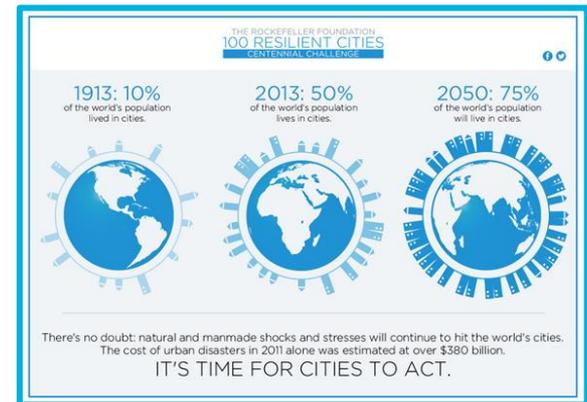
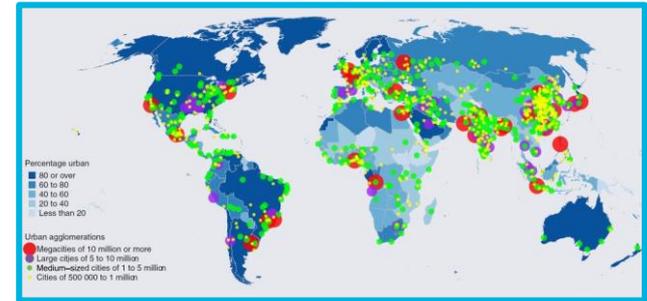
Research Focus



- Architecture, Planning, Landscape, Ecology, Geography, Politics and **SUSTAINABLE DEVELOPMENT**;
- **What is the role of the built environment in addressing future challenges?**
- Resilience, Risk, Climate Change Adaption, Infrastructure; **Living with Water, GOVERNANCE**;
- Sustainable Urban Development, Decision Making, Resilient Societies, Infrastructure, Collaborative Planning, Institutional Design, **Flooding**, Adaptive Capacity; Sustainable Pathways;
- **DESIGN.**

Global Urbanisation Trends

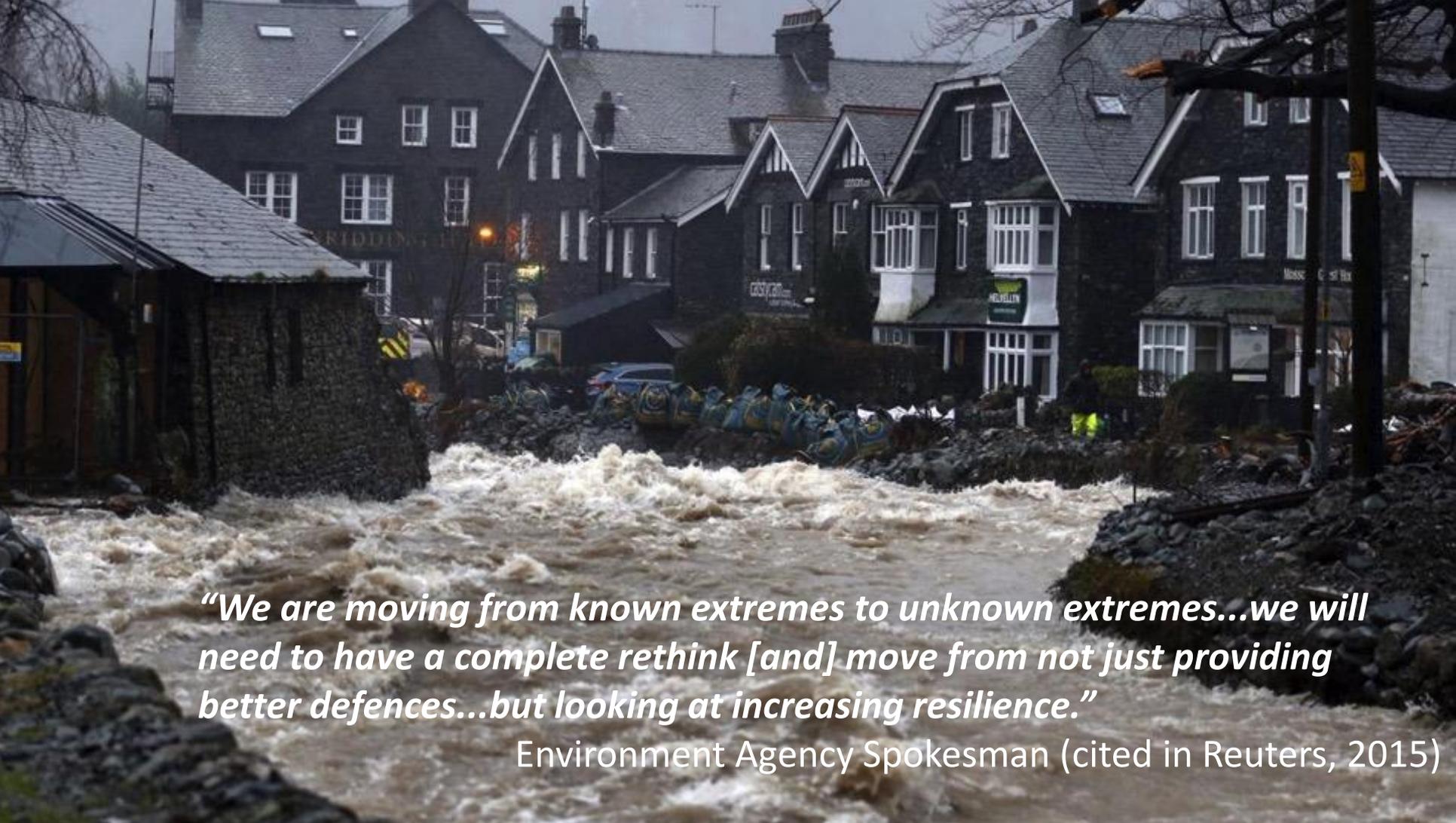
- Rising global populations are increasingly focused within cities;
- To accommodate the extra three billion people, we will need to build the equivalent of one new city that can support one million people every five days between now and 2050 (Norman, 2018);
- This pattern of urban settlement and rate of urbanisation will drive major environmental degradation, continuing economic and social inequality (UN Habitat and United Nations ESCAP 2015);
- These trends amplify the amplifies other pressures to keep citizens safe, happy and healthy.



Water and the Urban Challenge

- Our current pattern of urban growth is unsustainable and will worsen a range of water-related challenges;
- Patterns of urban growth are not matched by growing access to clean water and sanitation (United Nations, 2016);
- It is anticipated that by 2030 global water demand will exceed current supply by 40%;
- There are presently one billion people living on land vulnerable to flooding, this will rise to two billion by 2050 (UN-HABITAT, 2011);
- Over the last century, “weather-related catastrophes” have increased exponentially (Fisher, 2012).





“We are moving from known extremes to unknown extremes...we will need to have a complete rethink [and] move from not just providing better defences...but looking at increasing resilience.”

Environment Agency Spokesman (cited in Reuters, 2015)

Urban Resilience

“Resilience is, simultaneously, a theory about how systems can behave across scales, a practice or proactive approach to planning systems that applies across social spaces, and an analytical tool that enables researchers to examine how and why some systems are able to respond to disruption.”

Vale (2013, p.1)

- Key approach for addressing global challenges, disruption and uncertainty;
- A tool for understanding systems, connections and interdependencies and promoting proactive and long-term strategies;
- Critical to understand the interrelated concerns of urbanisation, climate change and sustainable development;
- Reflexive approach for managing complexity (Chandler, 2014);
- A rationale for promoting adaption and addressing maladaptation, particularly in the built environment.

“For me, the essence of the urban design approach is that it concentrates more on relations between objects, more on linkages, contexts, and in-between places, than on the objects themselves. It deals with long time-spans, incremental growth over time, decision-making that is complex and fractionated, and relations between different levels and types of decision- making.”

(Scott Brown, 2008, p.76-77)



Resilient Urban Design

“Urban resilience, if operationalized effectively, can provide a practical explanatory framework for urban design practitioners seeking to work with risk, crisis, and uncertainty and genuinely transform the way in which they work..”

- Urban design is a collaborative and multi-disciplinary process;
- It can provide a space for community participation, social justice and technical knowledge's;
- Design provides the tool for generating and interrogating possibility;
- Optimum scale for resilience practice, connected to contextual concerns and wider strategy;
- Eliminating maladaptation and promoting adaptive capacity.

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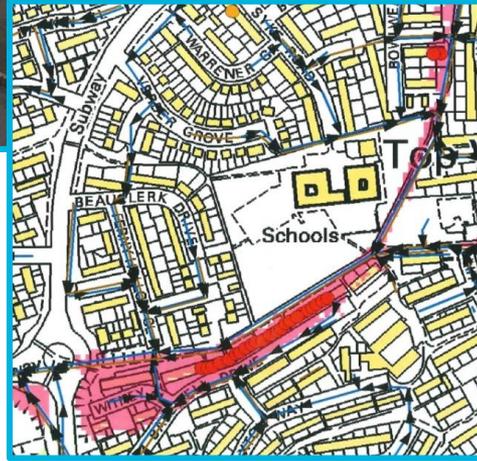
Coaffee and Clarke (2017, p.65)





Case Study: Top Valley, Nottingham

- Recent residential development on school playing field;
- No Environment Agency input (not near any watercourses);
- No flood mitigation (e.g. SuDS) or significant green space, although development made financial contribution to local parks;
- Serious flash flooding event in 2013, as a result of 'integrated flooding', affecting 31 properties on single road.



Case Study: Top Valley, Nottingham

- “Look at the topography!”
- Subsequently, many residents noted that area had flooded many times in the past,
- EA surface-water datasets predicted extent of flooding (notably, not the likelihood);
- Estimated 1:30 year rain event led to integrated flooding;
- Demonstrates the value of contextual design.



Case Study: Copenhagen

- A masterplan led by SLA architects uses the need to alleviate localized flood risk from 'cloudburst' rain events as an opportunity for advancing a series of coherent public spaces that provide a range of co- benefits;
- A network of sunken basins with water-purifying plantings utilize a range of natural processes to provide greater rainwater catchment to alleviate flooding, but the design also offers a vibrant range of community uses to improve the residents' quality of life.

The Implementation Gap

- There is an ‘implementation gap’ (Coaffee and Clarke, 2015) in resilience practice;
- There are a range of knowledge, assessment and operational barriers, including:
 - Lack of a clear practical definitions of resilience,
 - Difficulty in evaluating impacts,
 - A lack of political drive and guidance,
 - Resistance to changing organisational culture.
- The implementation gap is a governance challenge.



Transforming Urban Governance: Birmingham

- Governance seen in its wider meaning as collective decision-making;
- Since the 1940s, we've seen a restless shift from centralised powers to a wider governance network;
- Interest in governance changes that might facilitate system integration and create innovative spaces where new practices might emerge and be mainstreamed;
- Governance practices are often trapped into formalised ways of working;
- Vertical siloes can discouraged transdisciplinary issues, such as green infrastructure.



urban living
Birmingham

Green Infrastructure

“Green infrastructure is the ecological framework for environmental, social and economic health – in short our life-support system.”

(Benedict and McMahon, 2006, p.1)

- Green Infrastructure offers a solution to a wide variety of urban challenges, including flooding, storms and extreme heat, as well as providing benefits to health and wellbeing;
- Despite these obvious benefits, and with some notable exceptions, implementation is



Green Infrastructure Governance in Birmingham

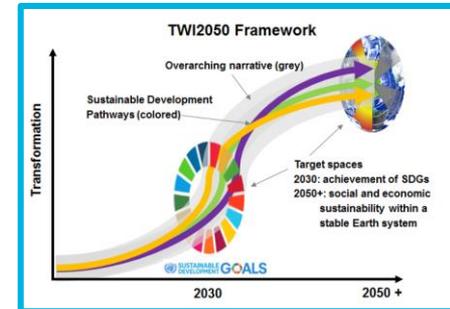
- The implementation gap exists on two levels:
- Lack of an implementable strategic vision for GI,
- Little implementation of GI at individual site level (often disconnected),
- Involvement in decision-making is still too narrow and dictated by policy siloes;
- Austerity tends to limit innovation and outside involvement;
- We need to promote urban governance to:
- Work across silos and scales,
- Embed adaptability and flexibility,
- Reshape organisational habits,
- Promote resilient design.



Sustainable Pathways

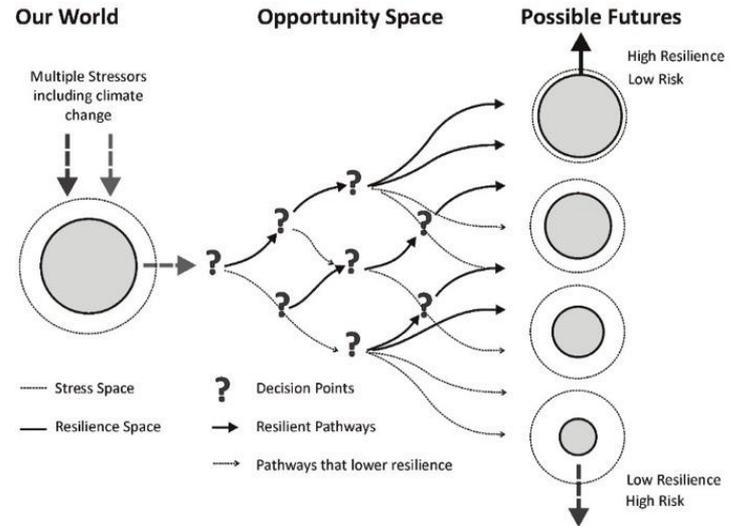
- We need to plan for our uncertain future, and sustainable pathways offer a method for doing so;
- To define a pathway, we need to imagine a future scenario and see how it can be achieved or look at the outcome of policies that lead to a particular outcome;
- Sustainable pathways can be seen as the medium for connecting the key elements of a more sustainable future relationship with water and urbanization;
- Pathways can be promoted via policy levers and frameworks (economic, social and environmental) or through urban design and land use planning.

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Future Adaptation

- Urban stakeholders need to address irreducible risk and uncertainty, through the creation of alternative visions of the future;
- Adaptive pathway approaches presents alternative ways of getting to a desired end point in the future;
- Promotes long-term planning rather than relying on short term, risk-based incremental changes;
- Solutions centred around integrated solutions, innovation and new ideas.



Imagining Urban Futures

- The future of urban settlement will be influenced by a myriad of factors including basic human needs – water, energy, clean air, biodiversity, health and wellbeing;
- The contemporary city is where water-related problems are manifested, but also the location of potential solutions;
- Risk and uncertainty are key considerations for sustainable urban development;
- Good governance occurs at multiple levels and through approaches that are adaptable, flexible and learning-based;
- Design is critical to envisage new sustainable and adaptive pathways for living with water.



“Adaptive Planning... The continuous adaptive loop of vision, targets, monitoring and evaluation, that is, learning by doing, provides, in my view a more resilient basis to planning for the future.”

(Norman, 2018, p.147)