



RISK & RESILIENCE IN THE BUILT ENVIRONMENT

April 27-28TH 2017

Melbourne School of Design and Faculty of Science

Briefing #1

OVERVIEW

*

JR 11-04-17

Much of Australia is vulnerable to natural hazards – drought, fire, flood, storm or sea-level rise. There's a growing combination of climate change, urban change, technology hazard and community fragmentation. While the techniques for risk reduction are better than ever, the physical challenges are greater, and the social fabric is stretched further. We need to understand the dynamics of 'resilient communities' in the face of these complex and increasing challenges.

The 'Risk and Resilience in the Built Environment' ('R&R') programme is a live exploration on the frontiers of resilience thinking and practice. Past experience shows we need to look beyond the simple building of defences: we need to look at how society works, learns, thinks and communicates.

This is all framed as **Resilience-III**. Developed at the University of Manchester, Resilience-III is one of a suite of tools now being applied internationally. Resilience-III is based on the wisdom of communities and cities. It's about the collective intelligence, the capacity of organizations, enterprises and markets, to learn, think ahead, adapt and innovate. It has applications in building design, landscape management, finance and property, urban infrastructure and many other areas.

The overall goal of the Risk and Resilience programme is to build capacity of future cities for resilience to hazard and disruption in Australia. The overall question is how to do this – or at least, how to understand the problem, and the possible responses? The Programme/ Resilience III approach aims to contribute, through four keystages:

- a) mapping of city systems: to identify unseen gaps, vulnerabilities and pressure points;
- b) explore possible futures and risks: beyond short term horizons;
- c) develop new models for resilience: based on shared learning and collective intelligence; and,
- d) identify the pathways / roadmaps: directions, strategies and actions.

* Bowler, N (1972) *Flood image: Floods in central Melbourne. Looking up Elizabeth Street from Flinders Street*, The Age, 17 February, 1972. Neg: A 6589 CN.

1 OVERVIEW

The programme begins with critical questions on the meaning of risk and resilience: resilience to what?, for whom?, where and when?, and under which conditions and subtexts?? For the official Sendai Framework, resilience is: *“The ability of a system, community or society exposed to hazards to resist, absorb, accommodate 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.”*¹

But what if the ‘community or society’ here is based on inequality and exploitation? In that case resilience would simply continue the trends and gaps in power and wealth. Local knowledge and memories, common or shared values and understandings (imaginaries) along with any underlying tensions or traumas mean that the risk and resilience of a community/society/place poses not only technical ‘engineering questions’ but political and ethical questions. These dilemmas may play a role as important as official plans and policies.²

To explore such questions we need to include the ‘wider’ real-world inter-connections, and also the ‘deeper’ political and ethical dilemmas, and as climate change forces a future which is different to the past, we need to look ‘further’. We need methods that will assist us to confront complex change.

1.1 SYNERGISTIC TOOLKIT: A Methodology

The synergistic toolkit represents a methodology for connecting up the diverse aspects of 21stC decision making in the face of uncertainty. It presents methods, tools and practices which help to apply synergistic thinking, the inter-connectedness of systems not only in direct functional terms, but in cognitive human terms, to practical problems. The approach/understanding/philosophy is based on a three- dimensional framework of wider, deeper, and further.

1.2 Context

- **‘Wider’** synergies between communities of actors and factors, (people or organizations or institutions). We start with the people around the table, their inter-connections and exchanges.
- **‘Deeper’** synergies between different value systems. This includes social, technical, economic, ecological, political and cultural values and rationalities. It also includes surface / structural / archetypal layers. This is also about different knowledge systems – ‘know-what, know-how, know-who, know-why’ ...
- **‘Further’** synergies which emerge from systems change.

To explore the ‘further’ dimension we look at different levels of synergy and systems change, i.e. **‘mechanical, biological or human’**. These can also be framed as **‘clever, smart or wise’**. Here we refer to **“Mode I, II or III”** type operating systems:

- **‘Mode-I’ (1.0): linear and ‘clever’**: here the synergy works as a ‘functional system’: it follows direct instructions and responds to short term pressures. A linear-type ‘Resilience-I’ strategy would build higher walls in response to flood risk.
- **‘Mode-II’ (2.0): evolutionary and ‘smart’**: here the synergy works as a ‘complex adaptive system’, evolving by self-selection and self-organization. Evolutionary type ‘Resilience-II’ looks for interactions between flood risk, property and infrastructure, with innovations, incentives, markets etc: (but often it tends to reinforce inequality and exclusion).
- **‘Mode-III’ (3.0): co-evolutionary and ‘wise’**: here the synergy works with co-learning, co- innovation and co-creation. A co-evolutionary ‘Resilience-III’ works on the cognitive level, and promotes shared learning and collective intelligence of all stakeholders. It aims beyond simple flood defence, and beyond competitive markets, to a co-evolution of urban systems with their climate systems.

¹ Sendai Framework, UNSDR 2011: Sendai Framework for Disaster Risk Reduction 2015 – 2030. NY, UNSDR

² Beilin & Wilkinson 2015: Beilin, R, & Wilkinson, C, (2015) Introduction: Governing for urban resilience. Urban Studies, Vol. 52(7) 1205–121

1.3 Method

To explore all this, we use the '**synergistic toolkit**', a structured process of mapping and design, with four stages:

- a) **Systems mapping**: the landscape, baseline, and the issues / challenges on the table;
- b) **Change mapping**: the drivers of change, dynamics, risks and alternative futures;
- c) **Synergy mapping**: the opportunities, visions, innovations, transformations; and,
- d) **Pathway mapping**: practical pathways, road-maps, strategies, policies & projects.

Each of these 4 stages has three steps, so a complete synergistic toolkit has a total of 12 steps. This is the basis for the Resilience-III methodology.

Synergistic thinking in Resilience-III is part of a larger picture. Similar principles apply to many other fields, such as Climate-III, Neighborhood-III and Finance-III. As each of these are highly inter-connected – progress on resilience needs new kinds of finance, governance, urban design and so on, potential 'synergistic pathways from smart to wise' can be explored and mapped in each.

1.4 PARALLEL APPROACHES

One approach is the RESIN, the largest EU funded project on urban resilience (with a base in Manchester) – see www.resin-cities.eu. This aims at standardised approaches to increase the resilience of Europe's urban areas to extreme weather and climate change. The scope includes:

Urban systems: critical infrastructure: climate change risk: adaptation / resilience strategy and action. The RESIN framework sees two interacting cycles of feedback, or learning loops:

- Urban system: hazards & drivers: climate risk: adaptation action: resilience building:
- Adaptation planning system: assess climate risk: adaptation objectives: prioritize options: implementation plan.

Another is the Rockefeller 100, a global community of cities each with an urban resilience program. The framework includes 12 goals: (essential needs; health management; livelihood support; law enforcement; social harmonisation; knowledge management; capacity and coordination; critical infrastructure management; environmental management; urban strategy and planning; economic sustainability; accessibility). These 12 rest on seven systemic qualities, which are similar in some ways to the Resilience-III thinking on cognitive complex systems:

- *“Reflective systems are accepting of the inherent and ever-increasing uncertainty and change in today's world.*
- *Robust systems include well-conceived, constructed and managed physical assets, so that they can withstand the impacts of hazard events without significant damage or loss of function.*
- *Redundancy refers to spare capacity purposely created within systems so that they can accommodate disruption, extreme pressures or surges in demand.*
- *Flexibility implies that systems can change, evolve and adapt in response to changing circumstances*
- *Resourcefulness implies that people and institutions are able to rapidly find different ways to achieve their goals or meet their needs during a shock or when under stress.*
- *Inclusion emphasises the need for broad consultation and engagement of communities, including the most vulnerable groups*
- *Integration and alignment between city systems promotes consistency in decision-making and ensures that all investments are mutually supportive to a common outcome.”*

1.5 ISSUES & CHALLENGES

The RESIN and Rockefeller and others are great first steps – but often they bypass more challenging issues. Power, inequality, conflict, paranoia, alienation and corruption are hardly mentioned – but they are present in every city, some more than others. ‘Communities’ and ‘the vulnerable’ are framed as neutral technical items – as in *‘if I help the poor I’m a saint, but if I ask why are they poor, I’m a communist’*... Resilience projects also tend to overlook the inter-dependencies, e.g. London might be quite ‘resilient’ to flooding, being a (relatively) rich and organized city, but it’s also a hub for exploitation of other regions and other countries, past and present.

Many other challenges arise -

- Conflation of ‘system resilience’ with other concepts of sustainability, justice, prosperity... e.g. the North Korean dictatorship appears (so far) very resilient.
- The RESIN double loop, and many similar models, seem to assume that climate risk & adaptation planning are discreet & identifiable things: but in reality cities & climate are generally highly inter-connected and entangled.
- Climate risk in practice involves huge uncertainties in the medium future with unknown distributional effects: very difficult to separate weather variability from climate change. Also difficult to justify large investments which really depend on a fickle set of ‘co-benefits’.
- Generally the climate adaptation planning model assumes some kind of rational governance which may or may not exist. For instance, in the UK the current housing system & welfare systems are each highly dysfunctional and regressive (i.e. the poor get poorer and are blamed for it). So, adaptation planning with rhetoric about ‘inclusion’ may or may not be effective.
- From the state of the art, the IPCC working group on Impacts, Adaptation and Vulnerability:³ *“Overall, cities tend to concentrate vulnerability to storm, heat and sea-level rise, but they also concentrate the capacities for adaptation and resilience. The way forward is seen as coordination and linkage between urban climate adaptation and sustainable urban development, but this depends on “cooperative multilevel governance,” “responsive finance” and realization of the “co- benefits”*. These are great intentions... , but in reality most of us are complete beginners on - “cooperative multilevel governance,” “responsive finance” and realization of “co-benefits”...

1.6 NEXT STEPS

Overall the R&R programme aims at visionary yet practical results - ‘synergistic pathways from smart to wise’ - to enhance the overall resilience of the future city. It’s possible to envisage technical solutions – sealed air-con buildings, surveillance cameras feeding into control centres – but mono- functional technology seems to exacerbate other kinds of gaps and vulnerabilities. The combination of co-learning, co-creation and co-production of all stakeholders, adds up to a urban shared-mind, a collective intelligence. This isn’t a solution, more like an experimental space or *collaboratorium*, where creative forward looking responses can emerge and flourish. The synergistic thinking and toolkit outlined here can help to design and explore this space.

³ Revi et al., 2014: Revi, A., D.E. Satterthwaite and F. Aragón-Durand et al. (2014), “Urban areas,” in C.B. Field, V.R. Barros and D.J. Dokken et al. (eds), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge, UK: Cambridge University Press.