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Top-down resilience: Governing cities for resilience in the face of uncertain change and transformation

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Abstract

This paper explores how social-ecological resilience may be applied to urban planning and governance in the face of uncertain change. It examines the various interpretations of resilience in the built environment and investigates what social-ecological resilience can bring to urban planning and governance processes at city-region level. Identifying the characteristics of resilient systems presented within theories of social-ecological resilience, this paper develops a framework for urban planning and governance for resilience. It explores how the elements of this framework present themselves in current approaches to city-region planning and, using the Detroit Strategic Framework Plan process as a case-study, identifies what additional influences have to be considered in turning planning for resilience into reality.

1. Introduction

Resilience is understood as a system's *ability to absorb change and disturbance and still persist* (derived from Holling 1973: pp 14, 17) or, in other words, *maintain its functions and controls* (Gunderson & Holling 2001). Arising from ecology[1], this simple and seemingly intuitive definition of resilience has been widely adopted by many disciplines, including planning, with significant variations in the manner in which it is interpreted and applied.

The two contradictory views of resilience within ecology have been reviewed elsewhere (Walker et al. 2004; Folke 2006). One view sees resilience as the ability of systems to return to a defined equilibrium after a disturbance (Pimm 1991), while the non-equilibrium view considers that ecological systems adapt to multiple destabilising forces and have "multiple potential futures" (Holling 1996: 733). While the former focusses on stability, the latter takes uncertainty as its starting point. The non-equilibrium view is more suited to the dynamics of complex adaptive systems such as cities, which are open to internal and external influences at different scales and are constantly evolving. This view

conceptualises cities as social-ecological systems and has been the basis of using resilience in planning (Wilkinson 2012; Goldstein 2009; Pickett & Cadenasso 2004).

In the realm of urban practice, three predominant expressions of resilience are noted: resilience as the functionality of engineered systems in the face of unexpected events (for example, seismic performance, reliability of transport networks); resilience as risk management and preparedness (for example, disaster preparedness, counter-terrorism); and resilience as learning and adaptation to an uncertain event (for example, resilience to global environmental change). A marked difference between the object of resilience can be noted: while some practices focus on the physical outcome of engineering and design, others focus on the institutions and communities affected. Practices concerned with built systems often aim to make these fail-safe, provide safe means of failure when this is inevitable, and return to normal (in other words, a state of equilibrium) following a breakdown or disaster. Practices concerned with institutions and communities attempt to build capacity at multiple scales by embedding appropriate institutions and resources. While these practices of urban resilience span the equilibrium and non-equilibrium view of resilience, neither considers how cities can govern for resilience or what the characteristics of a resilient process are. This paper attempts to contribute to this gap by exploring how planning and governance for resilience compares against practice.

2. Methodology

Based upon an exploration of social-ecological resilience theory, the research identified the traits required of planning and governance processes that aim to build resilience in a complex social-ecological system such as the city. An exploration of how these characteristics may manifest themselves in a city-level planning exercise was then undertaken. These assumptions were tested against a qualitative analysis of the Detroit Strategic Framework Plan (DSFP) process.

The Detroit Strategic Framework Plan (DSFP) process was chosen for two reasons. Firstly, the context of the city was appropriate to the exploration: the city was devastated by the auto industry's global collapse in the 1960's, racial segregation and lack of political vision; the legacies are evident to this day in regional affluence and city-level decline. Now, the DSFP endeavours to chart a new course for the future of Detroit City and define a new transformed identity that is not based on the negative perceptions that surround it. This reorganisation phase was considered particularly appropriate to understand social-ecological resilience in the context of urban planning and governance, given that resilience authors often call for greater attention to the release and reorganisation phases - the backloop - of the adaptive cycle (Folke 2006; Gunderson & Holling 2001).

Secondly, this research is in collaboration with a consulting firm that formed part of the DSFP production team; this allowed access to data suitable for a desktop study, including published and draft documents, selected emails, and meeting minutes and transcripts. Newspaper articles and informal discussions with team members were used to develop a fuller picture of the DSFP process where necessary. While I do not underestimate the value of being in the field, and recognise my own positionality having previously worked with the firm on similar projects, it was felt that the data and my experience of other planning processes provided sufficient basis for this initial exploration.

The next section of the paper will present the key findings from social-ecological resilience discourses, section 4 will develop these findings into a framework for resilience, asking two questions: (1) what does this attribute mean in social-ecological literature; and (2) what may it mean in relation to planning and governance for resilience. Following this, section 5 explores how this reflects in the Detroit Strategic Framework Plan process. Lastly, this paper will review the gaps and highlight the challenges in translating social-ecological resilience into planning practice and the additional influences to be considered in turning planning for resilience into reality.

3. Brief introduction to social-ecological resilience

In order to identify the traits of planning and governance for resilience, it is first important to outline some key messages within social-ecological resilience. Social-ecological resilience maintains that, rather than existing in a state of equilibrium, social-ecological systems move between a variety of combinations (states) that are controlled by the same attractor (rules) and therefore have the same inherent functions and structure (Holling 1973; Walker et al. 2004; Folke 2006). However, internal or external disturbances can cause the system to shift to a different set of states (regime), controlled by a different attractor and having entirely different functions and structure (Walker et al. 2004). In relation to cities, moving between states within the same regime could be equated to phases of growth and recess or political changes, whereas a regime shift entails entirely new functions and structure which could be triggered by socio-economic, environmental or political transformations. Regime shifts are not necessarily undesirable, reversible (Walker et al. 2004; Carpenter et al. 2001) or predictable (Folke 2006). Hence, contrary to popular interpretations of the concept, resilience does not entail stability or certainty. On the contrary, resilience scholars recognise that any changes at one scale result in adjustments at multiple linked scales (Gunderson & Holling 2001), refuting the concept of a precise 'original' state that can be returned to. Hence, resilience requires "assuming change and explaining stability, instead of assuming stability and explaining change" (van der Leeuw 2000).

In the context of constant change experienced in cities, resilience is defined as *a system's ability to remain within a desirable regime, as a consequence of the characteristics and trajectory of the system as well as the capacity and actions of its actors* (Walker et al. 2004; Folke et al. 2010). This application of resilience focusses not only on the city and its various territories and institutions as a system, but also on the capacity of actors to adapt the current trajectory, intervene to influence the thresholds, and transform the system into an entirely different regime when circumstances dictate (Walker et al. 2004; Folke et al. 2010); the latter may include changing a city's economic base, social norms, or a nation's political set-up. As such, resilience is a function of the self-organisation, learning, adaptability and resources with the system (Berkes & Turner 2006; I. Fazey et al. 2007). It is specific to place, spatial scale and timescale[2] (Carpenter et al. 2001) and understood in the wider context of its related places, spaces and timescales. However, it is not a measure of the outcome, but a characteristic of social-ecological-economic-political processes that occur within and outside times of change.

Building adaptive capacity to cope with change is central to resilience, because it provides the ability for actors to be able to respond to the non-linear dynamics of change characteristic of complex adaptive systems such as cities (Wilkinson 2011). Because resilience is specific to scale, such adaptive capacity has to be built at multiple spatial and temporal scales, with actors at all levels able to participate in the processes of transformation (large and small).

4. A framework for resilience in urban planning and governance

Social-ecological resilience can be understood as a three-dimensional model for planning and governance approaches that build resilience in city-regions undergoing transformation (Figure 1). I argue that building urban resilience requires actors within the system (cities) to understand the multi-scalar system in itself and as a context for their actions, incorporate diversity within the process, and encourage and manage the resultant heterogeneity. These correspond to three areas of resilience theory: interconnectedness across scales, diversity, and heterogeneity respectively.

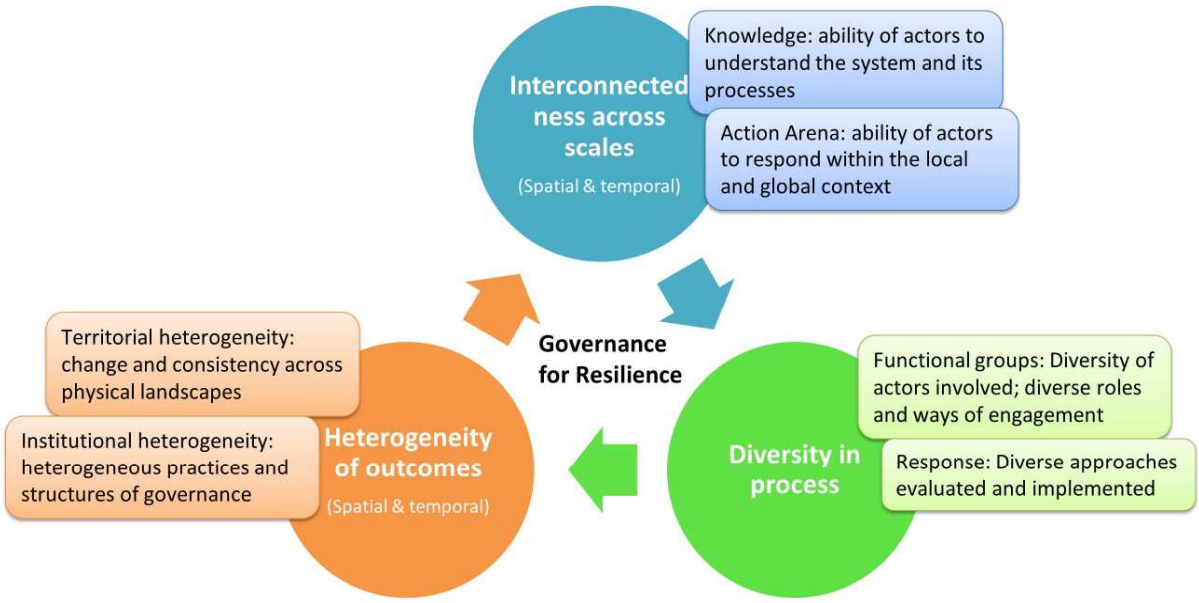

Figure 1 A framework for translating social-ecological resilience into urban planning and governance

Interconnectedness across scales

Social-ecological systems are influenced by changes at other spatial and temporal scales. For example, spatially, cities are influenced by national policy, global economy, and community actions; temporally, they are affected by legacies of previous actions and on-going long-term initiatives. Cross-scalar linkages allow weaknesses at one scale to be compensated by strengths at other scales and hold knowledge within the system (Berkes et al. 2003). Critical innovations at smaller scales can cascade up to produce transformation, while the larger scales facilitate renewal and re-organisation by drawing on the memory of previous events and providing inertia to change (Gunderson & Holling 2001). Therefore, both the top-down and bottom-up linkages become crucial to the self-organisation and renewal of the system, providing arenas for learning, and contributing to the development of new approaches and adaptation of previous approaches.

In terms of planning, connectedness across scales can relate to both the actors' knowledge of the system (*ability to see*) as well as their *ability to respond* to actual or anticipated changes in the system. The former corresponds to knowledge that enables actors to understand system interdependencies, the rationale behind decisions made, and the generation and expression of knowledge, and is achieved through the sharing of knowledge within and between groups. The latter corresponds to the action arena and relates to opportunities for action, recognition of the 'room for manoeuvre' (Safier 1983), and ability and resources to respond appropriately and awareness of the impact of decisions on the larger system. Rules within the action arena may restrict or enhance actors' ability to respond, for example, in order to prevent exploitation or to encourage response to crises in other parts of the system. Communication and feedbacks within the larger system are therefore essential.

Diversity in the process

Social-ecological resilience scholarship suggests that managing for stability reduces diversity and erodes resilience (Holling 1996); by driving towards the same goals and conserving the same selection of resources, other resources that could serve in transformation and reorganisation of the system are weakened. Diversity conserves resources for change, renewal and variation, providing

opportunities for novelty and innovation within the system (Holling 1996; Gunderson & Holling 2001; Berkes et al. 2003). Walker (1992) introduces the importance of a diversity of *functional groups* - for system performance, productivity and renewal, while Elmqvist et al (2003) call for a diversity of *responses* to change - to aid reorganisation in the face of a disturbance. In the context of urban transformation, the former can be interpreted as nurturing the diversity of social groups in the decision-making process, incorporating the voices of a diversity of actors and, importantly, ensuring diversity in the roles of these actors. The latter, diversity of responses, relates to raising and considering a diversity of issues, evaluating multiple proposals, and assessing and implementing a diverse variety of approaches. This may require non-linear ways of thinking and may be limited by actors' abilities to imagine alternative futures and implement new ways of doing things (see Albrechts 2005). Practices that encourage diversity may employ reframing of dominant discourses (Levy 2007) and multiple ways of engaging to maximise inclusion (Quick & Feldman 2011). Diversity thus relates to multiple ways of *doing*.

Diversity in the process enhances the options available but also creates redundancy (Walker 1992) which, in planning, may require establishing the basis to select some options and discard others. It may also require deciding which actors to involve in decision-making, when to involve them and in what way (Healey 1998; Rydin 2010). Such selections are inevitably highly politicised and raise questions of legitimacy, such as: whose knowledge counts (Sandercock 1998) and who decides (Lebel et al. 2006).

Heterogeneity of outcomes

Diversity provides different opportunities for renewal and reorganisation of the social-ecological system which result in heterogeneous landscapes through space and time (Holling 1973; Walker et al. 2009); hence, heterogeneity within a social-ecological system can be viewed as the *outcome* of diversity. Heterogeneity may arise as actors build on previous experience, local and system-wide knowledge, or move away from linear processes to embrace innovation. In urban systems, heterogeneity may manifest itself in the form of a variety of physical landscapes, institutions, and practices, and varying combinations of these. Hence, heterogeneity conserves resources within an interconnected system by conserving multiple ways of *being*, which may be territorial, institutional, or both.

Heterogeneous territorial and institutional outcomes are naturally found in most cities, except perhaps the newest ones. It is suggested that territorial heterogeneity in the context of resilience relates, not only to different physical outcomes, but to the nature of the differences which determine whether the resulting heterogeneity has a role in conserving resources and knowledge within the city. Institutional heterogeneity, on the other hand, is considered to relate to the emergence of new organisations, new policies, or governance mechanisms, including existing institutions using their abilities in entirely new ways.

Nevertheless, non-homogeneous ways of being present challenges for planning practice with respect to the governance of inherently different urban structures, and may challenge the capacity of local institutions to manage increasing levels of diversity in subsequent planning processes. Indeed, Alessa et al. (2009) caution that excess levels of heterogeneity may impede collective action over time. In addition to interconnectedness, managing heterogeneity relies on continuity and sustained temporal openness: keeping spaces for discourses open (Quick & Feldman 2011), incorporating previous and emerging issues while remembering the basis of past decisions and actions, learning from previous events (locally and regionally), involving previous and new participants, reviewing decisions already made in light of new voices as well as actions already taken, and maintaining a willingness to change.

5. Testing the framework : observations from City of Detroit

Introduction to Detroit

Following the collapse of the auto-industry in the late 1960's and 1970's, Detroit went from being one of America's most prominent cities to "the nation's symbol of urban decay" (Boyle 2001: 109). The loss of manufacturing jobs devastated a city that was already falling apart as a result of racial divide and lack of political vision, while "white flight" to the suburbs evaporated the city's tax base (Boyle 2001; Sugrue 2005). The legacy of suburban ascendancy and racial divide is still reflected in the differences between the city and its county region. Population decline, property abandonment, broken down or stuttering infrastructure, and a dire financial situation have been Detroit's realities, while the surrounding counties continue to flourish (Vey & Bradley 2010; SEMCOG 2011). According to Bruce Katz (in Arellano 2010)

> "There's a "Nothing left to lose" quality in Detroit - much like there was in New Orleans after Katrina. Detroit has suffered a Katrina equivalent, but over the course of ... several decades, rather than a few days"

The Detroit Works Project, initiated in 2010 and funded through public, private and philanthropic funding, aims to arrest the city's decline, provide stability, and put in place strategies that will revert the city to a positive cycle of socio-economic growth within a 50-year period. The Detroit Strategic Framework Plan (DSFP) comprises levels of engagement unusual for a city-led plan, as evidenced in a community engagement team more sizeable than the technical team. Nevertheless, the plan endeavours specifically to chart a new course for the future of Detroit city, having recognised that a joint city-regional solution is unlikely. This involves creating a new identity at city-level that residents can relate to (but which is not based on the auto-industry) and charting pathways to this transformation.

The next sections review the theoretical framework for resilience against the Detroit Strategic Framework Plan (DSFP) process. Firstly, the analysis highlighted the dynamic nature of any intervention in a social-ecological system - the mix of actors, knowledge, opinions, priorities and resources constantly changed throughout the process - reiterating that governance for resilience has to incorporate uncertainty and change rather than certainty and stability.

Interconnectedness of knowledge

The processes behind the DSFP were informed by many - government, public and private stakeholders within the city-region and beyond - and various mechanisms were employed to gain and disseminate information. Knowledge from a particular source was gained when those stakeholders were engaged, which in turn was driven by planning priorities and resources at any time. For example, the city decided to focus on understanding priorities within the city before engaging with stakeholders at county-region level; this meant delaying the availability of greater knowledge of issues around economic growth and transportation at the regional level. This meant that connectivity of knowledge related not only to the stakeholders engaged, but also along the issues and spatial scales that were prioritised by the planning process.

The planning priorities also affect the value associated with various types of knowledge at any point in time. For example, the value of community-generated knowledge was greater in the second stage of the plan due to citizen demands as well as the requirements of the funding foundations. As a result, this knowledge was extensively recorded, circulated and discussed amongst the DSFP teams. This suggests that the value associated with specific knowledge affects how visible and connected it is within the system. This may also apply to stakeholders holding that knowledge.

Engaging with stakeholders did not necessarily mean that the anticipated knowledge was gained; for example, some actors withheld information on political, commercial or other grounds. However, such meetings demonstrate awareness of where knowledge exists, and an effort to gain that knowledge where required. It also suggests that certain stakeholders may become visible if the knowledge they hold is required or valuable for the tasks at hand.

The above implies that interconnectedness of knowledge is selective and influenced by current priorities, which in turn can be influenced by several variables such as actors involved, planning process adopted, etc. This raises the question: do particular types of planning processes - or particular practices - improve interconnectedness of knowledge? How do these influence the resilience of the system?

Interconnected action arena

Actors held abilities and resources as a result of their role in the process: for example, by being an elected public official (Mayor), funder (foundations), regulator (State of Michigan), trusted representative of the community, or expert advisor on a particular topic. Planning team actors enhanced their action arena through gaining and generating knowledge and forming connections with other stakeholders, in line with their purpose of involvement. However, actors' ability to respond changed due to other factors, for example, as a result of re-defined project structures, remits, or public trust.

Notwithstanding actor's ability to act, their actions may not achieve the scale required for transformation, for example, previous philanthropic investments in the city achieved at best incremental progress. Later, the joint efforts of various philanthropic groups, the city, community and businesses initiated the DSFP for coordinated effort to alter the dynamics of the city. This suggests that actors used strategic partnerships, or interconnectedness *of* action, to enhance their action arena.

Some actors may choose not to act due to perceived or actual barriers to action. For example, various roundtable participants identified the absence of a citywide vision or current legislation to be a barrier to action (roundtable transcript, unpublished), and state-level legislation presented limits to what could be done. Other actors may exercise their ability to *not* act, such as utility providers who chose to withhold infrastructure upgrades until there was more certainty on the city strategic direction; this limited what the city could do to improve the quality of life in neighbourhoods in the short-term.

In summary, actors' influence on the action arena appeared to be influenced less by planning priorities than by actors' own resourcefulness and effort to link their actions with those of other actors. This implies that actors with fewer resources, lesser means or motivation to act, or those reliant on engagement are likely to remain at the margins. This requires specific attention from a process aiming to build resilience at all scales.

Diversity of functional actor groups

The DSFP was initiated by actors with diverse interests in the city, for example, build the community (Ford Foundation), re-establish the city (Kresge Foundation), ensure business success (DEGC), etc. Various methods of engagement were also used to attract diverse actor groups: meetings of different types and sizes with various stakeholders, a walk in office to gain information on the plan, and "quirky methods" such as mobile phone apps, interactive games, and a roaming table to engage residents in impromptu locations (Gallagher 2011: np). However, in order to provide output in a useable format, each form of engagement had to be structured, for example, by preparation of meeting agendas, questions, or specific sessions to engage with participants of particular backgrounds. Thereby, each

actor adopts a 'role' depending upon the engagement method(s) they participate in (or are invited to participate in). The risk is that similar types of actors are attracted to similar methods of engagement - for example, local developers to a developers' workshop - causing roles to be delineated by actor groups. In these circumstances, actors could also be under pressure to conform to peers, for example, architects on sustainability. Hence, evaluating diversity of actors alone is not sufficient to understand whether the inputs into the process are diverse; rather, building resilience should seek diversity in the role(s) or function(s) that each type of actor plays in the process. I refer to these diverse actor--role combinations as diverse *functional* actor groups.

Diversity of responses

As noted above, diverse functional groups at all points in the process may be less important than how they contribute to diverse responses. While there was evidence of established local groups and initiatives, responses at micro-scales are not easily visible when viewing things at city level. Nevertheless, there appeared to be wide agreement that re-establishing Detroit city required transformation; however, engagement highlighted that the conceptualisation of transformation differed greatly amongst actors in relation to issues, priorities, types of intervention, identity, timescales for improvement, etc. To focus the efforts at city level, the planning production team identified themes within the various responses, the evolution and refinement of which is evident from subsequent revisions of draft documents. This suggests the presence of feedback loops in the evolution of the response, which was evidenced within the data in the reframing, questioning, communication and revision of proposals throughout the process. Various means of communication featured strongly in getting stakeholder input into the process, suggesting that interconnectedness of knowledge could be a precursor to generating diverse responses in the planning process. However, in terms of diverse responses from diverse actors that builds resilience, it is also important to ask: what feedback is retained in the process, what is diluted or lost, and which aspects are prioritised and by whom?

Territorial heterogeneity

The anticipated outcome from the analysis was that diverse responses result in heterogeneous outcomes; however, the analysis revealed that, in effect, existing territorial heterogeneity could be a trigger for diverse responses. For example, varying neighbourhood conditions (i.e., physical and social needs and assets) in the city demanded to be dealt with in different ways and various area-specific groups demanded for their existing initiatives to be incorporated within the plan. As mentioned above, a process for resilience would bear in mind whether and how this diversity is retained, to ensure that local responses are not eventually overtaken by city-level aspirations.

The analysis also highlighted barriers to territorial heterogeneity through time. Clearly, the legacy of large-scale infrastructure limits how territories can change. However, substantial changes to urban structures and spatial forms can raise concerns about creating a different urban identity and therefore face resistance from communities; for example, the physical changes required in Detroit entail a move away from accepted spatial forms such as neighbourhoods associated with job centres and 'traditional' low-density housing. This raises the question: what are the triggers for heterogeneity? Do changes introduced on a large-scale contribute meaningfully to heterogeneity that conserves resources and builds resilience, or must heterogeneity necessarily be local? It is recognised that analysing territorial heterogeneity arising from this process would require a longitudinal study into the future.

Institutional heterogeneity

New institutional set-ups emerged as actors at several levels were brought on board, including businesses, community and religious groups, and neighbourhood-level groups that had drawn up their

own action plans. The involvement of new groups occurred iteratively - influenced by stakeholder demands, changing needs of the process as well as recognition of the gaps in the structures adopted previously - and resulted in the refinement of working structures and remits, including those of the city planning department. Overall, stakeholders who would normally have led the process moved to being part of a process led by local philanthropists, businesses and outsiders. This suggests an openness to change in order to remain fit-for-purpose. However, it raises questions such as: Who should be open to change? And what is the role of political pressures and power influences in embracing change, i.e., as opposed to reinstating the previous? In addition, what does institutional change mean for the continuity of previously established dialogues?

Similar questions can be asked in relation to recognising gaps and learning from previous experience: who learns, under what conditions, and when is this learning implemented in the planning process rather than brushed aside?

6. Discussion

The previous sections have explored how characteristics of social-ecological resilience relate to each other within a city-level planning process. This exploration highlights the interdependence and messy relationships between interconnectedness across scales, diversity in process, and heterogeneity in outcome. It identifies that in complex social-ecological systems such as cities, a linearised model for resilience - where one element feeds neatly into the next one - is not possible. Neither is this the approach advocated by social-ecological resilience scholars. Rather, multiple overlapping influences have to be considered in looking for resilience and any boundaries drawn may be blurred. Based upon this, the framework may be revised to reflect some of the interdependencies observed (Figure 2).

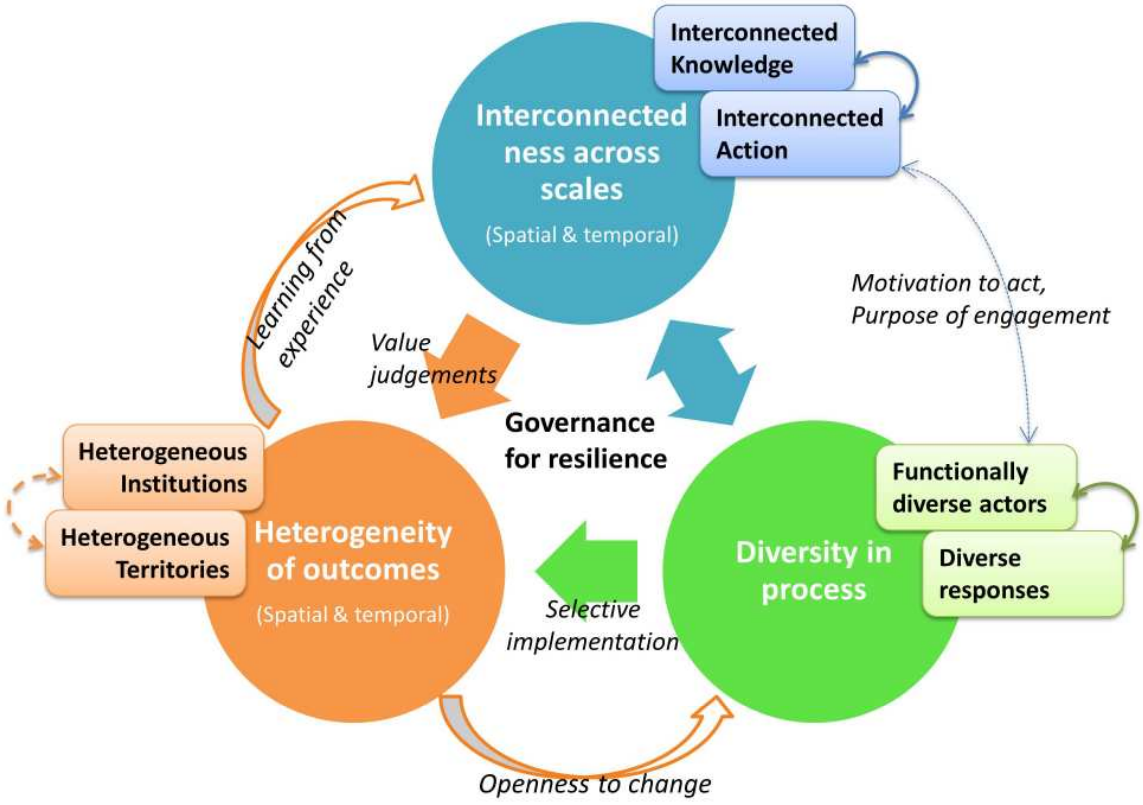

Figure 2 Revised framework for resilience capturing some observed interdependencies

Decision-making in complex urban systems is intensely political and any framework that applies to planning has to explicitly recognise this. That social-ecological resilience does not consider power, negotiation, or conflict has already been identified (Lebel et al. 2006; Wilkinson 2011). In reviewing the framework against the DSFP, this paper identifies how judgements of value, political priorities and popular opinion may adversely influence each of the three dimensions of resilience. The multi-scalar nature of these influences raises questions for delivering resilience in any one way: i.e., top-down through city-level decision-making or bottom up by community groups. In addition, it is worth bearing in mind that we still do not know what resilient cities look like; given this, whether there are conditions under which power and politics could enhance resilience is open to further research.

Notwithstanding discussions of 'specified resilience' potentially causing a system to lose 'general resilience' (Folke et al. 2010), this analysis suggests that it is important to consider the boundaries in any application of this framework; for example, does one consider the abilities institutions only or of actors whose resources may only be temporarily available? On the other hand, can framework be harmlessly applied to socio-economic systems (I think that this would require a different translation)? Cultural specificity may be another consideration: how would the framework translate if applied to a planning process at neighbourhood scale, or in another city? It would be interesting to see those results.

Conclusions

Developing a framework for social-ecological resilience and testing this against the Detroit Strategic Framework Plan, this paper has explored how characteristics of social-ecological resilience manifest themselves in top-down planning at city-level, and also opened up room to question if resilience can be only top-down. Adding to research pertaining to commonalities between social-ecological resilience and planning, this paper highlights the challenges in translation. It suggests that we need to better understand what resilient processes and outcomes look like as well as better understand urban uncertainty and transformation, a phenomenon which neither planning nor social-ecological resilience focus much attention on. This enquiry into resilience in urban transformation should adopt an open mind in order to not be influenced by established scholarship around participation, engagement, transparency, and power. This is the only way in which potentially controversial propositions within social-ecological systems, such as disturbance or redundancy, can be explored in urban decision-making and the value of social-ecological resilience as a metaphor for planning best derived.

Endnotes

[1] 'Resilience' has been widely used in psychology and medicine since the 1940's (I. Fazey et al. 2007; Manyena 2006) which has influenced theories of individual and organisational resilience. However, this is not seen to be the primary driver for resilience discourse in the urban environment.

[2] This means that a system that is resilient in one place, at one scale or within one timescale may not be resilient at others, for example, capitalism is resilient at a global scale but at a local scale results in communities incapable of influencing their environment (and therefore not resilient); similarly, a nation may secure natural resources for a set time ensuring the resilience of reliant systems and communities, but at planetary and long-term scales this approach undermines resilience.

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