Working paper 519

Challenges for resilience policy and practice

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Key messages

- Resilience is interpreted in multiple, often conflicting ways, which prompts critiques but is also viewed by others as a strength, bringing together otherwise disparate groups, institutions, disciplines and scales.
- The absence of explicit values within resilience concepts has caused some authors to caution its use as a guiding narrative or framework.
- A major challenge for practitioners lies in how to explicitly inject values and to navigate tradeoffs in resilience between groups, locations and timescales.
- Resilience narratives have been accused of a depoliticising effect by reframing issues in a way that makes populations affected by shocks and stresses responsible for securing themselves.
- Researchers and practitioners need to take stock and answer fundamental questions if they are to realise the potential and address the limitations of resilience thinking and practice.

As the ‘resilience revolution’ in international development continues, researchers at ODI are capturing the new directions and reviewing the latest thinking in this field through The Rockefeller Foundation-supported Resilience Scan initiative. This paper forms part of the initiative’s ‘deep-dive’ series on key emerging resilience-related topics. These ‘deep-dives’ complement a quarterly analytical review of resilience literature, social media activity and key resilience-related events, with a particular focus on developing countries.

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Abstract

Resilience has a long history but has emerged in the past decade to become a more widely adopted concept to underpin policies and projects, particularly in international development contexts. This working paper summarises some of the challenges and debates based on a review of recent academic literature.

The paper highlights the multiple and sometimes conflicting ways in which resilience is interpreted. This same diversity that prompts critiques is seen as a strength by others, bringing together otherwise disparate groups, institutions, disciplines and scales. The paper highlights the broad dichotomy between functional and dynamic interpretations of resilience, which lead to different operational approaches. A functional perspective tends to fit with existing institutional approaches and a projectised approach, while dynamic interpretations perhaps represent the complexities and chaos evident across the world. The inconsistent treatment of system transformations is also a major challenge; while some see transformation as occurring incrementally within a system, others see it as when resilience fails and systems collapse.

The absence of explicit values within resilience concepts has caused some authors to caution its use as a guiding narrative or framework. A major challenge for practitioners lies in how to explicitly inject values and to navigate trade-offs in resilience between groups, locations and timescales. As operational approaches to building resilience have grown, so have efforts to measure those processes and their impacts, as well as their costs and benefits. Measurement approaches are highly dependent on context, but efforts to learn from common challenges are growing globally.

As the resilience concept has been popularised, it also becomes prone to appropriation as a narrative to further particular goals and aims. Resilience narratives have been accused of a depoliticising effect by reframing issues in a way that makes populations affected by shocks and stresses responsible for securing themselves. Similarly, resilience has been interpreted by some as a potential form of 'governmentality' through which neoliberal ideas and discourses are perpetuated and embedded in particular governance systems.

This working paper aims to help researchers and practitioners take stock and to stimulate further debate and discussion. As such, it concludes with a series of forward-looking questions to address some of the challenges highlighted in the paper.

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1. Introduction

While resilience thinking and practice has a long history, it has emerged in the past decade to become a widely adopted concept underpinning policies and projects. Internationally, the suite of frameworks and agreements developed for the 'post-2015' era, including goals on climate change, disasters, humanitarian and development assistance, all contained significant reference to and framing around resilience (Peters et al., 2016). As such, resilience has gone beyond a conceptually informed approach to informing policy and projects to become a major narrative in international development cooperation. Operational approaches to building resilience are also growing, expanding beyond their initial bases in areas such as social-ecological systems (SES), disaster risk reduction (DRR) and psychology (Lovell et al., 2016). Communities of practice are growing to share lessons and challenges that are emerging globally (Gregorowski et al., 2017).

It is therefore timely to take a step back to consider the challenges and emerging critiques of resilience – not least because reflection is often considered a tenet of resilience thinking itself. This working paper is intended to provide researchers and practitioners with a summary of the key challenges and debates in resilience thinking and practice, based on a review of recent academic literature, to stimulate further discussion, learning and strategies to overcome these challenges. It begins this process by setting out a series of questions for future work on resilience.

Section 2 considers some of the structural challenges for resilience thinking and practice. This includes the multiple and sometimes conflicting ways in which resilience is interpreted and the implications for practice of the broad dichotomy between more functional and more dynamic interpretations of resilience. These differences matter, given the use of resilience as a common language in the diverse post-2015 agreements around disasters, climate change, sustainable development and humanitarian action. The section also highlights the different ways that transformational changes have been tackled in a resilience context.

Section 3 summarises the technical challenges around equity considerations and the trade-offs that exist in building resilience among some areas or groups at the expense of others. It then touches on issues around resilience measurement and how to assess the costs and benefits of resilience-building.

Section 4 details some of the more politically focused challenges and critiques of resilience discourse and practice. This includes the attention to agency and equity within resilience approaches, the potential for resilience as a narrative that can depoliticise policy agendas, and as a form of 'governmentality' through which neoliberal ideas and discourses are perpetuated and embedded in particular governance systems. Section 5 presents the conclusions.

2. Structural challenges

2.1. Interpreting resilience

Many scholars have noted the wide range of definitions and interpretations of resilience emerging from multiple disciplines (Klein et al., 2003; Gallopín, 2006; Davoudi, 2012; Alexander, 2013; Olsson et al., 2015). These include contributions from a range of resilience 'schools' that notably include engineering (Holling, 1996; Park et al., 2013), psychology (Fletcher and Sarkar, 2013), SES (Holling, 1973; Berkes et al., 2008), and economics (Rose, 2007: Briguglio et al., 2009).

Patel et al. (2017: 1) find that resilience remains 'an amorphous concept that is understood and applied differently by different research groups'. Despite this, they do find some agreement on the elements that are widely accepted as important for a resilient community. More critically, there are considerable variations in how tightly the word 'resilience' is defined, from very specific definitions (usually based on a particular school of thought) through to more loose definitions (relying more on the general meaning of the term) to cases where the term may not be defined at all (Béné et al., 2017a).

Use of the word 'resilience' also varies in intent, including as a goal, a tool, a metaphor, and buzzword (see Table 1). Use as a buzzword can lead to 'paradigm creep': the use of buzzwords far beyond their original sphere of application, which in turn can dilute their meaning and utility (Brand and Jax, 2007; Park, 2011). Indeed, a review by Reghezza-Zitt and colleagues (2012: 1) questions whether the popularity of the term 'resilience' undermines its pertinence, and notes that 'use of the concept, especially in social sciences, does not always come with a solid theoretical base'. This may reflect a view of needing to develop theory and apply to practice rather than developing grounded theory based on observing empirical practice (Birks and Mills, 2015).

Table 1. Uses of resilience

Resilience as…	Purpose
Goal	To determine what to aim at
Analytical tool	To understand the problem and find better solutions
Metaphor	To help break disciplinary or sectoral silos
Indicator	As a part of development objectives and sustainability
Heuristic	As a basis for modelling or describing a system
Buzzword	As a strategy (e.g. to publish or attract funds)
No use	Used in name only

Source: Adapted from Béné et al. (2017a)

However, the same diversity of use that prompts critiques is seen as a strength by others, enabling those employing resilience approaches to select an interpretation that matches their particular goal, context or sector. Flexibility over use of the term can potentially be beneficial in bringing together otherwise disparate groups, institutions, disciplines and scales. Many international development agencies have used resilience as the basis for linking actions on climate change adaptation (CCA), disaster risk reduction (DRR), social protection, humanitarian response, peace-building and food security programming (Davies et al., 2013; Weichselgartner and Kelman, 2015; ActionAid International, 2016). Béné et al. (2016) find that the main value to food security and nutrition programmes is the integrative nature of resilience; it is a 'mobilising metaphor', enabling multidisciplinary collaboration between groups and communities of practice that frequently work in silos.

This use of resilience as a common language and an integrative 'boundary object' (Brand and Jax, 2007) has thereby been claimed to fuel creativity, joint problem-solving and articulation around shared goals (Strunz, 2012). Despite this, network analysis of academic research articles suggests that resilience has largely been employed within individual disciplinary silos (Baggio et al., 2015). Some have argued that this may be because many of the core resilience concepts drawn from the ecological systems are not compatible with those from the social sciences (Alexander, 2013; Olsson et al., 2015).

Resilience has created common language and goal-setting in the diverse post-2015 agreements: the Sendai Framework for Disaster Risk Reduction, the United Nations Sustainable Development Goals (SDGs), the Paris Agreement on Climate Change and the World Humanitarian Summit framework (Peters et al., 2016). In doing so, the concept has drawn together disparate or poorly connected actors, but differences in interpretation and weak policy linkages create challenges for joined-up actions have been highlighted as challenges for subsequent joined-up actions at national or subnational level (Matyas and Pelling, 2015; Peters et al., 2016).

2.2. Functional versus dynamic resilience

The critiques of resilience and the opportunities for using it more effectively have many roots – some applied, others conceptual. At their heart, however, tensions and opportunities both reflect a basic dichotomy between 'functional' and more 'dynamic' forms of understanding. This dichotomy reflects previous distinctions between engineering and dynamic resilience (Holling, 1996; Davoudi, 2012), but is extended here into the more practice-based consequences of these different framings.

Functional resilience is similar to earlier concepts of engineering resilience, or the ability of a system to return to equilibrium or a steady state (Holling, 1996). It is also similar to ecological resilience – the magnitude of disturbance that can be absorbed before a system changes its structure or function (Holling, 1996; Walker and Salt, 2012). Concepts of functional resilience do not exclude change or even the incremental transformation of systems, but the aim is to manage change processes deliberately. As such, resilience implies that key functional outputs, structures or relationships persist and desired trajectories are sustained and resume despite temporary dips caused by shocks and stresses (Woods, 2015).

In contrast to functional resilience, dynamic resilience can be seen as much more deeply rooted in notions of system complexity, uncertainty, surprise, non-linearity, adaptation, transformation and evolution (Carpenter et al., 2005; Davoudi, 2012; Folke et al., 2010; Bahadur et al., 2013). Rather than identifying desired outcomes or trajectories, it recognises the potential for multiple different 'metastable' system states (stable under small disturbances but potentially unstable when subjected to larger or compound disturbance).

Dynamic resilience describes the tendency of systems to resist collapse (maintain structure and function) or 'flip' when subject to accumulated stress or sudden disruption, thus remaining within a given 'metastable' state. Disruption, collapse and reorganisation are understood as inherent features of the cyclical adaptive processes that drive change within dynamic systems (Holling and Gunderson, 2002). Such change is episodic and processes occur at multiple scales and different rates from deep and slow (e.g. the gradual accumulation or depletion of groundwater resources) to short and fast (e.g. the turnover of businesses in a market economy). Because many such events involve processes occurring across scales or on different time frames, systemic interactions across scales and time frames ('panarchy') are fundamental to dynamic perspectives on resilience (Gunderson and Holling, 2002).

Practically, the distinction between functional and dynamic perspectives has significant implications for how resilience is conceptualised and acted upon. Dynamic approaches to resilience are more difficult to translate into implementation, programmatic or policy contexts than functional approaches. Functional perspectives emphasise what can be done now and what can be achieved within the existing governance context. They suggest that change and transformation can be managed through targeted interventions by existing organisations and within existing institutional frameworks (Weichselgartner and Kelman, 2015). White and O'Hare (2014) note that these resilience approaches are most common in spatial planning, characterised by a simple return to normality that is more analogous with planning norms, engineered responses, dominant interests, and techno-managerial trends.

By contrast, dynamic perspectives suggest courses of action that challenge existing operational silos, infrastructure norms, institutions, and political relationships. They imply that our ability to manage disruption, stress and change processes is difficult or limited (Berkes et al., 2008). The world is messy, dominated by uncertainty, surprise and the underpinning incentives driving agent behaviour. Collapse and disruption are inherent parts of the process (Gunderson and Holling, 2002). We may have the ability to influence the directions of change and possibly to manage disruption or encourage shifts toward more desirable states. Trade-offs are, however, inevitable and the ability to maintain or reach desired conditions cannot be assured (Chelleri et al., 2015).

Practically, dynamic approaches therefore necessitate much greater attention to iterative and experimental processes, where targets, strategies and goals are continuously adjusted across scales, sectors, and multiple potential arenas of action. This can imply the acceptance of socially, politically, demographically, environmentally, or otherwise difficult trade-offs. Rather than 'proofing' an area against disaster, climate or other disruptive change processes, for example, the goal might be to develop systems that fail safely and catalyse transformation (an example would be migration and the active depopulation of low-lying regions in the face of climate change). It could also imply altering institutional frameworks in ways that reshape agent incentives and power relations. This has a range of implications that can be difficult for most governments and organisations to accept.

Generally, functional resilience is, by contrast, much easier to operationalise because it implies immediately practical courses of action designed to maintain progress on social goals without necessarily challenging existing power structures beyond incremental changes (Pelling, 2011; White and O'Hare, 2014). As such, functional approaches to building resilience tend to be highly operational with management and implementation occurring through the projects, programmes and transactional relationships of major organisations operating within established institutional frameworks (Weichselgartner and Kelman, 2015).

2.3. Resilience and systems transformation

One of the core elements of resilience thinking, at least in its dynamic interpretation, is the understanding of interdependent systems operating at different scales. Systemic interactions occur across and between systems

that change across different scales and time frames (Gunderson and Holling, 2002). At the same time as the rise in popularity of resilience practice, there has been an increasing emphasis on transformation of these systems.

The conceptual relationship between transformation and resilience is muddied, because systems are said to transform in situations when:

- they return to significantly different conditions following disturbance because they lack sufficient resilience. This casts transformation as the flip from one state to another when a system reaches a tipping point (e.g. the collapse of a political or ecological system). This is common in discussions on biophysical systems such as polar ice sheets.
- change occurs as a response (or in anticipation of) a shock or stress, which can occur without the trauma of collapse. Actions that enable certain parts of a wider system to enhance their resilience are often described as transformative. Such forms of transformative change are often described as an inherent part of system resilience. This use of resilience is found in some conceptual frameworks (e.g. Jeans et al., 2016; ActionAid, 2016) and is also common to programmes that aim to build resilience among particular groups or sectors (Bahadur et al., 2015).

Discussions on transformation are proliferating in part because of the recognition that many resilience-building strategies actually support the status quo and the promotion of 'business as usual' (Brown, 2012; Reghezza-Zitt et al., 2012; Weichselgartner and Kelman, 2015). Debates on climate change have similarly questioned the need to go beyond adaptation as an adjustment within existing practices to more transformational change (Kates et al., 2012; Colloff et al., 2017). These critiques charge that the focus is on maintaining the ability to function and thrive. Current systems and paradigms may be modified but this largely occurs with those systems, institutions and paradigms being challenged (Pelling, 2011; O'Brien, 2012). Indeed, at the extreme, a return to the previous 'normal' state can imply returning to the conditions that actually caused the disaster or crisis. Kelman et al. (2015) note that this may be a state where women are oppressed, racial segregation is rife and poverty is endemic; such 'normality' may not be in line with development objectives. Conditions can be resilient but undesirable.

In practice, this idea of rebound to prior conditions may confuse the maintenance of function with maintenance of structure. Much resilience practice is now informed by the idea of 'bouncing forward' (Jeans et al., 2016), with the concept of 'build back better' included within Priority 4 of the Sendai Framework on Disaster Risk Reduction (Wahlström, 2015). This implies the need to alter the conditions underlying the previous disaster event to reduce future risk.

Just as in efforts to build resilience, defining normative values is critical to approaches to transformation. The transformational changes that are deliberately managed require value judgements on what is desirable or undesirable within a system. O'Brien (2012: 670) raises a number of important questions in the context of the growing interest in transformation as the 'solution' to environmental change and social sustainability, including the following.

- What exactly do we mean by transformation?
- What types of transformations are considered necessary and why?
- Who decides?
- Can transformations be carried out in a deliberative, participatory manner that is both ethical and sustainable?
- How can they occur at a scale that will make a difference?

Transformation can be viewed in terms of the scale and speed of the changes needed given the risks and vulnerabilities facing certain groups, regions or systems. For example, Kates et al. (2012), in their definition of transformational adaptations to climate change, include those that are adopted at a much larger scale, or that are truly new to a region or resource system (in essence, introducing new elements of structure or function). Other programmatic approaches see transformation in terms of the scale, speed and sustainability of results, or how interventions to build resilience have leveraged wider changes (Bahadur et al., 2015).

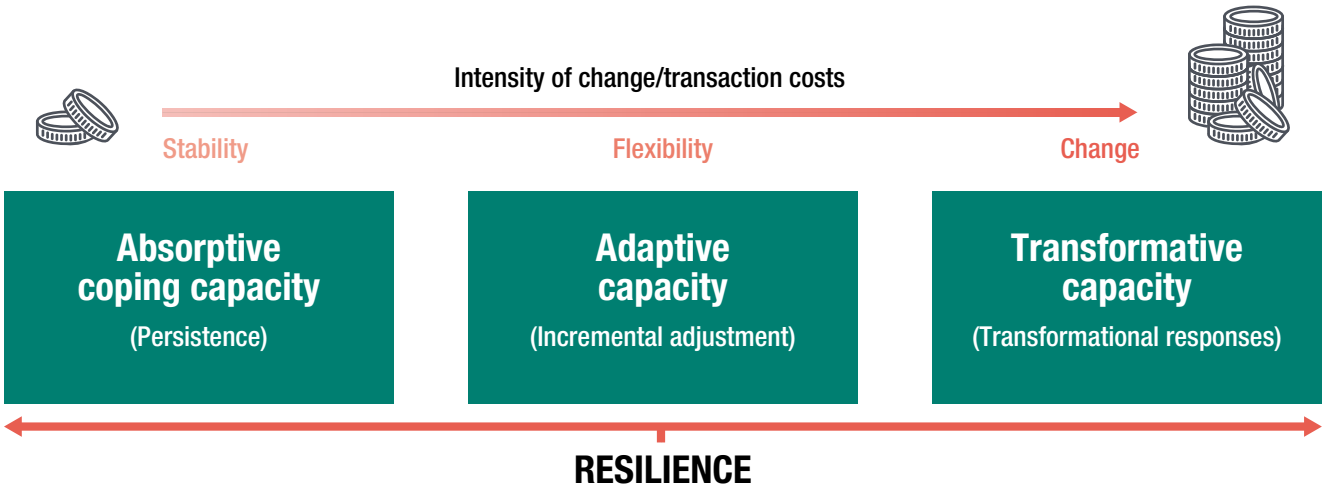
Transformation usually implies a clear break and shift away from one particular configuration of system components to another. This shift can be deliberate and managed or forced and unplanned (Walker et al., 2004; Folke et al., 2010). Managed/deliberate transformation has been described as an intentional process involving fundamental, systemic shifts in empowerment, values and beliefs, patterns of social behaviour, institutional structures, governance, technology or management regimes (Olsson et al., 2015). In contrast, forced transformation occurs when the accumulation of stress or impact of a sudden disruption causes the collapse or 'flipping' of a system into a fundamentally new state (Folke et al., 2010).

Managed/deliberate transformation can be seen in two ways. The first vision entails direct, deliberate and purposive action to structurally alter the configuration of system elements so that it flips into a new type of system in a short span of time (O'Brien, 2012). In these cases, there is a clear break or tipping point where the change in the system is palpable. Examples of this could include the passage of legislation that mandates the transition away from a particular socio-technical regime, such as shifting from a fossil fuel-based energy system to one that is more reliant on renewable energy (Kemp, 1994). This form of transformation is usually not described as integral to system resilience since it involves distinct shifts between stability domains.

The second vision of transformation also entails direct and deliberate action to structurally alter the system but entails a response or anticipation of shocks and stresses. These can combine, over a period of time, to deliver more systemic transformation. Examples of this could include actions to improve the economic and social position of women in a particular country through increased access to credit, education and decision-making spaces (Bahadur et al., 2015). Transformation as a response can therefore be seen as part of a continuum that extends from capacities for absorption through adaptation to transformation (Béné et al., 2012; see Figure 1).

Pelling (2011) argues that socioeconomic systems that permit the maximisation of personal economic wealth without considering social or environmental aspects of well-being result in a system that becomes locked into further entrenchment of risk and vulnerability for economically and politically marginalised people. These systems need to be reconfigured or 'transformed' through empowerment, rights and entitlements. Similarly, Cannon and Müller-Mahn (2010) argue that global institutional arrangements that privilege a system where 'economic growth' is the primary social goal are structurally antithetical to the idea of enhancing resilience to the impacts of climate change and therefore must be undone or transformed. Transformation has also been seen as a means of bringing issues of power and politics into the potentially value-free frameworks of resilience drawn from socio-ecological systems thinking (Bahadur and Tanner, 2014).

Figure 1. Resilience as the result of absorptive, adaptive and transformative capacities



Source: Béné et al. (2012)

3. Technical challenges

3.1. Navigating trade-offs

Trade-offs are increasingly bound up in a new political economy of resilience and resilience-building (Tanner and Allouche, 2011). They are perhaps most explicitly examined in resilience-building when the economic costs and benefits of actions are being evaluated. In this case, the opportunity costs of action are an integral part of the analysis, but distributional consequences may still be poorly treated. However, trade-offs in structure and function, governance scales, time scales, geographic areas and disturbances can be overlooked (Chelleri et al., 2015). Uncritical assumption of positive outcomes from resilience-building without adequate acknowledgement of trade-offs may fail to address different winners and losers or engage with the political processes that often mediate trade-offs between actors (Bahadur and Tanner, 2014).

For some, resilience thinking may pay inadequate attention to how conditions of society (such as improvements in human health and livelihoods) can come at the cost of environmental services (Turner, 2010). This is partly due to the failure to distinguish between the resilience of functions and the structures put in place to achieve them. For instance, constant electricity supply may be desirable, but the resilience of current fossil fuel-based methods to provide this may not (ibid.). There can also be trade-offs between resilience in the short term and in the long term. For example, developing new maize seed varieties may be one way to deal with shocks in food availability, but a move away from maize cultivation may be what is needed in light of a shift towards a drier climate. 'The focus on building resilience to shocks and ignoring long term stress may lead to robustness which inhibits adaptability and transformability' (Smith and Stirling, 2010: 4).

Trade-offs may also occur across time. In the context of climate change, Brown (2012) notes that the trade-offs between investments yielding immediate benefits and those that address longer-term impacts are difficult to negotiate. Those studying resilience in the context of psychology make a similar point, arguing that responses may resemble features of resilience and positive adaptation in the short term but yield very different results in the long term. For example, in one study, children whose mothers suffered from depression responded well when becoming caretakers of siblings in the short term but were more susceptible to anxiety and depression in the long term (Boyden and Cooper, 2006).

There can also be trade-offs across scales where enhancing resilience at one scale may erode resilience at another (Adger et al., 2005). For example, governments may revoke rights and entitlements from particular groups of people in particularly flood-prone geographical areas in order ensure the 'resilience' of a country or province (see Arnall, 2014, for examples of resettlement in Mozambique under the banner of climate adaptation policy). Trade-offs can also exist between geographic areas where, for instance, inner-city areas can be made much more resilient to flooding but only because excess water is being diverted towards poorer areas of the surrounding hinterland (see Bahadur and Tanner, 2014, for examples in Gorakpur, India). Trade-offs can also be made between types of shock or hazard, meaning that resilience to one kind of disturbance might lead to vulnerability to another kind (Béné et al., 2012). For example, building materials that are light and flexible may enhance the ability of houses to withstand earthquakes but could increase their vulnerability to cyclones.

3.2. Measuring resilience

Where the interpretation and definition of resilience is ambiguous (see section 2.1), then naturally measurement becomes contested and a major challenge. The choice of resilience indicators will depend, to some extent, on the system, subsystem or target group that is of interest. For example, assessing the resilience of an entire city and its economy will not necessarily reflect the resilience of a particular group or sector (e.g. slum-dwellers or the informal economy).

Many of the existing operational frameworks are designed primarily as mechanisms for organisations to diagnose issues and identify potential courses of action related to their capacity and mandates and/or report back to donors, governments and other decision-makers on their activities. In addition, most measurement frameworks reflect more functional rather than dynamic conceptualisations of resilience (ODI/MEL-COP, 2016). Nevertheless, those engaged in measuring resilience are now starting to take stock of common challenges and develop joint strategies accordingly (GIB, 2016; Gregorowski et al., 2017, see Table 2).

Table 2. Main challenges for monitoring, evaluation and learning around resilience

1. Integration	Integrating resilience measurement into standard workflows of ongoing programmes, and not keeping them as separate monitoring and evaluation (M&E) processes
2. Spatial levels	Linking evidence and building processes from local to national levels that inform, advise and guide resilience-building investments
3. Complexity	Addressing the issue of complex systems in M&E through connecting people who are working on innovative evaluation approaches and methods with a focus on resilience
4. Common frameworks and tools	Lacking commonly accepted frameworks, tools and databases to systematically generate and store evidence on resilience
5. Power and gender	Incorporating issues of vulnerability, power and gender effectively into resilience measurements
6. Large-scale investments	Establishing M&E for programme-level, large-scale investments
7. National capacity	Building capacity of M&E practitioners in the field, for building – and strengthening – the pipeline
8. Measurement of transformation	Bringing in effective methods for measurement of transformative capacity at levels above community, making more of the data we are collecting, and supporting more cross-fertilisation, maybe around common strategic goals
9. Systems-level measures	Developing systems-level indicators that measure capacities (anticipatory, adaptive and transformative) at scales greater than the household (e.g. cities)
10. Capacity to track large-scale changes	Applying capacities to larger scales, and measuring capacities at levels higher than household scale to determine applicability and to track changes
11. Systems-level resilience	Bringing in data and measurement techniques that can help capture systems-level resilience, rather than simple households (noting that 'simple' is a misnomer)
12. Indicators of systems-level resilience	Defining common indicators of resilience capacity and resilience outcomes at system, rather than individual, levels

Source: Gregorowski et al. (2017)

Process-based approaches focus on measuring the availability of resilience-building services or assets (see, for example, World Bank, 2012, in the context of the Pilot Programme for Climate Resilience (PPCR)). Others have drawn together sets of characteristics that combine to support resilient systems; see Twigg, 2007, for characteristics of resilient communities or Da Silva and Morera, 2014, for cities (see Figure 2).

A growing number of approaches are using a capacity-based framework to frame resilience measurement (for example, Bahadur et al., 2015; ActionAid, 2016; Jeans et al., 2016 (see Figure 3)). These variously measure resilience as emerging from a combination of anticipatory, absorptive, adaptive and transformative capacities, leading to different outcomes: persistence, incremental adjustment or transformational responses (Béné et al., 2012). Finally, metrics are emerging that are focused on resilience as outcomes, whether ongoing trajectories of economic development, food security outcomes, or reduced disaster losses (Béné, 2013; Barrett and Constas, 2014; Hallegatte, 2016).

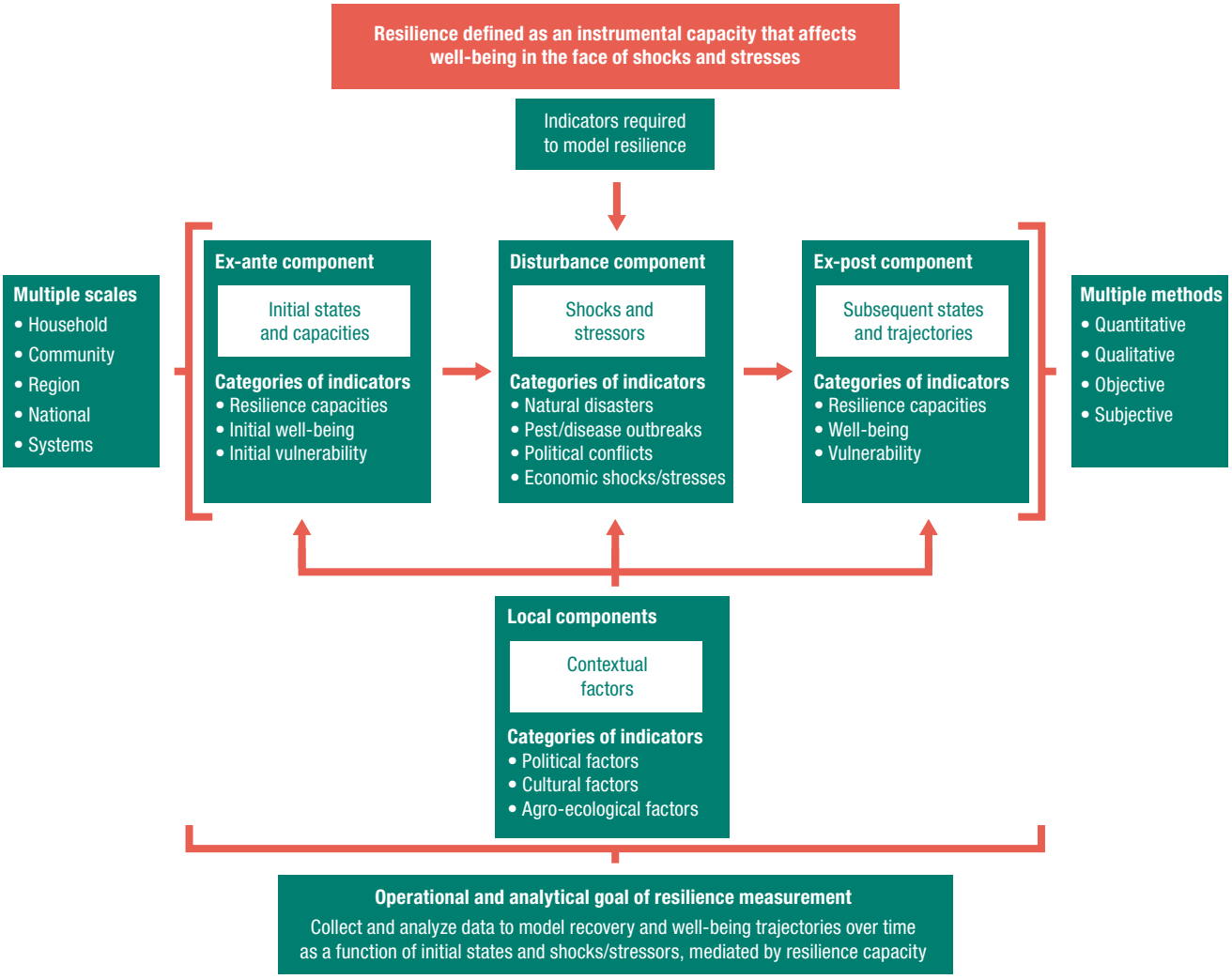
More dynamic resilience approaches call for measurement that goes beyond individual assets, or simply the dynamism of hazards, to capture how actions improve or erode the resilience of the wider system by affecting the flexibility to handle surprise and multiple interacting impacts. More comprehensive approaches therefore need to measure indicators across categories that include the following (Béné et al., 2015: 9):

- an *ex-ante component*: resilience capacity, initial well-being outcomes and initial vulnerability level
- a *disturbance component*: natural disasters, pest/disease outbreaks, political conflicts and economic shocks/stressors
- an *ex-post component*: resilience capacity, well-being outcomes and vulnerability level.

A major challenge emerges from the interdependence of systems and subsystems, and multiple hazards. For example, infrequent but higher-magnitude shocks will interact with recurrent stressors, such as waterlogging, that tend to be lower profile but may be critical to resilient livelihoods (Ayers, 2011). At the same time as assessing a mixed and dynamic hazard burden, resilience will relate to other changes in the system, including changes to the assets exposed (e.g. building more houses on the floodplain) or sensitivity of activities pursued (e.g. a move to more rain-dependent farming).

The interdependent nature of systems also makes any changes in resilience resulting from interventions in one sphere of activity difficult to discern, which complicates attribution. Measuring resilience therefore requires integrated approaches that can respond to multiple, interrelated and uncertain risks. This dynamism requires consistent definition and mapping, which is complicated in areas of rapid population flux and informality, such as urban areas of the developing world.

Figure 2. Resilience defined as an instrumental capacity that affects well-being in the face of shocks and stresses



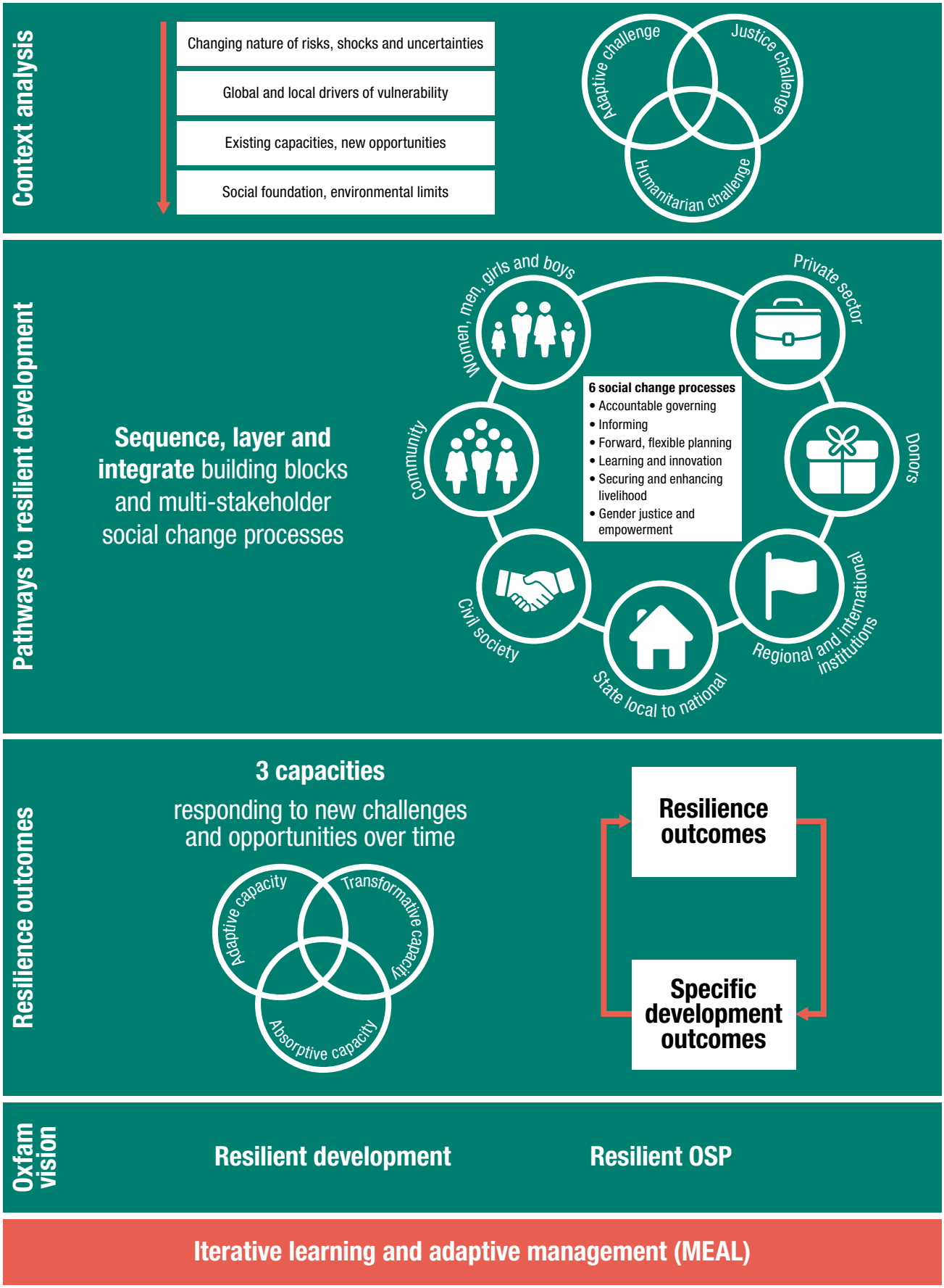
Source: Constas et al. (2014)

In reducing the complexity of measurement frameworks, most tend to be focused on proximate measures of resilience at the household, community or city level rather than larger systems or processes (Da Silva and Morera, 2014; Patel et al., 2017). Project and reporting cycles may also be too short to determine whether or not activities deliver real resilience benefits in relation to the much longer time scale on which stresses accumulate and episodic disruptive events occur. Measurement bias may occur through focusing on indicators that are easy to collect or measuring increases in resilience based on the attributes organisations have themselves defined or assumed as contributing to resilience (referred to by Béné et al. (2016) as circularity).

Another common challenge is that measurement can bias action towards elements that can be more easily measured and more easily quantified. A review of recent international resilience-building efforts by Weichselgartner and Kelman (2015) found that international recommendations for resilience-building are often based on unchallenged assumptions about the social world and are heavily reliant on quantitative data. As such, they fail to recognise the importance of qualitative data and the role of factors that cannot be captured through quantitative data such as power, governance and social capital. For example, case studies of community flood resilience in Nepal show the limitations of relying on outcome indicators and the need to measure and validate the role of resilience-building processes (such as grazing management practices, skills training, organisational skills and education) in determining these outcomes (Sudmeier and Jaboyedoff, 2013).

Alongside this qualitiative–quantitative distinction, there is growing acceptance that resilience can be determined not only by objectively determined indicators, but also by the subjective values and perceptions of people regarding what makes them resilient (Maxwell et al., 2016; Jones and Tanner, 2017). This may be both a qualitative or quantitative assessment, and can help to enhance stakeholder engagement and joint ownership of the resilience values that an intervention is seeking to realise.

Figure 3. Oxfam's Framework for Resilient Development



Source: Jeans et al. (2016)

3.3. Costing resilience

The rising burden of losses related to disaster and crises suggests that more compelling business cases are needed for investments to build resilience and protect human and environmental systems from damage. The total number of disaster events has been increasing since the 1980s, with this trend set to continue, driven by climate change, population growth, urbanisation, more people living in coastal areas and floodplains, and the degradation or loss of natural ecosystems (IPCC, 2012; UNISDR, 2015). Economic losses from 'natural' disasters are now reaching between $150 billion and $200 billion each year, up from $50 billion in the 1980s, while projected future disaster losses in the built environment alone are estimated at $314 billion per year (UNISDR, 2015).

Different groups of people involved in investment decisions around resilience, from citizens and business owners to civil servants and politicians, may have very different perspectives and interests. For example, in restoring peri-urban wetland habitats in Colombo, Sri Lanka, some people may be interested in protecting biodiversity whereas others may seek flood protection for high-value housing, industrial areas or informal settlements (Surminski and Tanner, 2016).

As with measurement in general, data challenges frustrate costing of resilience. Cost-benefit analysis (CBA) has traditionally been used for more straightforward single investments (such as whether to build a new bridge), where data can either be readily estimated from existing documentation or easily measured from observable phenomena (Shreve and Kelman, 2014). CBA may be less appropriate for resilience-building measures that are often more socially or economically focused and dependent on interactions with many variables. As such, demonstrating the benefits of an intervention in ways that are compelling to decision-makers can be difficult, even when such an intervention is clearly highly beneficial to target communities (Mochizuki et al., 2016). Economic costs and benefits are highly location-specific and sector-specific, and the choice is either to rely on proxies for economic returns that may not be entirely comparable or to undertake significant *ex-ante* appraisal.

Some types of investment in resilience lend themselves more easily than others to strong business cases. This can lead to bias in decision-making, with the choice reflecting the available data rather than the best course of action. Most often, it is easier to calculate the additional costs and potentially avoided losses for 'hard' investments such as protective infrastructure based on engineering designs. However, a growing number of resilience investments are in 'softer' institutional capacity, policy and planning, mainstreaming, information, and monitoring, which means that other tools such as cost-effectiveness analysis, multi-criteria analysis and robust decision-making approaches deserve more attention (Mechler, 2016).

There are also difficulties in calculating what the future losses would be without the resilience-building measure. Developing such 'counterfactuals' is demanding given the wide range of possible future hazards (especially under climate change) and the changing exposure of human systems under different economic development pathways. This also needs to factor in how much resilience would be created without a specific investment, either through autonomous measures or through other initiatives or government programmes (Béné et al., 2017b).

Longer-term investments in resilience are also a challenge because CBA calculations reduce the value of future benefits in today's terms (so-called 'discounting'). At the same time, investments in resilience typically cost more upfront, but longer-term investment horizons do not always fit with government terms or with the public wanting to see results for their money (Mochizuki et al., 2016).

Uncertainty around the nature, extent and severity of hazards also frustrates business cases for resilience-building actions. It is not always clear when a disaster or disruption will happen; this is even more pronounced in the case of climate change adaptation, where the economic appraisal is expected to incorporate the change in future hazard burdens.

Future uncertainty can also be tackled through the use of a range of future scenarios, which allows decision-makers to assess options for enhancing resilience in terms of their flexibility to incorporate future changes and whether they are robust enough to deliver resilience across different possible futures (Dittrich et al., 2016). Iterative risk management frameworks can also help identify low-regret options by supporting the framing, sequencing and prioritisation of early resilience-building measures – from national and programmatic level through to individual projects (Watkiss and Hunt, 2016).

Finally, an emerging approach to strengthen business cases for investing in resilience moves away from a singular focus on losses as a driver for action towards the recognition and appraisal of a broader set of 'resilience dividends' (Rodin, 2014; Surminksi and Tanner, 2017). This business case builds on understanding of the ancillary benefits or co-benefits of action and posits that investments to build resilience can be good for wealth, well-being, profit, growth and sustainable development, even in the absence of a disruptive event.

Understanding these dividends and incorporating them into planning and decision-making is critical to strengthening the business case for resilience investments. Presenting evidence of additional dividends to policy-makers and investors can provide a narrative that reconciles short- and long-term objectives, thereby improving the acceptability and feasibility of investments to strengthen resilience.

4. Political challenges

4.1. Agency and equity

A key challenge for resilience as a framing development goal is that the concept can be used to pursue a range of different goals, supporting a range of different values. Indeed, in considering resilience as an end or an outcome of action, much literature on social-ecological systems (SES) assumes that there is consensus on the 'desired state' or that a desired state even exists (Beymer-Farris et al., 2012). This has led some authors to note that 'resilience is in fact a neutral characteristic which, in itself, is neither good nor bad' (Béné et al., 2012: 13). From a theoretical perspective, resilience depends heavily on the nature of the system and the stresses it is subjected to: the resilience 'of what' 'to what'. 'There is a need to reflect on what precisely it is that is being made resilient, in the face of which specific dynamics, for whom and by what criteria this is good or bad, and whether such resilience is consequently problematic or not' (Smith and Stirling, 2010: 10).

This value-neutrality has been traced to the ecological origins of resilience thinking, with its more value-free natural science epistemology (Leach, 2008; Moench et al., 2015; Friend and Moench 2015). Swanstrom (2008) argues that resilience, as understood in natural systems, does not adequately address the ways in which risk/changes/disturbance can be actively constructed. He notes: 'We do not start from a state of nature but from a civil society in which resilience is shaped by laws, policies, and very human institutions… when applied to human systems, ecological resilience can overlook the crucial role of authorities in both nurturing and undermining resilience' (ibid: 16). Olssen et al. (2015) note these difficulties in transferring resilience thinking to the social sciences but also highlight the existence of some SES work that is more explicitly value-laden – for example, in trying to preserve ecosystem service flows for human use.

A key critique therefore argues that resilience thinking stresses the scientific, the technical and the rational elements of practice while paying inadequate attention to the human and social elements (Cannon and Müller-Mahn, 2010). This risks overlooking the role of individuals, groups and institutions in building (and weakening) resilience, and underplays their aims and values in doing so. As such, the role of politics and power in determining resilience can also be underemphasised (Bahadur and Tanner, 2014). Gillard (2016) argued that the current focus on socio-technical transitions and socio-ecological resilience for climate change describes system processes through a techno-centric or eco-centric lens, omitting social theory insights on human agency. This creates 'conceptual blind spots' about human agency, and ultimately results in a reformist rather than a radical response to climate change.

Underemphasising 'people' in resilience thinking also results in blindness to the inherent political complexity and power in issues of managing risk (Kuhlicke, 2013). Limited attention is then paid to the structures and forces that shape these challenges. As Swanstrom (2008: 18) notes: 'Resilience tends to treat stressors as generated by basically unpredictable forces in nature, such as storms, climate change, or forest fires. A forest cannot prevent fires or stop climate change. Humans can.'

The differences in structure and dynamics between environmental and social systems are also highlighted by Ernstson et al. (2010: 537), who argue that unlike environmental systems, social systems are 'self-constructed by society allowing different people to understand each other, share values and beliefs'. Resilience is contingent on social values about what we deem important and how we ought to allocate resources to foster it (O'Brien and Wolf, 2010). Attention to such values it central to the winners and losers of resilience building actions and the political processes mediating trade-offs between actors (see section 3.1).

Berkhout (2008) famously noted that resilience may not be a desirable characteristic and there may be good reasons for wanting to destroy or transform a system such as slavery, fascism, or fossil fuel-based energy systems. Equally, strategies may interpret resilience as a move to low-risk, low-return activities (for example, drought-tolerant cassava production) that may in turn close potential pathways to commercialisation, diversification and poverty reduction (Dercon, 2005). People may be perpetually locked into resilient but undesirable states of poverty and marginality (Tanner et al., 2015). Indeed, '… in practice, defining a problem for an individual or a society incurs normative judgments; what is "bad" is predicated on values, interests and assumptions'. The goals and processes of building resilience are not an objective reality but depend heavily on subjective interpretation (Boyden and Cooper, 2006: 6; Jones and Tanner, 2017). Often, there are contesting interpretations of risk and those that dominate are often attached to powerful interests (Keeley and Scoones, 2003).

Resilience thinking has therefore been challenged to focus on the ways that different groups of actors construct ideas of 'resilience' in order to pursue their interests

(Smith and Stirling, 2010). This provides an important means of enhancing people's place as active agents within the concept of resilience (Bahadur and Tanner, 2014).

This value-neutrality has also highlighted the weak engagement with issues of equity and equality in resilience thinking and practice (Leichenko, 2011; Friend and Moench, 2015). As noted in section 3.1, building resilience for some scales, locations or groups of people can come at the expense of others, whereby resilience becomes a mechanism of 'vulnerability transfer' (Sapountzaki, 2007). Within functional approaches, resilience may not be explicitly recognised in the same way as it has been under framing concepts of vulnerability (Cannon and Müller-Mahn, 2010). Within dynamic resilience approaches, the acceptance of uncertainty and inevitable transformational shifts may present loss of life and suffering as part and parcel of the dynamic process.

Without defining goals in terms of the resilience of a system, we may overlook conflicts over resources, resilience-building and the importance of power asymmetries (Gaillard, 2007; Cannon and Müller-Mahn, 2010; Beymer-Farris et al., 2012). As a result, there have been calls for more attention to the question of 'resilience for whom' and the integration of rights-based approaches within resilience practice to explicitly inject values (Friend and Moench, 2015; Tanner et al., 2015).

4.2. Resilience as a depoliticising narrative

As the resilience concept has been popularised, it has also become prone to appropriation as a narrative to further particular goals and aims. One possibility is that a focus on resilience can help absolve industrialised nations of their responsibility towards the vulnerable populations in the global South by framing issues in a way that makes populations affected by climate change responsible for securing themselves.

Resilience as a narrative has been interpreted as depoliticising the global negotiations over climate change and finance. This reflects the separation between a 'convention' and 'development' perspective. The former dominates the United Nations Framework Convention on Climate Change (UNFCCC), focusing on the incremental element that climate change adds to the current variability of the climate, while the latter accepts all sustainable development benefits, not only the global ones, and makes no distinction about costs or 'who pays' (Burton and van Aalst, 2004). 'Adaptation' in the UNFCCC embodies the idea of payment of compensation by the historically polluting industrialised countries to the less industrialised countries for the costs of climate change. This implied responsibility has increasingly been diverted into debates on 'loss and damage' from climate change, while 'adaptation' has been increasingly replaced by the use of 'resilience', which implies a more shared problem and shared responsibilities for action. From a climate justice perspective, this can be interpreted as an attempt by dominant power structures to place the burden back on the most affected countries (Brown, 2012).

Equally, this depoliticising effect could bring benefits, enabling conversations in the negotiations that would otherwise stall if framed around compensation and questions of payments for loss and damage caused by climate change. Similarly, outside the UN climate fora, resilience terminology takes the audience away from the politics of compensation to enable a compelling story about development and risk within other international and national arenas (Peters et al., 2016).

Focusing on migration, Methmann and Oels (2015) argue that employing 'resilience' as a response to climate change prevents a more thorough engagement with the structural issues that drive migration. As a result, they claim that it legitimises a discourse where the climate-induced migration of millions of people is '… rendered as a "normal", rational and therefore acceptable response to changing environments, which are presented as being beyond human control'.

4.3. Resilience as 'governmentality'

One emerging set of challenges places the resilience concept within the context of neoliberalism. These have commonly interpreted resilience as 'governmentality' (control through governance) through which neoliberal ideas and discourses are perpetuated and embedded in particular governance systems. These accounts question the use of localism in resilience discourses and critique its inherent neoliberalism (Gillard, 2016). The emphases in resilience approaches on agency, individual preparedness, adaptability and 'bouncing back' are seen as part of a shift in emphasis that 'encourages the idea of active citizenship, whereby people, rather than relying on the state, take responsibility for their own social and economic well-being' (Joseph, 2013: 42).

Some commentators have thereby argued that resilience can be (mis)used as a narrative that enables governments to deprive subjects of their rights, or transfer responsibility of government authorities to provide services to local residents (Joseph, 2013; Welsh, 2014). Rinne and Nygren (2015), for example, argue that framing the problem of urban flooding in Mexico in terms of resilience has facilitated the propagation of a view that battling floods is less a responsibility of the state and more about 'self-responsibility' and 'self-governance'.

Some of this critique cited above has emerged in richer countries in response to security threats, such as the 9/11 attacks in New York (Joseph, 2013; Welsh, 2014). Others have argued that resilience can be better understood as part of the process of reframing norms, values and organisational structures than as a response to such threats (Zebrowski, 2008). As part of this discourse, resilience is described as a means of exerting control, or appearing to exert control, over complex challenges (O'Hare and White, 2013). The resilience discourse is sustained

and legitimised by subjecting individuals to conditions of unpredictability, novelty, vulnerability and transformation (Welsh, 2014). O'Malley (2010) suggests that in doing so, resilience acts as a means to create adaptable subjects capable of adapting to and exploiting situations of radical uncertainty.

Others have engaged with the localism promoted by this interpretation of resilience as a policy narrative to highlight the potential opportunity to re-engage with 'the local' and the highly contextual nature of vulnerability (Kelman, 2008). While this can also be seen as abdicating the state from its responsibilities, this vision of resilience places the emphasis on the self-empowerment of local actors, not on the imposition of solutions developed externally to the local contexts in which they are applied (Chandler, 2014). In this sense, the emphasis in resilience on self-organisation and internal capacities can be seen as a liberating and empowering concept, encouraging devolution of power and exercise of free will. Self-organisation is seen as an inherent process following disruption, often allowing communities and localities to mobilise faster than governments can following a disaster.

Such mobilisation can also foster alternatives and challenge the forces creating risk and vulnerability. This can be seen in emergent behaviours following disasters, such as the formation of the independent 'Mudslingers' group to help citizens dig their homes and belongings out of the debris following the 2013 floods in Boulder, Colorado (MacClune et al., 2014). Similarly, Cretney and Bond (2014) interpret such emergent community projects following the Christchurch (New Zealand) earthquake of 2011 as signs that resilience can hold more radical potential to challenge everyday capitalist life.

5. Next steps for practice

The preceding sections have summarised key debates on the concept and practice of resilience. By way of conclusion, the following questions are intended to highlight some of the fundamental issues these debates raise in order to realise the potential and address the limitations of resilience thinking and practice.

1. Should resilience practitioners attempt to create common definitions, tenets and metrics, or is there greater value for practice in the diversity of interpretation?
2. Is the emphasis in applied contexts on more functional formulations of resilience as opposed to more dynamic concepts an operational necessity or is it fundamentally flawed as a representation of the real world?
3. What, if any, are the advantages of clarifying the practical distinction and links between the concepts of resilience, adaptation and transformation?
4. Can a common set of metrics or ground rules helpfully inform resilience measurement, and if so, how?
5. What are the distributional costs and benefits of different resilience-building actions (in economic and other terms) and how can such understanding foster proactive resilience-building and risk management?
6. Should resilience definitions explicitly incorporate normative values and potential trade-offs or is it better to maintain the descriptive neutrality of the term and state values separately?
7. Can avenues be identified for bridging perspectives that emphasise power, politics and vulnerability with dynamic perspectives emerging from work on complex adaptive systems?
8. What is the empirical evidence that resilience narratives have a depoliticising effect or can lead to governmentality and change in state–society relationships?

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