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Avi Sharma (eds.)

URBAN RESILIENCE IN A GLOBAL CONTEXT

Actors, Narratives, and Temporalities

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Urban Resilience in a Global Context

Urban Studies

For Anika and Felix

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Dorothee Brantz and Avi Sharma

In the early 21ˢᵗ century, resilience has become the preferred policy constellation to address futures that are extremely uncertain but that are likely to be extreme. The Bloomberg and Rockefeller Foundations have resilient cities programming, as do the World Bank, Asia Development Bank, and dozens of other mega-organizations. Resilience plays an important role in the UN Sustainable Development Goals, which have set global development targets for more than one hundred nations through 2030, and have on-the-ground impacts that will shape lives in all corners of the planet for a generation (Sharma 2015: 592).[1] As Aditya Bahadur and others have argued, "The vision set out in the SDGs – for people, planet, prosperity and peace – will inevitably fail if shocks and stresses are not addressed [...] A focus on strengthening resilience can protect development gains and ensure people have the resources and capacities to better reduce, prevent, anticipate, absorb and adapt to a range of shocks, stresses, risks and uncertainties" (Bahadur et al. 2015: 2).[2] Some argue that resilience is simply a trendy term, one that has gained currency in a variety of sectors because it is easy to use and extremely flexible. This may be true. But resilience as a development discourse and an urban practice directly impacts the lives of hundreds of millions of the world's most vulnerable people: It is at the core of funding, development, and aid initiatives worth tens of billions of dollars. This alone – the fact that resilience does and will continue to shape lived realities across the planet – is a reason to think seriously about the concept, discourse, and practice.

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1   More than 1.3 million stakeholders participated in the development of the 17 'universal principles' that make up the SDGs.

2   Resilience is acknowledged both explicitly and implicitly in a range of the proposed SDG targets. Target 1.5 represents the core resilience target, as follows: "By 2030 build the resilience of the poor and those in vulnerable situations, and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters."

Critical Claims about Resilience Practices

Resilience has been applied to a range of issues and at a variety of scales – from global financial and ecological systems to human development – but cities have become a particular object for resilience approaches (Chandler/Coaffee 2016). There are a host of reasons why this is the case. As population, commercial, religious, and political centers, cities have always served as amplifiers, and when disruptions do occur, they are felt with particular intensity in urban centers. When, for example, a natural disaster impacts a city, the sheer density of the population and built environment regularly contributes to higher mortality rates; when financial crises occur, urban centers are impacted more visibly than other areas because they concentrate financial and other capital institutions (Amin 2014: 308–9). At least since the Second World War, the vulnerability of urban systems has been noted by armed forces – military strategists, militias, terrorist groups – who have recognized that attacking cities can achieve a maximal return on investment (Coaffee et al. 2009: 4; 9-27).

Cities are extremely vulnerable to a range of disruptions, but they are also (allegedly) extremely resilient. In their seminal 2005 publication, urbanists Vale and Campanella note that between the years 1100 and 1800, only 42 cities damaged by natural disasters, military conflicts, or other causes were abandoned, and the rate of rebuilding has, again according to Vale and Campanella, risen since 1800 (Vale/Campanella 2005).[3] There are a variety of reasons why, historically, cities have not been abandoned: urban development is accompanied by property rights and enormous sunk costs, and rebuilding is typically a common agenda for diverse stakeholders and interest groups, even those who are in other instances bitterly opposed. Cities are also repositories of shared memory and civic pride, and making sure that cities are rebuilt after a disaster – or recover from different kinds of disruption – is a matter of great symbolic significance. Research by Vale and Campanella; Jon Coaffee and others suggests that 'resilience' is in the very DNA of the urban.

In recent years cities across the world are developing resilience strategies, often with assistance from well-financed foundations and other civil society actors. In 2013, for example, the Rockefeller Foundation launched the 100 Resilient Cities initiative, which would assist and guide selected cities in their efforts to develop a 'robust resilience strategy.' There are dozens of other foundations, corporations,

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3   This may now be changing. In a small but growing number of cases, city and state actors are deploying a strategy known as 'managed retreat' rather than rebuilding. If this continues – and given the likely impacts of climate change, one expects that it will – this will represent a fundamental reorientation in the areas of planning, insurance, ecological and environmental preservation, as well as property ownership.

consultancies, NGOs, IGOs, and governmental agencies working at all scales to advance resilience thinking. And the urban occupies a crucial space in planning for more 'resilient futures.' Advocates of more resilient cities believe that planning can enhance the capacity of subnational actors to respond to crisis scenarios. From disaster management to community advocates, financial institutions to the builders of urban infrastructures, it appears that everyone wants to build more resilient cities.

As resilience discourses have gained in popularity, though, they have also generated opposition. Some critics argue that resilience is part of a larger neoliberal project that leverages real or perceived crises to justify policy agenda that would otherwise be unpalatable to the public and the international community (Cretney 2014; Diprose 2014; Slater 2014; Kaika 2017). Most obviously, critics are concerned about the way that resilience is used to push non-governmental solutions to challenges that have typically been the responsibility of the state. In the aftermath of Hurricane Katrina, for example, it was widely noted that politicians and media outlets praised the resilience of city residents only *after* state actors failed to contain a slow-moving catastrophe (Kaika 2017). Community activists and critics around the world argue that resilience is part of a larger neoliberal project that pushes responsibility for extreme situations onto small scale actors. Resilience is, in this view, the mask that hides the face of the shrinking state (Derrickson/MacKinnon 2013; Slater 2014).

A growing community of scholars has argued that resilience is itself a product of the crisis-driven cycle of (neoliberal) capitalism (Pelling 2003; Eraydin 2013: 19–20). As deregulation expands on a global scale, the hedges against dangerous land use practices, the protections against financial melt-down, the robustness of disaster relief agencies, the funding of international aid initiatives have all been degraded. We as a species are, ourselves, expanding the threats to which we are subject. Humans are more at risk to extreme weather events because we have changed the climate through our everyday practices; societies are more exposed to military conflict, terrorism, and ordinary violence because military grade weaponry is easily available on the market; we are more likely to see catastrophic damage due to natural disasters because population growth and, more importantly, real estate speculation has seen the continual expansion of human settlement on geologically and ecologically unsuitable lands. We are living in a world that is riskier, and it is riskier because we made it that way (ibid: 19–25). In this view, resilience is a band-aid to self-inflicted wounds (Castree 2010; Cretney 2014; Diprose 2014). The porousness of the term, its vagueness, the variety of ways that it is used – and as we shall see, it is used in more than two dozen ways (Meerow/Newell 2016: 41) – is perfectly suited to provide humanitarian and ecological window-dressing to otherwise loathsome projects. Resilience may be an increasingly ubiquitous policy framework, but it is hardly uncontested.

The disagreements cited above are, to a very large degree, ideological in nature. There are also, though, disciplinary and professional tensions that explain why resilience is a contested concept, and much of this is structured into the very nature of professional practice. Hurricane Katrina is probably the most discussed example of these kinds of structural differences, though it is hardly unique. When, for example, massive rainfalls caused flash flooding and mudslides in Vargas state, Venezuela in 1999, the damage was extraordinary.[4] Tens of thousands were killed, more than 75.000 lost their homes, food, water, and electricity supply were profoundly disrupted, the capacities of local, state, federal and non-governmental actors were stretched to the breaking point (Schieder 1957: 65; Takahashi et al. 2001: 65; Genatios/Lafuente 2003). The most vulnerable citizens – those with limited transportation, financial, physical, mental, or emotional resources – were the most dramatically impacted. Actors across the political and demographic spectrum called for immediate assistance. Newly elected president Hugo Chavez simultaneously declared martial law (mobilizing the state apparatus) and urged residents to "adopt a family" impacted by the disaster during the approaching Christmas holiday season (Long 1999). Unlike Hurricane Katrina, which occurred in a strongly neoliberal context, *La Tragedia* played out in a state-socialist one. It too, though, was defined by high levels of engagement by civil society actors. Volunteer police and fire, relief agencies like the Red Cross, and individuals travelled to the impact zone or sent financial or other aid.

Architects, designers, planners, engineers, logistics and development professionals also donated time and resources to relief and rehabilitation. These were people who, whatever their social, political, or other commitments, saw a problem, recognized its profound impact on human lives, and wanted to act. The act of intervening is, to a great extent, a personal choice, but it is also informed by a professional ethos. Practice-oriented disciplines teach that identifying a clear causal chain – of impact, effect, and solution – is the way to achieve meaningful transformations in the lives of those impacted. Simply stated, torrential rainfall was the cause of disruption, the destruction of housing and infrastructure was the effect, and rebuilding shelter and infrastructure was the needed solution. This is not to say that practice-oriented professionals were unaware of the larger socio-political, global economic or ecological factors that shaped the Vargas floods. It is simply to emphasize that their pressing professional imperative was to help people with their immediate problems, and to assist in short and medium-term rebuilding. For architects, designers, engineers, planners, logistics and development professionals,

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4   Cities, peri-urban, and rural areas across Vargas were impacted, creating, sadly, many opportunities to explore differential responses to different kinds of human settlements.

the nature of the crisis, its impact, and the way forward to relief, rebuilding, and rehabilitation was more or less clear.[5]

Critical geographers, historians, and urbanists typically respond to crises like the Vargas floods rather differently. Many point out that the most affected populations are the poorest ones; that there are race, gender, and class dynamics that shape the way disasters effect individuals; that the financial and material sourcing of aid differs depending on whether the impacted city is in the global north or the global south. In cases like Vargas, they point out that, while the proximate cause of the crisis may have been rainfall, the deregulation of land-use practices, speculative development, under-resourced infrastructure, poor strategic planning, and extreme inequality were all reasons for the way that *La Tragedia* played out (Hartman/Squires 2006; Castree 2010; Fainstein 2015; Squires 2015). Hundreds of thousands of people, they rightly argue, were affected in different ways by the same event because of socio-political and political-economic unevenness that was historically and sociologically rooted. Highly urbanized and mostly poor districts built on alluvial fans formed by earlier flood events were the hardest-hit areas. In some cases, whole villages and shantytowns were swept into the sea.

In the view of critical scholars, solving the problem is not about restoring the Vargas and other regions impacted by disaster (natural or otherwise) to the way they were before. Indeed, 'the way things were before' is a central part of the problem. In this view, a resilience approach reproduces the unevenness of existing social realities and, in doing so, both justifies and further entrenches those inequalities. This example, which could be easily multiplied, shows that even when researchers and practitioners agree on broad goals – for example, rebuilding homes after a natural disaster; limiting reliance on agricultural or financial monocultures – they often disagree on the causal logics of disruption and, by extension, the necessary responses.

This is not a particularly controversial claim, and we the editors have often encountered this tension between planning, practice, and critique in academic settings that bring together researchers and practitioners. In their edited volume on resilient planning, Eraydin and Taşan-Kok argue that this tension between practice-oriented disciplines and critical urbanists is itself a product of neoliberalism. Planning, they argue, has since the 1970s "become increasingly market-oriented and entrepreneurial [...]. All around the world, urban development has become

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5   This can be seen in the excellent article by civil engineering experts Nakagawa Takahashi *et al*., who discuss the uneven economic geographies of rural and urban regions in Vargas, before turning to a plan to increase "conveyance capacity" of the San Julian River. While they clearly recognize the significance of economic and spatial inequality in shaping the impacts of *La Tragedia*, the solutions – drawing in substantial part on Japanese experience with natural disaster – is essentially technocratic. (Takahashi et al. 2001: 71; 80).

increasingly fragmented [...] with opportunity-led planning practices taking root everywhere in reaction to rapid and complex change" (Eraydın/Taşan-Kok 2013: 4). In their own calls for a shift towards a "resilient planning" paradigm, Eraydın and Taşan-Kok argue that architects and planners have increasingly been forced to design and plan for the short and medium term, to package and sell plans to stakeholders who are committed to market principles, and this is an important point. The question, then, is whether we can find ways to balance the short-term perspectives based on pressing needs with a longer-term view that focuses on structural and intersectional causes. In our view, disruptions to everyday life – from earthquakes to uneven access to water – must be addressed both in terms of their immediate causes and effects, as well as their longer terms drivers and desired outcomes.

This volume is motivated by a number of different but related assumptions. First, and most obviously, is that crises of various kinds do regularly happen around the world, and that the people affected by those crises should be helped. What that help should look like is, in our view, a contextual question that deserves attention that is both means and ends oriented. Second, we think that there are good reasons to disagree about what resilience means, and how it can and should be implemented. Should the focus of resilience be on long-term planning, the creation of redundancies and silent systems, as some critical scholarship suggests? Or should it aim at the most rapidly possible return to the status quo ante, as was the case with the 19th century Japanese cities detailed by Carola Hein (Hein 2005)? Essays in this volume, particularly Florian Liedtke's and Andreas Wesener's respective contributions on the 1995 Kobe and 2011 Christchurch earthquakes, delineate how both things are possible and, indeed, relatively easily so. Resilience policy and practitioners are, indeed, vulnerable to cooptation by neoliberal agendas, and this rightly concerns critics. This does not, however, change the fact that crises occur, people are affected, and those people deserve aid and attention. Christian Parenti has argued, in a slightly different context, that the work of achieving the best possible solution should not be a reason to take the difficult steps of implementing approaches that are better than the ones that are currently in place (Parenti 2013). We believe that eradicating poverty, race and gender discrimination, finding a robust role for the state, enhancing protections for the environment are all desirable long *and* short-term goals that should make up a common agenda.

There are, of course, alternatives to resilience, including those compellingly made by eco-socialists like Ian Angus, John Bellamy Foster, Ramchandra Guha, Joel Kovel and others (Guha/Martinez-Alier 1997; Kovel 2002; Dawson 2016; Foster/Angus 2016) who propose a systematic transformation of the planetary systems that undergird inequality and exploitation of humans, plants, animals, and the planet itself. These alternatives are very powerful, but they are also focused on a distant horizon. The needs of actually existing people, animals, ecosystems, and the environment also demand that we act with immediacy, and this sometimes means

implementing incremental solutions as we pursue transformational ones. In short, ideological, disciplinary, or professional disagreement should not preclude spaces of potentially life-saving action. Finally, it is also worth remembering that resilience is both a well-funded and politically compelling umbrella terminology that brings together stakeholders – vulnerable and powerful – across the world. This should not be ignored, because generating consensus among international actors at different scales is extremely challenging.

Conceptual Foundations of the Book

When we began working on this volume, we thought that we would resolve troubling ideological tensions within resilience discourse, and help to generate a framework that would make resilience both more concrete and more conceptually robust. In this sense, our initial goals fit quite comfortably within the universe of already existing work. Our goals though, have evolved as we struggled to understand the strengths and weaknesses of resilience as discourse, policy, and practice. And working with the authors in this volume, it has become clear to us that we could contribute to a conversation between researchers and practitioners not by doing more definitional or even genealogical work. There is already excellent work that lays out highly differentiated definitions, develops indicators, and proposes concrete strategies for resilience (Müller 2011; Taşan-Kok et al. 2013; Meerow/Newell 2016; Zhang/Li 2018). We think that we can add a new perspective by moving in a very different direction. Resilience is applied to different kinds of disruptions that take place in dramatically different circumstances; it is theorized and practiced in global cities, small towns, and remote villages; it is, in the best cases, changing and evolving to respond to on the ground needs and long-term goals. So why not take seriously the dynamic nature of resilience, instead of trying to constrain an unruly concept with definitions that never quite seem to fit?

   The present volume brings together historical and contemporary research on cities from Kobe to Medellín, the Arctic Circle to New Zealand. Contributors include planners, architects, engineers, sociologists, historians, and development experts. The authors write about post-earthquake scenarios, post-conflict recovery, urban policy, social solidarity and informal economies, and in part because of the different objects of inquiry, the different temporal scales, and the different agenda, they use resilience in different ways. None of these individual case studies is supposed to offer a totalizing perspective. Each is supposed to highlight the fractured and context-specific nature of resilience thinking, policy, and practice. Indeed, in our view, resilience should continuously be defined and redefined in negotiations between different actors working at different scales with often diverging agendas working in anticipation of or response to different phenomena and processes. In-

ternational aid agencies, environmentalists, community rights activists, citizens rich and poor – the different actors who act in actual situations – should negotiate what they mean and want from resilience. By treating the concept's varied usages as an essential characteristic; opening its definition to different interpretations, case specificity, and everyday usages we see a way to build on the strengths of resilience as a set of practices, while also recognizing ideological risks, political failings, and policy pitfalls.

This approach draws on insights generated nearly a century ago. Linguists like Ferdinand de Saussure argued that words and their meaning are essentially contextual, and they evolve in a negotiation between the people who use those words.[6] This is precisely how we think resilience should be used in part because this kind of usage would make it possible for researchers and practitioners who work on different cases with more or less different assumptions to contribute to a common project of making resilience better at achieving desired goals like enhancing solidarity and inclusiveness, reducing environmental and ecological impacts and risks and so on. And, in our view, these negotiations must account for the other actors who are impacted by resilience policy and practice, even if they do not speak. This includes the flora and fauna, the atmosphere and biosphere as well as physical infrastructures and technological systems.

Using resilience in its contextual, vernacular, everyday sense creates space for negotiation between different sets of actors, and opens up the possibility for new common understandings to emerge. And this is essential, because 'resilient responses' and 'resilience building' should be different in different contexts. Most obviously, resilient responses can and should vary in terms of the systems being addressed: building a resilient ecosystem is, for example, different than (and potentially at odds with) creating resilient financial institutions. But the nature of the disruption is perhaps less important than the sociological, political, cultural, and ecological differences between places and across scales. It matters, for example, whether one is attempting to create resilience in small agricultural communities or in a mega-city; in coastal areas or the mountains; in rich countries or poor ones; in Nordic style social democracies or command economies; in places where the communitarian ethos is strong or society is enclaved. The chapters in this collection illustrate, among other things, how important historical logics, geographical, institutional, and contextual differences can be.

Sönke Kunkel's chapter on the socio-technology of disaster prevention and mitigation during the cold war, for example, shows how troubling and potentially authoritarian assumptions continue to freight present-day resilience strategies. He alerts us to the way that language, technology, and policy all contribute to path

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6   This is not to say that de Saussure argued that individuals determine meaning, but rather to point out that meaning is negotiated in practice.

dependencies which can, nevertheless, be avoided. Another chapter by Ann Maudsley explores architecture and planning in extreme environments, and reminds us that public-private partnerships carry both risks and opportunities. This is not in itself a revelation, but looking at the way that actually built communities in the arctic circle have survived and failed tells us something far more specific than a general rejection of the P-P-P model can. Ann's case shows that partnerships with particular kinds of private partners might be particularly problematic. And unfortunately, these are precisely the partners that are so active today. Marcela Lopez writes about the formalization of car washes in present-day Medellìn, and her essay offers a different perspective on P-P-Ps, in this case showing how mutual interests can indeed generate spaces of resilience and protection. She argues that the characteristics of the private partners are extremely important for explaining how and when these can reasonably be expected to yield benefits to the community and the environment, and when these benefits are unlikely to materialize. The anthropologically and historically centered research in this volume shows that one size fits all approaches to resilience lend themselves to co-optation by powerful actors with questionable motives.

Acknowledging the usefulness of a contextual, vernacular, everyday usage of resilience would also generate a methodological flexibility that builds on some of the more desirable logics of the term itself. There is broad agreement in planning and development communities that co-creative approaches are the key to crafting effective resilience strategies – a top-down approach to disruptions of diverse kinds is demonstrably less effective than approaches that engage local actors. Critical urbanists agree with planners that local communities and a range of vulnerable stakeholders should be given a voice in the ways that their communities respond to disaster. Given this space of agreement between advocates and critics, then, it makes sense to build methodological flexibility that privileges co-creativity into the very structure of resilience approaches. The principle of co-creativity would entail a kind of ad hoc methodology which combines the merits of the global best practices approach (advocated by, for example, the RC100) with an extreme sensitivity to specific contexts, local needs and conditions, and community input.

These two perspectives appear to lead in very different directions, and indeed, in practice, they do. The first approach is anchored in globally centralized, top-down, and technocratic strategies which are (despite substantial critique) extremely important. The latter is based on local, bottom-up, and often idiosyncratic tactics that are very much in vogue in some circles. But there is no real reason that planning for, and responding to, crisis should preclude a collaborative approach which brings together these distinct bodies of strategy and tactic. Indeed, the merits of wedding a best-practices approach to one that takes local knowledge, needs, and aspirations seriously is that it overcomes the twin problems of power and parochialism that are so often a part of preparing for and responding to crisis. And

despite the widespread tendency to define, classify, codify, and measure, an ad hoc approach that uses available tools and resources – whether they come from the United Nations, a corporate or family foundation, The Red Crescent, the village council, the alderman's office, the local hardware shop, the central bank or the labor union – is what actually happens in practice anyways.

There are obvious problems with this approach. First, resilience as a global development project that is the target of massive investment needs indicators in order to assess whether certain strategies are achieving their desired goals. Second, an everyday, vernacular approach to resilience is also open to agenda capture by corporate actors. If resilience is not defined in very specific ways that apply to very particular sets of circumstances, then any kind of initiative, policy, or funding stream can be described as resilience enhancing. Third, if resilience is used by different stakeholders in different ways, resilience strategies can collide or even cancel one another out. As already mentioned, the goal of building more resilient ecosystems may be coincident with that of creating more resilient food production, but may well be at odds with the project of building more resilient financial institutions. Fourth, and in very much the same vein, an ad hoc, vernacular, everyday usage of resilience can lead to what is called mal-adaptation. Such a mal-adapted usage might seemingly promote resilience on one level, while actually serving to multiply vulnerabilities on another, which is particularly problematic if it further perpetuates already existing social and environmental inequalities (Dawson 2017).

These are all reasonable objections, but it is worth pointing out that there is a rather substantial literature that is focused on definitions, indicators, metrics, evaluation and so on. This literature is, in our view, important in hedging against those objections catalogued above. We believe that the perspectives presented here add to the richness of this existing literature, and add useful insights about a collaborative approach to resilience that is process-based and respectful of difference. The cases in this book suggest that by learning about resilience in diverse historical and contemporary cases, we can also learn how to better enact resilience as a process negotiated by a huge number of actors who are simultaneously embedded in multiple temporalities that are parts of many and sometimes competing narratives. Instead of defining resilience, we want to open it up to on-the-ground contestation that includes different actors and temporalities representing different narratives of the same phenomenon.

Concepts as Strategies: Actors, Narratives, and Temporalities

Resilience thinking has been applied to everything from human development to systems engineering, and this is one of the reasons that critics believe the terminology has become hopelessly vague. But is this actually true? Are engineers,

psychologists, international aid agencies, and ecologists really talking about such different things? We have already discussed some of the definitions of resilience, some of the differences between them, and the array of topics they address. As stated above, we are not convinced that it is necessary to seek a clear-cut definition of resilience, but in terms of clarification we would like to highlight three distinct aspects – actors, narratives, and temporalities.

Firstly, in order to identify the framing of resilience discourses, we need to have a clear understanding of the actors involved and their specific position in a constellation of actors and practices. Resilience can be focused on community building or disaster relief, it can happen at a local, regional, national or international level; the disruptions can come from a variety of more or less complicated and/or socially embedded causes. It is obvious, for example, that actors are differently affected by a military conflict, an earthquake, or an extended drought, and that responses will vary based on scale, scope, and location. Why, though, does this mean that the goal of fostering social (and ecological) formations capable of effectively responding to those shocks would be different? We believe that the first step in building a resilience that is responsive to particular cases across geographies and scales is to identify the actors who are impacted and can be impactful. When attempting to build resilience in a variety of different contexts, the first goal should be to understand who the key actors are. Who is impacted by the disruption and in what way? Is it an individual, a community, an infrastructure, an institution, a way of thinking, an ecological habitat or environmental system? When it comes to resilience, actors are incredibly diverse, but this is also true of other areas of sociological, historical, scientific, or planning inquiry. Actors are not always obvious, and are obviously not always human. Earthquakes, for example, often especially affect infrastructures and buildings. Environmental disasters often have the most devastating impact on animals.

When it comes to actors, it is also critical to identify those who intervene in resilience building. Are these community or environmental activists, international agencies, corporations, state actors? Identifying such actors and the specific configurations in which they perform makes it better possible to evaluate their shared agendas, recognizing conflicts of interest, but also to uncover power inequalities among different groups of actors as well as, the often tenuous, circumstances that can lead from good intentions to deficient outcomes and unintended consequences. The goal of identifying key actors, then, is not about defining resilience. It is about recognizing who gets to negotiate such definitions. Identifying actors is a vital element in crafting a resilience policy and practice that achieves widely agreed upon goals. So, too, are narratives because actors legitimize their intentions through the stories they tell.

On the most straightforward level, narratives are about stories – what do people say, who speaks, and why. Not surprisingly, community activists often have a

very different perspective on resilience measures than planners or governmental agents. Those directly affected by crisis obviously have a different view from those who decide about measures from a desk or computer screen. So, the first question in relation to resilience narratives should be – whose voice is heard, and how does it get articulated? Several essays in this volume, most notably those by López, Sharma, and Wesener, take up the perspective of those most immediately affected to trace how their experiences translated into concrete actions (such as car washing, food hamstring, or community gardening); and how, in turn, they were embedded in particular policy measures (like water bills, rationing cards, and gardening rules). For historians, anthropologists, and scholars of culture more generally, narrative usually plays a central role in any kind of analysis because they know that sources never speak for themselves, but that they gain meaning only through the contexts in which they are placed. As the essays in this volume indicate, the broad array of sources available (interviews, policies, maps, official and personal records, media coverage, photographs, economic surveys, laws and ordinances to name just a few) lends itself to varied interpretations of resilience discourses and their implementation in different geographical and temporal contexts, which brings us to a second crucial dimension of narrativity.

The concept of resilience is itself embedded in a narrative construction. From its etymological origins in the 1620s to its present-day use, the term resilience has been framed in numerous ways and across disciplinary contexts from philosophy to engineering, planning, and psychology all the way to ecology and the social sciences (Alexander 2013; Rogers 2016). Taken together these discourses provide a genealogical narrative about resilience and its intrinsic norms and values. As some of the essays in this book (especially Danneels et al., Kunkel, and Maudsley) document, a careful reading of sources will uncover the norms and values that undergirded many debates about resilience in the past and how they might have laid the foundation for current attitudes towards resilience, particularly in planning, engineering, and policy discourses.

Finally, there is the narrative of resilience itself that needs to be critically evaluated. As we have seen, resilience does not just serve as critical planning tool, it also functions as a powerful policy agenda. In urban contexts in particular, the notion of resilience has become highly politicized. Resilience strategies, as advocated by the 100 RC Initiative of the Rockefeller Foundation, the UN's New Urban Agenda and others, have become another driver in urban governance expansion and P-P-Ps across the globe. Resilience has become another buzzword for urban development – justifiably so in many cases – but this also entails the risk that the notion becomes part of a political greenwashing rhetoric, and hence, ineffective in debates about urban development. We know quite well what happened to the idea of sustainability, a concept that originated in 18th-century forestry and whose meaning and

political implications have shifted from ecological empowerment to a more or less empty rhetoric employed to advance political, marketing, and business interests.

Recently, there has been a notable discursive reframing of urban development efforts away from notions of sustainability towards practices of resilience. This narrative shift can be clearly traced in the literature starting in the early 2000s (Zhang/Li 2018). But this move is not just a matter of scholarly debate, it is also taking over in governmental and policy circles signifying a demonstrative shift towards an increasingly pervasive expectation of crisis. It almost appears as if a more or less permanent state of crisis has become a widely accepted norm. The question no longer appears to be *if* but rather *when* the next disaster hits. In consequence, long-range sustainability efforts are frequently giving way to more immediate, techno-fix-centered, approaches meant to enhance a city's ability to better withstand acute shocks or chronic stress. Thus, a 'narrative of resilience' rather than urban sustainability appears to be the new urban paradigm and this narrative shift needs to be critically evaluated (Sudmeier-Rieux 2014).

In general, paying more attention to narrative on all its discursive levels will broaden the chorus of voices and sharpen our critical understanding of the various practical and ideological uses of the concept. In an essay on governing urban resilience, Bruce Goldstein et al. called for a 'plurivocal narrative' to give voice to the subjective and symbolic meanings of resilience (Goldstein et al. 2015). Such a plurivocal narrative combines the descriptive and normative dimensions of resilience discourses and sheds light on the ways these discourses operate across scales - from the concrete to the abstract, from the individual to the collective, from the very local to the planetary. Moreover, the closer focus on narratives should also include a critical assessment of the various temporal levels involved.

The editors of this volume, and at least some of the contributors, are historians by training and profession, and temporality is something we think about in our work on a daily basis. But we also think temporality is something that needs to be more seriously considered in allied disciplines as they consider a range of dynamic and still evolving concepts. Resilience is a perfect example of this, and happily, our non-historian collaborators agree that temporality matters. For present purposes, temporality matters in at least three ways.

First is temporality in terms of the relationship between past, present, and future. The usefulness of history for the understanding of the present and future is generally agreed, and it is quite common for non-specialists to argue that those who do not learn from history are doomed to repeat it. As historians, we the editors think this well-known saying does not quite capture the way that history can be useful for thinking about contemporary topics like resilience. Indeed, in many of the historical chapters in this collection, we find that the past is best understood not as a tool for forecasting the future, but something that is profoundly embedded in the present. Sönke Kunkel's essay, for example, suggests that current resilience

discourses continue to be structured by the same assumptions that already riddled disaster prevention and mitigation policy during the cold war. In a different vein, Avi Sharma's chapter asks readers to think about how historical cases of survival in catastrophic circumstances shape the assumptions we make about being resilient in the wake of a crisis. We hope the present volume is able to show the persistence of the past in ways that make clear how history can actually be a resource for thinking about and understanding the present and, indeed, the future.

Second is the issue of temporal scales. The resilience literature very often deals with post-crisis scenarios, and this is as true of chapters in the present volume as it is with the literature more generally. Because of this focus on crisis and post-crisis cases, though, thinking about the practices of resilience tend to center quite strongly on short-term scenarios. There are good reasons to focus on short term temporal frames, not the least because the kinds of disruptions that elicit calls for resilience often require immediate assistance. One of the key findings of the present work is, however, that resilience building as well as post-crisis recovery happen best when systems are already in place that enhance social solidarity, educate local populations to risk, and multiply the number of stakeholders. Ash Amin calls these silent systems, and as he points out, such silent systems are typically not particularly sexy with regard to political showmanship. They also often do not align with the narrow horizons dictated by legislative periods or the 'return of investment' logic of so much contemporary urban design.[7] The chapters in the present work suggest that, if resilience is to avoid capture by some of the neoliberalizing tendencies of contemporary political practice (deregulation, privatization, branding, green-washing etc.), the concept needs to become a planning and preparedness instrument for everyday life, and not just post-crisis recovery.

A third aspect directly related to the notion of temporal scales concerns the timeframes in which we think about urban resilience. As Florian Liedtke points out in his chapter on the 1995 Kobe earthquake, different recovery phases following an acute crisis are marked by different notions of temporariness. He focusses particularly on ways that the immediate need for emergency shelters was soon replaced by a need for more durable, yet still temporary, housing during the restoration phase, which itself took many years. The example of postwar Berlin discussed by Avi Sharma also underscores the different kinds of temporary housing arrangements that were intended for short-term shelter but frequently became semi-permanent living arrangements for people who had lost their homes. Resilience measures that are insensitive to questions of temporality has the potential to create a 'permanent temporariness' that leaves particularly vulnerable populations in a prolonged state

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7   It should be noted, of course, that this focus on the short-term time scales, what Eraydin et al. describe as neoliberal planning, is often an imperative despite the aspirations and professional better judgement of planners, architects, policy makers, and designers.

of uncertainty and exposure. In a similar vein, resilience discourses that remain indifferent to questions of temporal duration might misjudge the impact of recovery measures on affected urban populations and environments.

Finally, if resilience discourses are tied to debates about sustainability and climate change, questions of duration need to be posed with a long-term view to the future. In other words, if as the New Urban Agenda's SDG 11 claims, resilient cities are to be sustainable, then resilience thinking needs to span decades maybe even centuries. This might entail very difficult but fundamental questions regarding urban settlements, e.g., if simple 'bounce-back' policies of rebuilding housing in low lying areas is advisable or if resettlement might generate a more 'bounce forward' approach in an age of rising sea levels (Parenti 2017). Such thinking would require vision and it might prove quite unpopular in terms of voting cycle politics, but it appears to be necessary with a view towards a more temporality-resilient future.

We hope that focusing on these multiple frames – actors, narratives, and temporalities – brings into focus precisely this question of process, negotiation, and contestation that is too often hidden away in resilience discourses. It needs to be clear that what qualifies as a resilience-building agenda for one set of actors is often rejected by others; that short, medium, and long-term perspectives can illuminate different logics of disruption and recovery, and that these must all be negotiated in politically open, context specific ways. Many scholars, including the authors who contributed to the present volume, employ the concept of resilience not because they all agree that it is the best possible way to address disaster relief, achieve social mobility and integration, create more inclusive and less environmentally harmful cities. The contributors to this volume realize that resilience discourse will, for better or worse, shape the lives of millions of vulnerable people for years to come. Taken together, the goal of the chapters in this volume is to offer other, and potentially more dynamic ways, of thinking about a challenging concept.

The Chapters

The volume is separated into two sections. The first explores the ecologies of resilience. We use the term ecologies to signal our focus both on an environmentally-sensitive approach to questions of resilience as well as a more socially-oriented understanding of resilience as a constellation of lifeworld circumstances that include food provision and housing. The papers in this section demonstrate how architects and planners engaged ecological knowledge to understand, design, and rebuild cities in light of extreme physical circumstances. Each in its own way also illustrates how green (or "white") spaces played a crucial role in the (re)configuration of cities following severe crises.

The first chapter, co-written by Koenraad Danneels, Greet De Block, and Bruno Notteboom, examines the influence of Belgian natural scientists and urban designers in creating a socio-environmental perspective on urban resilience. The first part of the chapter looks at the idea of the 'sociobiological city,' which was developed by landscape architect Louis Van der Swaelmen as a response to the destructions of the First World War. The second part of the essay explores the concept of the city as an ecosystem, which ecologist Paul Duvigneaud developed in response to the environmental crisis of the 1970s. This historical analysis draws attention to the use of crisis, the idea of equilibrium and the (contested) sociopolitical motives and forces in resilient urbanism as it developed in 20th-century Belgium. These two scientific approaches also offer critical insights into the new concept of resilience, highlighting ways that power and inequality are embedded in socio-biological metaphors, and asking how these metaphors continue to be used in current debates about resilience.

Ann Maudsley's chapter then looks at Ralph Erskine, a British-Swedish architect who designed "ideal towns" for the Arctic in the 1950s and 60s. As Maudsley documents, Erskine set out to create a new regionalism conditioned by northern culture and climate. He aimed to create more climatically-suited, inclusive, well-serviced resilient communities rich with amenities and varied activities. Erksine became internationally known as an 'Arctic architect' and was employed to design several new communities north of the Arctic Circle in the succeeding decades. This chapter focuses on two Erskine projects in Sweden, one in Kiruna and the other in the nearby town Svappavaara. By examining design and architecture, planning, development and outcomes in each location, this chapter is an effort to better understand what resilience and survival mean in extreme geoclimatic and socio-cultural contexts. Finally, it asks whether urban design and planning in the Arctic circle can offer insights into the work of building more resilient cities in other ecological and environmental conditions.

In his contribution, architecture and urban design scholar Andreas Wesener examines the role of urban gardens for strengthening urban resilience in times of crisis. His chapter begins with a discussion of systems-based approaches to resilience, before turning to the specific example of urban community gardening as a special crisis response following the Canterbury and Christchurch earthquakes of 2010/11. Through a close interpretation of a range of interviews with urban gardeners, Wesener shows how gardens have helped communities recover from social, emotional, and other effects of this natural disaster. His chapter highlights the direct impact of urban ecologies on recovery practices and hence underscores the necessity of including community gardens in urban resilience strategies.

Avi Sharma's chapter turns to postwar Berlin to examine how the governmentalities and everyday experiences of survival might offer us insights into the logics of our contemporary discourses about resilience. From the destruction of physical

infrastructures to the large-scale arrival of refugees and DPs, postwar Berlin was a site of extreme social dislocation. Focusing on shelter and food in Berlin between 1945 and 1950, this essay explores what it means to survive in the context of intersectional crises that cascaded across numerous scales. Sharma documents how the close interconnections between individual fates and collective circumstances, between private inhabitants and governmental/occupational agencies made survival possible. Through this specific case study, Sharma demonstrates, among other things, how historical examples might be productively used to elucidate current-day challenges.

The second section shifts our attention towards infrastructures of resilience. Bringing together scholars working in a wide range of fields, including history, architecture, planning and science and technology studies, this section questions the impact of institutional and material infrastructures in the supply and maintenance of urban resilience networks. The individual chapters examine how different actors including international agencies, local governments, commercial enterprises, and urban inhabitants have collectively contributed – in some cases, inadvertently - to the creation of structured networks aimed to enhance the resilience of their respective communities or cities. For all their disciplinary differences, the contributions in this section maintain that resilience can generate tools and resources to deal with crisis scenarios, but they also warn that the concept can easily be coopted by powerful financial and institutional interests.

Sönke Kunkel's chapter scrutinizes the way that changing ideas about environmental risk in the 1960s caused the international development community to develop new policies that focused on disaster mitigation and prevention projects. Those policies included, among other things, funding transnational scientific research projects on urban earthquake hazard reduction, the establishment of various earthquake centers, and the creation of building codes and seismic risk mapping. As he demonstrates, while those approaches promoted a new transnational discourse on urban disaster mitigation, they also quickly ran into problems on the ground, not least since they paid little attention to the social dynamics of rapid urbanization, instead treating environmental dangers in purely techno-scientific challenges. Using the examples of major earthquakes in Morocco and Chile in the 1960s, this paper argues that a more critical understanding of historical discourses about resilience policies can enhance our awareness of the potential pitfalls and blinders in global urban development debates centered on techno-fixes and standardized international policies. He also sharpens our understanding of how institutional infrastructures like the UN have contributed to a a universalizing approach towards resilience strategies.

Discourses of resilience often focus on the everyday capacities of the urban poor to overcome threats posed by extreme socio-natural events. In 2013, the Colombian city of Medellín was labeled as one of the most resilient cities in the world due to

its residents' capacity to withstand violence and criminality as well as floods and landslides. The chapter by Marcela López provides a critical lens on what a resilient city entails by looking at the question of water supply in Medellín. She describes how the city's water utility company made efforts to protect the urban poor from adversity in order to secure revenues. Facing enormous challenges to control illegal water connections, the company has deployed different strategies in which ideas about water scarcity, human rights, and civil society converge to facilitate, among other things, the formalization of the illegal carwash sector. This chapter shows that the resilience of the informal carwash – ubiquitous in Colombian cities like Medellín – should not just be understood in relation to claims about power on the state and other institutional levels, rather than just on everyday survival strategies within an informal economy. Hence, this chapter sheds light on the multi-directional power relations and resilience strategies built around urban infrastructures like water supply.

Florian Liedtke's chapter discusses the aftermath of the 1995 Kobe earthquake that caused massive destruction throughout the city. As Liedtke documents, parks and open spaces became central recovery areas. Not only did people move to open spaces to escape their destroyed homes, they also sought shelter in parks during the first days of emergency recovery. As emergency recovery shifted to restoration, parks and open spaces served as temporary housing areas where people could live until their own houses were rebuilt. For many, however, these temporary shelters turned into semi-permanent homes because in some instances rebuilding efforts took longer than anticipated. In addition to housing, parks and open spaces were also used for the storage of debris. Liedtke argues that both spaces provided vital areas for urban recovery measures, and that they should be an integral part of urban resilience strategies. Moreover, he makes a plea for a more multi-functional planning that incorporates urban green and open spaces as infrastructures of recreation as well as central sites of emergency and recovery planning. In that sense he insists that resilient cities require multifunctional planning for the very different living situations and needs that might arise, especially in earthquake prone areas.

Diego Silva Ardila's contribution brings us back to Latin America, exploring transportation infrastructures in four different cities. Mexico City, Bogotá, Medellín, and Buenos Aires. He is particularly interested in the different mobility solutions that evolved "organically" to fill gaps in public and private transportation services. His examples range from Buenos Aires' *Remis* system, to Mexico City's Bus Rapid Transit, the *Transmillenio* in Bogotá and aerial cable cars in Medellín. Silva Ardila is not interested in judging these various interventions from an ideological perspective, but simply demonstrating how different solutions – bottom-up; top-down; private sector driven; public sector financed – differently stabilized dysfunctional transportation infrastructures. He argues that this should be understood not

in terms of the formal/informal dichotomy that is now widely used in urban resiliency literature, not least in essays in the present volume. Instead, he insists that in many Latin American cities, the symbiotic relationship between formal and informal, elite and precarious actors is so deeply embedded in the urban fabric that it does not make sense to disentangle. Consequently, he proposes a new framework – urban dualism – to understand these entanglements. It is worth exploring whether this analytic applies equally to other global cases or, as he suggests, is particular to the Latin American city.

Timothy Moss' epilogue brings us back to the immediate concerns of our present time and the multiple crises we are facing right now. He uses this to ponder where the concept of resilience has taken us; how it has lent renewed purpose to planning, architecture, and civil engineering; and where it has left gaps in our understanding of the world, particularly when it comes to cities. Taking up the arguments of some of the book chapters, he recaps the need to study resilience in light of geographical and historical specificities as well as with a critical perspective on the politics inherent in urban resilience discourses. In closing he offers four programmatic points to advance resilience research beyond presentism, eventism, essentialism, and disciplining. With that he reminds us that much remains to be done in the field of resilience scholarship.

At the outset we stated that one important reason to study resilience is that it is – whether or not one likes it – a development approach that directly impacts millions of lives in our own world, and in our mid-term future. But there is another reason. When Vale and Campanella wrote in 2005, they made a major point about the fact that, throughout history, destroyed cities are – in the vast majority of cases – rebuilt. Vale and Campanella signaled the assumption that, at least when it comes to the urban, resilience is about recovering and rebuilding. Something has changed in the last 15 years, and this makes it a good time to think resilience anew. A recent study in *Science* suggested that the best response to disaster might be to move rather than rebuild, no longer to fight against but to work with nature (Siders/Hino/Mach 2019). Now may not be the time to redefine resilience, but it certainly is time to rethink it.

References

Alexander, David E. (2013): "Resilience and Disaster Risk Reduction: An Etymological Journal." In: Natural Hazards and Earth Systems Science 13, pp. 2707–16.

Amin, Ash (2014): "Epilogue: The Machinery of Urban Resilience." In: Social Sciences 3/3, pp. 308–13.

Bahadur, Aditya/ Lovell, Emma/ Wilkerson, Emily/Tanner, Thomas (eds.) (2015): Resilience in the SDGs. Developing an Indicator for Target 1.5 that is Fit

for Purpose, (ODI, 2015), https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9780.pdf.

Castree, Noel (2010): "Neoliberalism and the Biophysical Environment A Synthesis and Evaluation of the Research." In: Environment and Society: Advances in Research 1, pp. 5–45.

Chandler, David/ Coaffee, Jon (eds.) (2016): The Routledge Handbook of International Resilience, London: Routledge.

Coaffee, Jon/ Wood, David Murakami/ Rogers, Peter (2009): The Everyday Resilience of the City: How Cities Respond to Terrorism and Disaster, Basingstoke: Palgrave Macmillan.

Cretney, Raven (2014): "Resilience for Whom? Emerging Critical Geographies of Socio-ecological Resilience." In: Geography Compass 8/9, pp. 627–40.

Dawson, Ashley (2016): Extinction: A Radical History, New York: O/R Books.

Dawson, Ashley (2017): Extreme Cities: The Peril and Promise of Urban Life in the Age of Climate Change, New York: Verso.

Derrickson, Kate/ MacKinnon, Danny (2013): "From Resilience to Resourcefulness: A Critique of Resilience Policy and Activism." In: Progress in Human Geography 37/2, pp. 253–70.

Diprose, Kristina (2014): "Resilience is Futile.: The Cultivation of Resilience is not an Answer to Austerity and Poverty." In: Soundings 58, pp. 44–56.

Eraydın, Ayda (2013): "'Resilience Thinking' for Planning." In: Ayda Eraydın/ Tuna Taşan-Kok (eds.), Resilience Thinking in Urban Planning, Dordrecht, London: Springer, pp. 17–38.

Eraydın, Ayda/ Taşan-Kok, Tuna (eds.) (2013): Resilience Thinking in Urban Planning, Dordrecht, London: Springer.

Fainstein, Susan (2015): "Resilience and Justice." In: International Journal of Urban and Regional Research 39/1, pp. 157–67.

Foster, John Bellamy/ Angus, Ian (2016): "Marxism in the Anthropocene: Dialectical Rifts on the Left." In: International Critical Thought 6/3, pp. 393–421.

Genatios, Carlos/ Lafuente, Marianela (2003): "Lluvias Torrenciales En Vargas, Venezuela, En Diciembre De 1999. Protección Ambiental Y Recuperación Urbana" (http://ve.scielo.org/scielo.php?script=sci_arttext&pid=S0376-723X2003-000200004&lng=es&nrm=iso&tlng=es).

Goldstein, Bruce/ Wessekks, Anne/ Lejano, Raul/ Butler, William (2015): "Narrating Resilience: Transforming Urban Systems Through Collaborative Storytelling." In: Urban Studies 52/7, pp. 1285–1303.

Guha, Ramachandra/Martinez-Alier, Juan (1997): Varieties of Environmentalism: Essays North and South, London: Earthscan.

Hartman, Chester W./ Squires, Gregory D. (2006): There is No Such Thing as a Natural Disaster: Race, Class, and Hurricane Katrina, New York, London: Routledge.

Hein, Carola (2005): "Resilient Tokyo: Disaster and Transformation in the Resilient City." In: Lawrence J. Vale/ Thomas J. Campanella (eds.), The Resilient City: How Modern Cities Recover from Disaster, New York, Oxford: Oxford University Press, pp. 213–34.

Kaika, Maria (2017): "'Don't call me resilient again!': The New Urban Agenda as Immunology … or … What Happens when Communities Refuse to be Vaccinated with 'Smart Cities' and Indicators." In: Environment and Urbanization 29/1, pp. 89–102.

Kovel, Joel (2002): The Enemy of Nature: The End of Capitalism or the End of the World? London: Zed Books.

Long, Cynthia (1999): "Rescue and Recovery Continues in Flood-Ravaged Venezuela." (https://reliefweb.int/report/venezuela-bolivarian-republic/rescue-and-recovery-continues-flood-ravaged-venezuela).

Meerow, Rachel/ Newell, Joshua (2016): "Defining Urban Resilience: A Review." In: Landscape and Urban Planning 147, pp. 38–49.

Müller, Bernhard (2011): "Urban and Regional Resilience: A New Catchword or a Consistent Concept for Research and Practice?" In: Bernhard Müller (ed.), Urban Regional Resilience: How do Cities and Regions Deal with Change? Heidelberg: Springer Verlag, pp. 1–13.

Parenti, Christian (2013): "A Radical Approach to the Climate Crisis." In: Dissent 60/3, pp. 51–57.

Parenti, Christian (2017): "If We Fail." In: The Jacobin, August 29 (https://jacobinmag.com/2017/08/if-we-fail).

Pelling, Mark (2003): The Vulnerability of Cities: Social Resilience and Natural Disaster, London: Earthscan.

Rogers, Peter (2016): "The Etymology and Genealogy of a Contested Concept." In: David Chandler/ Jon Coaffee (eds.), The Routledge Handbook of International Resilience, London: Routledge, pp. 13–25.

Schieder, Theodor (1957): Dokumentation der Vertreibung der Deutschen aus Ost-Mitteleuropa 4,2: Die Vertreibung der deutschen Bevölkerung aus der Tschechoslowakei 2: Bonn: Bundesministerium für Vertriebene.

Sharma, Avi (2015): "Who Leads in a G-Zero World: Multi-Nationals, Sustainable Development, and Corporate Social Responsibility in a Changing Global Order." In: Washington International Law Journal 24, pp. 589–612.

Siders, A. R./ Hino, Miyuki/ Mach, Katherine (2019): "The Case for Strategic and Managed Climate Retreat." In: Science 365/6455, pp. 761–63.

Slater, Tom (2014): "The Resilience of Neoliberal Urbanism." (https://www.opendemocracy.net/en/opensecurity/resilience-of-neoliberal-urbanism/).

Squires, Gregory D. (2015): "Crisis Cities: Disaster and Redevelopment in New York and New Orleans, by Kevin Fox, Gotham and Miriam Greenberg." In: American Journal of Sociology 120/5, pp. 1560–62.

Sudmeier-Rieux, Karen (2014): "Resilience - an Emerging Paradigm of Danger or of Hope?" In: Disaster Prevention and Management 23/1, pp. 67–80.

Takahashi, Tamotsu/ Nakagawa, Hajime/ Satofuka, Yoshifumi/ Kawaike, Kenji (2001): "Flood and Sediment Disasters Triggered by 1999 Rainfall in Venezuela; A River Restoration Plan for an Alluvial Fan." In: Journal of Natural Disaster Science 23/2, pp. 65–82.

Taşan-Kok, Tuna/ Stead, Dominic/ Lu, Peiwen (2013): "Conceptual Overview of Resilience: History and Context." In: Ayda Eraydın/ Tuna Taşan-Kok (eds.), Resilience Thinking in Urban Planning, Dordrecht, London: Springer, pp. 39–51.

Vale, Lawrence J./ Campanella, Thomas J. (eds.) (2005): The Resilient City: How Modern Cities Recover from Disaster, New York, Oxford: Oxford University Press.

Zhang, Xiaoling/ Li, Huan (2018): "Urban Resilience and Urban Sustainability: What We Know and What Do Not Know?" In: Cities 72, pp. 141–48.

II)
Ecologies of Resilience

A Historical Perspective on Resilient Urbanism
The 'Sociobiology of Cities' and 'Ecosystem Urbs' in Belgium, 1900-1980

Koenraad Danneels, Bruno Notteboom and Greet De Block

In one of the first books written on urbanism and spatial planning in Belgium – published in 1916 under the title *Preliminaries of Civic Art in Relation to the 'Clinical Case' of Belgium* (hereafter *Preliminaries*) – landscape architect and urbanist Louis Van der Swaelmen (1883-1929) stated that a crisis had struck the country. "Entire cities have been destroyed," he lamented, comparable to the power of multiple "London fires" or "Messina earthquakes" (Van der Swaelmen 1916: 6). The crisis Van der Swaelmen was refering to was the destruction caused by World War I; a destruction he sought to address and overcome in *Preliminairies* with a reconstruction agenda that was based on what he called his "sociobiological" theory (Van der Swaelmen 1919). Although the foundation of this theory was somewhat vague, a close reading of Van der Swaelmen's writings reveals that it was based in mainly French environmental thought of that period, leaning on early ethological and sociobiological research (Thomas 2003; De Bont 2008 and 2010). Early ethology is understood as a branch of biological research concerned with the "interactions between organisms and their environment," a kind of proto-ecology (De Bont 2010: 4), while sociobiology in France and Belgium was specifically concerned with the "continuity between animal and human societies" (Thomas 2003: 109).[1] Van der Swaelmen's sociobiological take on urbanization was based on the same observations. He believed that the environment was crucial for urbanization processes. Using a biological analogy, he even compared cities to natural organisms. Coupling this kind of environmental thought to architecture and urban planning was not unique in the Belgian context - it was a widespread international phenomenon during the late 19th and early 20th centuries

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1.   In the context of this chapter, ethology is not the discipline developed in the 1930s that was concerned with animal behavior, but a "scientific attitude" developed earlier in France, in which environmental factors were of the outmost importance for studying organisms (De Bont 2010). Sociobiology is a general term, not used at that time, but applied by historians of science like Marion Thomas (2003). However, Louis Van der Swaelmen did posit that he studied the "sociobiology of cities" (Van der Swaelmen, 1919).

(Welter 2003; Platt 2015). In addition, Kenny Cupers has demonstrated in his work on *Bodenständigkeit* that new biological theories that were mobilized in urban thinking in early 20th-century Germany reinforced widespread nostalgic beliefs of the loss of an original cultural and natural landscape due to industrialization (Cupers 2016: 1234). Van der Swaelmen's work shows that in Belgium, the same logic was at play. In *Préliminaires* it was his diagnosis of the disaster of wartime destruction that revealed the ongoing conflict between modern urbanization and industrialization, on the one hand, and the original natural and cultural environment, on the other. Van der Swaelmen's new urban theory was therefore geared towards redefining and reconfiguring the relation between city and countryside in order to solve, or at least curb, the devastating side-effects of the urbanization of nature on both the natural and social worlds. His self-proclaimed sociobiological theory not only responded to the urgent crisis caused by wartime destruction but also sought to tackle the shortcomings of 19th-century industrial cities (Van der Swaelmen 1921).

Half a century later, Brussels-based urban ecologist Paul Duvigneaud (1913-1991) laid the foundation for a theory of the city as an ecosystem. Like Van der Swaelmen, he lamented the "pathological" state of the modern city (Duvigneaud 1974). More specifically, the environmental crisis caused by large-scale resource extraction, accelerating industrialization, and urban consumption prompted him to formulate a socio-ecological theoretical framework that could cope with the 'overheating' of the urban metabolism (Duvigneaud 1974: 6). Thoroughly based in the ascent of ecosystem science, he claimed that his *écosystème 'urbs'* would reconnect the city to its natural substrate, thus short-circuiting such overheating. Duvignead believed that a renewed, sustainable city could be created by analyzing the city's flows in detail, re-rooting them in a metabolic framework, and operationalizing this analysis in planning policies.

Although Duvigneaud and Van der Swaelmen had different disciplinary backgrounds and mobilized different discourses, both articulated a spatial reaction to what they perceived as a 'crisis' of the modern city and landscape. Each approached this crisis with a theoretical framework fusing the natural and social sciences in order to reconnect society and nature. Both Van der Swaelmen and Duvigneaud criticized the unbalanced interaction of the historical and natural landscape with modern processes like industrialization and urbanization, and in that sense they perceived the same sort of crisis. By blending their disciplinary expertise with scientific research and an urban planning agenda, they both hoped to rebalance the built environment by reconfiguring its spatial layout. Linking terms such as 'destruction' or 'pathology' to the concept of crisis enables us to draw attention to similarities and differences between their strategies to balance society-nature relationships. In this chapter we will use 'crisis' as an operational concept to analyze the discourses mobilized by Van der Swaelmen and Duvigneaud. Crisis, as Reinhart Koselleck argued, always has subtle deviations in its meaning and can be both

"imprecise and vague" and is used to describe "vaguely disturbing moods or situations" (Koselleck 2006: 399).[2] Koselleck therefore cautioned scholars in their use of the word, but still we mobilize it freely because "this lack of clarity is often welcome, since it makes it possible to keep open what it may mean in the future"(Ibid: 399).

Nowadays, crisis is again high on the agenda of the discipline of urbanism. Indeed, it seems to be a central component of resilient urbanism: one of the newest 'isms' geared to remedy today's ecological "apocalypse" (Swyngedouw 2010). In his essay *Notes on a Resilient City*, Ross Exo Adams analyzes the project *Rebuild by Design (RBD)*, an ambitious design initiative created by the Bloomberg Foundation that tried to "implement strategies for rebuilding a city [New York] severely damaged by 'Superstorm Sandy'" (Adams 2014: 127). Adams uses the RBD project as an example of so-called 'resilient urbanism,' and argues that ünder the regime of resilience the spatial order of the urban begins to exhibit radically new tendencies."This new regime of resilience draws its force from ïts ability to incorporate a concrete crisis in its own discursive and political formation,änd ünlike sustainability or ecological urbanism, [resilient urbanism] immediately frames itself as a program of response to crisis"(Adams 2014: 127).

In this chapter, we study the relationship of urbanism and spatial planning to crisis, as an entry into the history of resilient urbanism before Crawford Holling introduced the term resilience in ecological science (Holling 1973) and before it was coopted into urban design in recent years (Eraydin/Taşan-Kok 2013). We analyze the two historical figures of Louis Van der Swaelmen and Paul Duvigneaud who proposed a resilient urbanism *avant-la-lettre* and link it to the use of the concept today in order to better understand the current relationship between urbanism/planning and crisis. Firstly, we demonstrate that these earlier theories of resilient urbanism were produced by the interplay of environmental sciences like biology and ecology on the one hand, and design disciplines including landscape architecture and urbanism on the other. Secondly, a comparison of these historical responses to crisis with current notions of resilience aims to uncover the historically specific relationship between urbanism and crisis. Moreover, this essay will focus on how interactions between city and nature, urbanization and the natural environment, were thought in relation to specific crises. In addition to previous meaningful contributions to the analysis of the concept of resilience and practices of resilient urbanism (Bankoff 2001 and 2019; Kirchoff 2010; Walker/Cooper 2011; Braun 2014), our analysis will show how the alliance of the natural and design sciences in history is rehearsed today. We argue that resilient urbanism is not as new as is often proclaimed, rather it is deeply rooted in a crisis of modernity.

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2   In his paper on the Eco-city, Ross Adams also refers to the work of Koselleck on crisis and relates it to the history of urbanism and planning (2010).

With the analysis of the two case studies, we do not aim or pretend to compose a continuous timeline until present-day resilient urbanism approaches. These cases are but snapshots, two (Foucauldian) genealogies, with which we aim to demonstrate how elements of a resilient approach to urbanism are already present in the discipline before the birth of the present resilient urbanism. As David Garland already argued, Foucauldian genealogies or 'histories of the present' try to uncover "hidden conflicts and contexts as a means of re-valuing the value of contemporary phenomena" (2014: 365). In the first part, we offer a close reading of the book *Préliminaires* by Van der Swaelmen. In the second part, we examine Paul Duvigneaud's work on urban ecology and his influence on Brussels planning policy. In the conclusion, we return to the question of crisis and the influence of environmental science in current-day discourses on urbanism.

Sociobiological Theory: The Crisis of the Modern City

The German invasion of Belgium in August 1914 caused vast destruction of the built environment (Horne/Kramer 2001). Many urban designers immediately began to think about reconstruction (Smets 1985). Louis Van der Swaelmen, exiled in the Netherlands during the occupation years, was one of them. Before the war, he had been active both as a theoretician as well as practitioner in the field of landscape architecture (Stynen 1979). His work focused primarily on ideas regarding the creation of a modern aesthetic for gardens (Notteboom 2009). However, following a congress on urbanism and urban governance during the Ghent World Exhibition of 1913, Van der Swaelmen began to reconsider the urban question. At the Ghent conference he got acquainted with a wide range of influential urbanists and planners of that period, not least biologist and urban planner Patrick Geddes and his 'Cities and Town Planning Exhibition' (Van Acker/Dehaene/Uyttenhove 2013). After the outbreak of the World War that had forced him into exile, Van der Swaelmen started to think more concretely about the question of urbanism and its potential as a discipline and policy domain. In 1916, he wrote *Préliminaires d'art civique, mis en relation avec le 'Cas Clinique' de la Belgique* [Preliminaries of Civic Art in Relation to the 'Clinical Case' of Belgium], which examined the problem of wartime destruction alongside the long-range impacts of the industrial revolution and transformation of the agricultural economy on urbanization (Van der Swaelmen 1916). Van der Swaelmen used a series of reports by the Royal Commission of Art and Archeology to diagnose the state of his Belgian homeland. These reports were concerned with both the wartime destruction but also with the disappearance of the original Belgian landscape (Lagasse de Locht/Saintenoy 1914). The Royal Commission reports showed how chemical fertilizers, large agricultural corporations, and local railways were transforming the countryside at an unprecedented pace (Com-

missions Royales d'Art et d'Archéologie 1914). The problematization of widespread war-damage and the disappearance of the 'original' landscape was further substantiated by referring to a report by Jean Massart – a biologist and geobotanist – who claimed that after the disasters of the war it was necessary to conserve traditional elements "so that we don't need to deplore the fact that the traces of the past will be irrevocably lost" (Commissions Royales d'Art et d'Archéologie 1914: 254). In the discussions between 'modernists' and 'traditionalists' that would dominate the debate on the reconstruction of the country during and after the war, the Commission demanded that the Belgian landscape be rebuilt according to its earlier nature (Smets 1985). While Van der Swaelmen endorsed such a policy, he also wanted to go further to counteract modern society's disconnection from the natural landscape through a new linkage between landscape architecture and urbanism. Van der Swaelmen believed that the "historical growth of the city" was "opposed" to the "functioning of the modern city", which resulted in "conflicts" (Ibid: XI). Van der Swaelmen therefore wanted to "achieve [...] harmonies between the things of Nature and the Creations of Man" (Ibid: 100). Unlike the approach advocated by the Commission, he argued that the new spatial lay-out should follow from the recoupling of the natural landscape to modern urbanization patterns: instead of a historicist reconstruction, he imagined a new landscape that would incorporate the historical city while also making way for new settlements based on the natural and cultural environment.

Urbanism, Science, and Politics

In *Préliminaires*, Van der Swaelmen used the work of contemporary ethological scientists to tackle this case study of Belgium and create what he called a "sociobiological" approach that grounded urban theory in biological laws and environmental considerations. In his analysis, the city functioned as a biological organism determined by environmental factors, ideas that could be traced back to the philosopher of biology Félix Le Dantec (1869–1917) (Van der Swaelmen, n.d.). Van der Swaelmen explained the growth of cities using biological laws, assigning biological functions to different aspects of the urban environment. In his archival notes, Van der Swaelmen noted that Le Dantec's theorem could be "applied to the city" (Van der Swaelmen, n.d.). As a neo-Lamarckian, Le Dantec "held to a hard-and-fast determinism", and studied the continual "trafficking" of the organism with its environment ("Dr. Felix Le Dantec" 1917: 489). By constructing the idea of what he called a "*organisme-cité*" (city-organism), Van der Swaelmen equated the urban environment with various biological functions: buildings were cells, road networks worked like veins, and parks were the city's lungs (Van der Swaelmen 1916: 78). In this *organisme-cité*, environmental factors had a determining influence on the growth and development

Figure 1: Cover of Préliminaires d'Art Civique (Louis Van der Swaelmen 1916). Figure 2: The Organisme-cité (Louis Van der Swaelmen 1916).
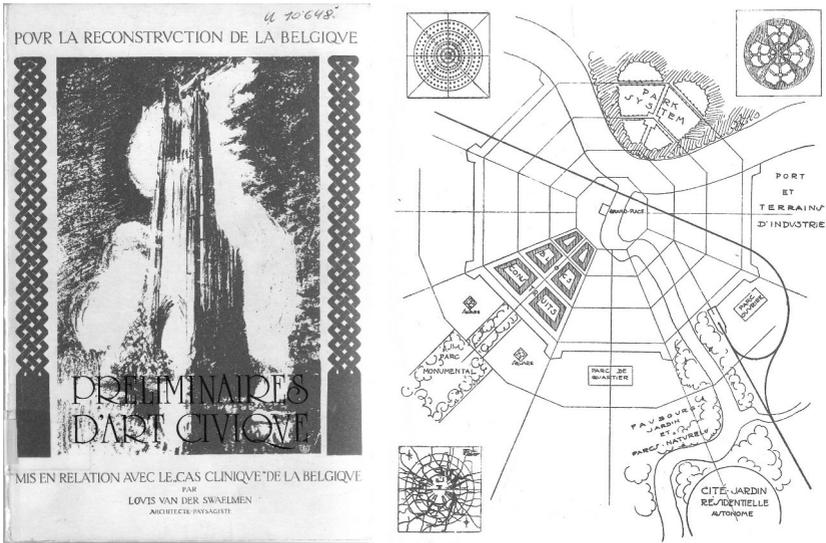
of the city. The fundamental organizing principles of the built environment were the "horizontality of the terrain," the "water regime," and the "draining system of the soil." The "geographical condition" would put its "indelible imprint on the future physiognomy of the city," and "inevitably determine the internal law of its future development" (Ibid: 9). Van der Swaelmen believed in an "absolute determinism" of the laws of nature (Ibid: 10).

As a tool to help the planner or designer understand the characteristics of the Belgian environment, Van der Swaelmen proposed to base the growth of the built environment in "physionomical districts" (Ibid: 101). These districts were copied from the work of Jean Massart, a geobotanist, ethologist, and professor at the Université Libre de Bruxelles. Massart divided the Belgian territory in geobotanical regions and attached natural and cultural characteristics to these areas. These regions were differentiated by their conditions of climate and soil, the present vegetal associations, but also by the nature of human interventions in the area (Notteboom 2009: 111). Massart's social-ecological analysis of these geobotanical regions became a tool for Van der Swaelmen as he worked towards a new urbanism in the postwar reconstruction of Belgium (Massart 1910; Notteboom/Uyttenhove 2018).

Both Van der Swaelmen and Massart can be considered part of a broader Belgian reformist movement that consisted of experts and technicians who tried to

Figure 3: The Geobotanical Map of Belgium (Jean Massart, Esquisse de la géographie botanique de la Belgique 1910).

improve the living conditions of the working-class without rejecting capitalist development (Uyttenhove 2011). Van der Swaelmen's theory illustrated how naturalistic conceptions of the social realm, which he incorporated into his notion of the 'ideal city,' were part of this reformist movement. In his ideal city, for example, so-called workers' parks were an integral part of the city. Social classes were to be neatly separated in the city-organism in much the same way that organs occupied distinct places in a body. The "democratic society of the future" would find its spatial representation in the newly created balance between city and natural environment (Van der Swaelmen 1921). These ideas were quite common in modernist architectural circles at the time. Van der Swaelmen, for instance, was deeply influenced by the Dutch architect and writer Hendrik P. Berlage (Berlage 1913; Stynen 1979; Berlage/Whyte 1996).

After the war, Van der Swaelmen became active in the rethinking of the Belgian housing policy by giving lectures on cooperative housing. He had good contacts in socialist circles that supported a policy of financial subsidies for workers' housing

through the formation of cooperatives, culminating in the establishment of diffe-rent garden cities in Belgium (Van der Swaelmen 1920; Smets 1977; Danneels 2019). Van der Swaelmen himself designed some of these garden cities where he tried to combine sociobiological design with the socio-political goals of a cooperative housing strategy (Danneels 2019). For Van der Swaelmen, such socio-political ideas were of equal importance to the biological and scientific metaphors when it came to formulating his design theory.

With his design theory, Van der Swaelmen responded to the crisis he percei-ved in long-range urban development, but he also addressed the more immediate concerns following the First World War. He believed that a sociobiological theory of urbanism and urbanization with its reattachment of environment to the urban fabric would lead to a new equilibrium in which man and nature, the city, the en-vironment and society would find a balance within one organic whole. What is also clear in Van der Swaelmen's case, and can be observed today in resilient de-sign theory and practices, is the envisioning of "the social as a product of an all-encompassing, dominant natural development of systems to a sustainable state of equilibrium" (De Block 2016: 377). The biological determinism present in Van der Swaelmen's work can, in fact, be understood as a mobilization of scientific discour-ses to empower design language and political – in Van Swaelmen's case socialist – beliefs. This can be problematic because biological theories have been invoked by all sides of the political spectrum to underscore their ideological agendas (Daston 2014, 2019; De Bont 2008). Today, similarly, the mobilization of ecological resilience theory, which infuses "immunology" in resilient and sustainable design practices, is sometimes criticized for its intrinsic neoliberal agenda (Swyngedouw 2010; Wal-ker/Cooper 2011; Kaika 2017; Swyngedouw/Ernstson 2018).

The City as an Ecosystem: Ecology and Planning during the Seventies[3]

More than fifty years later, Paul Duvigneaud developed the concept of the 'city as an ecosystem' in response to the environmental crisis facing Belgian cities in the 1970s. In the post-Second World War era, Brussels witnessed a period of large-scale demolition that was spurred by both by the city's position as a central node in the national road and railroad infrastructure and its role as the new capital of Euro-pe (Ryckewaert 2011). Carola Hein captures the situation by stating that: "Brussels,

3   Parts of the content on Duvigneaud in this chapter was previously published as a confer-ence proceeding (Danneels 2018). Jens Lachmund also studied the 'Duvigneaud group' and analyzed how "urban ecosystem analysis took shape in one particular city," showing how ur-ban ecosystem science was appropriated by Duvigneaud in the Brussels context (Lachmund 2017: 141-142). Other recent publications that mention Duvigneaud are, among others: Gandy (2015: 151) and Bortolloti/Ranzato (2016).

although spared by two world wars, resembled German or Japanese cities rebuilt after World War II" (Hein 2004: ix). The increasing importance of the city center as a base for Belgian and European governmental institutions, and the rapid construction of office buildings led to demolition and population decrease in the city center; but it also enhanced urban sprawl, which in turn eradicated open and natural spaces in and around the city (Sterken 2013). These (urban) problems caused widespread discontent among citizens. Among other things, citizen initiatives opposed governmental plans for high-rise building in the historical inner-city and spoke out against the destruction of regional green spaces (Demey 1992; Leloutre 2009; Doucet 2015).

This period of radical urbanization plunged both the city center and the outskirts of the city into environmental distress. Duvigneaud made extensive use of data to map these changes in the 1970s (Duvigneaud 1974: 6). The city of Brussels was the primary place to build a theory of a distinctively urban ecosystem – the *écosystème urbs*. Duvigneaud spatialized his data-driven approach derived from plant ecology and ecosystem theory by grounding it in concrete ecological observations in Brussels (Lachmund 2017). As Lachmund has argued, Duvigneaud was not only a scientist concerned with scientific data and publications, but he was also active in both planning and policy in the Brussels region. He was able to connect the work of his lab to Brussels' regional politics through the *Agglomeration Bruxelloise*, a new regional governmental agency responsible for metropolitan issues concerning planning and the environment (Apers 1982: 342).

Duvigneaud was trained at the Université Libre de Bruxelles (ULB) as a botanist and chemist and finished his PhD in botanical sciences in 1940 (Pierart and Duvigneaud 1992). As a professor at the ULB, he was the successor of Van der Swaelmen's contemporary Jean Massart. Throughout the 1940s and 1950s, Duvigneaud was involved in research in the Belgian Congo where he specialized in plant sociology and lichenology. He perceived the Congo as a place of untouched nature, where he could perform research into the "basic principles of plant sociology" (Duvigneaud 1953: 172). Although his work on the Congo continued into the 1950s, he shifted his attention to European ecology during those years. He became a professor at the ULB in 1952, and from 1959 onward he focused on fundamental ecology, or systems ecology. He founded the *Centre national d'écologie Générale* (CNEG), and in 1963 established an experimental station at Virelles-Blaimont, and later another one on the site of Mirwart in the Belgian Ardennes (Pierart/Duvigneaud 1992). The research was conducted under the auspices of the International Biological Program (1964-1974) where Duvigneaud was the director of the Belgian section (Duvigneaud/Kestemont 1977). The research center measured all incoming and outgoing biomass and energy flows on site. Duvigneaud and his colleagues published widely based on the data collected over a period of several years (Duvigneaud 1971). In his studies on the site of the Walloon community of Mirwart, however, he did not just

study the "natural" landscape, but also the 'rural ecosystem,' which he treated as a closed agricultural ecosystem (Duvigneaud et al. 1977). Unlike earlier researchers, Duvigneaud incorporated human activity and buildings in his analyzes, describing how heating a farm, for example, made it necessary to import energy from nearby forest systems. Additionally, some flows were "exported," in the form of meat or milk, while others where "discarded," like dung or urine (Duvigneaud et al. 1977: 482). Rhetorically, Duvigneaud remained an ecologist, and even when he incorporated human activity, his language effectively incorporated the presence of these cultural activities in his ecological models. Duvigneaud became particularly well known for his visual depictions of the ecosystem, which were based on earlier drawings by Odum in which energy flows were shown as energy circuits (Taylor/Blum 1991). By a method of the cross-section, he documented how flows of energy traveled through the system, effectively constructing a new way of mapping territorial metabolic relationships. Throughout his career, these drawings grew in both complexity and graphical quality, making them an excellent reference both for teaching and popularizing ecological knowledge.

Figure 4: The Ecosystème 'Urbs' and its Metabolic Flows (Paul Duvigneaud and Isidore Goedhuys in L'Écosystème urb: l'Ecosystème urbain Bruxellois 1977).
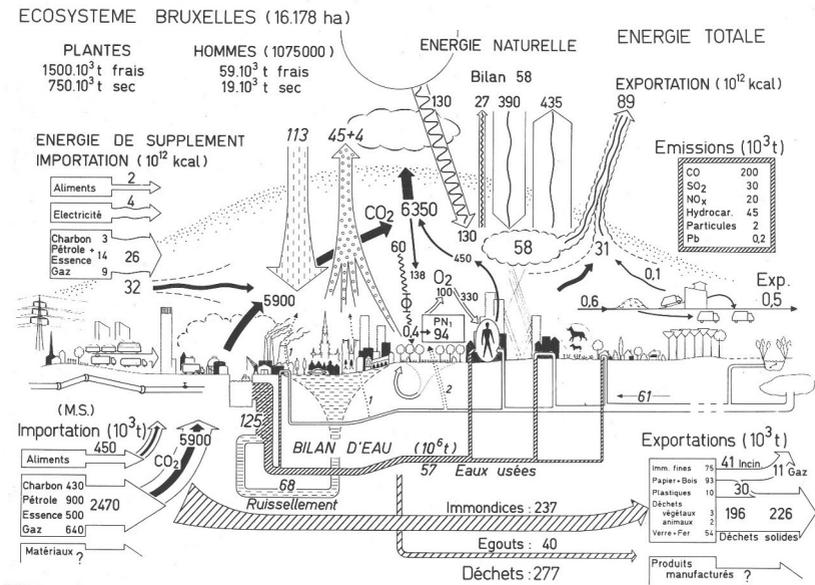
The Ecosystème urbs: From Science to Policy

From the 1970s onwards, Duvigneaud increasingly turned his attention towards the city itself (Duvigneaud 1974). Given his continued attention to human activity in the Ardennes studies of forest ecosystems, his hometown Brussels appeared like another worthy place for studying the functioning of ecosystems. He called this the *écosystème urbs*, opposed to the *ecosystème 'silva'* (forest ecosystem). When reading his contribution to the study of the urban ecosystem, it becomes apparent that one of his explicit goals was to influence the city's urbanization process. In a time of increasing regionalization, the ecological laboratory of the ULB "could not ignore the urban ecosystem of Brussels" (Duvigneaud 1974: 7). Therefore, a study center for the urban environment was created. Duvigneaud insisted that serious regional planning had to incorporate the work of ecologists. He clearly searched for a place at the table of planning services, engaging ecologists in the governmental apparatus of the recently formed Brussels Agglomeration. In addition, the new regional government also proved to be a financial opportunity for Duvigneaud's lab, a public client with ample resources that was eager to receive quantitative ecological data upon which it could build its new planning policy. Duvigneaud was ideally placed to bring this ecological expertise into the Brussels Agglomeration given his expertise as an ecologist, but also his political activities in the FDF (the Democratic Front of Francophones). The Agglomeration council was dominated by the FDF, and the alderman for the environment, Pierre Havelange, was a party member as well. Duvigneaud was therefore welcomed both as an expert and political player.[4]

Duvigneaud and his colleagues published widely on the *écosystème urbs*. What made this ecosystem different, in their view, was the predominance of human activity, or *anthropocénose*. But human activity was not the only factor shaping the urban ecosystem. The *biocénoses reliques*, or the original biological communities, and the *biocénoses urbanophiles* – biological communities for which the urban environment is beneficial and necessary – were also core elements of the systems upon which Duvigneaud and his colleagues worked (Duvigneaud 1974: 13). The 'weight', or 'biomass' of these different communities was measured in tons and displayed on a cross-section like that of the forest ecosystem. Additionally, the energy balance was calculated in both natural energy (e.g., sunlight) and subsidiary energy (e.g., carbon). Because of the great amount of subsidiary energy imported into the city, the amount of flows out of the city were high as well. To understand these flows, Duvigneaud stated that it was important to study the sub-systems of the city, outlining a future research agenda. In an early image, Duvigneaud exemplified these diverse sub-systems by providing a sort of Geddessian Valley Section that

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4   Duvigneaud's extensive political work and network will be the central subject of a future paper.

matched energy in- and output (Duvigneaud 1974: 20). The subsystems were inhabited by different socio-ecological groups of people, parallel to socio-ecological groups of plants and animals. These ideas had first been investigated by geographer Bernard Jouret, who had claimed that the link between the population and its habitat was "analogous to botany, where a vegetal group corresponded with a particular soil." Building on categories used in the botanical sciences, a socio-ecological group was defined by its habitat and position, its ethnic composition and its employment (Jouret 1972: 85). Here, Duvigneaud went quite far with his ecological take on the city by claiming that cities not only functioned like ecosystems, but that their inhabitants could also be understood as "socio-ecological" (Duvigneaud, 1974: 19). In other words, he implied that people – much like plants – were bound to their environment.

Duvigneaud also identified some of the major problems he perceived in the urban metabolism. Most notably, he admonished the extensive use of fossil fuels to energize the urban system. Contrasting the metabolism of *écosystème urbs* with the circular and low-energy consumption of the *écosystème 'silva,'* he criticized the high levels of urban energy consumption as well as the urban dependence on external energy imports. Instead, he used his data-driven metabolism models to call for more circular energy flows.

But there were problems with Duvigneaud's system approach as well, most notably with his attitude towards the role of human subjects. Even though people were an important component of his data-driven research, he did not seem to treat them as real political stakeholders, a perspective that is frequently criticized in other resilient urbanism contexts as well (Kaika 2017). Even at the time, citizen initiatives were one of the main forces that helped to redirect urban planning debates in Brussels (Demey 1992; Doucet 2015). Instead, he mainly looked towards governmental planning policy as an active agent in urban development.

Ecological Zoning for Brussels

Duvigneaud's data-driven framework was linked to a variety of strategies that were designed by the Brussels Agglomeration to help build a more balanced urban landscape. Through his active work in the *Commission des Espaces Verts* (the Commission for Green Spaces) at the Brussels region, he tried to establish multi-layered strategies to deal with the environmental problems of Brussels. On the building-scale, the commission advised on the need for green spaces to counterbalance the negative effects that new (and often large-scale, high-rise) buildings often had on the environment of Brussels' inner-city. On a regional scale, Duvigneaud actively sought to introduce biological and ecological considerations into the planning apparatus by providing survey studies. A map showing the occupancy of the soil and the degree

Figure 5: The Carte écologique de l'occupation du sol et des degrés de verdurisation de l'agglomération Bruxelloise (CIVA).

of green areas was the most impressive example of this research (Duvigneaud 1977). The map was ordered by the government of the Brussels region as a tool to be used in future planning policies. By creating an overview of the problems of the city on a regional scale, the alderman for the environment, Pierre Havelange, believed that the map would help the Brussels Agglomeration to reach its goals for more green space (Ibid.: preface). The map used existing aerial photography, official structural plans, and photographic images taken from a zeppelin. These photos were essential because they showed the biological productivity of the green spaces in terms of biomass volume. The map showed the amount of greenness of certain areas, visualizing Duvigneaud's theory of biological productivity onto a spatial plane. The map was supposed to serve as a planning tool to identify the most ecologically important areas. It was a tool that could be used to evaluate the potential of further urbanization areas in the Brussels region while also protecting the green, biomass-rich areas of the region.

On the sub-regional level, the *Plan Directeur de la Vallée de la Woluwe,* (the Directory Plan for the Woluwe Valley) was the most telling example of Duvigneaud's quest to mobilize ecological science for planning policy. The Woluwe valley, located in the South-Eastern fringe of the city, was rapidly urbanizing during the 1970s. The Agglomeration commissioned a round table to prepare a zoning plan for the area. In this round table, Duvigneaud, his collaborator Martin Tanghe, and the architect Pierre Puttemans played a key role in drawing up the necessary maps and surveys. Duvigneaud and his collaborators hoped to minimize the impacts of further development by protecting the areas that were most productive in terms of biomass. In doing so, he was able to balance the claims of local politicians with the need for new construction advocated by private as well as governmental actors. Duvigneaud and Tanghe were not only active in the political negotiations, but they also made an ecological survey of the valley and published it as a scientific paper (Tanghe/Duvigneaud 1978). In that paper, Duvigneaud and Tanghe used topographical maps, aerial photographs, and local observation of the terrain to create a detailed and comprehensive map of the valley (Ibid: 6).

The lab of Duvigneaud made two survey mappings. First was a map with the ecological occupancy of the soil that also demarcated forests, vacant land, and apartment buildings, among others. The second map visualized the biological value of the area. Here, they indicated which areas were of high ecological value, and which of lesser ecological value. Duvigneaud and Tanghe drew inspiration for their mapping work from Herbert Sukopp, the Berlin ecologist who had drawn up an ecological map of West-Berlin to serve as a government tool in the early 1970s (Lachmund 2013). Sukopp proposed a mapping system with degrees of *hémérobiose*, the degree of "human modifications to the natural system." In this system, the territory did not possess any "true natural areas" anymore. Everything was in some sense influenced by human activity. Apart from these purely ecological delineati-

ons, some areas were designated as "of little ecological value, but of great esthetical and socio-cultural value", thus adding to a social and cultural evaluation. Although these maps where clearly made by ecologists, it is also true that their mapping practices were guided by the need to produce a general zoning plan. In other words, Duvigneaud's metabolic perspective did not result in a rejection of the conventional zoning plan.

In the conclusion of their study, Tanghe and Duvigneaud stressed that the proposed maps should orient urban planners in their project of modifying space by highlighting both bio-ecological and socio-cultural values. The maps established a distinction between spaces that could be designated for construction without affecting the natural and social benefits of the valley. In their view, construction in areas designated as "wild" or buffer zones should be deferred or at least pursued with additional precautions. Semi-natural areas, in particular, had to be protected completely from urbanization because of their great value in vegetation, soil or wildlife. In addition, artificial green spaces, like the riverbanks of the small lakes or the Woluwe, should be upgraded in an ecological and biological way (Tanghe/Duvigneaud 1978: 29). Works on public paths in the different parks had to be kept at a minimum (Ibid: 30). Apart from its significance for ecological planning, the *Plan Directeur* clearly documented the capacity of the ecological viewpoint to overcome existing power relations in the area. The functioning of the river-ecosystem of the Woluwe, for example, clearly transcended the competing interests of both the communities and the Agglomeration. By highlighting the shared natural capacity of the river and its valley, Duvigneaud and the Agglomeration were able to highlight the need for integrative planning and thwart the political goals of local politicians. Paradoxically, though, the *Plan Directeur* actually incorporated both the urbanization processes and natural protection in the valley through zoning, rather than refurbishing the development of the built environment in the region in a more integrated way.

Although Duvigneaud did not use the work of Holling in his *écosystème urbs*, many of the theoretical assumptions and governmental tools he developed were in line with the resilient urbanism approach pioneered by Holling. Firstly, by applying the medium of the energy scheme – usually the depiction of natural ecosystems in 'natural' areas outside the city – he 'naturalized' the urban environment. Duvigneaud wanted to mobilize his knowledge into the planning apparatus of the Brussels government by combining society and nature into one framework. However, upon closer inspection, when transposing these eco-systems notions of the city towards the regional government's planning policy and subsequent zoning maps, we see that in fact it treated urban and natural phenomena as mutually exclusive rather than as a socio-natural hybrid.

Conclusion

The past and present search for an answer to 'crisis' by urban designers and natural scientists alike is one that attempts to establish an equilibrium between nature and the city by incorporating both systems into one model. In Van der Swaelmen's case, the city and the socio-natural environment are reconfigured to fit together in an organic city, or *organisme-cité*. In the case of Duvigneaud, his metabolic schemes for the *écosystème urbs* simultaneously critiques the use of energy in the modern city, while also bringing nature and city together into one model. His zoning schemes juxtaposed the built and the natural environment, trying to establish an equilibrium between them. Although resilience thinking in ecology moves "away from the notion that a 'balance of nature' exists" (Walker/Cooper 2011: 145), our historical analysis of resilient urbanism shows that designers have long searched for a balance – either with regard to the landscape as in Van der Swaelmen's case or with regard to natural energy flows as Duvigneaud advocated.

In summary, we propose that the scholarship on resilience should not only consider the past use of the word 'resilience' in urbanism, but should also pay tribute to similar debates and their influences on the development of resilience practices. Historically, many different experts have used crisis to propose a reconfiguration of the society-nature nexus. Juxtaposing these cases uncovers specific logics at play in resilient urbanism, both in the past and today, as well as different stances towards the socio-political. The socio-politics of resilient design theory and practice underscores how the environmental sciences can be paired with planning and design. But they also show how the fear of environmental crisis and loss of socio-natural landscapes might turn out to be a "fear of loss, not of a threatened nature and its capacity to sustain life, but of the conditions which sustain a threatened liberal utopia" (Adams 2010: 7). The cases of Van der Swaelmen and Duvigneaud demonstrated how they tried to mitigate the negative and detrimental side-effects of capitalist development and unbridled urbanization by finding alternative ways of reconfiguring the urban landscape through new modes of ecological planning. But these cases also show how they failed to thoroughly critique the political and economic bases of these environmental crises. If we want to understand the ecological and resilient urbanisms of the past, a broader emphasis on the historical interaction between the scientific and planning fields including their ideological beliefs is necessary.

Figure 6: The Carte d'evaluation biologique du milieu of the Woluwe Valley (Paul Duvigneaud, Martin Tanghe and Isidore Goedhuys 1978).
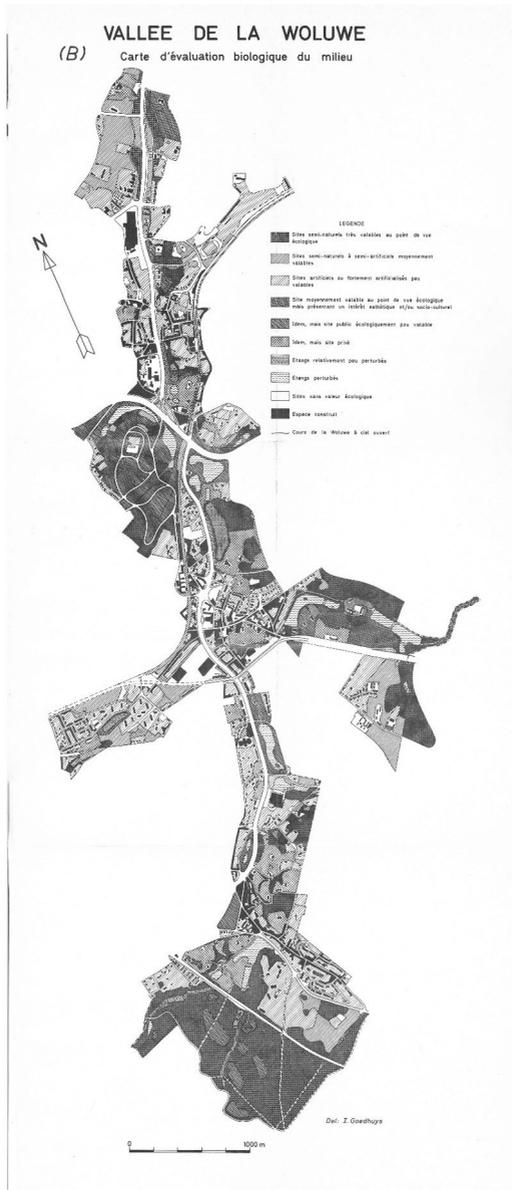
References

Adams, Ross Exo (2010): "Longing for a Greener Present: Neoliberalism and the Eco-City." In: Radical Philosophy 163, pp. 2–7.

Adams, Ross Exo (2014): "Notes from the Resilient City." In: Log 32, pp. 126–39.

Apers, Jan (1982): Straten en stenen: Brussel: stadsgroei 1780-1980, Brussel: Weissenbruch.

Bankoff, Greg (2001): "Rendering the World Unsafe: 'Vulnerability' as Western Discourse." In: Disasters 25/1, pp. 19–35.

Bankoff, Greg (2019): "Remaking the World in Our Own Image: Vulnerability, Resilience and Adaptation as Historical Discourses." In: Disasters 43/2, pp. 221–39.

Berlage, Hendrik Petrus (1913-1914): "L'Art et La Société." In: Art & Technique, pp. 95–132, pp. 157-163 (1913), pp. 169-182 (1914).

Berlage, Hendrik Petrus/Whyte, Iain Boyd (1996): Hendrik Petrus Berlage Thoughts on Style, 1886-1909, Santa Monica: The Getty Center for the History of Art and the Humanities.

Bortolloti, Andrea/Ranzato, Marco (2016): "On Ecology and Design: Heritage and Emerging Perspectives on Brussels' Urban Metabolism." In: Carola Hein (ed), International Planning History Society Proceedings, 17th IPHS Conference, History-Urbanism-Resilience, Delft: TU Delft Open, v.07, pp. 99-109.

Braun, Bruce P. (2014): "A New Urban Dispositif? Governing Life in an Age of Climate Change." In: Environment and Planning D: Society and Space 32/1, pp. 49–64.

Commissions Royales d'Art et d'Archéologie (1914) : "Section des Sites. Séances des 20 Juin et 22 Août 1914.". In: Bulletin Des Commissions Royales d'Art et d'Archéologie 53/7–8), pp. 126–35.

Cumming, Graeme/Per Olsson, S./Chapin, F. S./Holling, C. S. (2013): "Resilience, Experimentation, and Scale Mismatches in Social-Ecological Landscapes." In: Landscape Ecology 28/6, pp. 1139–1150.

Cupers, Kenny (2016): "Bodenständigkeit: The Environmental Epistemology of Modernism." In: The Journal of Architecture 21/8, pp. 1226–52.

Danneels, Koenraad (2018): "Historicizing Ecological Urbanism: Paul Duvigneaud, the Brussels Agglomeration and the Influence of Ecology on Urbanism (1970-2016)." In: Michiel Dehaene/David Peleman (eds.), On Reproduction. Re-Imagining the Political Ecology of Urbanism. Urbanism & Urbanization Conference Proceedings, Gent, Ghent University, pp. 343–56.

Danneels, Koenraad (2019): "'Nature's Offensive': The Sociobiological Theory and Practice of Louis Van Der Swaelmen." In: Journal of Landscape Architecture 14/3, pp. 52-61.

Daston, Lorraine (2014): "The Naturalistic Fallacy Is Modern." In: Isis 105/3, pp. 579–87.

Daston, Lorraine (2019): Against Nature, Cambridge & London: MIT Press.

De Block, Greet (2016): "Ecological Infrastructure in a Critical-Historical Perspective: From Engineering 'Social' Territory to Encoding 'Natural' Topography." In: Environment and Planning A 48/2, pp. 367–90.

De Bont, Raf (2008): Darwins Kleinkinderen: De Evolutietheorie in België, 1865-1945, Nijmegen: Vantilt.

De Bont, Raf (2010): "Organisms in Their Milieu: Alfred Giard, His Pupils, and Early Ethology, 1870-1930." In: Isis 101/1, pp. 1–29.

Dehaene, Michiel (2002): A Descriptive Tradition in Urbanism. Patrick Abercrombie and the Legacy of Geddesian Survey, Leuven: KU Leuven.

Demey, Thierry (1992): Bruxelles: Chronique d'une capitale en chantier. 2: De l'Expo '58 au siège de la CEE, Bruxelles: Legrain.

Doucet, Isabelle (2015): The Practice Turn in Architecture: Brussels after 1968, Surrey: Ashgate.

N.a. (1917): "Dr. Felix Le Dantec. " In: Nature 99/2494, pp. 488–89.

Duvigneaud, Paul (n.d): "De La Geobotanique de Jean Massart à l'ecologie Moderne." Fonds Duvigneaud.

Duvigneaud, Paul (1953) : Les savanes du Bas-Congo: essai de phytosociologie topographique, Liège: Lejeunia.

Duvigneaud, Paul, ed. (1971): Productivity of Forest Ecosystem: Proceedings of the Brussels Symposium Organized by UNESCO and the International Biological Programme (27-31 Oct. 1969), Paris: UNESCO.

Duvigneaud, Paul (1974): "L'écosystème Urbs. Études Écologiques de l'écosystème Urbain Bruxellois: Contribution n. 1." Mémoires de La Société Royale de Botanique de Belgique 6: 5–35.

Duvigneaud, Paul (1977): Carte Ecologique de l'occupation du sol et des degres de verdurisation de l'agglomération de Bruxelles, situation mars 1975, Notice explicative. Bruxelles: Service de l'environnement.

Duvigneaud, Paul (1990) : Les sites semi-naturels de l'écosystème Bruxelles. La végétation du Kauwberg à Uccle. Bruxelles: Edition du Centre d'Etudes Jacques Georgin.

Duvigneaud, Paul/Kestemont P. (1977): Productivité Biologique en Belgique, Paris-Gembloux: Editions Duculot.

Duvigneaud, Paul/Timperman, J/Scailteur-De Winter, N/Piette, A (1977): "Le Ferme Ardennaise considérée comme Agroécosystème." In Paul Duvigneaud/P. Kestemont (eds.), Productivité Biologique en Belgique, Paris-Gembloux: Editions Duculot. pp. 469–488.

Eraydin, Ayda/Taşan-Kok, Tuna (2013): Resilience Thinking in Urban Planning, Dordrecht: Springer.

Gandy, Matthew (2015): "From Urban Ecology to Ecological Urbanism: An Ambiguous Trajectory." In: Area 47/2, pp. 150–54.

Garland, David (2014): "What is a 'History of the Present'? On Foucault's Genealogies and their Critical Preconditions." In: Punishment & Society 16/4, pp. 365–84.

Halpern, Orit (2017): "Hopeful Resilience." E-Flux Architecture - Accumulation. 2017. http://www.e-flux.com/architecture/accumulation/96421/hopeful-resilience/.

Hein, Carola (2004): The Capital of Europe: Architecture and Urban Planning for the European Union, Westport: Greenwood Publishing Group.

Holling, Crawford Stanley (1973): "Resilience and Stability of Ecological Systems." In: Annual Review of Ecological Systems 4, pp. 1–23.

Horne, John/Kramer, Alan (2001): German Atrocities, 1914: A History of Denial, New Haven (Conn.): Yale University Press.

Jouret, Bernard (1972): "La Méthode du Transect Appliquée à l'Analyse Urbaine. Un Example Bruxellois." Revue de Géographie de Lyon 47/1, pp. 77–96.

Kaika, Maria (2017): "'Don't Call Me Resilient Again!': The New Urban Agenda as Immunology … or … What Happens When Communities Refuse to Be Vaccinated with 'Smart Cities' and Indicators." In: Environment and Urbanization 29/1, pp. 89–102.

Kirchhoff, Thomas/Brand, Fridolin/Hoheisel, Deborah/Grimm, Volker (2010): "The One-Sidedness and Cultural Bias of the Resilience Approach." In: Gaia: Okologische Perspektiven in Natur-, Geistes- Und Wirtschaftswissenschaften 19/1, pp. 25–32.

Koselleck, Reinhart (2006): "Crisis." In: Journal of the History of Ideas 67/2, pp. 357–400.

Lachmund, Jens (2013): Greening Berlin: The Co-Production of Science, Politics, and Urban Nature. Cambridge, MA: MIT Press.

Lachmund, Jens (2017): "The City as Ecosystem: Paul Duvigneaud and the Ecological Study of Brussels." In: Raf De Bont/Jens Lachmund (eds.), Spatializing the History of Ecology: Sites, Journeys, Mappings, New York & London: Routledge, pp. 141–61.

Lagasse de Locht, Charles/Saintenoy, Paul (1914): "La Reconstruction des Villes et Villages Détruits par la Guerre de 1914. Rapport sur les Devoirs Administratifs Incombant aux Pouvoirs Publics." In: Bulletin des Commissions Royales d'Art et d'Archéologie 53, pp. 253–264.

Leloutre, Géry (2009): "Revisiting the Modern Project for Brussel: An Observatory for Metropolisation." In: Bruno De Meulder/Michael Ryckewaert/Kelly Shannon, Transcending the Discipline. Urbanism & Urbanization as Receptors of Multiple Practices, Discourses and Realities, Leuven: KULeuven, pp. 173–92

Massart, Jean (1910): Esquisse de La Géographie Botanique de La Belgique, Brussel: Lamertin.

Massart, Jean, and Émile Vandervelde (1893): Parasitisme organique et parasitisme social, Londres: Dulau.

Notteboom, Bruno (2006): "De Verborgen Ideologie van Jean Massart: Vertogen over Landschap en (Anti-)Stedelijkheid in België in het begin van de Twintigste Eeuw." In: Stadsgeschiedenis 1/1, pp. 27–44.

Notteboom, Bruno (2009): "Ouvrons Les Yeux!": Stedenbouw En Beeldvorming van Het Landschap in België 1890-1940, Ghent: Ghent University.

Notteboom, Bruno/Uyttenhove, Pieter (2018): Recollecting Landscapes: Rephotography, Memory and Transformation 1904-1980-2004-2014, Amsterdam: Stichting Roma Publications.

Pierart, Pierre/Duvigneaud, Jacques (1992): "À La Mémoire Du Professeur Paul Duvigneaud (1913-1991)." In: Naturalistes Belges 73/4.

Platt, Harold (2015): Building the Urban Environment: Visions of the Organic City in the United States, Europe, and Latin America, Philadelphia: Temple University Press.

Polasky, Janet (1995): The Democratic Socialism of Emile Vandervelde. Between Reform and Revolution, Oxford: Berg.

Rabinow, Paul (1989): French Modern: Norms and Forms of the Social Environment, Cambridge: MIT Press.

Ryckewaert, Michael (2011): Building the Economic Backbone of the Belgian Welfare State: Infrastructure, Planning and Architecture 1945-1973, Rotterdam: 010.

Smets, Marcel (1977): De ontwikkeling van de tuinwijkgedachte in België: een overzicht van de Belgische volkswoningbouw in de periode van 1830 tot 1930, Brussel: Mardaga.

Smets, Marcel (1985): Resurgam. De Belgische Wederopbouw Na 1914. Edited by Marcel Smets. Brussel: Gemeentekrediet van België.

Sterken, Sven (2013): "Brussel: een hoofdstad in beweging? 50 jaar architectuur en stedenbouw." In: Erfgoed Brussel, 187–209.

Stynen, Herman (1979): Stedebouw en Gemeenschap. Louis Van der Swaelmen (1883-1929), Bezieler van de Moderne Beweging in België, Bruxelles: Mardaga.

Swyngedouw, Erik (2010): "Trouble with Nature: 'Ecology as the New Opium for the Masses.'" In: The Ashgate Research Companion to Planning Theory, London: Routledge.

Swyngedouw, Erik/Ernstson, Henrik (2018): "Interrupting the Anthropo-ObScene: Immuno-Biopolitics and Depoliticizing Ontologies in the Anthropocene." In: Theory, Culture & Society 35/6, pp. 3–30.

Tanghe, Martin/Duvigneaud, Paul (1978): "Etude Phyto-Écologique de La Vallée de La Woluwe Dans La Région Bruxelloise, Comme Base de Son Aménagement." In: Bulletin de La Société Royale Belge de Géographie 102/1, pp. 5–32.

Taylor, Peter J./Blum, Ann S. (1991). "Ecosystems as Circuits: Diagrams and the Limits of Physical Analogies." In: Biology and Philosophy 6, pp. 275–94.

Thomas, Marion (2003): Rethinking the History of Ethology: French Animal Be-
    haviour Studies in the Third Republic (1870-1940), Manchester: The University
    of Manchester.

Uyttenhove, Pieter (2011): "Individu en Ruimte. Utopie in het Begisch Reformisme."
    In: Stadland België. Hoofdstukken Uit de Geschiedenis van de Stedenbouw,
    Gent: A&S/books, pp. 17–44.

Van Acker, Wouter/Dehaene, Michiel/Uyttenhove, Pieter (2013): "Tussen Steden-
    bouw en Stadsbestuur. de Stedententoonstelling van Patrick Geddes en het
    Internationaal Stedencongres." In: Wouter Van Acker/Christophe Verbruggen
    (ed.), Gent 1913: op het breukvlak van de moderniteit, Gent: Snoeck, pp. 154–69.

Van der Swaelmen, Louis (1916): Préliminaires d'Art Civique: mis En relation avec le
    "cas clinique" de la Belgique, Leyde: AW Sijthoff.

Van der Swaelmen, Louis (1919): "Concordances." In : La Cité ½, pp. 21–23.

Van der Swaelmen, Louis (1920): "La Technique et l'Esthétique des Agglomérations
    d'Habitations à Bon Marché, Populaires Ou Pour La Classe Moyenne." In: Confé-
    rence Nationale de l'habitation a Bon Marché, Bruxelles 24-26 Avril 1920, v1–10.

Van der Swaelmen, Louis (n.d.): "Stedebouw - Introduction." KULeuven: Archive
    Raphaël Verwilghen.

Van der Swaelmen, Louis (1921): "Les Deux Poles de l'Urbanisme." In : La Cité, 4, pp.
    81–86.

Walker, Jeremy/Cooper, Melinda (2011): "Genealogies of Resilience: From Systems
    Ecology to the Political Economy of Crisis Adaptation." In: Security Dialogue
    42/2, pp. 143–60.

Welter, Volker M. (2003): Biopolis: Patrick Geddes and the City of Life, Cambridge:
    MIT Press.

North of the Arctic Circle

Ralph Erskine's Mid-20thCentury Urban Planning and Design Projects in Kiruna and Svappavaara

Ann Maudsley

This chapter examines the imagined Arctic towns of Ralph Erskine (1914-2005), a British born and educated architect who, in 1939, started his own architectural office in Sweden. This chapter then explores Erskine's own theoretical and practical architectural, design and town planning visions for building communities in the north in the 1950s and 1960s. Focusing on Erskine's projects at a town planning scale in Kiruna and in the nearby town of Svappavaara, both in Sweden, the chapter studies the built environment elements and design of these places; planning and development processes for each project; and the outcomes in each location, as described by Erskine himself and by other sources (e.g. Egelius 1990). It draws upon evidence from primary and secondary material, much of which is from the collections of Erskine's architectural office held at ArkDes, Sweden's national center for architecture and design. The chapter asks: 'What are the fundamental elements of Erskine's ideal Arctic town; what factors have challenged the resilience and survival of built examples of these communities; and what can Erskine's planning visions teach us about contemporary resilience discourse and practice?' This chapter attempts to identify lessons learned from Erskine's approach to planning and design in Arctic and subarctic regions, with a particular focus on community and climate.

The Arctic Architect

In 1939, Ralph Erskine, a newly qualified architect with training in urban planning, left his native England to find work in Sweden (Egelius 1990: 7-8). As a pacifist, Sweden's neutrality on the brink of the Second World War was "certainly significant for his decision to start his career in Sweden" (ibid: 8). Erskine remarked that he "first came to Sweden at the end of the thirties to escape from English conservatism" (Erskine 1961: 161). With the Stockholm Exhibition of 1930, Sweden "had confirmed [...its] position at that time as a country that was building extensively using a

modern architecture" (Collymore 1994: 4). The "links with social questions, and the Swedish political insistence on creating a novel, less inequitable society, strongly attracted Erskine" (Egelius 1990: 7). Social and environmental commitment became a central focus of Erskine's architecture and urban planning.

After moving to Sweden, Erskine started building a career in architecture and planning, with several projects being located in the northern parts of Sweden. Early Erskine buildings in northern Sweden include the wooden Avasjö Chapel in Borgafjäll (1947) with Sören Wimmerström and Uffe Olrik. A year later he also worked on another project in Borgafjäll, a ski hotel (1948), with Aage Rosenvald, Lennart Bergström and John Staalehoef. This hotel was "designed to integrate into the landscape" (ibid: 209), with "[l]ong roof slopes [that] doubled as nursery ski slopes, until the snow built up to transform them into part of the mountain landscape." (Rowntree 1964) Meanwhile "[i]ndoors, the play of levels and planning of space was so imaginative that guests did not much mind when the weather kept them inside." (ibid) The hotel was "[b]uilt in material available or prepared locally: rough sawn timber, stone, brick, telephone poles" (Egelius 1990: 209). Another 'pioneering' northern project of Erskine's with Henrik Jais Nielsen, Bo Sundberg and Jörgen Andersen, was the shopping center in Luleå (1954-56). "The first indoor shopping centre in Sweden", with a mix of uses this "was intended as a town within a town but differs from American shopping centres in being planned for the bleak northern climate, close to the Arctic Circle" (ibid: 46). Here, "[t]he icy outdoor air was excluded by a curtain of heated air: inside there was an artificially warm oasis in the midst of a frozen town" and "circulation areas that were given many exterior qualities" (ibid: 46).

In the 1950s Erskine also began developing theoretical design and planning visions for northern cities and towns. These included a plan for central Kiruna with Peer-Ove Skånes (1955, unbuilt); and an Arctic Town that is an "ideal, climatically-suited community" (ibid: 211-212). His early architectural and urban design vision laid the groundwork for his plans for Arctic and subarctic towns for decades to come.

Erskine's focus was on the Arctic, and within it, "the Arctic zone proper consisting of polar sea and the partly glaciated islands [...] where snow and ice never disappear, and the sub-Arctic[1] zone, a great circumpolar region stretching from the polar sea to well south of the tree line where it merges into the cold temperate zone" (Erskine 1960: 216). In the Arctic zone, both the climate and environment are harsh. There is "isolation, and continuously shifting boundaries between liquid and solid, between darkness and light" (Jull 2016: 214). Here, extreme cold, snow and wind dominate winter. In planning for these kinds of conditions, Erskine detailed

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1   Although subarctic is now the commonly used spelling, I keep the spelling "sub-Arctic" where it appears in the original historical text.

"the exceptional costs of road building, maintenance and snow clearance, of laying drains and water mains at a depth of 3 m often in rock to protect against frost, as well as the discomfort of moving in an open windy community in the winter blizzards" (Erskine 1968a: 168). In contrast to winter when "the sun is always fairly low", summer is characterized by constant light (Erskine 1961: 162). Writing for CIAM '59 in Otterlo, Erskine argued that in "[c]orresponding to these light conditions, one has the task of using buildings to reflect the light in spring and to give shade in the summer – quite different from the way we think about buildings here." (ibid:162) As McGowan notes, Erskine's "sub-Arctic projects, especially his unrealized utopian projects for an 'Ideal Town' north of the Arctic Circle, have been canonized in architectural discourse as exemplars of an architecture that is truly regional in character and, moreover, ideally suited to the unique cultural – especially with regard to indigenous populations – and environmental habitats of Arctic and sub-Arctic environments" (2008: 241). Erskine gained the label of "Arctic Architect" (Rowntree 1964: 9; Egelius 1990: 67). This "alias has continued to dominate an understanding of Erskine and his work" (McGowan 2008: 241).

Resilient Utopias in Extreme (Cold) Climates and Environments

Planning and designing buildings, cities and societies that are resilient to external shocks and that are tailored to their particular environmental and climatic conditions is a key feature in several utopian projects. As early as 1516, Sir Thomas More wrote about "streets that are well designed [...] for protection against wind" in his perfect society on the fantastical distant island, Utopia (2009 [1516]: 51). By the early 1800s, too, there was a fascination with creating ideal places in the north. For Charles Fourier, 60 degrees north and beyond represented a place for populating and cultivating (1996 [1808]). This 19th-century fascination with the north also aligned with the growth of the railway, which saw a boom in mass tourism driven by intrepid travel writers lured by the dramatic scenery and unfamiliar culture of the north (Hooker 1837; Lowe 1857; Stanford 1881). Writing approximately 125 years after Fourier, Le Corbusier suggested that Utopia could be found at 64.4 degrees parallel north (1967 [1933]). More recent utopian visions include "Rethinking the Bering Strait", an ecological and renewable system and structure for life proposed by OFF Architecture for the threshold between the Arctic and Pacific Oceans, Siberia and Alaska, with an envisaged completion date of 2070 (Klanten/Feireiss 2011). These examples suggest that there has been a fascination with climate and environment – and specifically the north – for more than five centuries.

A connection to the Arctic north is also characteristic of several 20th and 21st century domed science fiction type climatic utopias. Dubai Sunny Mountain Ski Dome is a 21st-century real-world example of a project, where an "Arctic experien-

ces" effect is emphasized, but within a weather-controlled structure in a climatically different place (Dubai Ski Dome 2018). While Dubai Sunny Mountain Ski Dome is yet to be constructed, a much smaller scale snow park, Ski Dubai, has already been built in the Mall of the Emirates. These visions of domed structures resemble science fiction type climatic utopias of the mid-20th century set in arid landscapes (Dorrian 2012). Such projects include Buckminster Fuller's geodesics, including the floating globes of his 'Cloud Nine' project (ca. 1960) with Shoji Sadao (ibid: 29). Frei Otto and Kenzō Tange similarly proposed a City in the Arctic (1971) of up to 40.000 inhabitants, with a city completely enclosed under a domed roof. In this example, a temperate latitude city is decoupled from the outside Arctic climate by means of mechanical and structural systems (Jull 2016).

The north and Arctic continue to exert a powerful influence on architectural imaginaries. The Arctic stands for nature "in its most pure, untouched, virginal and whitest state" (Dorrian 2012: 32). A territory rich in raw materials, it has been a place for exploitation and possibilities. Erskine himself described this space – particularly the subarctic – as a place of "isolation", an area that "was at the periphery of everything happening in the world" (Erskine 1961: 161). It was in this extreme environment that he proposed to "establish a habitat for a modern sub-arctic life" (ibid: 161).

Erskine's Ideal Arctic Town

Like his contemporaries Buckminster Fuller, Shoji Sadao, Frei Otto and Kenzō Tange, amongst others, Erskine explored the possibility of having northern towns with interior functions to enhance convenience and comfort in the context of extreme climatic conditions (Erskine 1961: 166). Erskine himself stated that "earlier it had seemed to me to be a possible solution for the high arctic", and had proposed, for example, indoor "planting with exotic vegetation – such as apple trees" (Erskine: 1960: 217). He later warned against the "science-fiction type solution which has appealed to many designers and engineers", that is, "the technical and economic solution [...] to plan all dwellings and other functions within one compact, weather protected and well heated building [...which] can have disastrous social and psychological consequences and [...] become very expensive in the long term" (Erskine 1978: 6). He argued that covering "the whole city with a plastic bubble or something like that [...] is wrong, for it has forgotten one important human factor and that is the question of the summer, the experience of it, the experience of the air and the direct sunlight" (Erskine 1961: 167). While planning for integrated indoor functions may allow for comfort and convenience, especially in the winter, important social and psychological relationships with nature are degraded. For these reasons, comfort and convenience should not be the exclusive target of the architect/planner:

Urban planning should recognize that a relationship to nature is important for the emotional, psychological and social well-being of city dwellers.

Erskine argued there should be "a grouping of many different functions under one roof for common shelter and warmth" (Anonymous from the Erskine ArkDes collections 1967: 127) and "well-heated and lit communications, piazzas and gardens, covered for bad weather" (Erskine 1960: 217). He also, though, advocated for human connection to the wilderness and outdoors. Erskine argued that "architecture must be adaptable to summer activities" (Anonymous from the Erskine ArkDes collections 1967: 127) and able to "open to spring and sunshine" (Erskine 1963a: 2; 1963c: 7); that formal planting must be complemented "with a view over the surrounding landscape, as there will be many indoor or underground workers"; and that "nature is the dominant, and the 'human' the exception" (Erskine 1960: 217).

Erskine also emphasized the function of buildings as climatic shelter, the importance of avoiding heat loss, allowing access to sunlight and protection from wind. Erskine argued that houses and towns in the north "should open like flowers to the sun of spring and summer but, also like flowers, turn their backs on the shadows and cold northern winds, offering sun-warmth and wind-protection to their terraces, gardens and streets" (Erskine 1968a: 167). His sketches (such as Fig. 1 below) show communities on slopes facing south surrounded by walled perimeters of the highest buildings, providing protection from wind and blizzards, whilst opening to the sun. Erskine saw perimeter walls and southern slopes as a source of heat saving during winter, and shade in the summer. He contrasted this orientation with north facing windows that "induce cold during winter and warmth during the midnight sun" (Anonymous from the Erskine ArkDes collections 1967: 130).

Erskine was also aware that the cost of building northern towns was "enormous", thus "should be based on technical rationalization and standardization" (1960: 217). His ideas were progressively modernist, using, among other strategies, industrialized methods in undeveloped areas. In response to climatic conditions, for example, Erskine argued that, "with modern techniques almost any degree of protection can be achieved" (1968a: 169). He used designs that would maximize efficiency, for example, modular prefabricated construction techniques; "aerodynamic forms" to prevent accumulation of snow on buildings; and separation of "pedestrian and mechanical traffic" to facilitate different types of snow clearing for these varying functions (ibid: 169-170).

Erskine's work also focused on people and communities (Erskine 1960: 217). Hemmersam remarks that Erskine's "practice was considered to have a particular cultural as well as social profile" (2016: 413). He wanted northern communities to allow for "personal freedom and privacy" (Erskine 1960: 217). Erskine also argued these communities "should be intensive [...] with rich amenities and possibilities for varied activities" and "should [...] be made more attractive and genuine than their equivalent in more southerly latitudes" (ibid: 217). He thought that one important

Figure 1: Ralph Erskine, An Ecological Arctic Town, 1958 (ArkDes collections, ARKM.1986-17-0362).
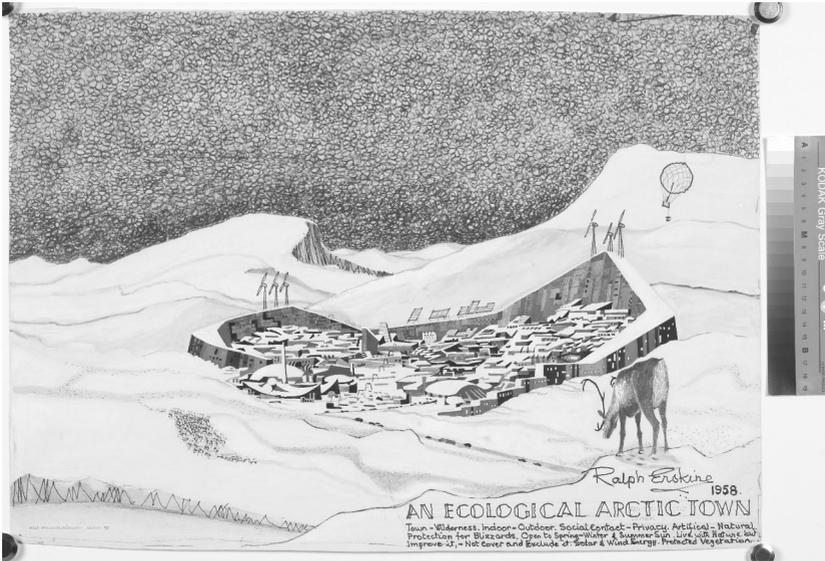
goal should be to facilitate more concentration, social interaction and human contact in these Arctic towns that were isolated from neighboring settlements by great distance and severe climatic conditions (ibid: 217).

Erskine also set out to create a new regionalism conditioned by the northern culture and climate. Regionalism "grew in strength and popularity during the post war period, often in opposition to what were seen as the homogenizing and globalizing tendencies of the International Style of modernism" (McGowan 2008: 242). It was "an approach to architecture that seeks to develop built form out of, and in response to, the traditions, needs and demands of a particular climate, locale, and culture" (ibid: 242). Northern towns, Erskine stated, "must become free of the 'colonial' attitude, and base their own culture on their own way of life" (1960: 217). He decided that new northern towns must "avoid imitating the 'home country's' culture" (Rowntree 1964: 9). Unlike the "usual when settlers move to a new country", "and attempt to recreate their old homes", Erskine argued that "in the sub-Arctic this can never be successful, and modern man [...] must use his resources to arrive by analysis and synthesis at an indigenous culture" (1960: 217). While he "studied indigenous Inuit and Sámi buildings in the region" (Egelius 1990: 212), the indigenous culture Erskine speaks of here is a new "method of life – of modern life" in what he considered an "untried region" (1961: 162). In his "search for a contemporary

architectural 'grammar' for the Arctic", Erskine, "overwrites the presence of Arctic indigenous peoples" (McGowan 2010: 104).

Building in the Arctic

In the 1940s and 1950s Erskine had already designed several buildings in northern Sweden and by the late 1950s and early 1960s he also had the opportunity to put his visions for northern towns into actual development plans. These commissions included projects in Kiruna (1959-1965) and in the nearby town of Svappavaara (1960s), both in Sweden. These areas were architectural and planning test cases for the advancements of the Swedish welfare state, and the bureaucrats and policymakers who made up the machinery of the welfare state were receptive to the theories for Arctic planning advocated by Erskine. Erskine noted that "experience in community planning in remote and northerly climates is by no means superfluous knowledge [...] as climatic extremes, whether hot or cold, wet or dry, have basically the same theoretical solution" (Burnett 1975). This idea of Erskine's aligns to contemporary resilience thinking. Both suggest, that planning can be adapted across different settings and build on learnings from other cases. The next section of this chapter traces Erskine's ideas for planning and designing in northern climates, and also interrogates the outcome of these projects in reality.

Kiruna

After working on concept proposals for Arctic town planning; plans for a total reconstruction of Kiruna town center in the 1950s (which remains unbuilt); and a housing scheme in Kiruna with Yngve Fredriksen (1955, built), Erskine with Peer-Ove Skånes, won a contract for a new quarter within central Kiruna. Kiruna, a town in northern Sweden, is built around the extraction of iron ore by the state-owned mining company Luossavaara-Kiirunavaara Aktiebolag (LKAB). While the client for the project was Kiruna HSB housing cooperative, it was widely recognized that LKAB would also play a leading role in decision-making: LKAB "besides dominating the labour market also in reality decides on the welfare, housing and service levels of the entire community" (Egelius 1990: 74). Because of LKAB's influence on the planning and construction process, Kiruna was inherently tied to the boom-bust cycle of the extractive industry at this location: As demand for iron ore ebbed and flowed, funding for town services and facilities followed similar trends. For Erskine, this whole project, including the preliminary study for Kiruna center, "was an attempt to create plans and structures which were specifically suited to meeting the life and needs of the people who live in a subarctic situation" (Erskine

n.d.b: 3). Here, the people are broadly "Kiruna dwellers" (Erskine 1968: 168). Erskine "suggested a continuous run of buildings, where people could move outdoors in wind protected sunny streets, or indoors in enclosed and heated walkways", which would also house ducts for services and infrastructure, to allow for easier access, than under streets (Erskine n.d.b: 1).

Only one block of the whole Kiruna scheme – the Kvarteret Ortdrivaren (1959-1965) with housing, office and community uses (Collymore 1994) – was "so built that it reminds of the original concept" (Erskine n.d.b: 1). This block, Erskine remarked "has for me been of great interest to design and execute" (ibid). However, his proposal for Kiruna was amended constantly, following discussions with representatives of the town (Egelius 1990: 77). Erskine remarked "the unfamiliarity of the vision I gave" (Erskine 1968: 168) and "the force of tradition and lack of familiarity with new ideas [...] led to the construction of the city along habitual lines" (Erskine n.d.c: 22) and "on its original street pattern and with a largely 'traditional' structure" (Erskine n.d.b: 1). The local partners were resistant to Erskine's new architectural and design strategies, and continual compromises ultimately led to an essentially conventional plan.

The ensemble of buildings constructed at Ortdrivaren (Fig. 2) were clearly marked by Erskine's theoretical ideas, but they also departed from his visions in important ways. In Architectural Design, in March 1967, it was noted the "Kiruna development represents a less doctrinaire interpretation of these ideas" (Anonymous from the Erskine ArkDes collections 1967: 131). A link to the outdoor environment was maintained. The site was intensely developed and totally occupied by a series of buildings containing a mix of uses (Erskine n.d.b; c). These included housing, offices, shops, car parking, play areas, and a church (Erskine n.d.b; c; 1968b). The buildings rise above a garage covering the whole block as a series of terraces. These terraces were provided with winter and summer play space, and sunny, wind protected balconies and seating space, with a view (Erskine n.d.b; c). A naturally lit and heated passage was built to connect the playground, shops and apartments (Erskine n.d.c). This and other outdoor stairs were also designed to allow for protection against snow and blizzards (Erskine n.d.b; c). Meanwhile, rounded corners of the buildings were designed to reduce cooling effects making them more economical (Egelius 1990). The church "was built for a very low cost, has the simplest of materials and finishes and a similar construction to that of the flats" (Erskine n.d.b: 3). The characteristics of Ortdrivaren described here are reflective of Erskine's theoretical ideas for building in northern towns. While the highest buildings were placed to the north, and lowest buildings are to the south, so that "the site becomes a grandstand facing the view, the summer warmth, and the return of winter-sun" (Erskine n.d.b: 2), there was no walled perimeter building facing south, opening up to the sun like a flower, while protecting the community from winds – an idea that had been central to Erskine's vision.

In his accounts of developing Ortdrivaren, Erskine paints an endearing picture of a warm, active and livable group of buildings (Erskine n.d.b; c; 1968b). Other reports also suggest the development had a positive impact on the community (Egelius 1990). Erskine has been praised for exciting architecture (Wrethagen 1985) and designing a fine place where people could thrive (Nordmark 1975). Similarly, the buildings have been described as lively residential places, with careful detailing and fine formal affiliation to the cityscape (Hård af Segerstad 1969). When interviewed decades after the construction of the project, some residents reported that living there – particularly in one of the high-rise buildings – was amazing (Rosell 1984).

In his design for Kiruna, Erskine was described as "completely and unpredictably original" (Anonymous from the Erskine ArkDes collections 1963: 305). One newspaper reported that it was perhaps Kiruna's most debated architecture project, a revolutionary artwork, by an architect who had never lived in Kiruna (Anonymous from the Erskine ArkDes collections 1972). The buildings were painted yellow,

red and brown to represent the midnight sun and the earth, and there were also references to mining in the design details (Nyström 2017). Erskine thought Ortdrivaren's "warm tonalities" "pleasurably contrast with a countryside which remains in winter conditions for so long" (Erskine n.d.c: 22). Erskine also claimed that he "tried to create a complete formation which might entice children to use their own fantasy and find their own forms of play, hide and seek and adventures" (Erskine n.d.b: 2). He used concrete, which he thought was attractive, but also because he thought children would hurt themselves less on it (Ulvskog 1974).

While many liked Erskine's design, others thought it looked terrible (Barck 1973). Criticism against Erskine's design was focused on aesthetics, color and material. People found it difficult to accept housing that looked like Erskine's Ortdrivaren buildings (Anonymous from the Erskine ArkDes collections 1977). It is unclear why, but conservatism, stubbornness and the amount of concrete are cited as possible reasons for the dissatisfaction of some residents (ibid). Ragnar Malmström, a former leader of municipal politics in Kiruna, felt Ortdrivaren ruined the cityscape (Wallström 1978). Erskine's buildings also gained nicknames, initially as a joke amongst the locals in response to the "strange architect" who designed them (Anonymous from the Erskine ArkDes collections 1977: 34). Some of these names referenced the color of the buildings, some of which had been painted snus/tobacco brown (ibid: 34). The concrete materiality was another point of criticism for the project. Residents campaigned against the concrete play areas, and for safe play spaces (Anonymous from the Erskine ArkDes collections 1974; Ulvskog 1974). There was so much concrete used in the balconies of one of the buildings, nicknamed Snusdosan (snuff box), it was joked that there was enough to facilitate the construction of several other high-rise buildings (Unknown source from the ArkDes collections n.d.). Though there was criticism, the area became more accepted as it developed (Anonymous from the Erskine ArkDes collections 1965), though the nicknames of the buildings remain.

Whatever the competing and shifting perceptions of the Kiruna project have been over more than six decades, it is also critical to note that Erskine's planned visions for Kiruna were only partially realized. Furthermore, Ortdrivaren is set to be demolished as part of the moving of the town three kilometers to the east to allow for the expansion of the adjoining iron ore mine (the planning for which began in 2004). While some buildings and areas in Kiruna have been deemed to have heritage value worth preserving and moving, Ortdrivaren, a national cultural heritage landmark (Norrbottens län 2010 [1997]), will be lost, though some parts of the building, such as the balconies, may be able to be relocated (Lövgren 2018). This is even though it is "an important part of Kiruna's modern architectural heritage" (Nyström 2017). By January 2017, the real estate subsidiary of LKAB, LKAB Fastigheter, had expropriated Ortdrivaren from the buildings' tenant association as part of the transformation of Kiruna (Lindblad 2017). Arild Storeide, chairman of the

buildings' tenant association noted that although over 90 per cent of homeowners decided to sell, they were not completely satisfied with the agreement (Palmäki 2016). In the coming years, residents from Ortdrivaren will need to relocate. These processes bring into question the resilience and sustainability of imagined town plans, urban areas and their communities when these are placed into conflict with powerful interests, in this case, the mining industry. The ability of Ortdrivaren and its community to adapt to change has been undermined by the processes surrounding the expanding extraction of iron ore adjoining the town. The current value of iron ore is so high that the continued extraction of this raw material and the moving of Kiruna has been warranted economically. This is at the cost of other factors, including the architectural and historical significance of buildings like Ortdrivaren, and the community and social networks that exist there.

Svappavaara

Another plan Erskine worked on, again with Peer-Ove Skånes as well as Aage Rosenvold, was for new development in Svappavaara, an existing village of 400 residents, 45 kilometers south east of the central city of Kiruna. Initially, Erskine's project for an ideal Arctic town at Svappavaara was simpler than at Kiruna, and developed out of a limited competition between invited architects (Egelius 1990). Erskine's entry, entitled, Ansikte mot söder (Facing the South), shared first prize with two other proposals, though eventually received the final commission (Egelius 1990; Djärv 1994). The competition was arranged by Kiruna Kommun (Kiruna City) and LKAB in 1961 to address the proposed expansion of the town as a result of iron ore exploitation close by. The Svappavaara proposal also represents a more doctrinaire and straightforward interpretation of Erskine's Arctic philosophy than his plan for Kiruna (Anonymous from the Erskine ArkDes collections 1967; Egelius 1990).

Erskine's plan for the Svappavaara ideal Arctic town was in strict accordance with his theories. Fig. 3 below shows a detailed section of Erskine's vision for the center of Svappavaara. A long three-story block of flats would be located on a hilltop, which would act as a shield against northern winds, and would face south to maximize exposure to the sun (Anonymous from the Erskine ArkDes collections 1969a; Egelius 1977). In front of the building, on the southern slope of the hill and facing the sun, Erskine sketched clusters of terraced housing, single family dwellings, shops, a hotel, restaurant, sport and leisure facilities, a school, new community center, and other services, while also allowing room for the original village (Anonymous from the Erskine ArkDes collections n.d.a; 1969b; Erskine 1963b; Egelius 1977). Different uses were to be linked by warmed, wind, rain and snow protected connections, and a sunlit interior street that would act as a meeting place

(Anonymous from the Erskine ArkDes collections 1969b; Erskine 1968c). Buildings were to be prefabricated to a large extent (Egelius 1977). Svappavaara was planned by Erskine to be a warm, protected, friendly, lively and well-connected community with varied services to mitigate the effects of spatial isolation (Anonymous from the Erskine ArkDes collections n.d.b).

Figure 3: Ralph Erskine, Svappavaara Centrum (center), 1964, from the ArkDes collections, ARKM.1986-17-0923-01.

As with his plan for Kiruna, Erskine's proposal for Svappavaara was only partially realized. "All that materialized" were some "disconnected bits" (Anonymous from the Erskine ArkDes collections 1969b). Some colorful, hypermodern owner-occupied housing was placed on the southern terrace, and a 197 meter long housing complex for LKAB workers, called Ormen Långe (the Long Snake), was also built (Anonymous from the Erskine ArkDes collections 1964a; b;Egelius 1977). The vast majority of the town was, however, not built according to Erskine's proposal (Wall 1973; Haugdal 2015). In addition to the residential buildings, one public building – a school – was built. Not only did the school fail, on its own, to address Erskine's goal of creating a richly serviced Arctic town, the school was designed and built by a local architect who largely ignored Erskine's goal of creating connections between different uses (Wettergren/Strömdahl 1970; Egelius 1977a). Ormen Långe is isolated

from the rest of the town, while the owner-occupied housing is grouped apart from the existing town. The internal street of Ormen Långe was gravely mismanaged, had no color, plants or meeting places with seats, only locked doors and concrete (Anonymous from the Erskine ArkDes collections n.d.b; Egelius 1977). Svappavaara became "bare, cold and desolate" and in reality, Erskine's ideal community turned out as a normal suburb, lacking any sort of cultural facilities (ibid). In 2009 a decision was also made to demolish Ormen Långe, and today around only half the original building remains (Sternlund 2010).

The failure of Erskine's scheme in Svappavaara, was not solely the responsibility of the architect. Erskine thought the plan would have worked if the construction had proceeded along his proposed lines. He himself later voiced discontent in the housing conditions, which, he argued, would have been more pleasant if Kiruna City had followed his plan (Rantatalo n.d.). Erskine had hoped to provide a high service standard and special environmental conditions to compensate for adverse climate conditions, and social isolation (Wettergren/Strömdahl 1970). Erskine felt that "the high costs of providing an efficient, well equipped and attractive community structure for people [...] is [...] an equally obvious operational cost" as "building a long railway in order to transport ore from an isolated mine" which was "accepted without question as one of the unavoidable operational costs" (Unknown source from the ArkDes Collections n.d.). LKAB and Kiruna City did not have the same view though: Due in part to reduced demand for iron ore beginning with the global oil crisis (Egelius 1977), LKAB no longer needed as many workers, and was unwilling to fund the project to completion (Wall 1973). With just under 1000 inhabitants, the community was too small to support a commercial district and social or cultural facilities; nor could it be effectively integrated into Kiruna City due to financial constraints (Egelius 1977). The costs of fulfilling Erskine's plans for a social and ecological development were rejected, while those serving profit motive were paid. By the early 1970s there was a high turnover of residents (Rantatalo n.d.) and due to the proximity of Kiruna, many mine workers preferred to live there and commute to their jobs (Anonymous from the Erskine ArkDes collections 1970). Erskine's Svappavaara project was the result of growing mining activity in the North and stood as a strong symbol of industry and boom times in the local community. It was dramatically impacted by the economic downturn and subsequent shift away from an extractive economy in the decades that followed (Haugdal 2015). Building a sustainable livable community that is resilient in the face of the everyday extremes of Arctic life requires a stable investment stream and an integrated planning vision. Today Svappavaara's population is 400 people (SCB (Statistics Sweden) 2019).

Erskine was not solely responsible for the shortcomings of Svappavaara, its failure to achieve sustainable population growth, or an adequate supply of social and cultural resources. Contemporaries did, however, rightly consider that Erskine was responsible for the mishandling of communal facilities and over-dimensioning re-

lative to the size of the community (Egelius 1977). His plan has been criticized for being romantic (Wettergren/Strömdahl 1970; Egelius 1977). It is also believed that he must have known that his imagined plan would never be completed, particularly since the danger of unstable funding streams was highlighted in the statement concluding the competition statement (ibid). Erskine was aware that some people might choose to commute from Kiruna where there were more services, rather than live in modern Svappavaara (1963b). Furthermore, perhaps Erskine should have assumed that people would choose a more established city, which might have led him to make more conservative projections about the scale of planned construction As one critic observed, Erskine should have recognized that, with developments in mining equipment, fewer employees would be required in the future than he projected (Anonymous from the Erskine ArkDes collections n.d.a.).

Another problem impacting the project was the lack of public consultation. Though Erskine had suggested open planning meetings and collaboration, these were never implemented (Unknown source from the ArkDes Collections n.d.). Local inhabitants bitterly criticized the alienation of the public in the decision-making processes (ibid). Workers in particular felt exploited as a result of planning taking place above them (Egelius 1977). The physical separation of workers' housing from the existing town center and other new construction worsened community cohesion as well as communication between workers and management (ibid). Though it is difficult to isolate the influence of Erskine's scheme, it was thought to be instrumental in igniting a LKAB strike that took place between 1969 and 1970 (ibid). Learning from his experiences with the Svappavaara project, Erskine made public participation an important element in his later projects, for example, the Arctic township at Resolute Bay, Canada (1973). Resilience theory does, in some cases, talk about learning, evolution, and adaptation as a core part of resilience. The communities Erskine planned in Kiruna and Svappavaara have largely shown not to be resilient, impacted by booms and busts in the iron ore extraction industry at these locations. However, principles of planning for extreme climates have themselves demonstrated resilience; learning from failures, adapting to new environmental, economic, social and political arrangements, and surviving setbacks of various kinds.

Learnings from Erskine

In his vision for the Arctic and subarctic, Erskine imagined vibrant, well-connected communities that were designed to withstand the extreme climatic and environmental characteristics of this northerly latitude. Some of the thinking introduced in his theoretical and practical schemes for Arctic cities continue to have broad relevance for energy conservation in the context of the energy crisis. Erskine, for

example, used passive building form and function to maximize solar gain and provide protection from wind, rain and snow (Erskine 1980; Egelius 1977; 1990). While Erskine's schemes were designed with regard to the environment, it is worth remembering that his Kiruna and Svappavaara projects were ultimately connected to extraction of resources and development of greenfield land. In part for this reason, some have criticized Erskine for having a colonial attitude that viewed the north as an empty space with no culture (Birk 2012; McGowan 2008). Erskine himself specifically wrote that "[i]n the sub-arctic zone there is an enormous quantity of space, but no established culture" (1961: 161). As McGowan points out, "the underlying logic of Erskine's 'Arctic Architecture' seems to script the North as a carte blanche playground for modern architects – as if the native populations of the Arctic vanished without a trace" (2010: 103). Furthermore, McGowan notes Erskine, often worked for the Swedish government at "a time of heightened colonialism in Sápmi" land (2008: 249). Erskine's own remarks confirm this colonial attitude (Erskine 1961; Unknown source from the ArkDes Collections n.d.). Erskine's visions for Arctic communities and the practical application of these, raises questions about who they were supposed to be ideal for.

Erskine's Arctic proposals reflect historical plans for ideal settlements in extreme (cold) climates and environments, as well as contemporary and emerging plans for growth and development. Erskine may not have used the rhetoric of resilience, but his plans shared many of the same goals of contemporary resilience discourse (see, for example, Walker/Salt 2012). His model cities were designed to build community cohesion, create a rich institutional reservoir and, most importantly in extremely cold Arctic environments, allow the system to adapt to the regular disturbances associated with extreme environments.

Erskine focused on "how to establish and maintain the presence of 'new settlers' in the Arctic regions" (McGowan 2010: 100). His work fits into a line of thinking that extends more than 100 years. In its beginnings, the settlement of Kiruna (founded in 1900) by architect Per Olof Hallman "was built to a plan, as a model society" (Bucht 1997: 63) and was designed "to adapt to the harsh sub-arctic inland climate" (Keshavarz/Lindstedt/Stenqvist 2013: 57). In the 21st century, the transformation of Kiruna provides an opportunity to "create a sustainable model city", and for Kiruna to "transform itself into a more socially and economically sustainable city", as is suggested by White Arkitekter (n.d.), who with Ghilardi + Hellsten Arkitekter, is responsible for the 2013 masterplan for Kiruna's phased relocation by 2033 – the winning entry of an international competition. This latest masterplan for Kiruna echoes the historical visions for Kiruna including Erskine's Arctic plans, proposing a model city – socially and environmentally – that addresses the extreme climate at this location.

Erskine has been a celebrated 'Arctic Architect', and authoritative figure on planning and designing buildings and cities north of the Arctic Circle, and he con-

tributed to this discussion throughout his decades long career. His plans for the ideal Arctic town, in the cases of Kiruna and Svappavaara remain, however, only partially realized. Furthermore, half of Ormen Långe has been demolished and Ortdrivaren faces the same fate in coming years. These projects show the complexity of building resilient communities within isolated extreme climates and environments in northern regions. The challenge is to be able to provide a high standard of services for living and connection to nature (to ensure social and psychological well-being), while also ensuring economically and environmentally efficiency. The Kiruna and Svappavaara cases also further reflect the challenges of strategic and master planning. Imagined visions for an ideal future are combined with tangible ever evolving social, cultural, political, economic and environmental factors. The United Nations, through their Sustainable Development Goals, advocates for multistakeholder and public-private partnerships as a tool for achieving sustainable development (2015). The cases presented here in Kiruna and Svappavaara support this view. They explicitly highlight that extractive industries tied to potentially short-term boom-bust market cycles are unreliable partners for resilient planning. For resilient and sustainable planning and development there must be a focus on farther horizons; the interests of community cohesion; and the integrity of human-non-human relations needs to be placed first.

References

Anonymous from the Erskine ArkDes collections (n.d.a): Neighbourhood unit for Svappavaara mining district, Kiruna, Northern Sweden, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (n.d.b): Picture No. I, Picture II, Picture III, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1963): "Farthest North." In: ar euromart, The Architectural Review CXXXIII/795, p. 305, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1964a): "Norrbottens längsta hus ska byggas i Svappavaara." In: Norrländska Socialdemokraten Boden February 21, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1964b): "Rekordlångt bygge får kritik i norr." In: S.T. May 29, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1965): "Turistfold vill premiera: Arkitekter med fantasi och idérikedom." In: Norrländska Socialdemokraten March 12, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1967): "Kiruna, Swedish Lapland." In: Architectural Design March, pp. 127-131, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1969a): "Kiruna i veckan: Svappa-vaara igen." In: Norrbottens-Kuriren May 24, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1969b): "No-one Knows How Long It Will Be Before Svappavaara is Completed." In: Sydsvenska Dagbladet December 24, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1970): ""Svappavaara är inte så omöjlig som ort…"…Men hur möjlig?" In: arkitekttidningen, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1972): "– staden som blivit ett levande museum." In: Ny Lidköpings-tidningen Nya Länstidningen March 17, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1974): "– Lekplats i betong – är den lämplig för barnen?" In: Norrländska Socialdemokraten September 4, p. 3, from the ArkDes collections.

Anonymous from the Erskine ArkDes collections (1977): "Bygg 77." In: Norrländska Socialdemokraten March 12, p. 34, from the ArkDes collections.

Barck, Åke (1973): "Norrbottens-Kuriren." In: Kiruna September 29, from the ArkDes collections.

Birk, Kirsten (2012): "Arktisk arkitektur? = Arctic architecture?: Ralph Erskine's Resolute Bay project." In: Arkitektur DK August 56/4, pp. 48-51.

Bucht, Östen (1997): "Local Mobilization in the Municipalitiy of Kiruna." In: Claes Göran Guinchard (ed.), Swedish Planning: Towards Sustainable Development, PLAN the Swedish Journal of Planning, Gävle: The Swedish Society for Town and Country Planning.

Burnett, Betty (1975): "Extract from ms. written by B. Burnett for 'Sweden Now'." May, from the ArkDes collections.

Collymore, Peter (1994): The Architecture of Ralph Erskine, London: Academy Editions.

Djärv, Kicki (1994): Hotell Borgafjäll och Avasjö Kapell av Ralph Erskine, Umeå: Institutionen för konstvetenskap Umeå Universitet.

Dorrian, Mark (2012): "Utopia on Ice." In: Cabinet 47, pp. 25-32.

"Dubai Ski Dome", August 1, 2018 (https://www.skidubai.com/mountain-ski-dome.html).

Egelius, Mats (1977): "Ralph Erskine: The Humane Architect." In: Architectural Design 47/11-12, pp. 750-852.

Egelius, Mats (1990): Ralph Erskine, Architect, Jeremy Franks (trans), Stockholm: Byggförlaget in conjunction with the Swedish Museum of Architecture [Arkitekturmuseet].

Erskine, Ralph (n.d.a): from the ArkDes collections.

Erskine, Ralph (n.d.b): Development in Kiruna, North Sweden, from the ArkDes collections.

Erskine, Ralph (n.d.c): Housing Estate at Kiruna, Sweden, from the ArkDes collections.

Erskine, Ralph (1960): "Building in the Arctic." In: Architectural Design May, pp. 216-217.

Erskine, Ralph (1961): "The Sub-Arctic Habitat." In: Oscar Newman (ed.), CIAM '59 in Otterlo: Arbeitsgruppe für die Gestaltung soziologischer und visueller Zusammenhänge. Stuttgart: Karl Krämer: pp. 160-168.

Erskine, Ralph (1963a): Att Bo 2, from the ArkDes collections.

Erskine, Ralph (1963b): Förslag till stadsplan över del av Svappavaara by. Besrkivning, from the ArkDes collections.

Erskine, Ralph (1963c): "Grammar for the North." In: Perspective, from the ArkDes collections.

Erskine, Ralph (1968a): "Architecture and Town Planning in the North." In: The Polar Record 14/89, pp. 165-171.

Erskine, Ralph (1968b): "Bostadsområde i Kiruna." In: Arkitektur 44, pp. 44-48.

Erskine, Ralph (1968c): Om Svappavaara, from the ArkDes collections.

Erskine, Ralph (1978): Housing and Community Planning, from the ArkDes collections.

Erskine, Ralph (1980): "Architecture in a Cold Climate." In: RIBAJ October, pp. 51-52, from the ArkDes collections.

Fourier, Charles (1996 [1808]): "The Theory of the Four Movements." In: Gareth Stedman Jones/Ian Patterson (eds.), Fourier: The Theory of the Four Movements, Cambridge: Cambridge University Press.

Haugdal, Elin (2015): "Boligblokker i hardt klima: Hestekoblokka i Hammerfest og Ormen långe i Svappavaara." In: Nordlit 36, pp. 79-106.

Hemmersam, Peter (2016): "Arctic architectures." In: Polar Record 52/265, pp. 412-422.

Hooker, William Dawson (1837): Extract from "Notes on Norway; or, A Brief Journal of a Tour made to the Northern Parts of Norway in the Summer of 1836." In: The London Library (ed.) (2016), The Lure of the North, London: Puskin Press, pp. 6-33.

Hård af Segerstad, Ulf (1969): "De har aldrig kompromissat." In: Svenska Dagbladet, p. 2, from the ArkDes collections.

Jull, Matthew (2016): "Toward a Northern Architecture: The Microrayon as Arctic Urban Prototype." In: Journal of Architectural Education 70/2, pp. 214-222.

Keshavarz, Sam/Lindstedt, Krister/Stenqvist, Mikael (2013): "Kiruna [Sweden]: the challenges of moving a town: mining subjects the town of Kiruna in Sweden to continuous transformation." In: Topos: The International Review Of Landscape Architecture & Urban Design 84, pp. 56-63.

Klanten, Robert/Feireiss, Lukas (eds.) (2011): Utopia Forever: Visions of Architecture and Urbanism, Berlin: Gestalten.

Le Corbusier (1967 [1933]): The Radiant City: Elements of a Doctrine of Urbanism to be Used as the Basis of our Machine-Age Civilization, Pamela Knight/Eleanor Levieux/Derek Coltman (trans.), London: Faber and Faber.

Lindblad, Erika: "Avtal klart - LKAB har köpt Ortdrivaren", January 24, 2017, (https://samhallsomvandling.lkab.com/sv/nyhetsarkiv/avtal-klart—lkab-har-kopt-ortdrivaren/).

Lowe, Emmeline (1857): Extract from "Unprotected Females in Norway; or, The Pleasantest Way of Travelling There, passing through Denmark and Sweden, with Scandinavian Sketches from Nature." London: G Routledge & Co. In: Pushkin Press, The London Library (eds.) (2016): Lure of the North, London: Puskin Press, pp. 37-71.

Lövgren, Thomas (2018): "Lista: Husen som är näst i tur att rivas." In: Norrländska Socialdemokraten March 14 (https://www.nsd.se/nyheter/lista-husen-som-ar-nast-i-tur-att-rivas-nm4788062.aspx).

McGowan, Jérémie Michael (2008): "Ralph Erskine (Skiing) Architect." In: Nordlit: Tidsskrift I Litteratur Og Kultur 21/1, pp. 241-252.

McGowan, Jérémie Michael (2010): Ralph Erskine, Colonist? Notes toward an Alternative History of Arctic Architecture. "In: Arctic Perspective Cahier No.1: Architecture 1, pp. 96-106.

More, Thomas (2009 [1516]): Utopia, Paul Turner (trans.), London: Penguin.

Nordmark, Carlösten (1975): "Han vill bygga höghus åt arbetarna: Själv bor han i villa på Djurgården." In: Aftonbladet September 29, from the ArkDes collections.

Norrbottens län (2010 [1997]): BD län beslut RAÄ 1997-11-17. Revidering 2010 avseende värdetext för BD 33. Dokument uppdaterat 2011-11-15 (https://www.raa.se/publicerat/varia2012_8.pdf).

Nyström, Clara: "Kvarteret Ortdrivaren", June 26, 2017 (https://www.kiruna.se/Kommun/Kultur-fritid/ga-var-qr-promenad/kvarteret-ortdrivaren/).

Palmäki, Teuvo (2016): "Nu säljs "Ortdrivaren."" In: SVT Nyheter December 20 (https://www.svt.se/nyheter/lokalt/norrbotten/nu-saljs-ortdrivaren).

Rantatalo, Folke (n.d.): Hur är det att bo här? – Erskine får besked från "sina" hyreshus, from the ArkDes collections.

Rosell, Annika (1984): "Ohoj, där nere!: Vi bor högst i." In: Vår Bostad HSB:s Riksförbund Hyresgästerna Riksförbund 9, p. 6, from the ArkDes collections.

Rowntree, Diana (1964): "Arctic Architect." In: The Guardian April 8, p. 9, from the ArkDes collections.

Stanford, Edward (1881): "The Cruise on the Hardanger Fiord; or, Six in Norway with a "Shark" by One of Them." In: The Field August 13 In: Pushkin Press, The London Library (eds.) (2016), The Lure of the North, London: Puskin Press, pp. 75-93.

Sternlund, Hans (2010): "Nu rivs (halva) Ormen långe." In: Norrländska Socialdemokraten August 17 (https://www.nsd.se/nyheter/nu-rivs-halva-ormen-lange-5540056.aspx).

SCB (Statistics Sweden) (2019): Tätorter 2015; befolkning 2010–2018, landareal, andel som överlappas av fritidshusområden, March 28 (https://www.scb.se/hitta-statistik/statistik-efter-amne/miljo/markanvandning/tatorter/).

Ulvskog, Mats (1974): "Kan NSD hjälpa oss? Omöjligt få lekplats i betong omändrad!" In: Norrländska Socialdemokaten September 4, from the ArkDes collections.

Unknown source (n.d.): from the ArkDes collections.

United Nations (2015): Transforming Our World: the 2030 Agenda for Sustaianble Development A/70/L.1 (https://sustainabledevelopment.un.org/).

Walker, Brian/Salt, David (2012): Resilience Practice: Building Capacity to Absorb Disturbance and Maintain Function, Washington: Island Press.

Wall, Åsa (1973): "Rapport om boende i bolags-Norrland." In: Svenska Dagbladet May 20, from the ArkDes collections.

Wallström, Lennart (1978): "Han formade nya Kirunas." In: Norrländska Socialdemokraten February 2, from the ArkDes collections.

Wettergren, Gunilla/Strömdahl, Jan (1970): "Lönsamhetskrav, cynism, romantik." In: Arkitekttidningen S.A.R., pp. 16-17, from the ArkDes collections.

White Arkitekter: "Kiruna", n.d. (https://whitearkitekter.com/se/projekt/kiruna-masterplan/).

Wrethagen, Lennart (1985): "Nya Norgevägen öppnar Europas sista vildmark." In: Karlskoga Tidning July 24, from the ArkDes collections.

Growing Resilient Cities

Urban Community Gardens and Disaster Recovery after the 2010/11 Canterbury/Christchurch Earthquakes

Andreas Wesener

This study explores the role and value of urban community gardens following a major crisis: the 2010/11 earthquakes in Christchurch, New Zealand. New Zealand is located within the 'Ring of Fire', a vast horseshoe-shaped area around the Pacific Ocean, and the world's most active seismic region accounting for about 80 percent of the largest earthquakes (USGS 2016). In 2010 and 2011, the Canterbury region on the South Island of New Zealand was struck by two major earthquakes and a series of devastating aftershocks. The first earthquake occurred on September 4, 2010 around 40 km away from the center of Christchurch, the country's second largest city. Despite having a 7.1 magnitude, it caused mostly minor damage. A second devastating 6.3 magnitude earthquake occurred on February 22, 2011 at 12:51 pm. Due to its closeness to the city center and destructive upwards vertical ground movement, it was one of the most devastating natural disasters in the history of New Zealand. It killed 185 and injured 7000 people, damaged 90 percent of residential properties, and resulted in the demolition of around 8000 households and 80 percent of the central city. By 2012, Christchurch's population had shrunk by about 20,000 people, six per cent of the total population – a significant statistical anomaly for a city with a steady long-term population growth. It took another five years to return to pre-earthquake population numbers (Brand et al. 2019).

Urban community gardens, here broadly defined as shared open green spaces for mainly horticultural uses that are managed by local communities, provide a broad variety of social, economic, environmental, and cultural benefits (Guitart et al. 2012). These are created incrementally and simultaneously, for example through daily (gardening) routines and social interactions, and are often cherished by community gardeners and local residents (Dubová/Macháč 2019). Several authors have discussed the benefitting role of urban community gardens in the aftermath of disasters. Gardens can help mitigate food shortages when supply chains are interrupted. For example, an assessment of the impacts of Hurricanes Katrina and Rita on existing food systems in Southern Louisiana revealed that unconventional

food sources, including those from community gardens, played an important role in diminishing food insecurity before and after the hurricanes (Sims-Muhammad 2012). Community gardens also help people withstand and recover from natural disasters by providing relevant social and mental health services. Following disasters, open spaces are often considered safer than built structures, which may be damaged, perceived unsafe or unusable (see also the essay by Florian Liedtke in this volume). Urban community gardens provide safe spatial settings with social activities that support the physical and mental health of community members in times of severe stress. For example, when Hurricane Sandy devastated New York City in 2012, community gardens were considered as safe "multi-purpose community refuges which hosted meaningful and restorative greening practices" (Chan et al. 2015: 625). Okvat and Zautra (2014) made similar observations in their review of the emotional benefits of gardening activities. They argued that in the wake of natural disasters, gardens provide post-trauma therapy for users and help "alleviate negative emotions and [...] engage in experiences that enhance positive emotions" (ibid: 81).

In addition, community gardens encourage team work, solidarity, and the creation of social capital. Kato et al. (2014) observed that following Hurricane Katrina, community gardens encouraged community empowerment and helped counteract socio-economic injustice in deprived urban areas: "[U]rban gardening activities in marginalised communities still recovering from the social disruption of Hurricane Katrina need to be seen both as countering practices to neoliberal abandonment [...] and as attempts to reclaim space and identity." (ibid: 1845) Others, however, have been critical regarding ways that gardens allegedly reinforce neoliberal policies on the local level. Community gardens have been simultaneously regarded as antipode (Schmelzkopf 2002; Ghose/Pettygrove 2014) and reinforcement of local neoliberal policies (Rosol 2010, 2012). The discourse around community gardens and neoliberalism has been described as internally and inherently contradictory with regard to the complexities of multi-facetted places: "Urban agriculture is not simply radical or neoliberal, but both, operating at multiple scales" (McClintock 2014: 165).

In New Zealand, the indigenous Māori population had a rich tradition of communal gardening when the first European settlers arrived, but this tradition declined within decades of European settlement (Earle 2011). Early European settlers' residential subdivisions were large enough to grow a sufficient supply of fruits and vegetables for their families (Trotman/Spinola 1994). For most of the 19th and 20th centuries, many New Zealanders grew food in their own gardens. Tenants in subsidized state houses were expected to support their food supply through gardening: "Growing your own vegetables wasn't just encouraged – it was little short of a moral obligation" (Dawson 2010: 232).

In response to growing economic affluence and accompanying lifestyle changes, the popularity of backyard gardens started to decline in the 1960s (Walker 1995:

154). The first community gardens started to pop-up in the 1970s and have become increasingly popular ever since. Growing urban populations, increased urban densities, attempts to strengthen community networks, and a general revival of local food production have been considered as reasons for people to join community gardens (Trotman/Spinola 1994: 16). The social and health benefits of community gardens in New Zealand are various and comparable to those of other countries (Earle 2011: 150); and community gardens are often supported by local governments and NGOs (Burtscher 2010). Official statistics about the number and distribution of urban community gardens do not exist in New Zealand. It has been estimated that there are about 150 gardens within the three largest cities Auckland, Christchurch, and Wellington (Shimpo et al. 2019).

In Christchurch, the city council published community garden guidelines based on a vision "for Christchurch to become the 'best edible garden city in the world'" and to "encourage community gardens throughout the city" (CCC 2016: 1). There are around 30 community gardens in the greater Christchurch metropolitan area; around half of them were established after the 2010/11 earthquakes (CCGA 2019). Most gardens are located in suburban locations in both affluent and less affluent areas. The city features predominantly low suburban residential densities (CCC 2013). Generously sized private backyards are still the standard for many households. However, higher urban densities and increased house sizes on smaller plots have generally reduced the potential space for growing food. Presuming the further growth of urban densities in Christchurch, community gardens provide an alternative to private backyard gardening.

The investigation in my study is two-fold: First, it analyzes experienced benefits of post-earthquake gardens that unfold through the individual accounts of community members, showing that community gardens provide valuable benefits in times of crisis (e.g. therapeutic, social, and educational). These exceed or add to the kind of 'regular' benefits of community gardens frequently described by the literature. Second, it discusses findings through the lens of urban and community resilience, arguing that many 'add-on' benefits of community gardens are already present as part of their inherent structures and processes. They can be easily activated when a disaster strikes. Such qualities of community gardens correspond to notions of urban resilience that involve preparedness with regard to 'silent' background systems that come to the fore when needed (Amin 2014).

Resilience and Community Gardens

The scholarly literature on resilience has boomed in recent years, and it is beyond the scope of this study to discuss the growing body of literature extensively. Resilience, in a general sense, has been understood as "the continued ability of a

person, group, or system to function during and after any sort of stress" (National Research Council 2011: 4). Across different disciplines, notions of resilience include stabilizing a system, bringing it back to a previous state, coping with and adapting to new conditions, and using opportunities, e.g. related to changing conditions or system disturbances (Vallance 2012). In the discussion on urban gardens and green spaces, scholars disagree when it comes to an alleged "historical affinity between resilience and neoliberalism" (Zebrowski/Sage 2017: 45).

Likewise, urban resilience is a contested (Leitner et al. 2018) and highly politicized concept (Wilson/Jonas 2018). Amin (2014) identified two distinctive narratives regarding urban resilience. The first narrative focuses on the inhabitants and communities of cities ('the people') who confront disasters not only to survive but bounce back from adversity. While essentially a bottom-up approach, this narrative has also been critically linked to neoliberal forms of governance that tend to delegate system-inflicted risks and uncertainties to individuals who are expected to "show their own initiative as active and reflexive agents capable of adaptive behaviour" (Joseph 2013: 39). The second narrative, related to 'smart city' concepts, combines smart governance with big data technology to provide quick and effective responses in an urban environment perceived to be increasingly risky. Such a technology-driven governance approach has been criticized for its inherent lack of data security and socio-spatial connectedness (Colding/Barthel 2017), the lack of face-to-face governance, and the tendency to embrace corporate control that may turn a city into a profit-driven living laboratory (Hollands 2014; Duffield 2016).

For all their differences, both urban resilience narratives require a high and continuous level of preparedness: "The resilient city – depending on local affordance – is imagined as the city of active citizens, intelligent technologies, and vigilant governance, a body on full alert. Any failure to mobilize hyper-vigilance in the form of anticipatory capability, continual surveillance, and entrepreneurial zeal, is seen as an abrogation of responsibility, an error of judgement." (Amin 2014: 310) Likewise, both narratives keep relying on "the many bureaucracies, supply chains, and metabolic systems" that work "constantly in the silent background" (ibid: 311).

Relating to Amin's first, community-centered narrative, (urban) community resilience (CR) is a concept that builds upon collaborative action at personal, community and institutional levels (Daly et al. 2009: 17). CR has been understood as the procurement and utilization of community resources in order to cope with and thrive under uncertain, unpredictable, and continuously changing circumstances (Magis 2010). While calling for equal access to economic, social, and environmental resources (Wilson 2012), CR also requires a combined engagement of community resources and community action (Magis 2010). At the institutional level, CR requires governance that accommodates community action (Vallance 2012). This involves active support from and collaboration with governmental and civic agencies to en-

courage the empowerment of communities through mutual trust and respect (Daly et al. 2009).

Community gardens are places that constitute a relationship between urban communities and notions of urban and community resilience (Barthel/Isendahl 2013; Colding/Barthel 2013). Community gardens can help prepare cities for times of crisis by increasing "the resilience of urban social–ecological systems" (Chan et al. 2015: 632). They may bolster "psychosocial resilience after a disaster, especially by enhancing cognitive capacity, positive emotions, and community engagement" (Okvat/Zautra 2014: 85). In addition, they show "signs of supporting adaptation by fostering ecological, human and social capital, providing the structure and practices to support social–ecological diversity, learning, and community support networks to better respond to future disturbances" (Chan et al. 2015: 633).

Social capital, in particular, has been considered as a driver for disaster recovery and the development of community resilience (Aldrich 2012; Wilson 2012). Physical spaces that encourage neighbourhood social interaction help build social capital – the networks and relationships between people within a society (Aldrich/Meyer 2015). Put into place before a disaster strikes, such social places are able to improve community recovery following a disaster (Aldrich 2012). Third spaces that are related neither to work nor home environments provide neutral settings for social interaction (Oldenburg 1989). Community gardens are accessible open third spaces with multiple opportunities for collaborative action (Firth et al. 2011). However, "[...] resilience research and disaster management practice have yet to fully embrace social capital as a critical component" (Aldrich/Meyer 2015: 256). Putnam (2000) who helped popularize Social Capital Theory (SCT) distinguished between 'bonding' and 'bridging' capitals. Bonding social capital is usually established locally between individuals, e.g. two gardeners that get to know each other in a community garden and help each other out. Bridging social capital is inter-local, e.g. between people of different organizations. It can be created across neighborhoods, connecting people that pursue common goals but might not otherwise associate with each other. While these two types of social capital usually work horizontally in terms of (political) power relationships, a third type – 'linking' social capital –describing "the ability to gain access to resources and influences externally and often to exert political leverage in some form" (Montgomery et al. 2016: 154) adds a vertical component. While bonding social capital tends to be created quickly in post-disaster situations (Solnit 2009), bridging and linking social capital are needed to create long-term benefits that strengthen the role of a community within the complexity of local and regional power relationships: "By expanding their social network and deepening their extant social ties, community gardens were able to mobilize resources (ranging from grant money to volunteers) to support their garden, their members, and their neighbourhood." (Chan et al. 2015: 632)

Method and Case Study

In 2015 and 2016 (around five years after the 2010/11 earthquakes), key informant interviews were conducted in ten community gardens in Greater Christchurch. They involved seventeen community gardeners or garden coordinators, four informants involved in establishing a post-earthquake temporary community garden, and eight community garden experts from governmental and non-governmental organizations. Three field surveys were carried out in the New Brighton Community Garden involving 44 gardeners. In addition, direct and participant observations were carried out on various community garden sites, often accompanied by informal forms of communication. While parts of the data and specific cases have been discussed in previous publications (Münderlein 2015; Montgomery et al. 2016; Fox-Kämper et al. 2018; Shimpo et al. 2019), this study focuses on interview data regarding benefits of community gardens as experienced by interviewees in a post-earthquake context across several cases. Relevant data was found in interview transcripts with key informants from eight community gardens (Figure 1). The study discusses both pre-earthquake and post-earthquake gardens (Table 1).

Findings

The findings in this section are assembled under three main categories that emerged inductively during content analysis: The community garden as a post-earthquake sanctuary and place for social exchange; the community garden as a source of food; the community garden as a post-disaster learning space. These categories reflect commonly experienced benefits of community gardens against the backdrop of the 2010/11 earthquakes, told through the individual voices of the interviewees.

The Community Garden as a Post-Earthquake Sanctuary and Place for Social Exchange

One of the most frequently mentioned benefits of community gardens following the Canterbury/Christchurch earthquakes was their role in providing safe accessible places to meet other people, talk about the events, work together in the garden, and, perhaps, escape from the difficult situation – at least for a few hours. The years 2011 and 2012 were characterized by continuous and often strong aftershocks. Many people in Christchurch felt scared and unsafe. Community gardeners and coordinators tried to welcome and accommodate people with small symbolic acts:

Figure 1: Greater Christchurch (scale 1 70,000) including the eight community gardens where relevant information for this study was found. Contains data from OpenStreetMap, licensed under the Open Data Commons Open Database License (ODbL).
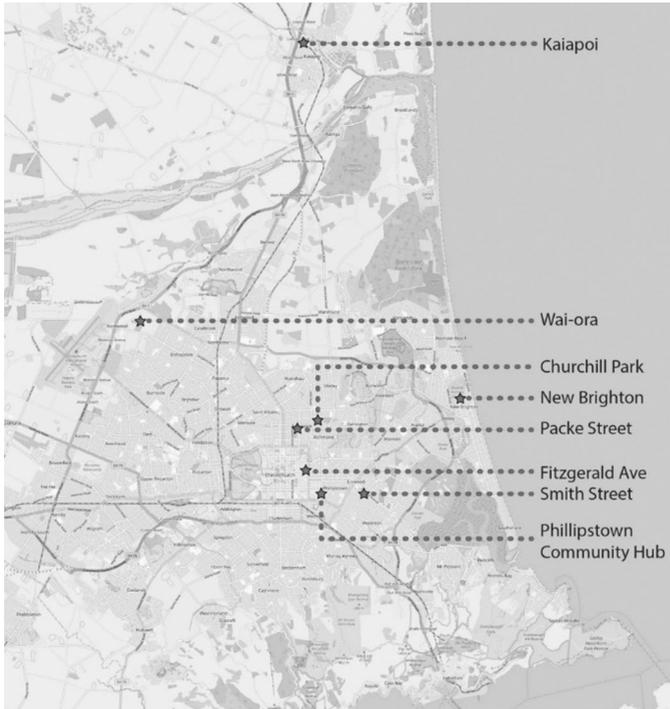
[...] we always have a cup of tea or we sit down together and everybody chats and certainly through the earthquakes, that was really important for people if they were going through a really hard time with their house or whatever, it was really important for them to come here, it's a safe place, they could talk about and it was ok. [...] it was an important focus for people to come down here and dig and garden and get away from the chaos at home.

- Kaiapoi community garden

[...] we opened all the time after the earthquakes and there were a lot of people that .... really just... came to talk and have company.

Table 1: Overview of the eight community gardens where relevant information for this study was found.

Community garden	Location	Short description	Year of establishment
Churchill Park	Christchurch, Richmond	Founded by the Richmond Community Action Network on a vacant post-earthquake suburban site that makes part of a temporary park. The project has a coordinator and several volunteers.	2013
Fitzgerald Avenue	Christchurch, CBD	Originally planned as a short-term temporary project by the community organization "Greening the Rubble" on a post-earthquake demolition site. Gardening activities continue; however, at a lower level than at the time it was founded.	2012
Kaiapoi	Kaiapoi	The garden is managed by a paid garden coordinator and involves a wide range of volunteers. It is located close to Kaiapoi Borough School and provides educational opportunities for pupils. The garden provides vegetables for the food bank at the Kaiapoi Community Support Centre.	2010
New Brighton	Christchurch, New Brighton	A large (ca. 2,300 sqm) and well-established garden in a coastal suburb that was severely affected by the earthquakes. It has an active community and well-organized leadership. Most of the site is used as common gardening space; some lots are designed for individual use. The garden employs two paid staff. There are about 120 volunteers involved.	2005
Packe Street	Christchurch, Edgeware	One of the oldest active community gardens in Christchurch. The land was bought as a reserve for a pocket park in collaboration with the City Council. This approach became known as the Adopt-a-Park scheme.	1996
Phillipstown Community Hub	Christchurch, Phillipstown	The garden makes part of the local community hub that hosts a range of community organizations, located on the premises of an abandoned school.	2015
Smith Street	Christchurch, Woolston	The garden provides individual and shared plots. A paid coordinator and ca. 70 volunteers operate the garden. The garden is also an important meeting point for the local community and a provider of social services.	2002
Wai-ora	Christchurch, Harewood	Offers individual plots in an allotment style system. The infrastructure for garden work including tools, water and seedling is provided by the Wai-ora Trust and shared amongst the members. There are 200-250 people involved in the project and one paid coordinator.	1982

- New Brighton community garden

  […] we managed to come back straight away more or less so it was really nice that we had that. Our sense of having a refuge away from the continual shakes because you don't sort of feel stuff… when you're in a building it's horrible whereas when you're out in the garden you may see a little swaying but you're quite centred and I think that helped a lot of people too. […] people would maybe come here to seek some sanctuary really because of what happened, it was so dramatic for so many people really because it was continual, non-stop; so anyway, any of the places they could come to that provided a nice connection away from the craziness that was the earthquake.

- Smith Street community garden

Simply getting out of their often earthquake-damaged homes to socialize with others was a relief for many. This was expressed frequently by the interviewees, including this retired gardener:

  I needed to meet people and have something to do because in a unit (they're little), and you can't sit around and do nothing, and I enjoy being able to take vegetables home and I love the company and it's good.

- New Brighton community garden

The aftershocks and widespread physical destruction that interrupted people's lives at home, at work and elsewhere in the city, made people long for stability and (social) places that reflected a sense of continuity:

  […] that's why the afternoon tea is so important and after the earthquake especially we found lots of people came back just to check if we were alright and that the park was still there, people who hadn't visited for a long time, years, would drop by on a Thursday just to see that it was still going so there seemed to be that need in the community for some continuity, especially when we lost all the churches.

- Packe Street community garden

People did not only seek refuge but spent time actively to construct or extend gardens. They donated building materials, often rescued from the post-quake rubble, recycled them, and gave them a new meaning. For example, creating commemorative places built from the rubble of the earthquake, was a coping strategy that

enabled reflections about loss. In that sense, work in the garden becomes part of an active grieving process following a disaster.

> [...] it became the social hub of the area very quickly and then we had huge energy went into it because people kept bringing their carloads of bricks from their chimneys and they would leave it at the entrance and we had one person who spent her whole time cleaning bricks and then we all learnt how to mix cement and lay bricks, we'd never done that before we reckoned if you could do a row of knitting and keep the stiches straight then you could do a row of bricks and we called it the celebratory chimneys or something [...] commemorative chimneys.

- Packe Street community garden

The willingness, and perhaps need, to contribute, donate and become active was also evident in the Fitzgerald Avenue community garden, established in 2012 as a temporary space. Many people and organizations contributed by donating materials, time and workforce to establish the garden.

> [...] we had second-hand bricks from the site and also some that the City Council gave us which were for us to build the brick sided beds [...] we got firms to give us soil and compost and to sell us mulch and other material very cheaply so we had lots of commercial support. [...] Placemakers, who are a construction supply company [...] deserve a mention because they've been a really good sponsor [...], they basically donate materials and they donated tools, wheelbarrows, garden tools, all sorts of stuff was given to us.

- Fitzgerald Avenue community garden

The active involvement in constructing the temporary Fitzgerald Avenue garden "provided post-trauma recovery and therapeutic with various benefits for community members" (Montgomery et al. 2016: 164). These benefits included the activation of coping, adaptive, and participative capacities and the construction of social capital (ibid). Community gardens are diverse social places where people from different backgrounds can meet and mingle. In the Fitzgerald Avenue community garden, for example, members of the New Zealand organization for hearing-impaired people (Deaf Aotearoa) actively participated as volunteers and helped establish the garden. For the spokesperson of the organization, the post-earthquake garden project echoed the value of "[d]eaf people participating in this community garden, collaborating with hearing volunteers." Community gardens are also places where different nationalities come together:

I've met Australians, Brazilians, I've got a friend who comes in and he's Australian. There's a Spanish girl comes here, there's about five... oh I suppose maybe over the years probably a dozen different nationalities have been here, well like yourself, Japanese, Dutch, occasional German, odd French person so that's normally summer time when they're on holiday or they're students and not at university and come and wander around so you meet different people.

- New Brighton community garden

For immigrants, community gardens provide opportunities to get in contact with locals and establish new social networks. This was particularly useful following the earthquakes, when thousands of construction workers who participated in the rebuild of the city came to Christchurch from overseas:

[…] that's why we came here, to help with the rebuild after the earthquake. […] I came in February and around March I was exploring New Brighton and I went to the library and I saw the pamphlet with these community garden advertising that they were working Monday, Wednesday, Friday and Saturdays and I say oh yeah, I didn't have a job for that time so I said yeah, let's go there and meet new people and do something for the community as well. […] I've been coming here every Saturday for a full year, it's part of my life already. […] they [this community] make me feel I am part of this place already even if I am foreign, they make me feel very comfortable and is like my family, my Saturday family.

- New Brighton community garden

Likewise, locally displaced people who had to leave their damaged homes and move into a new neighborhood, could find a first point of contact with their new community.

[…] so I've moved to a new suburb, another place now and so it takes a long time to get to know people whereas if there was something like this and you did have that interest in gardening or in just wanting to meet people what better way than to just pop down meet a few… especially if there's nothing else in that community, so that people can connect in.

- New Brighton community garden

Local community gardens may keep on playing an important role for immigrants after they change neighborhoods. The following anecdote, told by a community

gardener, exemplifies the symbolic importance of the Packe Street garden for a Kurdish family after the September 2010 earthquake:

> We used to have a Kurdish family who came as refugees and they lived just oppo-site the park and […] the family got bigger and they moved away to a bigger house but we see them from time to time and two days after the September earthquake, the first one, there was a knock at the door and I opened it and there was a stranger on the doorstep, big handsome man and he said he was a relative of these people who had lived opposite the park and they felt so grateful that they hadn't been killed in the earthquake that they wanted a cutting from the fig tree in the park to plant in their garden because it connected them with home, the fig tree, it was a Turkish thing so they came from that part of the world so Vince said it's not going to grow from a cutting so he got the big trenching spade and we went up and we dug in and we got some suckers and wrapped them up and gave them to him to take home […]

- Packe Street community garden

Interviewees frequently stated that community gardens helped them cope with stress experienced during and after the earthquakes. For some, sharing difficult experiences while working in the garden was a way of coping with stress:

> I've had people in here that have been… they've been through so much… one woman, I haven't seen her for a wee while but she was coming here a nervous wreck because she lived on her own and if you were on your own and you went through what we've gone through it would be really terrifying and maybe no-one close to you either to share it with and she came here […] she spent a few hours here and she could tell people her problems while she worked so we were trying to encourage that working and talking […] she'd say to me at the end when she was leaving […] look at me now, I'm a different person. And she'd calmed down because she had found a place where people are going to listen […] calming is what we all needed after the shakes.

- New Brighton community garden

For people with mental health issues, the earthquakes often exacerbated their symptoms. Working in a community garden was one way of coping:

> […] it was very noticeable in the earthquake for anyone who already had some anxiety that the earthquakes took that anxiety off the clock, they were the ones who had the most trouble, so they needed spaces and greens […]

- Churchill Park community garden

The Community Garden as a Source of Food

In general, there were no major problems to buy food in most of Christchurch following the earthquakes; many supermarkets re-opened quickly. However, some suburbs were cut-off and temporarily inaccessible, and general concerns about earthquake-related interruptions in food supply and distribution chains were publicly expressed, not only in Canterbury but the entire country (Wallace 2011). Following the February 2011 earthquake, food companies made emergency deliveries and donations to support the food supply in Christchurch (NZ Herald 2011).

Community gardens in Christchurch played a role in contributing to post-earthquake food supplies. Two interviewees reported about a direct involvement of their garden with regard to emergency food distributions. The Kaiapoi community garden collaborated with a helicopter pilot to get food into New Brighton, a coastal suburb in Christchurch that became temporarily inaccessible after the February 2011 earthquake:

> [...] there was a guy from Rangiora which is the town just up here, he had a helicopter and we couldn't get into New Brighton so we would drop food off and he would helicopter it into town [...]

- Kaiapoi community garden

The participation in the food donation scheme also enabled the garden to attract funding from the Christchurch City Council:

> [...] we actually got funding from the earthquake to get this going so there was funding through the Council for community initiatives and so we got money for that to start with and then we got all these fruit trees have been bought by money from the Rangiora Express that flew all the food over to New Brighton [...] so there was money left over from that and we got money for trees from that so we've have actually benefited from the earthquake I think in an extraordinary way and it also was a very positive thing happening around the earthquake time.

- Kaiapoi community garden

In New Brighton itself, the local community garden delivered food to those who needed it most following the February 2011 earthquake:

Actually the February earthquake which was the one that really hit the city hugely, we did up a lot because at that time of year we had projects everywhere and lots of food [...] there's a place down, a church affiliated and we sent lots of food down to them and there were people on the corner doing up food packages to give to people because shops were closed so we just got all the food out and tried to get it around to people.

- New Brighton community garden

Beyond the immediate post-disaster situation, community gardens in Christchurch contributed to the food supplies of people in need via charitable distribution networks or directly:

[...] when I first started there I couldn't give the vegetables away, I'd take them in to be given away in food banks and they'd still be there at 3pm in the afternoon wilted but now when I take them in they're not even there for 10 minutes.

- Churchill Park community garden

[...] one of the good things for me is that with my two volunteer jobs I have they both involve getting free fruit and vegetables for helping out and so I don't now have to go and buy them, so it takes that off my grocery bill which makes living a lot easier for me. I save about $20 a week on my grocery bill so I was really struggling before I started coming here.

- New Brighton community garden

The Community Garden as a Post-Disaster Learning Space

Community gardens are not only places where people meet, socialize and grow food. They are also important for the dissemination and sharing of knowledge and skills. The scholarly literature has reported widely on different aspects of community garden-based education (e.g. D'Abundo/Carden 2008; Surls et al. 2014; Gregory et al. 2016). In Christchurch, several gardeners confirmed that community gardens were hubs for learning and teaching:

[...] we have a group starting next week and they're a group of immigrants and they probably have grown vegetables in their own countries but they're immigrants here or maybe refugees so English will be their second language and they might

have some experience or no experience so then I will show them what to do and help them, work beside them to encourage them and support them.

- Wai-ora community garden

[...] we started a course called grow your own free lunch which has made all the difference in our community garden so we have funding for five courses of five weeks a year and we have two and a half, three hours and we did the first time on garden growing skills and we harvest and we go in the kitchen and we cook a lunch and that's made all the difference in the world.

- Churchill Park community garden

[...] it is about teaching as well; it's about handing on knowledge and inviting people to do something a bit different too because we have cooking classes in the winter and we just had one recently.

- Kaiapoi community garden

Following the earthquakes, the educational role of community gardens expanded. Many households had to cope with ongoing water shortages and dysfunctional infrastructure. Broken water pipes and sewers, and electricity outages required unusual actions. In response, the New Brighton garden offered workshops on practical skills that were needed in this post-disaster situation: *We did a lot after the earthquake in workshops on saving water, composting toilets [...].* In addition, the New Brighton garden coordinator responded to and actively addressed shortages in their community garden by installing new infrastructure. Such a response increased the coping capacity of the garden but also the level of preparedness for future disasters:

[...] we could pretty much run [following the earthquakes] and when we had power, we didn't have water for a little while... how did we manage that? Since then we've put rain tanks in. [...] But now we have all water coming off the gutters, so we save all our water now [...].
[...] we did talk about getting like a generator in [...] we started really looking at how we could look after the people if anything happened, but the generator was a wee bit expensive for us.

- New Brighton community garden

In the New Brighton case, the earthquakes created a new awareness about the consequences of disasters and triggered concrete actions to be better prepared for future disasters: "We're actually a lot more aware of things, you think ahead, I think ahead a little bit now because you never know what can happen."

- New Brighton community garden

Discussion

The above findings reflect the role of community gardens as sanctuaries, places for social exchange, post-disaster therapeutic, sources of food and learning following an earthquake. Social resilience concepts, particularly about community resilience, have been related to adaptive and participative capacities (Vallance 2012: 392). Gardeners in Christchurch expressed clearly that participating in a garden's activities and socializing with fellow gardeners helped them deal with the difficult situation following the earthquakes. Bonding social capital was frequently created through social interactions and shared activities. Activity and related participation levels in community gardens were high in the immediate post-disaster period, and a significant number of new gardens were established. However, there were differences regarding the durability of participation.

The Fitzgerald Avenue community garden that was established after the earthquakes by the community organization 'Greening the Rubble', showed high activity levels following the earthquakes. However, between 2012 and 2016, the level of activity had obviously tapered off; participation quickly slowed down and remained marginal at the time when it was studied (Montgomery 2016). Short-term increased participation could be interpreted as a mere coping response (Lorenz 2013) that does not necessarily include adaptation over time – a relevant indicator for resilience. The Fitzgerald Avenue garden – originally designed as a temporary place – was apparently not able to attract many users beyond the initial coping phase. And although it is difficult to predict future activities in the garden, its significance as a (long-term) resource for community resilience has become increasingly passive.

In contrast, in the New Brighton garden, established long before the earthquakes, participation also increased a few months after the February 2011 earthquake and then normalized in the following years; however, at a high level (Shimpo et al. 2019). To some extent, findings from the New Brighton and Fitzgerald Ave gardens support the argument that "post-disaster social networks are likely to tightly mirror pre-disaster conditions" (Aldrich 2012: 53) and that therefore pre-existing social capital is relevant for post-disaster recovery (Vallance 2012). They are also indicators that community gardens "well established and frequented before a disaster may provide continuous long-term benefits that extend past the immediate

disaster recovery period" (Shimpo et al. 2019: 130). While the obtained data across gardens (established both pre- and post-earthquake) confirms increased activities following the earthquakes, in most cases it does not provide sufficient information on long-term development, e.g. how participation and activity levels evolved after the immediate post-disaster recovery period. Follow-up studies, for example in gardens that were established after the earthquake – or as a result of it – are recommended. Longitudinal studies are needed to monitor long-term developments and to produce more substantial evidence beyond singular cases and snapshots in time.

With regard to adaptive capacities, two other findings of this study seem relevant: First, community gardens in post-earthquake Christchurch were places where diverse people met; young and old, local and foreign, able-bodied and disabled, healthy and ill. Community gardeners' accounts show that people from different national, ethnic and religious backgrounds came together in community gardens following the earthquakes. Local gardeners considered the experience as enriching. Migrants and gardeners new to the community were able to connect locally. While integrative aspects of community gardening are generally relevant, e.g. 'intercultural gardens' concepts in Germany (Moulin-Doos 2014), such aspects become even more important in a post-disaster situation where local populations are displaced (physically and mentally) and new migrants flock in to participate in the rebuild. The integrative aspect is an adaptive capacity with potential long-term benefits. It is also an indicator for the establishment of bridging social capital. Likewise, the collaboration of various organizations, as evident in the Fitzgerald Avenue community garden (Montgomery et al. 2016), established bridging social capital. Community diversity and integration can be considered as relevant indicators for community resilience. More research regarding the (long-term) performance of post-disaster community gardens with regard to fostering integrative aspects is needed.

Second, while community gardens are generally hubs for learning and teaching, some specific lessons were learned from the Christchurch earthquake experience that relate to concepts of resilience. Providing workshops on post-disaster skill development (e.g. building composting toilets) and integrating new infrastructure such as water tanks increases the level of awareness and preparedness. It also enables networks and connections beyond the community garden and is therefore a potential enabler for bridging social capital.

An explicit example of increased awareness and subsequent action in terms of strategic infrastructural improvements was detected only in the New Brighton garden. However, such infrastructure improvements could be expanded. Community gardens could potentially serve as emergency evacuation points for the local community when a disaster strikes, as suggested by Florian Liedtke's chapter in this volume. Shortages of toilets, water, power, food and shelter could be addressed immediately. With some funding, community gardens could be equipped with

complementary facilities that serve gardeners during regular operation as well as the wider community in an emergency. This implies effective governance and management for gardens, for example with the help of paid coordinators. In general, help from paid professionals including garden coordinators, advisors, tradesmen, etc. has been identified as a major enabler for the development of community gardens (Fox-Kämper et al. 2018). Such arrangements would likely strengthen the role of the gardens and their communities and create new vertical collaborations and linking social capital. The New Brighton community garden is an example of a well-governed garden that has learned from the earthquakes and actively responded to future threats.

With regard to preparedness as an indicator for urban resilience, community gardens could be understood as one of Amin's (2014) "silent background" systems that get activated when a disaster strikes. The findings indicate that in the context of community gardens, 'activation' could be a rather subtle process. Welcoming gestures such as offering tea or extending the opening hours are examples. Processes of more explicit 'activation' include building and construction activities, workshops on disaster-related topics, and the installation of new infrastructure. However, many specific benefits do not even need to be 'activated'. They belong to a community garden's DNA and are constructed and expressed through day-to-day activities. Making diverse people feel comfortable in a new environment, providing opportunities for social interaction, providing green spaces and healthy (work) activities, providing food, and learning new skills are examples. Such day-to-day benefits strengthen the potential of community gardens for urban and community resilience before and after a disaster.

This study shows that some community gardens in Christchurch responded to food shortages in the immediate aftermath of the earthquakes and supplied food to local communities. Community gardens have the potential to support local food supplies (Tahara et al. 2011) and they could have a more significant role following disasters. The Kaiapoi garden benefited from participating in a food donation scheme by establishing new collaborations (bridging and linking social capital) and receiving funding. Following the 2010/11 Canterbury/Christchurch earthquakes, growing food locally in urban locations has entered the political agenda. The Christchurch City Council (CCC) published a "Food Resilience Policy" (2014) that supports the establishment of urban community gardens amongst other initiatives.

However, the role of community gardens for community resilience beyond a food perspective has not yet attracted the widespread attention of policy makers. In Christchurch, funding and land tenure remain critical barriers for the development of community gardens (Fox-Kämper et al. 2018). If considered as a source of, or system for urban and community resilience, community gardens should be supported by state and non-state actors in order to maximize their potential. Not in the neoliberal sense of delegating responsibilities down to the individual, but as

beneficial systems that thrive on "bottom-up dynamics in combination with successive institutional support" (Fox-Kämper et al. 2018: 67), and are easy to activate when a disaster strikes. And while community gardens cannot be the only 'silent systems' that contribute to preparedness for a disaster, they should become – or are already – an integral part of it.

While additional studies are needed, for example to answer questions about long-term activation and related benefits, it is safe to say that community gardens bring people together and provide a safe and nurturing environment after a disaster. This gardener from the Phillipstown Hub community garden got to the heart of it when she reflectively concluded:

> [...] first of all I think it's about people, it's about bringing people together, it's about learning skills, how to look after yourself and how to feed yourself [...] I think once if you'd asked me that a while ago I might have said food first but no, I've learnt that [...] it's just bringing people together more than anything.

• Phillipstown Hub community garden

Conclusion

The role of urban community gardens in times of crises has remained pertinent for contemporary cities. However, the wider benefits of gardens beyond notions of food resilience remain understated. Community gardens are first and foremost about people. Their inherent ability to create and retain social capital provides valuable benefits in both pre- and post-disaster situations. It is the often latent and subtle power of continuous activities and social interaction that makes community gardens a valuable source of community resilience when a disaster strikes. Amin (2014) persuasively argued that narratives of urban resilience rely on well-functioning systems that work in the background and come to the fore when needed. Community gardens can be a part of such lifesaving systems; however, they need the necessary care and support like any other system. Notions of community resilience that break historical ties with neoliberalism are not about delegating uncertainties to individuals, but about building mutual support, trust and respect to empower communities.

Considering their potential social benefits before and following disasters, community gardens should be regarded as long-term assets. They should get the appropriate support in the form of funding, long-term tenure security, and protective urban planning policies. Policymakers at national, regional and local levels should provide innovative funding schemes that encourage community gardeners to rethink infrastructural and governance arrangements (for both pre- and post-

disaster situations) and apply for the necessary funds to improve them. In addition, more research is needed to analyze the long-term development and outcomes of gardens and produce substantial evidence. It will support policymakers to make better choices to support and maximize the benefits of urban community gardens. Therefore, longitudinal studies on selected gardens that monitor their development over time are recommended.

References

Aldrich, Daniel P. (2012): Building Resilience: Social Capital in Post-Disaster Recovery. Chicago: University of Chicago Press.

Aldrich, Daniel P./Meyer, Michelle A. (2015): "Social Capital and Community Resilience". In: American Behavioral Scientist, 59/2, pp. 254–269.

Amin, Ash (2014): "Epilogue: The Machinery of Urban Resilience". In: Social Sciences, 3/3, pp. 308-313.

Barthel, Stephan/Isendahl, Christian (2013): "Urban Gardens, agriculture, and Water Management: Sources of Resilience for Long-Term Food Security in Cities". In: Ecological Economics, 86, pp. 224-234.

Brand, Diane/Nicholson, Hugh/Allen, Natalie (2019): "The Role of Placemaking as a Tool for Resilience: Case Studies from Post-Earthquake Christchurch, New Zealand". In: Jaime Santos-Reyes (ed.), Earthquakes Impact, Community Vulnerability and Resilience, London: IntechOpen Limited, pp. 1-25.

Burtscher, Sonja (2010): "Management and Leadership in Community Gardens: Two Initiatives in Greater Christchurch, New Zealand". Diskussionspapier DP-47-2010, Vienna: BOKU-Universität für Bodenkultur Wien, Department für Wirtschafts- und Sozialwissenschaften, Institut für nachhaltige Wirtschaftsentwicklung. (http://www.boku.ac.at/wpr/wpr_dp/DP-47-2010.pdf).

CCC (2013): "Population Density Map 2013", August 7 2018 (https://www.ccc.govt.nz/assets/Documents/Culture-Community/Stats-and-facts-on-Christchurch/Facts-Stats-and-Figures/Maps-Directory/map-population-density-area-unit.pdf).

CCC (2014): "Christchurch City Council Food Resilience Policy". Christchurch: Christchurch City Council, November 29, 2016 (https://www.ccc.govt.nz/assets/Documents/Environment/Sustainability/FoodResiliencePolicy06-11-2014.pdf).

CCC (2016): "Christchurch City Council Community Gardens Guidelines". Christchurch: Christchurch City Council, November 29, 2016 (https://www.ccc.govt.nz/assets/Documents/Environment/Sustainability/CouncilCommunityGardensGuidelines2016.pdf).

CCGA (2019): "Garden Directory", July 24 2019 (http://www.ccga.org.nz/garden-directory/).

Chan, Joana/DuBois, Bryce/Tidball, Keith G (2015): "Refuges of Local Resilience: Community Gardens in post-Sandy New York City". In: Urban Forestry & Urban Greening, 14/3, pp. 625-635.

Colding, Johan/Barthel, Stephan (2013): "The Potential of 'Urban Green Commons' in the Resilience Building of Cities". In: Ecological Economics, 86, pp. 156-166.

Colding, Johan/Barthel, Stephan (2017): "An Urban Ecology Critique on the "Smart City" Model". In: Journal of Cleaner Production, 164, pp. 95-101.

D'Abundo, Michelle L./Carden, Andrea M. (2008): ""Growing Wellness": The Possibility of Promoting Collective Wellness through Community Garden Education Programs". In: Community Development, 39/4, pp. 83-94.

Daly, Michele/Becker, Julia/Parkes, Bruce/Johnston, David/Paton, Douglas (2009): "Defining and Measuring Community Resilience to Natural Disasters". In: Vince Cholewa, Ljubica Mamula-Seadon & Richard Smith (eds.), TEPHRA Volume 22. Community Resilience: Research, Planning and Civil Defence Emergency Management, Wellington: New Zealand Government. Ministry of Civil Defence & Emergency Management, pp. 15-20.

Dawson, Bee (2010): A history of gardening in New Zealand. Auckland: Godwit/Random House.

Dubová, Lenka/Macháč, Jan (2019): "Improving the Quality of Life in Cities using Community Gardens: From Benefits for Members to Benefits for all Local Residents". In: GeoScape, 13/1, pp. 68-78.

Duffield, Mark (2016): "The Resilience of the Ruins: Towards a Critique of Digital Humanitarianism". In: Resilience, 4/3, pp. 147-165.

Earle, Margaret (2011): Cultivating Health: Community Gardening as a Public Health Intervention. Wellington: University of Otago, Wellington School of Medicine and Health Sciences.

Firth, Chris/Maye, Damian/Pearson, David (2011): "Developing "Community" in Community Gardens". In: Local Environment: The International Journal of Justice and Sustainability, 16/6, pp. 555-568.

Fox-Kämper, Runrid/Wesener, Andreas/Münderlein, Daniel/Sondermann, Martin/McWilliam, Wendy/Kirk, Nick (2018): "Urban Community Gardens: An Evaluation of Governance Approaches and Related Enablers and Barriers at Different Development Stages". In: Landscape and Urban Planning, 170/Supplement C, pp. 59-68.

Ghose, Rina/Pettygrove, Margaret (2014): "Urban Community Gardens as Spaces of Citizenship". In: Antipode, 46/4, pp. 1092-1112.

Gregory, Megan M./Leslie, Timothy W./Drinkwater, Laurie E. (2016): "Agroecological and Social Characteristics of New York City Community Gardens: Contributions to Urban Food Security, Ecosystem Services, and Environmental Education". In: Urban Ecosystems, 19/2, pp. 763-794.

Guitart, Daniela/Pickering, Catherine/Byrne, Jason (2012): "Past Results and Future Directions in Urban Community Gardens Research". In: Urban Forestry & Urban Greening, 11/4, pp. 364– 373.

Hollands, Robert G. (2014): "Critical Interventions into the Corporate Smart City". In: Cambridge Journal of Regions, Economy and Society, 8/1, pp. 61-77.

Joseph, Jonathan (2013): "Resilience as Embedded Neoliberalism: A Governmentality Approach". In: Resilience, 1/1, pp. 38-52.

Kato, Yuki/Passidomo, Catarina/Harvey, Daina (2014): "Political Gardening in a Post-disaster City: Lessons from New Orleans". In: Urban Studies, 51/9, pp. 1833–1849.

Leitner, Helga/Sheppard, Eric/Webber, Sophie/Colven, Emma (2018): "Globalizing Urban Resilience". In: Urban Geography, 39/8, pp. 1276-1284.

Lorenz, Daniel F (2013): "The Diversity of Resilience: Contributions from a Social Science Perspective". In: Natural Hazards, 67/7, pp. 7-24.

Magis, Kristen (2010): "Community Resilience: An Indicator of Social Sustainability". In: Society & Natural Resources: An International Journal, 23/5, pp. 401-416.

McClintock, Nathan (2014): "Radical, Reformist, and Garden-Variety Neoliberal: Coming to Terms with Urban Agriculture's Contradictions". In: Local Environment, 19/2, pp. 147-171.

Montgomery, Alesia (2016): "Reappearance of the Public: Placemaking, Minoritization and Resistance in Detroit". In: International Journal of Urban and Regional Research, 40/4, pp. 776–799.

Montgomery, Roy/Wesener, Andreas/Davies, Fran (2016): "Bottom-Up Governance after a Natural Disaster: A Temporary Post-Earthquake Community Garden in Central Christchurch, New Zealand". In: Nordic Journal of Architectural Research, 28/3, pp. 143-173.

Moulin-Doos, Clair (2014): "Intercultural Gardens: The Use of Space by Migrants and the Practice of Respect". In: Journal of Urban Affairs, 36/2, pp. 197-206.

Münderlein, Daniel (2015): "Post-Earthquake Community Gardens in Christchurch New Zealand.". Short Scientific Report on the Short Term Scientific Mission, Dortmund/Kassel: COST ACTION TU 1201: Urban Allotment Gardens in European Cities. (http://www.urbanallotments.eu/fileadmin/uag/media/STSM/RSTSM/Post_Earthquake_Community_Gardens_STSM_final_report.pdf).

National Research Council (2011): Building Community Disaster Resilience Through Private-Public Collaboration. Washington, D.C.: The National Academies Press.

NZ Herald (2011): "Christchurch Earthquake: Food Companies Swing in to Deliver Supplies ". In: New Zealand Herald, February 25 (https://www.nzherald.co.nz/food-wine/news/article.cfm?c_id=206&objectid=10708702).

Okvat, Heather A/Zautra, Alex J (2014): "Sowing Seeds of Resilience: Community Gardening in a Post-Disaster Context". In: Keith G Tidball & Marianne E Krasny (eds.), Greening in the Red Zone, Dordrecht: Springer, pp. 73-90.

Oldenburg, Ray (1989): The Great Good Place: Cafes, Coffee Shops, Community Centers, Beauty Parlors, General Stores, Bars, Hangouts, and How They Get You Through the Day. New York: Paragon House.

Putnam, Robert D (2000): Bowling Alone: The Collapse and Revival of American Community New York: Simon & Schuster.

Rosol, Marit (2010): "Public Participation in Post-Fordist Urban Green Space Governance: The Case of Community Gardens in Berlin". In: International Journal of Urban and Regional Research, 34/3, pp. 548-563.

Rosol, Marit (2012): "Community Volunteering as Neoliberal Strategy? Green Space Production in Berlin". In: Antipode, 44/1, pp. 239-257.

Schmelzkopf, Karen (2002): "Incommensurability, Land Use, and the Right to Space: Community Gardens in New York City 1". In: Urban Geography, 23/4, pp. 323–343.

Shimpo, Naomi/Wesener, Andreas/McWilliam, Wendy (2019): "How Community Gardens may Contribute to Community Resilience Following an Earthquake". In: Urban Forestry & Urban Greening, 38, pp. 124-132.

Sims-Muhammad, Toni Y. (2012): "After the Storms: South Louisiana Sustainable Food System Assessment in light of Environmental Natural Disasters Hurricanes Katrina & Rita". In: International Journal of Humanities and Social Science, 2/3, pp. 129-135.

Solnit, Rebecca (2009): A Paradise Built in Hell: The Extraordinary Communities that Arise in Disaster. New York: Viking Penguin.

Surls, Rachel/Feenstra, Gail/Golden, Sheila/Galt, Ryan/Hardesty, Shermain/Napawan, Claire/Wilen, Cheryl (2014): "Gearing up to Support Urban Farming in California: Preliminary Results of a Needs Assessment". In: Renewable Agriculture and Food Systems, 30/1, pp. 33-42.

Tahara, Shinichi/Shioyama, Sayaka/Kurita, Hideharu/Terada, Toru (2011): "A Quantitative Assessment of Agricultural Production from Allotment Gardens". In: Journal of The Japanese Institute of Landscape Architecture, 74/5, pp. 685-688.

Trotman, Rachael/Spinola, Carla (1994): Community Gardening: A Literature Review. Auckland: University of Auckland, Alcohol & Public Health Research Unit.

USGS (2016): "Historical Earthquakes & Statistics FAQs", November 25, 2016 (https://www2.usgs.gov/faq/categories/9831/3342).

Vallance, Suzanne (2012): "Urban Resilience: Bouncing Back, Coping, Thriving". Conference paper. Proceedings of EARTH: FIRE AND RAIN Australian & New Zealand Disaster and Emergency Management Conference, Brisbane,April 16-18 2012.

Walker, Paul (1995): "Towards the Modern Garden". In: Matthew Bradbury (ed.), The Garden in New Zealand, Auckland: Penguin Books (NZ), pp. 153-171.

Wallace, Neal (2011): "Food Distribution Could be Affected". In: Otago Daily Times, February 24 (https://www.odt.co.nz/news/dunedin/food-distribution-could-be-affected).

Wilson, David/Jonas, Andrew E. G. (2018): "Urban Resilience: An Urban Political Movement". In: Urban Geography, 39/8, pp. 1265-1267.

Wilson, Geoff A (2012): Community Resilience and Environmental Transitions. Abingdon: Routledge.

Zebrowski, Chris/Sage, Daniel (2017): "Organising Community Resilience: An Examination of the Forms of Sociality Promoted in Community Resilience Programmes". In: Resilience, 5/1, pp. 44-60.

Before 'Resilience'
Surviving in Postwar Berlin, 1945-1950

Avi Sharma

Risk analysis and preparedness have long been core aspects of governance practice across a variety of scales (Giddens 1991; Beck 1992; Bauman 2007), but in recent decades, this discourse has undergone an important shift. As diverse actors recognize the interconnectedness of risk factors, from pollution and resource use to climate change, the idea of coordinated strategies for managing shared challenges has gained ground. The internationalization of emergency response has also played a role in shifting the perceptions of risk beyond territorial boundaries, with local and regional challenges in distant lands demanding the mobilization of global resources (Deere-Birbeck 2009; Goldin/Mariathasan 2014). None of this is entirely new. Colonial powers have, in some cases, responded to drought or famine in subject territories (Davis 2007; Simonow 2015); central banks were already coordinating policy to impact global financial crises long before the Great Depression (Polanyi 2001 [1944]); and humanitarian relief was deployed to assist refugees during the First World War (Anderson 2007; Balakian 2009). All of these were, however, seen as exceptional situations, rather than everyday events (Gatrell 2013; Ther 2017). In recent decades, international stakeholders – from the United States National Security Council to the leadership of Amnesty International seem increasingly resigned to the fact of perpetual crisis: somewhere in the world, war, natural disaster, climate catastrophe, epidemic or political instability is happening. Crisis is widely seen as an everyday phenomenon, rather than an exceptional circumstance (ARUP/Rockefeller Foundation 2016).

Resilience is a slippery term precisely because it is supposed to enhance the capacity to flexibly respond to a range of challenges, from ecological disruption and natural disasters to climate change, financial crisis to violent conflict and its aftermath (Müller 2011; Taşan-Kok et al. 2013). Resilience thinking can be found in a wide variety of disciplines, from engineering and ecology to disaster management and planning. A range of actors, from NGOs to Foundations and National Security Agencies argue that resilience is about fostering strong local communities and institutions. It is, in this view, about preparedness, innovative response, and empowering individuals to rebuild (Johnson/Blackburn 2014). All of these things may

be true from a policy perspective, but on the most fundamental level, resilience is about surviving profound disruption. It is about survival (Wilson 2014; Wrenn 2014). In my view, it is an extraordinarily pessimistic discourse because it 1) assumes that crisis is the norm and 2) assumes that global actors no longer have the capacity to simultaneously address multiple crises occurring across geographies and scales.

Critics reject both of these assumptions. There is, for example, a vast literature on the cynical ways that 'crisis' discourse is used by state and non-state actors to achieve political and economic ends, and a related critique of TINA ideologies which use claims about state capacity to weaken regulatory regimes to the advantage of corporate and financial interests. Critics argue that 'limited capacity' claims are a fiction conceived to mask ideological and political economic interests (Oosterlynck/González 2013; Mirowski 2014). This critique is powerful, and in many cases, the suspicion of both the 'crisis' and 'capacity' arguments has proven to be justified, as business-interests work to marginalize state and regulatory agencies in pursuit of allegedly free markets.

Critics and advocates of the concept agree on very little, but they do agree that resilience discourse is about surviving disruption, whether on the ecological, systems, individual, community, national, supra-national or species level. So far as I know, though, none of the literature on resilient social systems adequately describes, analyzes, or interprets 'survival' as a lived experience and social category.[1] What does it mean for individuals and groups when development consultants, IGOs or nation state actors ask them to survive a crisis by building resilience or being resilient (Kaika 2017)? What kinds of disruptions – past, present, and future – elicit calls for resilience? Are there scenarios when the 'resilience' approach is justified? Answering these questions can help us to better understand what it means to survive disruption, and to understand how different kinds of disruption affect individual and social lives (Diefendorf 2009).

Answering these questions can also help to distinguish between cases where a so-called crisis is being used to achieve cynical political or economic goals on the one hand (Graham/Marvin 2012; Gotham/Greenberg 2014); and scenarios where we are encountering radically disruptive events (Hansen 2007; Sharma 2015;

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1   Survival and trauma have, obviously, been a focus of the psychological research on resilience, and it could be argued that this research has a pedigree that stretches at least to Sigmund Freud (cp. Freud 1965 [1933]). More recent work on trauma also draws attention both to the phenomenology of suffering and the technologies of survival. Here the work of Judith Herman is instructive (cp. Herman 2015 [1992]). For a discussion of more recent approaches to trauma and survival (cp. Southwick et al. 2014). For an extremely moving and also illuminating discussion of the experience of survival and the psychology of survivors (cp. Levi 1996 [1947]).

Bell/Green 2016; Hansen et al. 2016). This is worth exploring, because pronounce-ments of 'crisis' are so common that they threaten to desensitize both laypersons and experts (Hartman/Squires 2006). Climate change is a particularly powerful example of the kind of intersectional crisis scenario that was produced by human activity but threatens to escape governmental, managerial, technocratic, or entre-preneurial initiatives to control it (Barnes/Gilman 2011; Held/Young 2011). It is well known, for example, that climate change generates natural disasters that are rela-tively local (wild-fires and tsunamis, e.g.); food shortages and armed conflicts that are regional; and migrations and species extinctions that are global. Climate chan-ge in the 21st century is not, however, the first time that humans have experienced genuine crisis scenarios that cascade across multiple scales. Historical examples can be productively used to understand these kinds of intersectional crisis scena-rios. The present article tries to highlight the tensions within resilience discourse before that discourse was ever systematically articulated. The goal is to understand what it means when crisis occurs on a genuinely global scale; the ways that the system – in this case, the complex political ecology of postwar Berlin – reset in the face of extreme disruption; and, most importantly, what that process looked like for the people who lived it. In simplest terms, this chapter explores the case of Postwar Berlin to better understand the past, present, and future of survival in moments of radical disruption.

For a variety of reasons, the Berlin case is useful for exploring the individual experience of survival, and the social, political, and economic logics of surviving that is at the foundation of resilience discourses (Vale/Campanella 2005; Obschon-ka et al. 2017).[2] During the war, hundreds of thousands of housing units were des-troyed, which made shelter an everyday question of survival; millions of refugees, displaced persons, returning soldiers and evacuees survived on starvation rations; theft, rape, and murder were as common as a decent meal. Survival is the baseli-ne assumption of diverse contemporary discourses about resilience, and postwar Berlin can help us better understand what it means to survive. The example of post-war Berlin also highlights tensions within resilience discourse, because none of the implicit and explicit strategies for resilience building could have possibly been en-ough. Self-help was important but hardly sufficient. Adapting to hardship meant extraordinary suffering. Selfless action could mean starvation. Communities were decimated by demography. In short, massive state intervention to distribute shel-ter and food was critical: Berlin and the millions of people who lived there on a temporary or permanent basis would not have survived simply by 'being resilient', and advocates of resilience are wrong to suggest that the Berlin case proves their argument about self-reliance, creativity, and endurance.

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2   Other global examples might be equally instructive, for example, Leningrad, Warsaw, or To-kyo in the postwar period.

This does not however mean that critics of resilience discourse are correct in arguing that crisis and capacity are only political-economic fictions, because massive state intervention was not nearly enough to guarantee the provision of food and shelter. In postwar Berlin, administrators were bewildered by the breakdown of bureaucratic and legal norms. They had no idea how to supply residents and millions of new arrivals with shelter. International food aid was totally inadequate. The material fact of a destroyed city overwhelmed the capacity to rebuild. Most of those who lived in, came to, or transited through Berlin in 1945 survived. But what did survival entail, what did it look like, how was it experienced? For many of those millions, survival meant years in temporary housing, years of starvation rations, years of sexual abuse or transactional sex. In short, the Berlin case gives us some indication of what it means when we ask people to be resilient. The survivors of Hurricane Katrina who courageously demanded that the media 'stop calling them resilient' understood all of this, and the Berlin case is written in solidarity with them (Kaika 2017). At the same time, it is intended as a gentle reminder that 'better policy' cannot always make the painful task of survival painless; that rebuilding cities is not simply a matter of will but resources; that politicians do not control the weather; and that crises often intersect across multiple social, material, ecological, and political frames. It is a well-established fact of natural, social, and human sciences that shelter and food are two fundamental needs of individual and social organisms. This article uses the examples of shelter and food in postwar Berlin to better understand what it means to survive the breakdown of society.

Living in the Rubble. Housing Shortages in Postwar Berlin

Years of aerial warfare devastated German cities to the point that observers could scarcely imagine, let alone describe, what they saw. They spoke of graveyards, moonscapes, the apocalypse (Reichardt/Zierenberg 2008: 18; Häusser/Maugg 2009: 20; Evans 2011: 16–18). More than 4 million of a total 19 million pre-war apartments, for example, had been destroyed. In Cologne, 235.000 of the 252.121 (93 per cent) apartments in the city were uninhabitable. Bochum, Braunschweig, Bremen, Dortmund, Dresden, Duisburg, Essen, Frankfurt, Hamburg, Hannover, Kassel, Kiel, Nuremberg, and Stuttgart all saw between 50-65 per cent of the housing stock completely destroyed. Compared to other German cities, Berlin was in relatively good shape in 1945. Four years of aerial bombardment had reduced much of the city to rubble, but just 525.000 of the total 1.5 million housing units in Berlin had been destroyed or badly damaged, amounting to only about 30 per cent (Schulz 1994; Steininger 2002). Nevertheless, photography, film, maps, and statistical data all show that the material destruction of the built environment was astonishing (Rürup 1995; Derenthal 1999; Shandley 2001; Evans 2011).

Figure 1: Herbert Hensky "Two boys fishing on the Spree in Berlin-Mitte," 1947. (Bildarchiv Preußischer Kulturbesitz). Figure 2: Willy Römer, "Rubble removal: rubble women on Alte-Jakob Straße," 1948 (Bildarchiv Preußischer Kulturbesitz).

US Commander of Operations Frank Howley famously described Berlin as the "greatest pile of rubble" the world had ever seen, but as some historians rightly point out, the situation was less bad than it initially appeared (ibid: 18). Many roads were impassable but the grid remained; water and sewage infrastructures were disrupted but intact; there was limited subway and tram service as early as May 14th; and most major arteries were cleared of rubble relatively quickly. The symphony gave its first performance again on May 18th, and the first public soccer match was played on May 20th (Grossmann 2009). For millions of residents, though, symphonies and soccer games would have been little consolation. Allied and German administrators estimated that the city contained 75 million cubic meters of rubble (Dept. of Building and Housing 1949). 75 million cubic meters is more than 2.6 billion cubic feet. It is enough rubble to build a mountain more than 300 meters high, though Berliners chose to build several smaller hills instead (Dept. of Building and Housing 1986). Experts estimated that ten freight trains a day, each with 50 wagons, would be able to remove the rubble in 16 years (Steininger 2002). In fact, it took 27 years before all of the rubble was removed (Dept. of Building and Housing 1986). In 1945, Berliners returning home could scarcely navigate the city: the landmarks were gone, the streets in many cases impassable. Housing was a critical problem.

Housing was, naturally, one of the most pressing issues for many Berliners. Between 1945 and 1955, it was not at all unusual to live in an apartment or house that would, in normal times, be considered unlivable: walking down the streets of

Berlin, a gaping hole in an exterior wall often gave a clear view into the private lives of one's neighbors.

Figure 3: Unknown, "A destroyed apartment in a badly damaged building serves as a balcony in the summer," 1946 (Bildarchiv Preußischer Kulturbesitz)

The private sphere was opened to the public; intimacies were exposed. One Berliner explained how transformative this was. He joked that it was difficult to remain on formal terms with one's neighbors after waving to them from the street through a missing wall (Reichardt/Zierenberg 2008: 16).

While some were clearly exposed to their neighbors and the elements, others had a different problem. Across Germany, millions lived in basements and cellars, which were more likely to survive aerial bombing than above-ground structures. This might explain why some observers described Berlin as a city of troglodytes who climbed out of the earth each day (Sebald 2004 [1999]). Enforced intimacies, dark, cold, and damp shelters, the loss of home – all of these shaped the lives of short and long-term residents in enduring ways (Borneman/Peck 1995). As of the writing of this text, the UNHCR estimates that displaced persons spend, *on average,* 27 years in refugee camps, but even in the postwar period, millions of people spent years in emergency shelters and temporary housing.

In extraordinary times, though, city residents took shelter where they could find it. The well-known journalist Ursula von Kardorff claimed to have moved on seven occasions between 1942 and 1945, always remaining one step ahead of the British and American bombers (Hartl/Kardorff 1997 [1962]). If resilience is, as this chapter suggests, essentially about surviving, the experience of life in the rubble is quite telling: in Germany and other places across east and central Europe in the 1940s and indeed the 1950s, resilience meant flight and displacement; uncomfortable and potentially dangerous cohabitation; fear and a perpetual encounter with mortality (Sebald 2004 [1999]: 36).

The destruction of housing stock presented a huge problem for von Kardorff and millions of others, but before the end of the war, population outflows and high mortality rates stabilized the situation. Evacuation to the countryside and war-related deaths, for example, had reduced Berlin's population by roughly 30 per cent from 4.3 million to roughly 2.8 million. The end of the war destabilized this morbid equilibrium between population and housing, with at least 1.5 million people arriving in Berlin in the summer of 1945. Observers around the world were stunned. Newspapers in Chicago and London reported "floods" of humanity "overwhelming" Berlin. One observer reported that in July and August, 15-18.000 persons were arriving in Berlin each day, most of them "Eastern European" (Chicago Tribune 1945). Official reports were higher, claiming the numbers were on average, roughly 30.000 per day between May and October. In 1945, there were an estimated seven million Displaced Persons in Germany, and an additional twelve million ethnic German expellees from across Eastern Europe.[3] 7.738.000 of those people – more than 30 per

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3   The distinction between Displaced Persons and Expellees is critically important, though it
     is beyond the scope of the present article. Most important, for present purposes, is that the

cent of all DPs and Expellees – transited through or settled in Berlin between July 1945 and March 1946 (Königseder 1998: 30).[4] This was one of the largest population transfers in modern history. On a city-scale, this contributed to a population density 230 times the national average (Berlin Senate 1952).[5] So where did people live in Berlin's ruined cityscape? How did they survive the postwar? What did it mean to "be resilient"?

Rebuilding Berlin? The Postwar Housing Crisis

When cities are destroyed by conflict or natural disaster, actors at a variety of scales typically talk about rebuilding, and indeed, rebuilding is a critical part of surviving. In some perspectives, the simple fact of urban rebuilding is an indication of the 'resilience' of urban forms (Ladd 2005; Vale/Campanella 2005). In the aftermath of disaster, state and some civil society actors regularly call on individuals and local communities to "be resilient". Critics typically demand that the state do more to help people who have lost their homes and livelihoods. These calls for the state to support extremely vulnerable persons to the greatest possible degree is, in my view, entirely justified. The postwar case, though, shows that neither the resilience demanded by some, nor the state assistance called for by others, is enough to insulate people from intersectional crises that occur on a genuinely global scale. There are, in other words, very real crises that outstrip the capacity of the state to intervene, and the abilities of the individual or local community to survive on their own. In Germany, but indeed in cities across central and Eastern Europe, the challenges were staggering, and Berlin offers important insights into what rebuilding a city from the ground up actually entails. As we have seen, rubble was part of the problem. Architect Max Taut was just one of many experts who projected that rubble clearance would take decades, and indeed, in 1971, ten million cubic meters of rubble remained in West Berlin alone (Taut 1946; Dept. of Building and

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expellees did not fall under the UNRRA mandate (cp. Holian 2018). Historians have shown that, while population spiked in the divided Germany directly after the war, the UNRRA did an extraordinary job in repatriating the millions of displaced persons to their countries of origin (cp. Eder 2002; Holian 2012). In part because they did not fall under the UNRRA mandate, though, ethnic Germans expellees remained a large and stable percentage of the total German population from 1945 onwards.

4   In July 1945, the housing office in Reinickendorf in Northwest Berlin reported as many as 1000 people arriving per day in their district alone. This figure is surely exaggerated (cp. District Office Reinickendorf 1945). Historian Rolf Steininger estimates an average 30.000 per day between May and October (cp. Steininger 2002: 67; Echternkamp 2003: 63). This is consistent with Angelika Königseder's figures.

5   This is roughly 20 per cent higher than the population in density in Berlin, 2015, a fact compounded by the intense contraction of housing stock during the war years.

Housing 1986). Rubble was literally a barrier to rebuilding, blocking roads, occupying potential construction sites, consuming human resources and machinery, but it was hardly the only factor that accounts for the glacial pace of renovation and new construction.

Building materials were in short supply because the industrial capacity to produce them was badly damaged. This meant, for example, that when winterizing damaged housing, district building offices were only using roofing paper to cover damaged windows, roofs and walls in preparation for the cold weather. In 1945, administrators in the American sector district of Tempelhof secured 220 apartment buildings in this way, providing winterized housing for nearly 4500 district residents by November. This amounted to less than five per cent of the total population of the district (District Office Tempelhof 1946). In the Soviet Sector, the situation was far worse. Of a total 89.000 apartments requiring winterization, building offices reported repairing just 50 units in the span of a month (Häusser/Maugg 2009). During the so-called Hunger Winter of 1946-47, the city halted all construction work on residential properties, diverting roofing paper, concrete, and glass to winterize emergency shelters in schools, hospitals, and other public buildings. Builders were directed to ensure that one of every six rooms in these facilities was adequately winterized, which meant closing holes in exterior walls and covering windows (Dept. of Building and Housing 1945b). In practical terms, this meant that residents of already overcrowded apartments and shelters were diverted to even more overcrowded warming rooms.

State actors were unable to build the hundreds of thousands of housing units because financing, skilled labor, and raw materials were extremely scarce. Scrambling to find solutions to the housing crunch, the central office for housing directed district offices to appropriate and redistribute damaged housing to anyone with the financial resources or the construction skills to repair the property (Dept. of Building and Housing 1945c). Neither the city, the allies, nor the private sector had the resources to build Berlin, which meant that city residents would have to do the best they could to make temporary and damaged housing livable. In the early 1950s, the city was still tearing down more buildings than it was constructing, and in 1952, there was still a critical housing shortage of 120.000 units in Berlin alone. The situation was so extreme that the central housing office put a moratorium on the use of concrete for all non-housing related construction. They promised to deliver a total 11.500 units by the end of the year, addressing slightly less than 10 per cent of the critical shortage (Dept. of Building and Housing 1952).

The supply of new construction, whether privately or publicly financed, took decades to approach demand, and neither city residents nor officials could do very much to change that. In other parts of Germany, the situation was better, but by 1950, there were still more than 900.000 refugees living in emergency shelters, and in 1955, there were still more than 1900 camps providing emergency shelter

in the Western parts of Germany alone. If one includes expellees and evacuees, the numbers of those living in temporary or billeted housing was far higher (Echternkamp 2003). Rebuilding a city is obviously a challenge, no matter what caused its destruction. These challenges are amplified when recovery takes place against the backdrop of genuinely global pressures on resources.[6] After all, it was not only Berlin that needed to be built from the ground up: cities across Europe were demanding and, indeed, competing for raw materials to rebuild. If new construction was not a realistic option for providing housing, how then did Berlin house more than a million people who desperately needed shelter?

Temporary Housing and Durable Camps

In the months after the cessation of hostilities in Europe, roughly 100.000 people were arriving in Berlin each week, and the scale of in-migration – returnees, displaced persons, refugees, allied personnel – exceeded resource and administrative capacity across all sectors. Allied and city administrators were responsible not just for housing, but rations, bathrooms, medical attention, security, legal services, clothing, bedding, pots, pans, translation services, and logistics (Berger/Müller 1983). Despite the challenges, Allied and municipal authorities did find a range of temporary solutions. Housing of Nazi party members, for example, could be confiscated and placed in a pool for selected displaced persons. Workshops in primarily residential areas were repurposed to provide shelter. Military barracks, warehouses, schools, sport facilities and air raid shelters were catalogued and made available (Dept. of Building and Housing 1945a). Ironically, some 400.000 people were housed either in army barracks or facilities that had earlier been used as prisons and labor camps. (Dept. of Building and Housing 1951; Lanz 2007).

Emergency and temporary housing was one critical strategy for managing the postwar population spike, but "billeting" was another strategy used to manage the unmanageable population flows. Billeting is, of course, a centuries old practice typically employed by occupying armies, but in WWII, it became relatively common to billet urban evacuees in the countryside in order to minimize the risk of casualties during air raids. After the war it was, if anything, even more critical to managing the housing situation, and between May and December 1945, nearly 400.000 persons were billeted in apartments across Berlin. Like other so-called temporary

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6   It is now generally assumed that the Marshall Plan was responsible for rebuilding Europe, and indeed, the 1948 initiative was an important factor in restoring industrial capacity, critical infrastructure, and injecting cash into economy. It is worth noting, though, that the Marshall Plan was directed at public and other high priority infrastructure projects and did not substantially fund or finance the construction of residential real estate (cp. Diefendorf 2009: 377–78).

housing arrangements, billeting often became semi-permanent (Harlander/Kuhn 2012: 78–79). The prime targets of billeting were housing units that were underutilized, and to this end, each of the allied sectors determined how much living space should be allocated per individual, with a range between 6.2 square meters in the British sector to 9.4 in the French sector. This meant that a 100 square meter apartment might house between 10 and 15 people. While this situation was by no means typical, neither was it uncommon, particularly in those districts identified as "hotspots" for housing shortage (Dept. of Building and Housing 1945a; Berger/Müller 1983: 23; Häusser/Maugg 2009: 54). Surviving meant finding shelter, and in postwar Berlin, the space, material, and structures that qualified as shelter would hardly have done so before the war. Resilience quite literally meant living in ways that just years before would have been unimaginable to most people. And in hundreds of thousands of cases in Berlin, and millions of cases across Europe and Asia, these emergency arrangements were not "temporary" but "durable".

Living together, oftentimes in overcrowded apartments where space, food, heating materials, and everyday supplies were in short supply, could be extremely difficult, and the relationships between older and newer residents could be acrimonious. Physical space and contests over supplies were, of course, important sources of tension. The war itself was *also* a point of contention. One man recalled living in a household with 16 people, including an unrepentant Nazi and his two children (ibid: 57). Across Germany, refugees and displaced persons were disgusted to find that, after years of forced labor, imprisonment, and murder, they were still being treated as inferiors. Many hosts also felt angry, complaining about the lack of "gratitude" on the part of billeted persons who were consuming already scarce resources (Antons 2014). Looking around the city, or waiting in lines at district housing offices, most city residents – 'natives' and new-comers – recognized that there was no quick solution to their problems. Housing was a matter of life and death, and would remain a critical issue for more than 15 years. Equally important, though, was access to food. Here too, a range of factors confounded efforts to normalize food supply. Here too, state actors and individuals used multiple strategies to ensure survival. Here, too, neither individual resilience nor state intervention was enough to stave off hunger and malnutrition. Here too, the work of surviving was miserable.

Surviving Scarcity. The Hunger Years, 1945-1950

In the first years of the postwar, food supply and distribution were catastrophic. The war interrupted harvests, depleted agricultural labor reserves, closed the trading routes that supplied vital foodstuffs to Europe. France, Belgium, England, the USSR, Poland – all of these countries were starved for resources (Trentmann

2006). Nor was the problem confined to Europe. The Bengal famine of 1943 was a clear product of British wartime policy, but the consequences for land distribution and food production lasted well into the postwar period and, indeed, after independence in 1947 (Sen 1980; De 2006). In China's Henan province, more than two million died starvation related deaths in 1942-43, disrupting social relations and food production well after 1945 (Wou 2007). Between 1943 and 1948, starvation was an everyday fact of life for more than a hundred million people spanning more than 5000 miles (Katkoff 1950; Ganson 2009). Berlin was just one of dozens of cities and town requiring food aid across Europe. Food imports were stretched thin in the face of the vast demand across the continent.

The weather compounded the challenges of restoring local food production to prewar levels. Winter 1946/7 was the coldest in decades, destroying late autumn crops, killing millions of livestock across the continent and British Isles, and making waterways impassable (Model 1948; Häusser/Maugg 2009: 69). The contemporary debate about resilience often turns on the question of whether nation-state and international actors have the capacity to solve post-crisis challenges, but the global food crisis in the mid-1940s suggests that there are indeed situations which outstrip the capacities of large-scale actors. These were not just questions of policy or political will, although those did play a role. Food shortages in Europe were also a product of durable limits on global food production, supply, and distribution. And even the weather.

Food was a critical issue for much of the world for much of the war, but in early 1945, the situation in Germany was far better than it was for many of the other combatants. For years, Germany had stolen resources from occupied territories, and millions of forced laborers worked German farms. Although some products were rationed as early as 1936, the food situation remained relatively steady through much of 1944. In fact, when Soviet and British soldiers arrived in Berlin in summer 1945, many noted how well fed the locals appeared to be. The end of food transfers and the liberation of forced laborers changed the situation dramatically, and in the immediate postwar period, food supply was reduced dramatically, in many cases, by as much as 40 per cent (District Office Tempelhof 1945b; Reichardt/Zierenberg 2008: 70). Even when food was available – through local production, imports, or food aid – the roads, bridges, and railways essential for the transport were badly damaged, making distribution extremely difficult. In Germany, roughly 40 per cent of motorized vehicles were unusable; and nearly 2400 train bridges, 10.000 locomotives, and 112.000 freight cars had been destroyed (ibid: 71). Food insecurity was ubiquitous, so where did food come from, and how did individuals make sure that they had enough to survive?

Surviving the Peace. Formal and Informal Strategies.

Germans could not have survived the postwar peace if not for food aid from the allies, and in May and June of 1945, the Allies authorized Berlin districts to issue roughly 1.5 million ration cards. Between August 15 and September 15, 1945, Joint Allied Commands delivered 71.000 metric tons of food aid, much of it imported from the Americas (Allied Kommandatura 1945).[7] In spite of the Allied Food Aid program, extreme hunger was widespread and in the first two years after the war, the situation got worse, not better. An average ration set at 1550 calories in summer 1945, for example, was reduced by nearly 30 per cent in just a few months. In the British zone this amounted to two slices of bread with margarine, two small potatoes, and a "ladle" of milk per person per day (Steininger 2002: 67). District administrators across Berlin agreed that this was their most pressing challenge. In a May 1946 report to district residents, for example, Tempelhof administrators expressed regret that some 80.000 individuals were not receiving rations, and asked for patience (District Office Tempelhof 1946). Just six months later, in winter 1946/7, total average rations were reduced to an average 700-800 calories across Allied zones (Häusser/Maugg 2009: 50). These calories were absolutely essential for survival, but they were not nearly enough to survive.[8]

Not everyone was happy about the rationing system. During the war, tens of millions of Russian civilians and soldiers suffered from extreme food insecurity, and many wondered why they were now responsible for supporting the Germans who were the cause of so much suffering. British public opinion was also suspicious of German demands for food aid. After all, Britons had been living on rations for years, leaving many to wonder why Germans deserved food aid while British citizens experienced continual shortages on the home front. One British MP noted that it was perhaps "the greatest joke in history. We defeat an enemy, and then call on tax payers to pay 80-100 million pounds a year to put them on their feet again" (ibid: 51). Despite the objections of some allied administrative and civilian populations, the rationing system survived until 1950.

Some in the ranks of former combatant nations were hostile to the rationing regime, but recipients *also* recognized that the system was unfair, if for different reasons. The rationing system was divided into five tiers, with those at the top in Tier I receiving more than double the ration of those in Tier V. Tier V was made up

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7   Berlin, like Germany as a whole, was split into Allied occupation zones. Unlike Germany, though, Berlin was administered by a Joint Allied Command until 1948, which meant that matters like rationing were, at least in theory, administered according to a common policy.

8   Official data indicates that the death rate in Berlin jumped from 13.5 per thousand in the period 1937-39 to 53.5 per thousand in the second half of 1945. Based on a population estimate of 3.5 million, this would amount to 187.250 deaths for 1945 as compared to an average annual 47.250 deaths between 1937-39 (cp. Black 2010: 147).

of people working in non-essential professions, people who were not employed (the unemployed, for example, but also retirees and the disabled), and members of the Nazi Party. The Tier V ration card was jokingly referred to as the "Himmelfahrts-karte" – a play on the German term for the Christian holiday marking "Ascension." The pun was a good one, because the Tier V entitlement to between 500-800 calories per day was, on its own, a sure-fired "ticket to heaven". Women, many of whom were involved in professions deemed "non-essential" – like child, elder or family care – were particularly likely to fall in Tier V. (Reichardt/Zierenberg 2008: 76; Häusser/Maugg 2009: 47).

A ration card was an entitlement but not a guarantee. If trains and trucks failed to deliver flour, there was no bread. In March 1946, for example, the monthly bread ration for Hamburg ran out in the second week of the month (Steininger 2002: 67). If storms destroyed crops, fruits and vegetables became even more difficult to find. Wolfgang Herchner, who was 17 when the war ended, remembers queuing at 5am for his daily rations – typically a pot of broth (Häusser/Maugg 2009: 49). In memoirs and oral histories, these hardships take on a particular tone – they represent suffering survived. Contemporary accounts show, though, how difficult this act of surviving really was. In July 1945, Klara J., the widowed mother of four children, reported that it had been weeks since she had been able to provide her children with any meat. Her youngest son had a ration card entitling him to a milk supplement, but had only been issued ½ of a liter over a period of 25 days (District Office Tempelhof 1945a). Here, the problem was not just the ration card, but the absolute shortages. In the context of extreme scarcity, how did people like Klara and her children survive? A complex of formal and informal strategies emerged that aimed at supplementing allied food aid. The following highlights some of the difficult choices individuals made in their efforts to feed themselves and their loved ones.

Partially because of the structure of the rationing regime, women were particularly impacted by food scarcity, and transactional sex was one of the survival strategies that was used to combat extreme precarity. (Grossmann 2009; Evans 2011). Transactional sex can take many forms, and not all, or perhaps even most of these exchanges would qualify as prostitution. Fraternization between allied personnel and women in Berlin might, for example, entail gift exchanges, intimacy, and even affection. Whatever the nature of these relationships, though, it is essential to remember that they were typically characterized by extreme power differentials between allied soldiers who had surplus food, money and fungible commodities like cigarettes; and women and girls who were trying to simply survive in desperate times. Sex and other forms of intimacy were, in the postwar years, key survival strategies for many vulnerable women (and some men). This, too, was a kind of resilience – a way to stabilize everyday life in exceptional times (Reichardt/Zierenberg 2008).

Sex was one kind of transaction, but informal trade could take a range of forms, and here, the unevenness of rationing system sometimes played an important role. In shared housing situations, for example, cohabitants frequently made implicit or explicit exchanges, trading rationed goods like cigarettes and food for more space, better living quarters, cooking utensils, bedding and so on (Prosser-Schell 2011; Antons 2014). These often complex negotiations within the household were hidden from view, but exchanges of space, food and other resources were important to postwar survival. If these kinds of exchanges were relatively hidden, the black market was everywhere visible. In illegal markets across Germany, people traded all sorts of goods – paintings and rings, baby clothes and bedding, food, medicine, licit and illicit drugs – in an effort to survive (Zierenberg, 2008). In an environment where paper currency was unstable, it was common to trade in other kinds of exchange products, and cigarettes became a preferred instrument of trade. (Steininger 2002: 26; Echternkamp 2003). Black markets were demonized by authorities, but they did give individuals increased flexibility in addressing food insecurity.

While secondary circuits helped to secure essential goods, there were times when food and fuel was simply impossible to find in cities. This led to a different but related strategy called 'hamstering', so-called because the hamsters were stuck in an endless back-and-forth circuit in the hunt for food (Häusser/Maugg 2009: 26).[9] On crowded platforms across Berlin and other German cities, the "hamsters" waited for trains to take them to the countryside - anywhere there was a chance to trade for food. The hamsters waited for hours for space in overcrowded trains. After disembarking, they would traverse the countryside, moving from village to village, farm to farm, searching for a willing exchange partner. They traded prized possessions for a few days of food and risked police controls where precious supplies would be confiscated. A young woman recounts trading her grandfather's gold watch for a sack of potatoes and a pair of apples. Hamsters, she said, never really thought about whether the time and resources were worth the return. "We had nothing to eat, so we had to trade" (ibid: 69).

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9   An employee of the German Railways reported that more than 1000 people a day were departing the Stettiner Train Station for farming villages in Mecklenburg to the North. They brought with them table lamps, linens, porcelain, radios – whatever they had available – to trade for potatoes, milk, vegetables and other food stuffs.

Figure 4: Friedrich Seidenstücker, "The 'Potato-Express' at the Potsdam train station," 1946 (Bildarchiv Preußischer Kulturbesitz).

Hamstering, transactional sex, informal arrangements in the household, and black markets were all tactics that individuals used to survive in the immediate postwar period, but none of these did anything to solve the fundamental problem, which was the material scarcity of food and other essential supplies. Berliners may have been resilient, but rations were not enough to survive, and informal strategies did nothing to increase overall supply. In an effort to address the root-problem, cities across Germany undertook ambitious initiatives to foster urban agriculture.

Urban gardening has long been a strategy for enhancing food security in both peacetime and war, so it is unsurprising that urban green spaces across Europe were repurposed to stabilize food supply (Helphand 2008). During the war, Berliners were already planting vegetables on balconies, in courtyards and other small spaces, but in September 1945, the Berlin City Council passed an ordinance calling for a city survey to catalogue potential food production sites. This was an enormous task. They proposed to bring every possible corner of the city under cultivation. Some sites were obvious targets for urban agriculture. City parks and squares, undeveloped land and abandoned property were quickly put to use. In other cases, though,

dangerous buildings needed to be demolished and rubble removed to ensure the most productive use of precious seeds and fertilizers. The survey itself took more than two years, but the results were promising. The Central Office for Green Planning and Agriculture catalogued more than 115.000 small garden parcels totaling 5087 Hectares and an additional 49.243 parcels of undeveloped or underutilized land in Berlin (Dept. of Building and Housing 1947).[10]

Figure 5: Willy Römer, "Potato harvest in the Tiergarten," 1945 (Bildarchiv Preußischer Kulturbesitz).

District offices did not, of course, wait for the completed survey, and by spring 1946 local officials were distributing available gardens plots and allocating space in parks and squares. In Spring 1946, Tempelhof distributed roughly 4.5 hectares of uncultivated land to district residents, and in Wilmersdorf, the public parks and squares (e.g., Olivaerplatz and Preußenpark) were shared out among district residents. In addition to the small plots, the city provided 165.000 vegetable sproutlings to residents who were trying to supplement rations (District Office Tempelhof 1946;

10   This space - roughly 69 square kilometers – was fairly substantial. By way of comparison, it amounts to more than 75 per cent of the total area of, for example, Copenhagen.

District Office Wilmersdorf 1946; Schmidt 2008). Districts would take a portion of the harvest to be collected at a central distribution center. The scheme was hardly without problems. Urban gardeners no doubt diverted parts of their harvest into their personal stores or used them for trade on the black market. And as the city council office of nutrition warned, some districts – particularly those in the North and East of the city – were withholding the assembled harvest from central distribution points. Nevertheless, by the end of the summer harvest 1946, local production accounted for a substantial proportion of total food supply, approaching as much as 30 per cent (Häusser/Maugg 2009: 66). While this is an impressive achievement, it speaks more to the limited supply than to overall production. As historian Jürgen Schmidt points out, most of those given garden plots had little or no experience farming, the soil quality was poor, and fertilizer and seed was scarce (Schmidt 2008). Having access to a plot of land and seed certainly did not make urban gardeners self-sufficient.

The image above – gardening in the Tiergarten with the Reichstag and Russian Memorial in the back-ground – encodes what 'resilience' means to so many people in the 21st century. One can see the cause of the disruption and some of its visible effects; the hardworking people trying to draw sustenance from the soil; the re-purposing of unfamiliar tools to scrape a living; a child helping mother or father. There is much that is not visible, though. The degraded soil, for one; the trades and exchanges to ensure that growing children have clothing; waiting in line and registering for a plot to garden; the insecurity of crop-yield and the threat of pilferage. If we admire people for their resilience, and I certainly do, it is essential to visibilize what it means to survive. This is even more important if we plan to call on others to be resilient.

The effort to survive extreme scarcity in the postwar combined a range of formal and informal strategies ranging from rationing and urban gardening to transactional sex and 'hamstering'. None of strategies, individually or taken together, were enough to ensure food security, and indeed, many remember the period 1945-1950 primarily in terms of persistent hunger. The postwar offers insights into a global food crisis – one where the issue is total capacity and not the lack of interest from donor nations (Trentmann 2006; Häusser/Maugg 2009: 50). The historical example of a food crisis that is simultaneously local, regional, and global may offer insights to those concerned with food security in a time of accelerating climate change.

Conclusion: Never Cry Crisis?

Postwar Berlin is, in a variety of ways, an extraordinary case. The legacies of genocidal violence and emerging geopolitical conflicts; the scale of physical destruction; the scarcity of food and building materials; the formal and informal survival strate-

gies – all of these are part of an historical record that still resonates in Berlin's urban everyday. The Berlin case is also useful for exploring questions about crisis and resilience more generally, offering potential insights into cases in different parts of the world and different time periods. It is, in fact, surprising that the postwar period has not already been comprehensively mined by resilience researchers and practitioners to generate insights into the challenges of surviving and rebuilding after catastrophe (Ladd 2005; Obschonka et al. 2017). For one thing, the postwar period is in the DNA of the debate between "regulationists" and neoliberals, informing the ways that each of these camps imagines the state's role in managing crisis and rebuilding after disaster (Mirowski 2014). The present case does not pretend to settle this debate, or the debate between advocates of resilience and their critics that was briefly sketched out in the introduction. It does show, however, that there are indeed instances in which state actors across scales lack the capacity to address life-threatening challenges like widespread homelessness or food-scarcity, as some advocates of resilience have argued. It also shows, and this is more important in my view, what resilience means for the people who live through profound disruptions. Berlin is an extreme example of the kinds of challenge that resilience claims to address, and in part because it is an extreme case, it illuminates the way that global disruptions differ from local or regional ones, creating different kinds of challenges for individual, state, and non-state actors.

This article attempted simultaneously to do several things. It showed the scale and scope of disruption to housing and provisioning; it explored some of the formal and informal strategies for addressing those disruptions; and it highlighted reasons why these disruptions were so difficult to solve, and so painful to survive. Most importantly, though, the article attempted to draw our attention to the particular challenges that arise when addressing intersectional crises that cascade across scales and geographies. The Berlin case, for example, shows that postwar housing and food crises were caused not just by aerial bombing and damage to the agricultural sector, but also by the regional pressures on building materials, machinery and human resources; population displacements occurring on regional and global scales; and food scarcity and weather events that were global in nature. This article suggests that, when talking about resilience in particular, and rebuilding in general, it is extremely important to distinguish between local, regional, and global disruptions (Held/Young 2011). As Diefendorf (2009) has argued, for example, rebuilding New Orleans in 2005 demands a different approach than rebuilding Berlin in 1945: in 2005, the resources and capacity to rebuild were available, while in 1945, they were not. New Orleans residents were right to demand that the media, state, and civil society actors stop applauding resilience and get to work supporting citizens in need. Berlin residents had no real hope that state intervention, whether local, federal, or international, could address shortages and material destruction in a timely way.

One troubling implication of this article is that there are global crises that exceed the capacity of state and other large-scale actors to effectively intervene. There were, of course, policy choices and geopolitical conflicts which retarded the process of rebuilding Berlin, stabilizing food supply, and addressing population displacement. But the entanglement of multiple disruptions across different scales meant that many people in Berlin would live in temporary shelters, cellars, and homes without walls for years; that many people would suffer from malnutrition for years; and that the best intentions in the world could not resolve the situation. This was a matter of capacity, and not political will or policy failure (although those, too, were abundant). The Berlin case suggests that there are instances when the terrible burden of surviving catastrophe has and will fall disproportionately on individuals. It also suggests that stakeholders should be extremely cautious in their calls for resilience, because the work of surviving is miserable work. All of this is worth considering for those who rightly argue that imminent challenges – most notably, climate change – are likely to overwhelm global capacity across a variety of crisis categories, geographies, and scales.

References

Allied Kommandatura (1945): Food Requirements, 15 August - 14 September, 1945, Landesarchiv Berlin, F-Rep 280 No. 3673.

Anderson, Margaret Lavinia (2007): "'Down in Turkey, Far Away': Human Rights, the Armenian Massacres, and Orientalism in Wilhelmine Germany." In: The Journal of Modern History 79/1, pp. 80–111.

Antons, Jan-Hinnerk (2014): "Displaced Persons in Postwar Germany: Parallel Societies in a Hostile Environment." In: Journal of Contemporary History 49/1, pp. 92–114.

ARUP/Rockefeller Foundation (2016): "City Resilience Index: Understanding and Measuring City Resilience", (https://www.arup.com/en/perspectives/publications/Research/Section/City-Resilience-Index).

Balakian, Peter (2009): The Burning Tigris: The Armenian Genocide and America's Response, New York: HarperCollins.

Barnes, William/Gilman, Nils (2011): "Green Social Democracy or Barbarism." In: Craig J. Calhoun/Georgi M. Derluguian (eds.), The Deepening Crisis: Governance Challenges After Neoliberalism, New York: New York University Press, pp. 43–66.

Bauman, Zygmunt (2007): Liquid Times: Living in an Age of Uncertainty, Cambridge: Polity.

Beck, Ulrich (1992): Risk Society: Towards a New Modernity, London: Sage.

Bell, Kirsten/Green, Judith (2016):"On the Perils of Invoking Neoliberalism in Public Health Critique." In: Critical Public Health 26/3, pp. 239–43.

Berger, Thomas/Müller, Karl-Heinz (1983): Lebenssituationen 1945 - 1948: Materialien zum Alltagsleben in den westlichen Besatzungszonen 1945 - 1948, Hannover: Niedersächsische Landeszentrale für Politische Bildung.

Berlin Senate (1952): Refugees Flooding Island Berlin, Landesarchiv Berlin, B-Rep 014 No. 269.

Black, Monica (2010): Death in Berlin: From Weimar to Divided Germany, Cambridge: Cambridge University Press.

Borneman, John/Peck, Jeffrey M. (1995): Sojourners: The Return of German Jews and the Question of Identity, Lincoln, London: University of Nebraska Press.

Calhoun, Craig J./Derluguian, Georgi M. (eds.) (2011): The Deepening Crisis: Governance Challenges After Neoliberalism, New York: New York University Press.

Chicago Tribune (1945): Refugees Flood Berlin, Landesarchiv Berlin, F-Rep 280 No. 3788.

Davis, Mike (2007): Late Victorian Holocausts: El Niño Famines and the Making of the Third World, London: Verso.

De, Bikramjit (2006):"Imperial Governance and the Challenges of War." In: Studies in History 22/1, pp. 1–43.

Deere-Birbeck, Carolyn (2009): "Global Governance in the Context of Climate Change: The Challenges of Increasingly Complex Risk Parameters." In: International Affairs 85/6, pp. 1173–94.

Dept. of Building and Housing (1945a): Directives on the Use of Residential and Commercial Space, Landesarchiv Berlin, F-Rep 280 No. 2201.

Dept. of Building and Housing (1945c): Self-Help and Compensatory Aid, Landesarchiv Berlin.

Dept. of Building and Housing (1945b): Winterizing Homes, Schools, and Hospitals, Landesarchiv Berlin, F-Rep 280 No. 3451.

Dept. of Building and Housing (1947): Report of the Office of Green Planning, 2 July 1947, Landesarchiv Berlin, C-Rep 109, No. 154.

Dept. of Building and Housing (1949): Rubble Survey, Landesarchiv Berlin, F-Rep 280 No. 2208.

Dept. of Building and Housing (1951): Massive Barracks in Borsigswalde, Landesarchiv Berlin, B-Rep 09 No. 126.

Dept. of Building and Housing (1952): Summary of Expert Testimony, Landesarchiv Berlin, B-Rep 09 No. 01.

Dept. of Building and Housing (1986): Competition: The Transformation of Rubble Depots into Recreational Areas, Landesarchiv Berlin, B-Rep 09 No. 373.

Derenthal, Ludger (1999): Bilder der Trümmer- und Aufbaujahre: Fotografie im sich teilenden Deutschland, Marburg: Jonas.

Diefendorf, Jeffry M. (2009): "Reconstructing Devastated Cities: Europe after World War II and New Orleans after Katrina." In: Journal of Urban Design 14/3, pp. 377–97.

District Office Reinickendorf (1945): Report on the Housing Situation in Reinickendorf, 16 July 1945, Landesarchiv Berlin, F-Rep 280 No. 2048.

District Office Tempelhof (1945b): Report on Rebuilding Efforts in the Tempelhof District, Landesarchiv Berlin, F-Rep 280 No. 2754.

District Office Tempelhof (1945a): Summary Report of the District Police, 26 July 1945, Landesarchiv Berlin, F-Rep 280 No. 2408.

District Office Tempelhof (1946): One Year of Rebuilding by the District Administration Tempelhof, Landesarchiv Berlin, F-Rep 280 No. 2755.

District Office Wilmersdorf (1946): Agriculture in City Squares and Parks, Landesarchiv Berlin.

Echternkamp, Jörg (2003): Nach dem Krieg: Alltagsnot, Neuorientierung und die Last der Vergangenheit 1945-1949, Zürich: Pendo.

Eder, Angelika (2002): "Displaced Persons/'Heimatlose Ausländer' als Arbeitskräfte in Westdeutschland." In: Archiv für Sozialgeschichte 42, pp. 1–17.

Evans, Jennifer V. (2011): Life Among the Ruins: Cityscape and Sexuality in Cold War Berlin, Basingstoke: Palgrave Macmillan.

Freud, Sigmund (1965 [1933]): New Introductory Lectures on Psychoanalysis, New York: W. W. Norton and Company.

Ganson, Nicholas (2009): The Soviet Famine of 1946-47 in Global and Historical Perspective, New York: Palgrave Macmillan.

Gatrell, Peter (2013): The Making of the Modern Refugee, Oxford: Oxford University Press.

Giddens, Anthony (1991): Modernity and Self-Identity: Self and Society in the Late Modern Age, Stanford: Stanford University Press.

Goldin, Ian/Mariathasan, Mike (2014): The Butterfly Defect: How Globalization Creates Systemic Risks, and What to do About it, Princeton: Princeton University Press.

Gotham, Kevin Fox/Greenberg, Miriam (2014): Crisis Cities: Disaster and Redevelopment in New York and New Orleans, Oxford: Oxford University Press.

Graham, S./Marvin, S. (2012): "Emergency Urbanism in the Anthroprocene: Eco-Emergency, Resource Securitisation and Premium Ecological Enclaves." In: Tigran Haas (ed.), Sustainable Urbanism and Beyond: Rethinking Cities for the Future, New York: Rizzoli, pp. 120–23.

Grossmann, Atina (2009): Jews, Germans, and Allies: Close Encounters in Occupied Germany, Princeton: Princeton University Press.

Hansen, J. E. (2007): "Scientific Reticence and Sea Level Rise." In: Environmental Research Letters 2/2, p. 24002.

Hansen, James/ Sato, Makiko/ Hearty, Paul/ Ruedy, Reto/ Kelley, Maxwell/ Masson-Delmotte, Valerie/ Russell, Gary/ Tselioudis, George/ Cao, Junji/ Rignot, Eric/ Velicogna, Isabella/ Tormey, Blair/ Donovan, Bailey/ Kandiano, Evgeniya/ von Schuckmann, Karina/ Kharecha, Pushker/ Legrande, Allegra N./ Bauer, Michael/Lo, Kwok-Wai (2016): "Ice Melt, Sea Level Rise and Superstorms: Evidence from Paleoclimate Data, Climate Modeling, and Modern Observations that 2 °C Global Warming Could be Dangerous." In: Atmospheric Chemistry and Physics 16/6, pp. 3761–3812.

Harlander, Tilman/Kuhn, Gerd (eds.) (2012): Soziale Mischung in der Stadt: Case Studies - Wohnungspolitik in Europa - Historische Analyse, Stuttgart: Krämer.

Hartl, Peter/Kardorff, Ursula von (eds.) (1997 [1962]): Berliner Aufzeichnungen 1942 bis 1945, München: Dt. Taschenbuch-Verlag.

Hartman, Chester W./Squires, Gregory D. (2006): There is No Such Thing as a Natural Disaster: Race, Class, and Hurricane Katrina, New York, London: Routledge.

Häusser, Alexander/Maugg, Gordian (2009): Hungerwinter: Deutschlands humanitäre Katastrophe 1946/47, Berlin: Propyläen.

Held, David/Young, Kevin (2011): "Crises in Parallel Worlds." In: Craig J. Calhoun/Georgi M. Derluguian (eds.), The Deepening Crisis: Governance Challenges After Neoliberalism, New York: New York University Press, pp. 19–42.

Helphand, Kenneth (2008): Defiant Gardens: Making Gardens in Wartime, San Antonio: Trinity University Press.

Herman, Judith (2015 [1992]): Trauma and Recovery: The Aftermath of Violence, from domestic Abuse to Political Terror, New York: Basic Books.

Holian, Anna (2012): "The Ambivalent Exception: American Occupation Policy in Postwar Germany and the Formation of Jewish Refugee Space." In: Journal of Refugee Studies 25/3, pp. 452–73.

Holian, Anna (2018): "A Missing Narrative: Displaced Persons in the History of Postwar West Germany." In: Cornelia Wilhelme (ed.), Migration, Memory, and Diversity: Germany from 1945 to the Present, New York: BERGHAHN BOOKS, pp. 32–55.

IPCC (ed.) (2014): Climate Change 2014: Impacts, Adaptation and Vulnerability., New York, NY: Cambridge University Press.

Johnson, Cassidy/Blackburn, Sophie (2014): "Advocacy for Urban Resilience: UNISDR's Making Cities Resilient Campaign." In: Environment and Urbanization 26/1, pp. 29–52.

Kaika, Maria (2017): "'Don't call me resilient again!': The New Urban Agenda as Immunology … or … What Happens when Communities Refuse to be Vaccinated with 'Smart Cities' and Indicators." In: Environment and Urbanization 29/1, pp. 89–102.

Katkoff, V. (1950): "Soviet Grain Production: 1940-1950." In: Land Economics 26/3, p. 207.

Königseder, Angelika (1998): Flucht nach Berlin: Jüdische Displaced Persons 1945-1948, Berlin: Metropol.

Ladd, Brian (2005): "Double Restoration: Rebuilding Berlin After 1945." In: Lawrence J. Vale/Thomas J. Campanella (eds.), The Resilient City: How Modern Cities Recover from Disaster, New York, Oxford: Oxford University Press, pp. 117–35.

Lanz, Stephen (2007): Berlin Aufgemischt: Abendländisch, multikulturell, kosmopolitisch? Die politische Konstruktion einer Einwanderungsstadt, Bielefeld: transcript Verlag.

Levi, Primo (1996 [1947]): Survival in Auschwitz, New York: Touchstone.

Mirowski, Philip (2014): Never let a Serious Crisis go to Waste: How Neoliberalism Survived the Financial Meltdown, London: Verso.

Model, Fritz (1948): "Eisdicke auf der Alster im Winter 1946–47." In: Deutsche Hydrographische Zeitschrift 1/2-3, pp. 104–6.

Müller, Bernhard (2011): "Urban and Regional Resilience: A New Catchword or a Consistent Concept for Research and Practice?" In: Bernhard Müller (ed.), Urban Regional Resilience: How do Cities and Regions Deal with Change?, Heidelberg: Springer Verlag, pp. 1–13.

Obschonka, Martin/ Stuetzer, Michael/ Rentfrow, P. Jason/ Potter, Jeff/Gosling, Samuel D. (2017): "Did Strategic Bombing in the Second World War Lead to 'German Angst'? A Large-scale Empirical Test Across 89 German Cities." In: European Journal of Personality 31/3, pp. 234–57.

Oosterlynck, Stijn/González, Sara (2013): "'Don't Waste a Crisis': Opening up the City Yet Again for Neoliberal Experimentation." In: International Journal of Urban and Regional Research 37/3, pp. 1075–82.

Polanyi, Karl (2001 [1944]): The Great Transformation: The Political and Economic Origins of Our Time, Boston, MA: Beacon Press.

Prosser-Schell, Michael (2011): "Ankunft und Einsiedlung von Flüchtlingen und Vertriebenen in Nordbaden 1945-1949." In: Richard Johler (ed.), Mobilität: Europa in Bewegung als Herausforderung kulturanalytischer Forschung, Münster: Waxmann, pp. 491–99.

Reichardt, Sven/Zierenberg, Malte (2008): Damals nach dem Krieg: Eine Geschichte Deutschlands 1945 bis 1949, München: Dt. Verl.-Anstalt.

Rürup, Reinhard (1995): Berlin 1945: Eine Dokumentation, Berlin: W. Arenhövel.

Schmidt, Jürgen (2008): Rote Rüben auf dem Olivaer Platz: Quellen zur Ernährungskrise in der Nachkriegszeit Berlins, 1945-1949, Berlin: Lit.

Schulz, Günther (1994): Wiederaufbau in Deutschland: Die Wohnungsbaupolitik in den Westzonen und der Bundesrepublik von 1945 bis 1957, Düsseldorf: Droste.

Sebald, W. G. (2004 [1999]): On the Natural History of Destruction, London: Penguin Books.

Sen, Amartya (1980): "Famine Mortality: A Study of the Bengal Famine of 1943: A Study of the Bengal Famine of 1943." In: Peasants in History.

Shandley, Robert R. (2001): Rubble Films: German Cinema in the Shadow of the Third Reich, Philadelphia: Temple University Press.

Sharma, Avi (2015): "Who Leads in a G-Zero World: Multi-Nationals, Sustainable Development, and Corporate Social Responsibility in a Changing Global Order." In: Washington International Law Journal 24, pp. 589–612.

Simonow, Joanne (2015): "Understanding Humanitarian Action in South Asia: Responses to Famine and Displacement in Nineteenth and Twentieth Century India." In: Humanitarian Policy Group, pp. 1–32.

Southwick, Stephen M./ Bonanno, George A./ Masten, Ann S./ Panter-Brick, Catherine/Yehuda, Rachel (2014): "Resilience Definitions, Theory, and Challenges: Interdisciplinary Perspectives." In: European Journal of Psychotraumatology 5/1.

Steininger, Rolf (2002): Deutsche Geschichte Vol. 1: 1945-1947, Frankfurt am Main: Fischer.

Taşan-Kok, Tuna/Stead, Dominic/Lu, Peiwen (2013): "Conceptual Overview of Resilience: History and Context." In: Ayda Eraydın/Tuna Taşan-Kok (eds.), Resilience Thinking in Urban Planning, Dordrecht, London: Springer, pp. 39–51.

Taut, Max (1946): Berlin im Aufbau, Berlin: Aufbau Verlag.

Ther, Philipp (2017): Die Aussenseiter: Flucht, Flüchtlinge und Integration im modernen Europa, Berlin: Suhrkamp.

Trentmann, Frank (2006): "Coping with Shortage: The Problem of Food Security and Global Visions of Coordination, C. 1890s-1950." In: Frank Trentmann/Flemming Just (eds.), Food and Conflict in Europe in the Age of the Two World Wars, Houndmills, Basingstoke, Hampshire, New York: Palgrave Macmillan, pp. 13–48.

Vale, Lawrence J./Campanella, Thomas J. (eds.) (2005): The Resilient City: How Modern Cities Recover from Disaster, New York, Oxford: Oxford University Press.

Wilson, Japhy (2014): "The Shock of the Real: The Neoliberal Neurosis in the Life and Times of Jeffrey Sachs." In: Antipode 46/1, pp. 301–21.

Wou, Odoric (2007): "China at War: Food Shortage and Japanese Grain Extraction in Henan." In: Stephen Mackinnon/Diana Lary/Ezra Vogel (eds.), China at War: Regions of China, 1937-1945, Stanford: Stanford University Press, pp. 175–206.

Wrenn, Mary V. (2014): "The Social Ontology of Fear and Neoliberalism." In: Review of Social Economy 72/3, pp. 337–53.

III)
Infrastructures of Resilience

No Easy Solutions

Global Cities, Natural Disasters, Development, and the Intellectual History of Resilience Thinking, 1960s to 1990s

Sönke Kunkel

A new promise is haunting the global development community today – the promise of resilience. The United States Agency for International Development carries it along in its portfolio. The United Nations has it on its list of top priorities, and so does the World Bank, which claims that climate change has made resilience "essential to eliminating extreme poverty and achieving shared prosperity by 2030" in developing countries (World Bank, 2013: vi). Fed by the human tragedy of major disasters such as the 2004 Asian tsunami and 2005 Hurricane Katrina, new resilience programs have also emerged in the global NGO sector where the Rockefeller Foundation now leads the way with its 100 Resilient Cities program. Under the scheme, the foundation offers funding for up to $ 1 million per city to allow for the hiring of a Chief Resilience Officer, and provides technical support to help cities develop comprehensive resilience strategies. "City resilience," the Rockefeller Foundation explains, is not alone geared towards strengthening the "capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow, no matter what kinds of chronic stresses and acute shocks they experience." It is also "about making a city better, in both good times and bad, for the benefit of all its citizens, particularly the poor and vulnerable" (Rockefeller Foundation 2019).

As development institutions have begun to redefine their missions, resilience thinking now also increasingly extends into academia. Social scientists, often working closely with development institutions, have put resilience onto their research agendas and explore ways and means to strengthen structures and resources in local communities. Environmental scientists, long at the forefront of resilience thinking, too, advance their models and point to the insights that the study of ecosystem-resilience may offer in building a sustainable world. Think tanks, universities, and research centers now increasingly make resilience the focus of their

work, operating on the premise that building resilience is the key to master the challenges of cities in a world of rapid urbanization.[1]

Offering a new framework for thinking about development, the promise of resilience has led to an important reappraisal of the environmental threats faced by global cities and now increasingly shapes new research on disaster risk reduction and urban emergency response systems. What is often lacking in current research, however, is a decidedly historical perspective on the very concept and idea of resilience itself – where notions and practices of resilience came from, in what contexts they arose, and what meanings they carried over time. Current scholarship takes much interest in theorizing resilience and working out practical solutions, but it has paid little attention to the specific historical circumstances that have made resilience part of the social and political imaginary of societies from past to present. Two exceptions are the edited volume by Laurence Vale and Thomas Campanella (2005) and Peter Rogers *Resilience and the City* (2012).

Against this backdrop, this essay has three goals: to historicize the origins and intellectual underpinnings of urban resilience thinking, to situate them in the context of international urban development policies between the 1960s and 1980s, and to invite critical reflection about the idea of resilience by drawing attention to the dead ends and technopolitical blinders that have been part of its history for some sixty years now. Resilience, I argue, may be a new buzzword in global development policy these days, but it is not a new way of thinking, and should rather be seen as the newest variation of an influential episteme that emerged between the 1960s and 1980s. In those years, as I will show, international development institutions increasingly began to turn their attention to the environmental dangers facing cities around the globe, and, in response, developed models and solutions for urban disaster mitigation whose impacts still linger on in resilience discourses today.

Existing genealogies of resilience thinking often attribute its origins to two landmark works. The first is Crawford Holling's 1973 essay on "Resilience and Stability of Ecological Systems", which for the first time introduced the idea of resilience as an analytical concept, defining it as "the persistence of relationships within a system" and the "ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist" (Holling 1973: 17). The other landmark work, many genealogies claim, was Aaron Wildavsky's "Searching for Safety," which extended the concept of resilience into the realm of public policymaking and administration (Wildavsky 1988). In contrast, this essay will show

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1   Historians, too, have opened up to the concept and now address interconnections between social transformations and resilience, going back as far as the 13th to 16th centuries. See the research group "Resilienz – Gesellschaftliche Umbruchphasen im Dialog zwischen Mediävistik und Soziologie," based at the University of Trier: https://www.uni-trier.de/index.php?id=60045 [accessed July 10, 2018].

that resilience *thinking* has much broader origins that include 1970s ecologists and 1980s sociologists as much as seismologists, geographers, disaster experts, and international development institutions of the 1960s and 1970s. To understand the rise and the logics of urban resilience policies in the 21st century, this essay claims, urban studies scholars and practitioners therefore also have to draw connections to the trajectories of global development policies, a field of inquiry global urban historians have only recently opened up to (see for background on the history of development: Macekura/Manela 2018; Unger 2018; Frey/Kunkel/Unger 2014).

This chapter traces the development origins of resilience thinking through an intellectual history of ideas that focuses mainly on international organizations and experts. My interest, above all, is to understand the shifting paradigms in the thinking of those actors. Accordingly, part one lays out a short outline of the 1960s historical context in which new approaches to urban disaster mitigation were formulated. Section two then explains why researchers and international organizations shifted attention to new approaches in the 1970s. Section three explores the new 1990s talk about 'resilience' and shows how it turned into a powerful label for practices that had already been formulated in the decades before. Section four concludes with a few broader observations on what a historical perspective can contribute to the study of resilience.

Origins: International Organizations and Urban Disaster Prevention in the 1960s

Cities in Africa, Latin America, and Asia that are located along the seismological fault lines of the world have shared a history of urban natural disasters for a long time. From the earthquake of Santiago de Chile in 1906 through the 1960 earthquake of Agadir to the 1985 earthquake in Mexico City, the experience of natural calamities has been a hallmark of urban life in many regions across the 'global South.' Initial efforts to develop mechanisms of urban disaster prevention and mitigation evolved only slowly beginning in the 1920s and 1930s, however, and became a more pronounced concern of states and international institutions only after World War II (see Hannig 2019 for the general history of natural disasters, though with a focus on Europe). Beginning with the 1949 Ambato earthquake in Ecuador, the United Nations began to assist regularly and systematically in the reconstruction of areas that had been struck by natural disasters, including aid to cities in El Salvador (1951), Pakistan (1953), Lebanon (1956), Iran (1957), Chile (1960), Indonesia, and Libya (1963) (see Wolffhardt 2019 on the general evolution of the UN's urban development policies). By the 1960s, as an interim report of the UN Secretariat noted, "emergency assistance of this kind [had] become a continuing activity of the Secretariat (Housing, Building and Planning Branch), and one which, owing to

the increased number of catastrophes, demands more attention and a more systematic approach" (United Nations 1964: 246). U.S. involvement in foreign disaster assistance for cities, too, grew in line with UN efforts. Especially in regions that were of geopolitical concern for the United States, U.S. assistance frequently surpassed the contributions of other countries. Following two major earthquakes in Agadir/Morocco and Chile in early 1960, the Eisenhower administration immediately authorized a $ 20 million grant to assist in the rebuilding of Chilean cities and sent its chairman of the National U.S. Capital Planning Commission, Harlan Bartholomew, to Agadir to assist in rebuilding that city. One year later, the Kennedy administration followed up with another $ 100 million grant for Chile, making the reconstruction of the Chilean port city Valdivia one of the showcase projects of the newly proclaimed *Alliance for Progress*. Under the program, the United States funded a significant degree of Valdivia's reconstruction efforts, which included the building of new residential districts, new regional roads, a levee for the harbor, and a number of modern buildings around Valdivia's main market. American aid underlined in concrete terms the United States' commitment to aid cities affected by disasters (New York Times 1963: 38).

In the immediate wake of the 1960 earthquakes of Agadir and Valdivia, the issue was not only rebuilding, however. The high number of earthquake victims in those cities and the sheer scale of urban destruction also raised more imminent questions: why had buildings collapsed so easily in those cities in the first place? Were other cities outside of Chile and Morocco facing similar dangers? What could cities do to protect themselves against earthquakes and how could they mitigate and diminish their impacts? Answers were not easy to find, but as the bulldozers set to work clearing out the rubble in the streets of Agadir and Valdivia, many development institutions began to refocus their attention from short-term questions of post-disaster relief to the more long-term issues of urban approaches to disaster prevention. Giving those concerns a global voice, the UN's Economic and Social Council during its thirtieth meeting in May 1960 drew attention to "the urgent need of further promoting international co-operation in order to provide the population of the world with sufficient safeguards" against natural disasters. It also charged the UN's General Secretary with conducting a "detailed and comprehensive study of the ways and means of reducing to a minimum the damage resulting from earthquakes and seismic sea waves" (United Nations 1960: 24).

In the following years, the UN General Secretariat and UNESCO greatly expanded their program in disaster prevention and began to reach out to countries that were seen to be facing elevated earthquake and tsunami risks. Survey missions sent abroad in 1961 visited dozens of countries in Southeast Asia, the Middle East, and South America, and investigated local conditions pertaining to seismological research and disaster prevention. At the same time, those missions also had the purpose of bringing "home to the governments and to the public in general

that something can be done to protect people and buildings against earthquakes" (UNESCO 1961: 3). Much to their concern, however, the survey missions noted fundamental gaps and obstacles in local disaster prevention. In most countries, experts noted, there was a depressing shortage of seismological stations, and few cities had actual building codes. There was also a perceived political problem in that "civil authorities governing some extremely seismic regions seemed virtually unaware of the existence of earthquake danger in their territory" (U.S. Department of State 1961/United Nations 1962). When, in 1962, UN General Secretary U Thant presented his report on "Seismology and Earthquake Engineering" to the UN's Economic and Social Council, an important segment of the report dealt with the practice of "seismic zoning" and "seismo-tectonic" mapping. Such maps, U Thant stressed, would be a crucial tool to get a complete picture of the earthquake risks faced by regions throughout the world. At the same time, they were "essential in planning the protection of populations against the effects of earthquakes" since they would indicate "in which areas protective measures should be applied." Earthquakes, the report claimed, drew their destructiveness mainly from expanding cities and poor building structures that could all too easy "be shattered or shaken down" by seismic activity. Earthquake protection, in turn, would therefore also have to include "designing and constructing buildings and public works able to withstand the forces imposed on them by impulsive or oscillatory movements of the soil or the rock on which they stand." The report further recommended that: "codes and regulations for the earthquake-resistant design of engineering structures" as well as "strict inspection and supervision" of existing building regulations (United Nations 1962: 2-4, 33).

Calling for a new focus on seismic risk mapping and new efforts in earthquake engineering, the General-Secretary's report pushed disaster mitigation onto the agenda of UN institutions (for an illuminating account of the idea and practice of seismic mapping at the time see Williford 2017). Within a few months, UNESCO cleared the way for a new International Institute of Seismology and Earthquake Engineering, to be set up in Tokyo. It soon began to train engineers and experts from developing countries. Back in Paris, UNESCO also started to organize field studies of earthquakes; to set up a number of working groups covering issues such as seismic mapping and the principles of earthquake-resistant design; and it convened an intergovernmental meeting to coordinate a concerted effort to study earthquakes and identify better ways to protect cities and rural areas against them. Taking place in 1964, the meeting agreed on far-reaching measures. It stressed the "importance of proper detailed town and country planning in seismic areas," recommended closer cooperation between architects and structural engineers, and called for new research into the "use of local building materials and on anti-seismic measures in housing construction." More important, it also spoke out in favor of more forceful measures, above all the investigation of all "existing houses and other buildings in

towns and cities in each seismic country" in order to "evaluate their earthquake resistant capacity." In case of a lack of such capacity, the meeting envisioned that "proper measures be taken to improve the situation" (Fournier d'Albe 1965: 79-83).

The importance that both the UN General-Secretary and UNESCO ascribed to seismological research and new directions in earthquake engineering had a significant consequence: it meant that the expertise of seismologists and earthquake engineers would play a leading role in urban disaster aid from now on. In other words, these experts became the leading voices of an international "earthquake establishment" (Stallings 1995, 35-37). For seismologists and earthquake engineers, this did not come by accident. Like other "action intellectuals" in the 1960s (White 1967), those scientists had confidence in the practical importance of their research, believing that natural disasters were techno-scientific problems that could be addressed through technical solutions (Rinne 1965). As Charles Francis Richter – the inventor of the Richter scale – put it, "earthquake losses" were "largely unnecessary and preventable" and it was easy to explain why. He argued that: "In the whole of past history, something like 90 percent of the loss of life in earthquakes, and a major fraction of the destruction and economic loss, has been due to the failure of weak structures, such as would never be erected under any modern system of building regulation and inspection" (Richter 1972: 50). Global cities, thinkers like Richter claimed, could not prevent disasters from happening, but it was possible to minimize their negative impacts through adopting the right kind of engineering knowledge.

The risk maps and engineering solutions seismologists generated helped to make disaster prevention a central feature of urban development policies but, for the time being, they also placed technocratic top-down solutions at the center of global disaster policies. The emphasis on such solutions was most evident in Turkey where the government introduced a policy of forced resettlements. Under the program, populations living in earthquake- and landslide-prone areas were resettled in small towns where the government constructed some 10.000 earthquake resistant houses (U.S. AID 1971). Authoritarian approaches like these, however, were an exception not the rule. For most countries living under earthquake risks, the standard way was to step up funding for seismic risk mapping and engineering research. In Chile, American earthquake engineers trained future engineers through collaborative teaching projects and assisted in working out a new building code for the entire nation (Arias/Husid/Monge 1969). In Peru, the government, on the urging of seismologists, joined forces with UNESCO and set up a Regional Center for Seismology in 1966 to study earthquake patterns and match those with urban planning strategies. The same year, UNESCO also set up an "International Fund for the Development of Seismology and Earthquake Engineering" and began to finance a network of seismological stations in Southeast Asia, while the United Nations

Development Program also began to fund a number of seismic mapping studies in the Balkans.

By the late 1960s even NATO entered the fray, conducting a series of pilot projects on urban earthquake security in Turkey and Italy and holding a global conference in 1971. Organized by NATO's Committee on the Challenges of Modern Society, the conference brought together seismologists, engineers, urban planners, and public officials from countries around the world to discuss findings and "formulate practical recommendations for reducing earthquake hazards and for mitigating the effects of major earthquakes" (NATO 1972). As Assistant Secretary General for Scientific Affairs of NATO Gunnar Randers told the conference, earthquakes were as old as mankind, but "the development of modern technology and big city communities affect the problem in two ways: first, the greater congregation of people and property, and the complex network of all amenities needed for life in big cities, make a modern society more vulnerable than before. Second, the possibilities of science and technology for preventive undertakings and for planning mitigation and relief in case of disaster, are infinitely greater today than they were before." There were "modern methods and possibilities," Randers emphasized, that had not "been systematically exploited," and would now have to be made available for those living under the earthquake threat (Randers 1972: 48-49).

Towards 'Systems Thinking': International Aid Strategies in the 1970s and 1980s

Roughly ten years after the 1960 earthquakes in Morocco and Chile, the results of those technoscientific strategies were mixed, however. Surveys done in the 1970s uncovered that a great number of cities and countries throughout Latin America still lacked building codes, while local authorities in other regions showed great restraint in enforcing existing ones. Another problem was land use planning in cities where commercial property interests often trumped environmental concerns. According to the findings of NATO's experts, "uncontrolled construction" was also a burden on cities since it was often "instituted on sites, which, because of their geological hazards, are unduly high risks." Finally, the costs involved in making "already existing structures in densely populated regions" earthquake-resistant were often prohibitive (NATO 1972: 9). Cities usually shied away from these investments, in part because there were so many complicated legal issues.

Such problems pointed to one important weakness of technoscientific approaches: they seldom took into account the social dynamics of rapid urbanization, a process that was most dramatically visible in the emerging Megacities of the global South. In those cities, building codes and zoning practices based on seismic risk maps were useful in theory, but hardly worked in practice. By the 1970s, in-

ternational institutions and researchers therefore increasingly began to look for alternative ways of dealing with disasters. Often, they refocused their attention on a new paradigm – disaster mitigation and preparedness. Cities and communities, those institutions argued, could hardly prevent natural disasters from happening. On the other hand, what they could do was to mitigate the damage and the destruction through better planning, training, and organizing in advance. If properly prepared, communities and international institutions would thus be able to minimize the losses accruing from disasters.

In the early 1970s, a series of international studies revealed a rather problematic state of disaster preparedness in many countries. Disaster preparedness schemes, a global analysis done by the United Nations Disaster Relief Office and the League of Red Cross Societies showed, existed only in a few countries, and hardly matched the scale of hazards many regions were facing. Making matters worse, disasters such as the 1970 Bay of Bengal cyclone or the 1972 Peruvian earthquake also exposed the limits of international relief operations themselves, laying bare the lack of coordination between humanitarian organizations on the ground and providing much publicized examples of aid gone wrong. X-Ray machines dispatched to the far-away countryside without a trained staff and container loads carrying pharmaceutical drugs marked 'discard after 1934' raised not only ethical questions, but also exposed problems how humanitarian organizations and governments appropriated their aid funds (D'Souza 1984: 496-497).

In response, researchers in the UK and the U.S. now began to focus more and more on evaluating relief operations themselves, gathering data, calculating estimates of projected relief needs, and developing models of how to structure relief measures. As Frances D'Souza, founding director of the International Disaster Institute, put it, those disaster studies addressed "how the right kind of relief can be distributed to the right people at the right time" in order to make relief operations more effective (ibid.). Meanwhile, aid donors such as the U.S. Agency for International Development also began to offer training seminars on disaster preparedness for public officials from Asia and Latin America (U.S. AID 1971). Those seminars often focused on the right techniques for planning, organizing, and formulating national emergency plans. They also addressed more practical questions as to how countries and regions could improve their warning systems, what could be done to raise community awareness for disaster threats, and what kinds of stockpiles regions would need, where those could be stored, and how useful pre-fabricated emergency shelters might be (U.S. AID 1979).

The new emphasis on disaster preparedness owed much to the new insights of social scientists, particularly those of U.S. geographer Gilbert F. White (see on White Hinshaw 2006; Lübken 2012; on the broader context of disaster research in the social sciences see Stehrenberger 2014). One of the most influential voices within the academic community in the 1970s, White had launched his career with

a study on settlement patterns in the floodplains of the Mississippi in the 1950s, and had then turned into one of the leading figures in the emerging field of disaster studies. By the late 1960s, his works and his reputation earned him a seat on the International Geographical Union's "Commission on Man and Environment," a position he used to orchestrate a comprehensive research program on the ways communities around the world coped with natural hazards. Involving studies in a dozen countries from Costa Rica to Kenya and Bangladesh, the program paid particular attention to social patterns of prevention and hazard awareness. Accordingly, researchers were equipped with the same basic questionnaire and then set out to map settlement patterns in hazard regions, but also determined "the range of possible adjustments by social groups" to hazards (White 1974: 4). Moreover, studies also inquired into individual hazard perceptions and examined the adjustments people made to reduce potential hazard damages.

The problem, however, was that governments paid little attention to the workings of those social systems. Even worse, their heavy focus on technological fixes often exacerbated the vulnerabilities of local communities since technologies of protection like dams, levees, and earthquake-resistant building narrowed the range of choices and actually encouraged settlement in hazard-prone areas – in consequence leading to higher death rates if those technologies failed. Paradoxically, White warned that the "present public policy emphasis in many regions upon technical and narrow adjustments" entailed the danger that societies would "become still less resilient and still more susceptible to catastrophes" (White 1978: 230).

Significantly, White's studies for the first time explicitly used the language of resilience. More important, they also introduced an alternative approach to disaster mitigation: systems thinking. If technological solutions alone would not do, and if, on the other hand, social coping mechanisms and the right kind of knowledge about them carried the promise of more effective mitigation strategies, the answer was obviously to connect those with one another. In White's view, a "crucial aspect of any long-term accommodation to the human environment" had to be "the skillful, sensitive use of a wide range of adjustments" (White 1974: 13). Those

would have to include "engineering devices, land management, and social regulation" (ibid), but also 'modern' warning systems, better communication structures, disaster preparedness plans, disaster insurance, and a stop on development projects that furthered the vulnerabilities of communities. In the end, White claimed, it was the interrelatedness and mixture of those tools that would make populations more resilient (see also Burton/Kates/White 1978).

Charging that White's research findings had only limited value, critics at first remained skeptical (see Waddell, 1977). But, over time, development institutions more and more caught on to White's ideas. A 1982 study by U.S. AID on "Natural Disasters and the Development Process" (U.S. AID 1982) quoted widely from White's works, arguing that development institutions had to strengthen the abilities of societies to cope with disasters through "analyses of hazard risk, public awareness campaigns, development of emergency plans and warning systems, and contingency planning for post-disaster rehabilitation and reconstruction" (ibid: 3). Putting such ideas into practice, U.S. AID also joined forces with international institutions, including the Pan American Health Organization and the League of Red Cross Societies, to set up a Caribbean Disaster Preparedness Team. Pooling resources and experts, the team trained officials throughout the Caribbean in preparedness planning, working out new ideas for warning systems, and initiating public awareness campaigns. In Haiti, meanwhile, U.S. AID funded a major disaster simulation exercise in 1983, while in Jamaica U.S. AID experts worked out a comprehensive Natural Hazards Management Plan (US AID 1985).

Enter Resilience: The 1990s and After

The introduction of the United Nations' "International Decade of Natural Disaster Reduction" in 1990 pushed those approaches another step forward (see Schemper 2019 on origins of the UN's Decade). The international "Yokohama Strategy for a Safe World," adopted in 1994 at the World Conference on the Reduction of Natural Disasters, noted that: "a global culture of prevention" had to be based on integrated approaches that combined technological measures such as risk maps or better construction with social strategies to reduce vulnerabilities. The strategy also explicitly called for local community participation, claiming that "involvement and active participation of the people in disaster reduction, prevention and preparedness" would lead to "improved risk management." Strengthening the "resilience and self-confidence of local communities," the United Nations acknowledged, would therefore also require "recognition and propagation of their traditional knowledge, practices and values as part of development activities" (United Nations 1994: 11-12).

Focusing international attention on the global drama of natural disasters, the UN Decade created new commitments towards strategies that took account of the

interdependencies between technical, social, economic, infrastructural, institutional, and political sub-systems. More importantly, it also introduced a more systematic focus on urban systems management. Leading the way with a new initiative in 1995, US AID and the Asian Disaster Preparedness Center launched the "Asian Urban Disaster Mitigation Program" to reduce the vulnerabilities of urban lifeline networks such as roads, critical infrastructures, hospitals, and shelters. Notably, the program put much emphasis on urban cross-sector cooperation and governance. Working with municipalities and local NGOs in eight Asian cities, development experts helped to set up local disaster management committees, organized city-wide disaster days involving schools and local communities, but also constructed model houses and conducted evacuation drills and trainings. The program, U.S. AID and the Asian Disaster Preparedness Center claimed, focused attention on "indigenous practices" and "community empowerment," opening a "new chapter in urban risk management" through a "multi-stakeholder, multi-sector, multi-disciplinary approach" (US AID 2005: 8).

The centrality of systems thinking drew much inspiration from the emerging strand of vulnerability studies that argued widely for the need of reducing social vulnerabilities and "changing the processes that put people at risk" (Blaikie/Cannon/Davies/Wisner 1994: 219; see also Oliver-Smith 1994; Pelling 1999). By the mid-1990s, however, researchers and policymakers also increasingly began to link the notion of systems management to another idea: the idea of resilience. In 1998, U.S. AID passed a new strategy titled "Making Cities Work," claiming that integrating disaster mitigation into urban governance processes would help to "enhance the resiliency, recovery, and self-reliance of cities" (U.S. AID 1998: 14). Similar ideas were also voiced at the United Nations where key documents now frequently claimed that disaster assistance was about enabling "societies to be resilient to natural hazards" (United Nations 2001). In 2004, UN General-Secretary Kofi Annan, too, argued that disaster assistance was about building "resilient communities and nations" on a "hazard-filled planet" (Annan 2004).

By the late 1990s, talk of resilience also increasingly permeated international policy papers on sustainable development, not least since ecologist C.S. Holling and a "Resilience Alliance" openly campaigned for it (World Commission on Environment and Development 1987; Folke 2002). The new rhetoric of resilience was thus not exclusive to the field of international disaster aid. But, contrary to common wisdom, it was not the exclusive brainchild of Holling either. Writing in 1996, researchers John Handmers and Stephen Dovers identified resilience as an "important concept in both ecology and risk research" that shared "the attention paid to systems approaches to the problems." Much like ecologists, Handmers and Dovers claimed, disaster researchers had developed their own tradition of thinking resilience since the 1970s, and there was much to learn from them about the patterns of interactions between social and natural systems or about the "creation of

decision-making and management approaches that possess an ability to operate in the face of ...uncertainty" (Handmers/Dovers 1996: 482-483, 485, 487, 490-491). Within the disaster study community, resilience was now widely recognized as a critical concept that informed debates about disasters and how to promote coping strategies that would strengthening a society's ability to recover from disaster losses through new forms of adaptability and institutional arrangements (ibid.)

In the following years, resilience became a powerful theme in international development policies. Building on the established intellectual trajectories of systems thinking, researchers began to work out systematic principles of how to create resilient cities, arguing that such principles would have to connect technical measures of hazard mitigation with "vulnerability reduction," assistance to poor and threatened neighborhoods or the building of "networked communications" (Godschalk 2003: 140). Meanwhile, the United Nations, too, made the strengthening of urban resilience a top priority with its "Hyogo Framework for Action," passed on the heels of the 2005 Kobe World Conference on Disaster Reduction (United Nations 2005). This framework titled "Building the Resilience of Nations and Communities to Disasters" had a notable impact. In 2007, the UN Human Settlements Programme passed its new "Strategic Policy on Human Settlements in Crisis" program, putting new emphasis on urban disaster mitigation and local capacity-building in flood- and earthquake-prone areas (UN-HABITAT 2007). Three years later, under the wings of the UN Office for Disaster Risk Reduction, the United Nations also launched a "Making Cities Resilient" Campaign to promote local awareness for urban environmental hazards and organizing local network-building and trainings.

Around the same time, the World Bank, too, refocused its attention towards urban resilience, linking its urban development policies more and more to issues like climate change and urban risk governance. Drawing from the work of the African Urban Risk Analysis Network (Satterthwaite 2006), the World Bank in 2009 funded a "Mayor's Task Force on Climate Change, Disaster Risk, and the Urban Poor" that brought together the mayors of Dar es Salaam, Jakarta, Mexico City, and São Paulo. Assisted by a research team at the World Bank, the mayors headed case studies on specific cities, reviewed best practice models of coping with disaster risks, and eventually came up with recommendations for urban resilience strategies over the next couple of years. Climate change and global urbanization, the mayors claimed, increasingly put the "urban poor [...] on the front line," making it imperative for cities to "build resilience by mainstreaming risk reduction into urban management" (World Bank 2012: 2). Twenty years after the launch of the international decade of natural disaster reduction, the promise of more resilient cities thus had come full circle, putting the world's cities at the center of global development policies.

Conclusion

The historical perspective offered in this essay raises a number of important questions and implications for the ways we think of and conceptualize resilience today. First, it reminds us that not all that is being sold as a new promise in development policy these days is in fact new. Current understandings of resilience, this essay has shown, build on patterns of thinking that emerged decades ago, and widely carry along the assumptions, norms, and premises that shaped historical understandings of resilience. These assumptions have changed and broadened into more systemic views of resilience, to be sure, but they have also created historical path dependencies that favor a limited set of interventions into urban systems. Today, major policy documents and initiatives – from the UN through the World Bank to the Rockefeller Foundation – still largely dwell on solutions worked out between the 1960s and 1990s, including the call for better disaster preparedness, better risk assessments, better building regulation and land-use planning, more investments in critical infrastructures, and strategies of local social empowerment that strengthen the development of local disaster response systems. Meanwhile, the fact that development institutions still largely dwell on the same basic solutions in their resilience strategies underscored not only a certain lack of ideas within the global development community, it also points to the limits and failures of those approaches. This, in turn, raises important questions: if measures like land-use planning and building regulation have not worked in the past, why should they work in the present or the future? Could more of the same really make the difference? Are there no new or alternative ways of thinking about resilience that move beyond conventional notions and historical path dependencies? Many essays in this volume point to such alternative ways of building resilient cities, providing a line of inquiry that generates new ideas for development practitioners.

A historical perspective also opens a critical perspective on resilience: as the historical record shows, promoting urban resilience worked out well in some cases. Chile, for example, began to implement new building codes after the 1960 earthquake, a move that largely paid off when Chile was hit again by earthquakes in the following decades. On the other hand, however, there is also a more shadowy history of resilience: one that includes forced resettlements and removals of populations in 1960s Turkey. Or that also saw the fostering of new urban inequalities in post-earthquake Agadir where zoning was based on seismic risk maps, meaning that middle- and upper-class residential areas were relocated to safer areas than low-income housing quarters. Seen this way, one can also think of resilience as a strategy to mask global and national inequalities: historically, international approaches to resilience have always favored instrumental solutions – be they top-down or bottom-up – but they have hardly addressed the structural socio-economic framework conditions that put the global poor in hazardous areas in the first

place. Thinking about resilience in historical terms, in other words, also forces us to rethink the relationships between resilience thinking and global inequalities: do practices and strategies of resilience address North-South inequalities? Are they effective in reducing them? Or are they merely a type of tranquilizer given every time a major disaster exposes those inequalities? As much as historical perspectives provide us with insights about the ways in which institutions seek to strengthen urban systems, then, they also prompt us not to lose sight of the very conditions that have constituted the cleavages and disparities within those systems.

Above all, however, a historical perspective on resilience warns against the belief that resilience strategies can offer easy solutions. Creating resilient cities, the historical record shows, was a challenging affair, involving reluctant city administrations, builders and estate agents who are keener about profit than protection (Solnit 2010). Often there are also social complexities on the ground that are difficult to master. One of the most important insights history may provide is therefore that practices of resilience only work if they link up with local communities and encourage their engagement through bottom-up processes. How to organize such processes, this essay has shown, has long been in dispute, and will likely remain so. But, in the end, the building of resilient cities will only succeed if city administrations and local communities realize that it is a shared responsibility in which both have their role to play.

References

Annan, Kofi (2004): "Foreword." In: United Nations (Ed.), Living with Risk: A Global Review of Disaster Reduction Initiatives, New York and Geneva, p. VII.

Arias, A./Husid R./Monge, J. (1969): "Comments on the New Chilean Seismic Code for Buildings." In: Proceedings of the Fourth World Conference on Earthquake Engineering, Santiago de Chile, 1969, Vol. III, pp. 41-52.

Blaikie, Piers/Cannon, Terry/Davis, Ian/Wisner, Ben (1994): At Risk: Natural Hazards, People's Vulnerability and Disasters, London: Routledge.

Burton, Ian/Kates, Robert/White, Gilbert (1978): The Environment as Hazard, New York: Oxford University Press.

Deutsches Institut für Entwicklungshilfe (2017): "Drought Adaptation and Resilience in Developing Countries," Briefing Paper 23/2017 (https://www.die-gdi.de/analysen-und-stellungnahmen/article/duerreanpassung-und-resilienz-in-entwicklungslaendern)

D'Souza, Frances (1984): "Disaster research – Ten years on." In: Ekistics 51/309, pp. 496-499.

Folke, Carl/Carpenter, Steven/Elmqvist, Thomas/Gunderson, Lance/Holling, C.S. et. al. (2002): "Resilience and Sustainable Development: Building Adaptive Ca-

pacity in a World of Transformations". In: Ambio. A Journal of the Human Environment, 31/5, pp. 437-440.

Fournier D'Albe, E. M. (1965): "Summary of UNESCO Activities in the Field of Earthquake Engineering." In: New Zealand National Committee on Earthquake Engineering (ed.), Proceedings of the Third World Conference on Earthquake Engineering Vol. III, Wellington, pp. IV/75-IV/85.

Frey, Marc/Kunkel, Sönke/Unger, Corinna (2014): International Organizations and Development, 1945-1990, Basingstoke: Palgrave.

Godschalk, David (2003): "Urban Hazard Mitigation: Creating Resilient Cities." In: Natural Hazards Review 4/3, pp. 136 – 143.

Handmer, John/Dovers, Stephen (1996): "A Typology of Resilience: Rethinking Institutions for Sustainable Development." In: Organization & Environment 9/4, pp. 482-511.

Hannig, Nicolai (2019): Kalkulierte Gefahren. Naturkatastrophen und Vorsorge seit 1800, Göttingen: Wallstein.

Hinshaw, Robert (2006): Living with Nature's Extremes: The Life of Gilbert Fowler White, Boulder, CO: Johnson Books.

Holling, Crawford (1973): "Resilience and Stability of Ecological Systems." In: Annual Review of Ecology and Systematics, 3/4, pp. 1-23.

Lübken, Uwe (2012): Die Natur der Gefahr: Überschwemmungen am Ohio River im 19. und 20. Jahrhundert, Göttingen: Vandenhoeck & Ruprecht.

Macekura, Stephen/Manela, Erez (2018): The Development Century: A Global History, Cambridge: Cambridge University Press, 2018.

Mitchell, James (1999): Crucibles of Hazard: Megacities and Disasters in Transition, Tokyo: United Nations University Press.

NATO (1972): "Report of the Working Group on Earthquake Disaster Prevention and Hazard Reduction." In: NATO Committee on the Challenges of Modern Society (ed.), Disaster Assistance. Earthquake Hazard Reduction, Vol. 1, 1972, Library of Congress, pp. 8-12.

New York Times (1963): "Chile Quake City is aiding Skopje." In: New York Times, August 11, 1963.

Oliver-Smith, Anthony (1994): "Peru's Five Hundred Year Earthquake: Vulnerability in Historical Context." In: Ann Varley (ed.), Disasters, Development and Environment, Chichester: John Wiley and Sons, pp. 34-40.

Pelling, Marc (1999): The Vulnerability of Cities: Natural Disasters and Social Resilience, London: Taylor and Francis.

Randers, Gunnar (1972): "Speech by the Assistant Secretary General for Scientific Affairs of NATO, Gunnar Randers." In: NATO Committee on the Challenges of Modern Society (ed.), Disaster Assistance. Earthquake Hazard Reduction, Vol. 1, 1972, Library of Congress, pp. 46-49.

Richter, Charles F. (1972): "Earthquake Disasters – An International Problem." In: NATO Committee on the Challenges of Modern Society (ed.), Disaster Assistance. Earthquake Hazard Reduction, Vol. 1, 1972, Library of Congress, pp. 50-52.

Rinne, John E. (1965): "The Earthquake Challenge to the Structural Engineer, Special Lecture." In: Proceedings of the Third World Conference on Earthquake Engineering, New Zealand, 1965, Vol. I, pp. 148-154.

Rockefeller Foundation (2019), "Frequently Asked Questions (FAQ) About 100 Resilient Cities" (http://www.100resilientcities.org/100rc-faq/)

Rogers, Peter (2012): Resilience and the City: Change, (Dis)order, and Disaster, Farnham: Ashgate.

Satterthwaite, David (2006): "The African Urban Risk Analysis Network." In: Humanitarian Practice Network 35, Nov. 2006, pp. 2-4.

Schemper, Lukas (2019): "Science Diplomacy and the Making of the United Nations International Decade for Natural Disaster Reduction." In: Diplomatica 1/2, pp. 243-267.

Solnit, Rebecca (2010): A Paradise Built in Hell: The Extraordinary Communities that Arise in Disaster, New York: Penguin.

Stallings, Robert (1995): Promoting Risk: Constructing the Earthquake Threat, New York: Aldine de Gruyter.

Stehrenberger, Cécile (2014): „Systeme und Organisationen unter Stress. Zur Geschichte der sozialwissenschaftlichen Katastrophenforschung (1949 – 1979)." In: Zeithistorische Forschungen/Studies in Contemporary History 11/3, pp. 406-424.

Unger, Corinna (2018): International Development: A Postwar History, London: Bloomsbury.

UN-HABITAT (2007): Summary Report 2007-2009. Implementation of UN-HABITAT Strategic Policy on Human Settlements in Crisis (SPHSC) , Geneva.

United Nations (1960): UN ECOSOC resolution 767 (XXX), International Co-operation in the Field of Seismological Research, July 8, 1960, In: Idem (Ed.): Resolutions Adopted by the Economic and Social Council During its 30th session, Vol. I, July 5-August 5 1960. - E/3422. – 1960, p. 24.

UNESCO (1961): UNESCO, Natural Sciences Department, UNESCO Seismological Survey Missions, Aims and Objectives, April 24, 1961, RG 59, Central Files, 1964-1966, Entry 3008d, Box 35, NA II.

United Nations (1962): Report of the Secretary-General of the United Nations on Seismology and Earthquake Engineering, Economic and Social Council, Thirty-Fourth Session, July 1962.

United Nations (1964): "Rehabilitation and Reconstruction Following Natural Disasters. Interim Report of the United Nations Secretariat." In: Ekistics 17/101, pp. 246-247.

United Nations (1994): Yokohama Strategy and Plan of Action for a Safer World. Guidelines for Natural Disaster Prevention, Preparedness and Mitigation, Geneva.

United Nations (2001): Natural Disasters and Sustainable Development - Understanding the Links Between Development, Environment, and Natural Disasters. Background document for the World Summit on Sustainable Development in Johannesburg, September 2002

United Nations (2005), Hyogo Framework for Action, 2005-2015: Building the Resilience of Nations and Communities to Disasters, Geneva.

United Nations (2009): "Secretary-General, at Incheon Conference, Urges Local Authorities to Accelerate Efforts to Make Cities 'Disaster Resilient'." August 11, 2009 (https://www.un.org/press/en/2009/sgsm12410.doc.htm).

U.S. AID (1971): Disaster Preparedness Information Memo, April 8, 1971, RG 286, Entry P 398, Box 7, NA II.

U.S. AID (1979): South Asia Disaster Preparedness Seminar. Proceedings, Issues and Recommendations, New Delhi, India, January 23 – February 1, 1979.

U.S. AID (1982): Natural Disasters and the Development Process. A Discussion of Issues, July 1982.

U.S. AID (1985): Natural Hazards Management in Montego Bay. Important Considerations in the Development of a Local Hazards Management Programme.

U.S. AID (1998): Making Cities Work. U.S. AID's Urban Strategy. An Initiative Launched by the Administrator and Prepared by the Urbanization Task Force, September 1998.

U.S. AID/Asian Disaster Preparedness Center (2001): Workshop on Urban Risk Reduction in Asia.

U.S. AID/Asian Disaster Preparedness Center (2005): Asian Urban Disaster Mitigation Program. Program Completion Report. Lessons Learned in Program Implementation and Future Directions.

U.S. Department of State (1961): Preliminary Report of the UNESCO Seismological Survey Mission to South East Asia, 1961, RG 59, Central Files, 1964-1966, Entry 3008d, Box 35, NA II.

Vale, Lawrence/Campanella, Thomas (2005): The Resilient City: How Modern Cities Recover from Disaster, New York: Oxford University Press.

Waddell, Eric (1977): "The Hazards of Scientism: A Review Article." In: Human Ecology 5/1, pp. 69-76.

White, Gilbert F. (1978): "Natural Hazards and the Third World: A Reply." In: Human Ecology 6/2, pp. 229-231.

White, Gilbert F. (ed.) (1974): Natural Hazards: Local, National, Global, New York: Oxford University Press.

White, Theodore (1967): "The Action Intellectuals." In: Life 62/23-25.

Wildavsky, Aaron (1988): Searching for Safety, New Brunswick: Transaction Books.

Willford, Daniel (2017): "Seismic Politics: Risk and Reconstruction after the 1960 Earthquake in Agadir, Morocco." In: Technology and Culture 58, pp. 982-1016.

Wolffhardt, Tobias (2019): "Vom Wiederaufbau zur urbanen Entwicklungspolitik: Die Vereinten Nationen, transnationale Netzwerke und das Problem der Urbanisierung, ca. 1945–1966." In: Historische Zeitschrift, 309/2, pp. 337-376.

World Bank (2012): Climate Change, Disaster Risk, and the Urban Poor: Cities Building Resilience for a Changing World, Washington.

World Bank (2013), Building Resilience. Integrating Climate and Disaster Risk into Development, Washington.

World Commission on Environment and Development (1987): Our Common Future, Oxford: Oxford University Press.

Building Resilience through Commercial Relations
The Formalization of Carwash Sites in Medellín

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The term resilience has been adopted by different international organizations as a way to guide the future development of cities. The Rockefeller Foundation, for example, has become one of the major promoters of resilience as a concept. Through its 100 Resilient Cities (100RC) Program, the foundation has built a network of cities to exchange experiences, assessment tools and norms to deal with the challenges posed by urbanization, globalization and climate change (Leitner et al. 2018). Medellín, the second largest city in Colombia with a population of 2.5 million people, was one of the Latin American cities invited in 2013 to be part of the 100RC network. The city was selected as a model city of urban resilience for its urban innovation projects to address social inequalities and violence. These projects, largely driven by local elites, introduced conventional infrastructures such as an aerial cable-car lines and an electric escalator in order to improve accessibility and mobility in the most violent and marginalized areas. Additionally, the city invited renowned international and national architects to transform water storage facilities located in economically and spatially marginal areas into public parks. By transforming hydraulic infrastructures that have been historically managed and controlled by the water utility company into public spaces for the enjoyment of the most vulnerable population, these aesthetic and technical works have become main attractions for tourists as well as exemplary models for many cities around the world.

Although infrastructure projects were highlighted as good models of urban resilience, the 100 Resilient Cities Program also cited Medellín residents and their capacity to overcome periods of severe urban violence and high rates of homicides, and to respond and adapt to devastating natural disasters. Resilience in the face of natural disasters is particularly important in the city, where approximately 30.000 houses are located in areas characterized as 'high-risk zones' that are extremely vulnerable to floods and landslides (López 2016; Medellín Como Vamos 2018). According to the Mayor of Medellín (2012-2015) a 'resilient society' has been a key to the transformation of Medellín, from a city known for widespread violence into a global model for resilience and innovative urban planning and design. Simi-

larly, the Chief Resilience Officer for Medellín claimed that the city was selected to be part of the 100RC Network because of the capacity of its citizens to overcome common problems and learn from past tragedies to envision a positive future (Rockefeller Foundation/Alcaldía de Medellín 2016).

These acts of individual and collective heroism portray residents of Medellín as subjects who are able to creatively deal with adversity and cope with environmental threats. By locating social inequalities and violence in the past, though, resilience discourse has also served to obscure the existing political and economic circumstances that are responsible for high rates of criminality. In effect, such discourses have served to maintain the status of Medellín as the most unequal city in Colombia. According to a study conducted by the Antioquia University, Medellín is ranked as the most dangerous city in Colombia, with rates of homicide skyrocketing since 2016, despite substantial economic investments in security (Núñez González/Quintero Herrera 2019). The high levels of criminality and persistent social inequalities have raised critical questions about the impact of Medellín's innovation model and its 'resilient' infrastructures (Brand 2012; González Escobar 2016; Franz 2017; Anguelovski et al. 2018; Garcia-Ferrari et al. 2018).

Indeed, the kinds of questions about urban resilience in Medellín echo critiques of resilience more generally. Critics argue that resilience discourse and practice ignore power relations and injustices (Fainstein 2014; Allen et al. 2017), socio-spatial inequalities (Leitner et al. 2018), the political economy of urbanization (Béné et al. 2017) as well as the role of the state (Amin 2013). Meerow, Newell and others stress the importance of asking: resilience for whom, where and why (Watts 2015; Meerow/Newell 2016). To date, much of the discussion concerning resilience tends to represent local communities as key agents responsible for overcoming adversity by building innovative and resilient solutions (Solnit 2009; Kuecker/Hall 2011). The urban poor are often portrayed as resilient subjects who are able to adapt and survive in the absence of state intervention. In this discourse, the urban poor are celebrated for their capacity to withstand natural disasters, cope with economic risks, and endure long periods of violence. This perspective emphasizes the importance of self-organization, flexibility and individual responsibility as corner-stones of urban resilience.

The intention of this chapter is not to dismiss or ignore the existing critical literature on resilience, but rather to explore the diverse ways in which the term is being interpreted and applied beyond mainstream definitions provided by international organizations such as the Rockefeller Foundation. Therefore, this chapter focuses on how resilience is mobilized on the ground to facilitate a particular kind of intervention: the formalization of carwash sites. But, in what way does formalization create resilience? This chapter shows that the political and legal recognition of a precarious economic activity by means of formalization creates opportunities to help the most vulnerable to deal with an uncertain future. By providing a close

reading of the efforts of water utilities to mobilize resources, build new alliances, provide functioning infrastructures and mediate conflicts, this chapter attempts to better understand how informal carwashes can be consolidated as resilient spaces.

In 2010, Medellín's public utility company, *Empresas Públicas de Medellín* (EPM) launched a Carwash Program to reduce commercial losses and recover revenues. As informal carwashes are highly dependent on the water that flows through the already-existing centralized network, they became a primary target for EPM not only because they disturb the management and operation of the hydraulic system (for example, inadequate pressure, intermittent supply, pipe breakdowns), but also contribute to excessive water waste without paying for it. The utility company estimated that in 2018 there were 310 informal carwash sites, which register water losses of approximately 34.400 m³ per month.

While much attention has been given to how water is extended, distributed and contested in informal settlements (Graham/Dessai/McFarlane 2013; Meehan 2013; Ranganathan 2014; Anand 2017), little is known about how water is secured and negotiated in informal carwash sites. In particular, the ways that utility companies adjust and adapt their structures to engage with informal carwashes and their associated technologies, practices and dynamics remains relatively unexplored. This chapter contributes to addressing this gap by drawing attention to the manner in which utility companies attempt at formalizing carwash sites by incorporating them into the existing centralized water network. I argue that what makes carwash workers resilient is not just their day-to-day survival strategies, but their capacity to make political claims on the state, which is granted by their formal recognition as consumers.

Carwashes are commonly represented as sites that consume high amounts of water (Al-Odwani/Ahmed/Bou-hamad 2007; Zaneti/Etchepare/Rubio 2012), as places of labor exploitation (Clark and Colling 2016, 2017) or as sites of conflict over public space (Carcedo 2017). However, the way in which different spatial practices, modes of using and valuing water, alternative infrastructures and possibilities for collaboration emerge in these underprivileged sites has received less scholarly attention. The aim of this chapter is to show how carwashes offer a critical opportunity to explore how they "reclaim the urban space, develop their own specific form of urbanism and infuse the city with their own praxis, values, moralities and temporal dynamics" (De Boeck 2011: 267) as well as provide possibilities to generate alternative forms of water supply provision that are more equitable, safe and affordable. Given that commercial water consumption is mediated by different power relations, market structures, ethical concerns and socio-material practices in relation to domestic water consumption, scrutinizing carwashes may shed new light on urban water studies.

By drawing upon science and technology studies (STS) and debates on urban informality, this chapter examines how resilience is being facilitated through a col-

laborative process between human and non-human actors to support the formalization of carwash sites. From this perspective, I view the resilience of carwashes as a practice mediated by complex and dynamic assemblages of human actors including the staff of the utility company, municipal authorities and carwash workers; and non-human entities such as water, meters, bills and laws. By incorporating non-humans, not as background but as active entities (Winner 1980; Bennett2005; Braun/Whatmore 2010;Meehan 2013; Anand/Gupta/Appel 2018) into the study of resilience, this chapter draws attention to two key points. First, to the ways in which complex interactions between notions of water scarcity and socio-technical systems that combine physical, commercial and juridical interventions come together to facilitate the formalization of carwash sites. Second, to the political capacity of ordinary objects to challenge conventional distinctions between legal/illegal, formal/informal and authorized/unauthorized (Roy 2011; McFarlane 2012; Cheng 2014; Acuto et al. 2019; Banks et al. 2020).

This study draws on fieldwork conducted in 2014, 2017 and 2018. The data used in this chapter emerges from visits to 30 carwash sites located in different neighborhoods in Medellín. In-depth interviews were conducted with both workers and owners of carwash sites as well as staff of the utility company, police officers, municipal employees and members of local NGOs. This information was complemented with participation in events organized by the Car Wash Roundtable as well as official documentation produced by EPM, municipal meetings' minutes, and review of local newspaper articles.

(S)car-City?

Many international institutions and governments around the world tend to assume that techno-managerial solutions are necessary to prevent a potential water crisis. Recent work in Cape Town (Scheba/Millington 2018), for example, demonstrates that city authorities responded to actual water scarcity by proposing the implementation of technologies based on desalination projects and water-saving devices. As Scheba and Millington argue, however, these technocratic solutions, which include incremental water tariff increases, could aggravate existing economic inequalities and produce new forms of water scarcity. Other scholars have shown how the construction of large-scale hydraulic infrastructures (for example, dam projects) and the increase in water prices amidst periods of extreme water shortages have become a major source of political struggles (Kaika 2003; Giglioli/Swyngedouw 2008).

Another strategy commonly used to address water crises is the control and elimination of informal connections to the city's centralized water system. In mainstream discourses, there is the tendency to perceive informal water practices as something criminal, chaotic, wasteful and inefficient, and therefore, punitive acts

are justified to prevent a potential water crisis and to avoid the collapse of the water infrastructure. In their study of the water wars in Mumbai, Graham/Dessai/McFarlane (2013) examined how police officers strategically mobilize water scarcity debates for the purpose of persecuting inhabitants of informal settlements and penalizing illegal water connections. In Mumbai, as in other cities around the world, water scarcity has become a common discursive tool to penalize and marginalize informal settlements and their associated water practices.

In Medellín, the proliferation of informal connections has also become increasingly associated with future water shortages. In 2013, for example, a campaign was launched by EPM in local newspapers, radio and television not only to portray water scarcity as an imminent threat, but also to criminalize informal water practices. At the center of the campaign was an image of a dried-up reservoir that is losing around 18 million m³ of water every year as a consequence of illegal water connections. Ironically, the image of an empty reservoir stands in sharp contrast to the 300 million m³ of water that the city draws from three distant reservoirs to supply its estimated 1 million consumers with a 24 hours service through a centralized network (EPM 2019). In absolute terms, this total volume is easily enough to guarantee water supply services to all urban residents. However, the prospective of catastrophic water shortages has been socially manufactured by the utility company to criminalize informal connections. As a response to a perceived environmental catastrophe, EPM is granted the power under Colombian Criminal Code (Article 256) to send people that connect illegally to the formal water network to prison for up to six years.

Yet if portraying a catastrophic scenario has served to penalize informal connections, it has also enabled EPM to tolerate and legitimize certain informal water practices. Since 2010, for example, the utility company has used the prospect of a future water crisis to justify the implementation of a program to reduce water losses in informal carwash sites. Informal carwash sites obtain water by connecting informally to the city's network or by manipulating the valves that regulate pressure. However, attempts at controlling and eliminating informal connections in carwashes have become an increasingly difficult and time-consuming task. Efforts to intervene and repair these complex socio-technical configurations are constantly subverted as devices installed by EPM to reduce or obstruct the flows of water are easily altered or modified. In this case, the inability to fully control the flows of water creates an opportunity for the utility company to reform water supply provision by legitimizing carwash sites, while at the same time intervening in their informal logics and practices (see also Furlong/Carré/Guerrero 2017). This kind of flexibility is only possible because EPM is able to effectively claim that working with the informal carwash sector is the best way both to protect an allegedly scarce natural resource, and partially recapture revenue lost through informal connections.

Informal Carwash Sites, a Waste of Water

The growing number of vehicles in many cities around the world has created a continually increasing demand for carwash facilities, but many cities are unable to provide adequate urban infrastructure to fill the increased demand. The explosion of informal carwash activities in Medellín and other fast-growing cities is filling this high demand in the market. Carwash activities constitute an important part of the informal urban economy, which contributes to 44 per cent of Medellín's economy (DANE 2019). According to EPM, as many as 70 per cent of automobiles in the city are washed in unauthorized facilities. The proliferation of unauthorized carwashes has been facilitated not only by the abundance of water in the city, and the integrated water network (Graham/Marvin 2001), but also by the high standards of cleanliness and hygiene around the car culture. Here, the convergence between water, technology and cultural habits helps to explain the proliferation of carwash sites around the city, particularly in poor and disadvantaged neighborhoods. Additionally, because informal carwashes are able to obtain water free of charge, they can provide low-costs relative to their formalized competitors – something which has contributed to constant demand for their services.

In the last couple of years, informal car washing activities have become highly controversial not only because of the unsanctioned use of public space, noise pollution and discharge of dangerous substances, but also for the constant waste of potable water. The main local newspapers commonly argue that informal carwash sites expose large parts of the population to water insecurity because of their wasteful use of a scarce natural resource (El Colombiano 2016). Historically, the informal work of car washing has been socially stigmatized due to its association with poverty, drugs and aesthetic impropriety. In some cases, this informal activity has been criminalized, as is the case with the Colombian Criminal Code, article 256 mentioned above. Carwash workers, commonly referred to as *alistadores*, are usually young men who, for a variety of reasons, are marginalized in the formal market sector. For many of these young men, work in carwash sites is seen not only as an economic survival strategy, but also as a way to stay away from criminal activities. It is estimated that some 10.000 people in Medellín derive their income from the volatile economy of washing cars.

In recent months, this economy has become an alternative source of employment for refugees from Venezuela (Álvarez Correa 2019). As is true in other sectors of the informal economy across the world, though, the unsanctioned, unregulated nature of such activity makes them subject to constant conflicts with public authorities. The police commonly enforce legal actions to confiscate car washing equipment, to close down carwash facilities or to issue fines to car owners. Such measures are justified on the grounds that informal carwashes violate a number

of city ordinances, threaten public interests, and disturb the social order and the aesthetics of the city.

The utility company has also increasingly targeted informal water connections in an effort to reduce the levels of unaccounted-for-water, which amounts to 30.51 per cent of the water supplied (EPM 2019). For EPM, informal connections are hard to ignore as they are seen as a major threat not only to the water availability per se, but also to the company's revenues. Despite techno-managerial efforts to secure the efficient functioning of the hydraulic system, though, the company is constantly being challenged by the 'unruly' nature of water. Water is a fluid and mobile resource that is difficult to control and regulate. As water is distributed in the city through kilometers of pipes, it leaks and disappears (Anand 2015). Water also means different things to different actors. While for carwash workers water is part of a larger economic survival strategy and a way to secure a viable place in the city, for EPM it is a scarce commodity in need of protection, and consumers have the moral responsibility to pay for it.

Because informal connections are difficult to regulate, discourses of water scarcity provide an opportunity to extend and reinforce control over water consumption in carwash sites and to mobilize state support. The discursive construction of water scarcity has been supported by the figure that nearly 34.400 m^3 of water is lost every month by informal carwash activities. The need to control this water loss plays an important role in calling for formalization. Rather than blame carwashes for future crises, the notion of water scarcity provides new possibilities for (re)organizing carwashes and (re)imaging carwash workers as consumers who are able to pay bills on time and to adapt to a water saving culture.

Building Resilience Through Commercial Relations

Engineers of EPM tend to promote techno-managerial approaches as the main strategy to control informal connections and to secure the proper functioning of the water infrastructure system. Implementing sanctions, inserting valves to restrict the flows of water, removing improvised pipes and confiscating equipment are common mechanisms to eliminate, punish, ban and blame carwashes for the illegal and unsustainable use of water. However, neither technical nor managerial solutions have been able to fully control water losses and recover revenues. Acknowledging that informal connections are deeply embedded in complex socio-economic and material conditions, the Commercial Department of EPM introduced the Carwash Program in 2010 to facilitate the establishment of a culture of legality and the habit of saving water. What has been interesting is that the logics of economic efficiency of EPM have pressed the company to create alternative arran-

gements to cooperate with carwashes in order to prevent commercial losses. There are 250 carwash sites that are currently part of the program aimed at formalization.

Informal carwash facilities have been operating in public space for more than 20 years and are frequently either family businesses or cooperatives ranging in size between 2 and 20 members. Services are provided to a wide variety of vehicles, including buses, taxis, private cars and motorbikes, with hand washing being the most common method (figure 1). Informal carwashes offer a range of different services, including exterior washing, waxing and interior cleaning. Workers are regularly exposed to hazardous chemicals and dangerously uncomfortable working conditions, and in most cases, they lack basic technical equipment or protective uniforms.

Figure 1: Carwash site specialized in washing buses (Marcela López 2017).

The formal integration into the centralized water network has had the effect of legitimizing informal carwashes, and this has a number of attendant advantages, including the improvement of their working conditions, stability in terms of income, providing educational training, adequate working spaces, health insurance, uniforms, basic equipment as well as all required licenses. This is why carwash workers see their official recognition as consumers as a key strategy to guarantee

their permanence in the long-term. While conducting fieldwork, workers reported that the main reason for joining the Carwash Program is to facilitate their formalization. Here, the formal recognition by EPM that the carwashes – and by extension, their workers – are a legal, tariff-paying consumer becomes a powerful tool to demand better access to different goods and services. Formalization as a consumer has an immediate effect on the social and economic resilience of carwash workers. The following section explores how resilience in carwash sites is increasingly exercised through a socio-technical system made of complex physical, commercial and juridical interventions facilitated by the utility company.

Physical Infrastructures

Informal carwash sites are typically places that lack the most basic infrastructure in terms of water, sewage, electricity and solid waste collection. To facilitate the formalization process, the utility company has physically intervened in carwash sites with a wide range of simple technologies and minimal investments. One of the main technical devices installed by EPM is a water meter. In carwash sites, a meter basically operates as a device that assigns economic value to water by measuring consumption in cubic meters. However, meters not only operate as mundane objects that control and measure the quantity of water being consumed, but also have political capacities that shift according to specific geographical and socio-political contexts. In some places, meters can become objects of political struggle while in others they are perceived as tools of possible collaboration. For example, Antina von Schnitzler (2016) shows how prepaid meters in South Africa became objects of massive resistance during the apartheid struggle because of their association with racial differentiation and discrimination. In a similar vein, Rohracher and Köhler (2019) discuss how the installation of new metering devices for hot water in a Swedish city became a political terrain in which issues such as high costs, uneven distribution and segregation were contested.

Meter also have the potential to create new opportunities for cooperation and recognition, while reflecting aspirations of modernity, progress, development and proper behavior (Harvey/Knox 2012; Larkin 2013; Anand/Gupta/Appel 2017). In Maputo, Mozambique, Baptista (2016) has drawn attention to the growing demand for prepaid systems as a way to secure access to electricity in a city that never achieved universal service provision. She shows how prepaid meters became surprisingly popular because customers could save money, avoid debts, control electricity consumption and reduce bureaucratic procedures associated with inaccurate bills. In Medellín, water meters have been deployed in carwash sites to produce particular environmental, ethical and commercial effects. A meter, for instance, has facilitated the active engagement of carwashes in resource management (for example, avoi-

ding water-waste); preventing disruptions (for example, performing regular repair and maintenance); and social responsibility (for example, paying bills on time).

For the utility company, therefore, water meters have been instrumental in encouraging carwashes to use less water, while also controlling leakages and damages in the infrastructure network. Thanks to these material devices, EPM delegates additional tasks to carwashes, including basic repair and maintenance functions that facilitate the functioning of the centralized water network (Graham 2010; Schwenkel 2015; Baptista 2019). Itineraries that were traditionally part of EPM's responsibility – e.g., leak detection, maintenance of equipment, checking faulty meters and cleaning of oil and grease traps – are now integrated in the daily routines of carwash workers in order to prevent water supply interruptions, high bills and environmental problems. Rather than reducing carwashes to passive consumers, meter technologies recognize them as ethical and political subjects involved in practices of repair and maintenance.

Figure 2: Technical interventions in carwash sites implemented by EPM: Installment of water meters, construction of drainage systems and provision of hoses. (Marcela López 2017).

Water meters are only part of a more comprehensive set of socio-technical interventions deployed by EPM and municipal authorities to manage and reorder carwashes. The utility company has also installed, free of charge, basic hydraulic infrastructure such as drainage systems, sewage connections as well as oil and grease traps to avoid the direct discharge of wastewater and hazardous chemicals into the storm drain system. These small-scale technical interventions introduced new norms for urban aesthetics in which carwashes become active in controlling wastewater disposal in order to prevent problems of pollution, smells and disorder. Additionally, the company has equipped facilities with water saving devices (for example, pressure washers and hosepipes) to avoid the constant waste of water (figure 2). According to EPM, the introduction of new equipment has contributed to a steady decrease of water consumption from 400-500 m3 per month to 80-100 m3 per month.

EPM has also pushed for interventions by the municipality, focusing on investing in and upgrading streets and public spaces around carwash facilities by greening parks, setting up benches and tables, and installing containers for the disposal of rubbish and chemical waste. Additionally, the utility company has supported the work of carwash workers who, together with local artists, have painted murals portraying their work on the facades of houses and local business (figure 3). All these small-scale interventions aim at creating a new social order and urban 'aesthetic' in carwash sites by transforming them into places that comply with minimum planning standards to avoid potential conflicts with public authorities, residents and consumers.

The utility company has also brought the work of carwashes into the city discourse by sponsoring exhibitions at the Antioquia Museum, one of the most important cultural institutions in Medellín. Exhibitions displaying the everyday labor of carwash workers and the importance of this activity for the economic development of the city has served to bring political recognition and mobilize state support. Additionally, these cultural events became important not only to create awareness among a general public, but also to educate the staff of EPM and the municipality about the daily practices and collective expectations of this informal economy. The shaping of public discourse around carwashes has given more power to the EPM Commercial Department to justify lower water tariffs, greater investments in technical infrastructures. It has also facilitated negotiations with municipal authorities and other EPM departments.

The Water Bill

As part of the formalization process, EPM issues carwashes a monthly bill. Rather than resisting the payment for water, carwash workers agreed to pay because a

Figure 3: Artistic interventions in houses and local business to visibilize the work of carwash workers. (Deúniti 2018)

bill enables them to actively negotiate their citizenship and to demand basic rights from the state. More specifically, a water bill acts as an object that allows workers to negotiate and strengthen their political claims to certain rights: the right to work, to legally occupy public space and to build new relations with the water company and other municipal authorities. The proof of payment of a water bill confers on workers legitimacy and improves their ability to consolidate carwashes as legitimate spaces of economic activity.

To facilitate the payment of monthly bills and prevent a "culture of non-payment", EPM has established a financial incentive in the form of a "transitional tariff". Over the course of six months, EPM charges only 30 per cent of the total consumption costs, and afterwards carwashes experience incremental increases of 2.5 per cent per month until reaching the full cost of a regular commercial tariff. Paying a bill not only grants carwash sites with certain rights (for example, safe and reliable water service, technical support, receiving a bill every month), but also assigns responsibilities and obligations (for example, sustainable use of water, avoidance of informal connections, leak detection and timely payment). Despite EPM's efforts to integrate carwashes as consumers, the material properties of water continue to pose significant challenges to the formalization process. One of the major issues of disagreements between EPM departments is the introduction of

a lower water tariff for carwash sites. As water and solid waste collection services are included in the same bill, negotiations to set up a lower tariff has put pressure on both water and solid waste collection departments to reach an agreement. In a meeting I had with different public authorities involved in the formalization of carwash sites, ENVARIAS (a company acquired by EPM in 2014) refused to implement a social tariff because carwash activities produce hazardous materials that need to be transported and disposed in designated sites thereby incurring higher costs. The staff of the water department reminded ENVARIAS personnel that their company was now part of EPM, and that their operating assumptions needed to be synchronized with the larger corporate social responsibility strategy of the company. This meant supporting the carwash program by offering a lower tariff for solid waste collection.

The project leader of the Carwash Program initiative at EPM insisted on the need to adjust the formula that calculates the prices to guarantee access to affordable tariffs and avoid the accumulation of debts. He claimed: "*Compañeros*, the formalization of carwashes is a social program and we should not forget to adapt our structures to provide affordable water and solid waste tariffs as part of our corporate social responsibility program." In Medellín, affordability concerns are particularly important: as the city reported in 2014, 36.560 households disconnected from water services for non-payment of bills (López 2016). Because of precarious and volatile economic conditions, carwashes constitute a group that is particularly likely to be disconnected for non-payment, which may pose significant challenges to the sustainability of formalization as a resilience practice over time. The issue of disconnection for non-payment could explain the reasons why some carwashes remain reluctant to be formalized, with incremental tariff increases rendering their activities economically unviable.

With the introduction of a water bill, EPM aims at providing opportunities to consolidate carwashes as sites of economic, ethical and environmental value. Receiving a monthly bill has been an important incentive not only to actively monitor and reduce water consumption, but also to make carwashes a commercially efficient activity. A bill, which carwash owners calculate as part of their monthly operating costs, helps the utility company to determine whether or not a particular carwash site can become economically and environmentally sustainable. In one of my visits in February 2017 to the Carwash Trinidad, one of the first carwashes impacted by the EPM initiative, the manager explained the broad motivation to participate in the program in the following way:

> Being part of the carwash program has helped us to be more organized, to save water and to better manage our finances. Now, we are able to offer our workers better working conditions by providing them with appropriate uniforms and health insurances. Also, the program has helped us to professionalize, as we are able to

deliver better quality services, build reputation and save money to invest in car care products and maintenance of shared spaces.

A water bill has also empowered carwash workers to initiate negotiations with different municipal authorities. For example, a police officer mentioned that carwash sites are using the EPM bill to avoid any kind of confrontation and punishment. He also complained that it had become more difficult to penalize these sites because workers often mobilize the bill as a way to prove that their activities are legally authorized. In this way, the water bill becomes a quasi-legal instrument that workers use to avoid having their equipment decommissioned and activities penalized with fines. A water bill has been used to disrupt the clear boundaries between informal and formal as it proves that carwashes have authorized access to water, even though they do not have a license to appropriate public space.

As McFarlane (2012) argues, the relations between informal and formal are never fixed, but instead are constantly negotiated and changeable over time. For carwashes, crossing formal-informal boundaries provides diverse opportunities to (re)negotiate their rights, and for this reason, confronts police officers with a dilemma: on the one hand, they have a duty to respond to citizen complaints about disturbances generated by carwash activities in residential areas. On the other, they cannot intervene in these sites because they are formally serviced by a public institution. When police officers organize inspections at carwashes, workers immediately get in contact with the staff of EPM, who feels obliged to mediate conflicts in order to protect the formalization process. By paying a water bill, carwash sites increase their ability to frustrate police actions and actively mobilize the utility company to validate their claims of citizenship. An examination of the way in which a water bill challenges the artificial division between formal and informal can provide new perspectives to think about informality.

The Law

Besides the investments in technical infrastructures and the implementation of commercial mechanisms, legal instruments have also become strategic tools to guarantee the resilience of carwash sites. Since 2010, the utility company has mediated and facilitated the establishment of a Car Wash Roundtable (*Mesa Interinstitucional de Lavadores de Autos*) to represent the interests of carwashes and to discuss concrete solutions to the problem of informal car washing. This roundtable operates as a platform that brings together different municipal authorities, including representatives from the offices of public space, mobility, police, human rights, security, environment, economic development, and urban planning. This alliance, whose members meet on a regular basis, provides opportunities to form

new solidarities, articulate programs, assign responsibilities and manage common budgets. Challenges can arise, though, when it comes to synchronizing the many objectives of the representative agencies.

In November 2018, for example, I participated in a series of meetings organized by the roundtable to identify potential conflicts arising from the construction of a bike lane adjacent to the airport and parallel to a street where multiple carwashes have been consolidated. The EDU (Urban Development Cooperation), the Department of Public Space and ENVARIAS (which is responsible for solid waste collection) came together to discuss possible ways to address multiple challenges - reducing traffic congestion, improving access to public space, and increasing the supply of rubbish containers - without adversely impacting the daily operations of the carwash sites.

EPM has also been working together with the Municipality of Medellín and carwash workers to adapt existing legal mechanisms to support the formalization process by changing water policies, redefining the use of public space and improving labor conditions. One of the main outcomes of this coalition was the issuing of the Municipal Accord 85/2013, which is currently actively debated in the City Council. This accord is the result of three-years of collective bargaining agreement, in which carwash workers agreed to comply with the following set of rules to facilitate their own legal status:

- Forbid the parking of cars that are not using carwash services.
- Restrict the hours of operation: From 6:00 am to 6:00 pm
- Avoid traffic congestions
- Forbid the parking of commercial trucks
- Use adequate carwash equipment
- Avoid obstructing pedestrian zones
- Keep equipment in good condition (for example, control of leakages)
- Maintain correct behavior (for example, use of adequate vocabulary)
- Forbid the sale and consumption of drugs and alcohol
- Forbid child labor
- Avoid high levels of noise
- Carry personal identification

By failing to comply with any or all of these guidelines, municipal authorities are granted with the right to intervene at carwash facilities and issue fines. The creation of this accord demonstrates the willingness of carwash workers to adopt certain rules and regulations that would substantially restructure their social and economic behaviors. In exchange for these commitments, though, carwash workers will be officially recognized as consumers, which will enable them to claim the right to work, and to legitimize their position in further negotiations with public authori-

ties. As such, the municipal accord becomes the first legal attempt to organize the carwash sector, to address their needs and to protect their interests. The ultimate goal is to transform this legal mechanism into a public policy that can be integrated in future Municipal Development Plans, so that the assignation of public resources can be allocated to secure the further development, consolidation and protection of carwashes as a resilient activity.

Conclusion

This chapter provided a detailed empirical study of how resilience is operationalized on the ground by examining the attempts to formalize carwashes in a city in Latin America. I have demonstrated how EPM's strong commercial logic - aimed at reducing water losses and consolidating revenues - played a critical role in its engagement with informal carwash activities. I have also shown that, because of difficulties in controlling and regulating informal connections, a utility company opted for finding alternative solutions that allowed carwashes to be formally inserted into the centralized infrastructure network. Instead of disrupting or restricting the flows of water by removing tubes and pipes, issuing fines and decommissioning equipment, EPM recognized the necessity to cooperate with carwashes by formally integrating them as consumers in the already-existing centralized network.

Drawing on STS and debates on urban informality, this chapter explored how resilience is produced out of and mediated by discursive and material strategies based on complex assemblages between human actors (staff of the utility company, municipal authorities, carwash workers) and non-human entities (water, meters, bills, laws). Firstly, EPM discursively constructed water as a scarce resource to justify the formalization of carwash sites as consumers. Rather than blaming carwash facilities for the constant waste of water, notions of water scarcity opened up new opportunities to position carwashes as political and ethical subjects actively involved in practices such as water-saving, payment of bills, the repair of leaks and maintenance of the infrastructure network.

Secondly, the Carwash Program implemented by EPM has largely relied on a set of socio-technical arrangements to make water formally accessible to carwash facilities. The program centered on providing carwash sites with basic physical technologies such as water meters to facilitate the measurement of water consumption, as well as drainage systems and oil and grease traps to reduce the environmental impacts and improve the aesthetic appearance. Additionally, the issuing of a water bill and the establishment of a legal mechanism (Accord 85/2013) increase the ability of carwashes to access better water services from EPM and to demand from the state recognition of their right to work and to access public space. The program has so far received broad support from carwash workers, with 250 out of 310 informal

carwash sites taking part in the program. A critical understanding of how carwashes are motivated to be part of the program and their aspirations to be officially recognized as consumers demands a greater appreciation of the political effects of mundane objects and the possibilities they offer to build new solidarities and forms of cooperation with the utility company and municipal authorities.

If the purpose of resilience is to help vulnerable population to adapt to and survive socio-natural disruption, it is important to go beyond the alleged innovation and creativity of low-income population and demand the intervention of the state and utility companies. As I have shown, socio-technical configurations that combine diverse physical, commercial and juridical interventions have been actively implicated in reducing the exposure of carwashes to conditions of precarity and uncertainty. Although these socio-technical configurations have created new capacities for building resilience, if the aim is to prevent more exclusion and marginalization, they need to be adjusted according to the heterogeneity of carwashes. The contribution of this chapter therefore lies in its attempt to situate carwashes, whether in Latin America or elsewhere, not only as spaces that report high water losses, but also as critical sites for understanding how resilient solutionscan be mobilized and implemented.

References

Acuto, Michele/ Dinardi, Cecilia/ Marx, Colin (2018): "Transcending (in)formal Urbanism." In: Urban Studies 56/3, pp. 475-487.

Allen, Adriana/ Griffin, Liza/ Johnson, Cassidy, eds. (2017): Environmental Justice and the Urban Resilience in the Global South, New York: Palgrave MacMillan.

Al-Odwani Ali/ Ahmed, Mansour I./ Bou-Hamad Sammer (2007): "Water Reclamation in Kuwait." In: Desalination 206/1–3, pp.17–28.

Álvarez Correa, Melissa (2019): "Lavautos Piden Ser Reubicados. En el Concejo se Evalúa el Acuerdo 85, Aprobado en el 2013." In: ADN, pp. 2.

Amin, Ash (2013): "Surviving the Turbulent Future." In: Environment and Planning D: Society and Space, 31, pp. 140-156.

Anand, Nikhil/ Gupta, Akhil/ Appel, Hannah (2018): The Promises of Infrastructures, Durham: Duke University Press.

Anand, Nikhil (2015): "Leaky States: Water Audits, Ignorance, and the Politics of Infrastructure." In: Public Culture 27/2, pp. 305-330.

Anand, Nikhil (2017): Hydraulic City: Water and the Infrastructures of Citizenship in Mumbai, Durham, NC: Duke University Press.

Anguelovski, Isabelle/ Irazábal-Zurita, Clara/ Connolly/ James J.T. (2018): "Grabbed Urban Landscapes: Socio-spatial Tensions in Green Infrastructure Planning in

Medellín." In: International Journal of Urban and Regional Research 43/1, pp. 133-156.

Banks, Nicola/ Lombard, Melanie/ Mitlin, Diana (2020): "Urban Informality as a Site of Critical Analysis." In: The Journal of Development Studies 56/2, pp. 223-238.

Baptista, Idalina (2016): "'We Live on Estimates': Everyday Practices of Prepaid Electricity and the Urban Condition in Maputo, Mozambique." In: International Journal of Urban and Regional Research 39/5, pp. 1004-1019.

Baptista, Idalina (2019): "Electricity Services Always in the Making: Informality and the Work of Infrastructure Maintenance and Repair in an African City." In: Urban Studies 56/3, pp. 510-525.

Béné, Christophe/ Mehta, Lyla/ McGranahan, Gordon/ Cannon, Terry/ Gupte, Jaideep/ Tanner, Thomas (2017): "Resilience as a Policy Narrative: Potentials and Limits in the Context of Urban Planning." In: Climate and Development 10/2, pp. 116-133.

Bennett, Jane (2005): "The Agency of Assemblages and the North America Blackout." In: Public Culture 17/3, pp. 445-466.

Brand, Peter (2013): "Governing Inequality in the South through the Barcelona Model: 'Social Urbanism' in Medellín, Colombia." June 11, 2019 (https://www.dmu.ac.uk/documents/business-and-law-documents/research/lgru/peterbrand.pdf).

Braun, Bruce/ Whatmore, Sarah J (2010): Political Matter: Technoscience, Democracy, and Public Life, Minneapolis: University of Minnesota Press.

Carcedo, Franco (2017): "Trabajo Informal y Control Policial en Espacios Públicos: El Caso de los Lavacoches de la Ciudad de Santa Rosa." In: Revista Huellas 21/1, pp. 31-48.

Cheng, Deborah (2014): "The Persistence of Informality: Small-Scale Water Providers in Manila's Post-privatisation Era." In: Water Alternatives 7/1, pp. 54-71.

Clark, Ian/ Colling, Trevor (2016): "New Insights into Informal Migrant Employment: Hand Car Washes in a Mid-sized English City." In: Economic and Industrial Democracy, pp. 1-21.

Clark, Ian/ Colling, Trevor (2017): "Work in Britain's Informal Economy: Learning from Road-Side Hand Car Washes." In: An International Journal of Employment Relations 56/2, pp. 320-341.

(DANE) Departamento Administrativo Nacional de Estadística (2019): Medición de Empleo Informal y Seguridad Social. Trimestre Móvil. Diciembre 2018 - Febrero 2019 (https://www.dane.gov.co/files/investigaciones/boletines/ech/ech_informalidad/bol_ech_informalidad_dic18_feb19.pdf).

De Boeck, Filip (2011): "Inhabiting Ocular Ground: Kinshasa's Future in the Light of Congo's Spectral Urban Politics." In: Cultural Anthropology 26/2, pp. 265-286.

(EPM) Empresas Públicas de Medellín (2019): Informe de Sostenibilidad 2018, Medellín: Grupo EPM.

El Colombiano (2016): "Lavaderos de Carros, con el Agua al Cuello." 23 January, 2016 (*https://www.elcolombiano.com/antioquia/lavaderos-de-carros-con-el-agua-al-cuello-JC3477209*).

Fainstein, Susan (2014): "Resilience and Justice." In: International Journal of Urban and Regional Research 39/1, pp. 157-167.

Franz, Tobias (2017): "Urban Governance and Economic Development in Medellín: An 'Urban Miracle'"?." In: Latin American Perspectives 44/2, pp. 52-70.

Furlong, Kathryn/ Carré, Marie Noelle/ Acevedo Guerrero, Tatiana (2017): "Urban Service Provision: Insights from Pragmatism and Ethics." In: Environment and Planning A 0/0, pp. 1-13.

Giglioli, Ilaria/ Swyngedouw, Erik (2008): "Let's Drink to the Great Thirst! Water and the Politics of Fractured Techno-natures in Sicily." In: International Journal of Urban and Regional Research 32/2, pp. 392-414.

González Escobar, Luis Fernando (2016): "¡Un 'Premio Nobel' Para Medellín!" In: Revista Universidad de Antioquia 326, pp. 105-111.

Graham, Stephen/ Marvin, Simon (2001): Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition, New York: Routledge.

Graham, Stephen/ Desai, Renu/ McFarlane, Collin (2013): "Water Wars in Mumbai." In: Public Culture 25, pp. 115-141.

Graham, Stephen (2010): "When Infrastructures Fail." In: Stephen Graham (eds.), Disrupted Cities: When Infrastructure Fails, New York: Routledge, pp. 1-26.

Harvey, Penny/ Knox, Hannah (2012): "The Enchantments of Infrastructure." In: Mobilities 7/4, pp. 521-536.

Kaika, Maria (2003): "Constructing Scarcity and Sensationalising Water Politics: 170 Days That Shook Athens." In: Antipode 35/5, pp. 919-954.

Kuecker, Glen D/ Thomas D. Hall (2011): "Resilience and Community in the Age of World-System Collapse." In: Nature and Culture 6/1, pp. 18–40.

Larkin, Brian (2013): "The Politics and Poetics of Infrastructure." In: Annual Review of Anthropology 42, pp. 327-43.

Leitner, Helga/ Sheppard, Eric/ Webber, Sophie/ Colven, Emma (2018): "Globalizing Urban Resilience." In: Urban Geography 39/8, pp. 1276-1284.

López, Marcela (2016): "Struggling for Public, Reclaiming Citizenship: Everyday Practices of Access to Water in Medellín. Colombia." In: McDonald, D.A. (Eds). Making Public in a Privatized World: The Struggle for Essential Services, pp. 165-178. London: Zed Books.

Medellín Como Vamos (2018): "Informe de Calidad de Vida Medellín 2018." June 24, 2019 (https://www.medellincomovamos.org/).

Meerow, Sara/ Newell, Joshua P. (2016): "Urban Resilience for Whom, What, When, Where, and Why?" In: Urban Geography 40/3, pp. 309-329.

Meehan, Katie M. (2013): "Tool-power: Water Infrastructure as Wellsprings of State Power." In: Geoforum 57/1, pp. 215-224.

Núñez González, Amaury/ Quintero Herrera, Edgar (2019): "Medellín: Aumentan los Asesinatos Pese a la Inversión." May 24, 2019 (https://territoriodeplomo. blog/2019/05/05/aumentan-los-homicidios-en-medellin-a-pesar-de-la-inversion/).

Ranganathan, Malini (2014): "'Mafias' in the Waterscape: Urban Informality and Everyday Public Authority in Bangalore." In: Water Alternatives 7/1, pp. 89-105.

Rockefeller Foundation/ Alcaldía de Medellín (2016): "Resilient Medellín. A Strategy for Our Future." June 15, 2019 (https://www.100resilientcities.org/wpcontent/ uploads/2017/07/Medellin-English-PDF.pdf)

Rohracher, Harald/ Köhler, Helena (2019): "Households as Infrastructure Junctions in Urban Sustainability Transitions: The Case of Hot Water Metering." In: Urban Studies 56/11, pp.2372-2386.

Roy, Ananya (2011): "Slumdog Cities: Rethinking Subaltern Urbanism." In: International Journal of Urban and Regional Research 35/2, pp. 223-238.

Scheba, Suraya/ Millington, Nate (2018): "Crisis Temporalities: Intersections between Infrastructure and Inequality in Cape Town Water Crises." International Journal of Urban and Regional Research Online. June 18, 2019 (http://www.ijurr. org/spotlight- on/parched-cities-parched-citizens/water-crisis/).

Schwenkel, Christina (2015): "Spectacular Infrastructure and its Breakdown in Socialist Vietnam." In: American Ethnologist 42/3, pp. 520-534.

Solnit, Rebecca (2009): A Paradise Built in Hell, New York: Viking.

Von Schnitzler, Antina (2016): Democracy's Infrastructure: Techno-Politics and Protest after Apartheid, Princeton, NJ: Princeton University Press.

Watts, Michael (2015): "Adapting to the Anthropocene: Some Reflections on Development and Climate in the West African Sahel." In: Geographical Research 53/3, pp. 288-297.

Winner, Langdon (1980): "Do Artifacts have Politics?." In: Daedalus 109/1, pp. 121-136.

Zaneti, Rafael/ Etchepare, Ramiro/ Rubio, Jorge (2012): "More Environmentally Friendly Vehicle Washes: Water Reclamation." In: Journal of Cleaner Production 37, pp. 115-124.

Enhancing Urban Resilience After the 1995 Kobe Earthquake
Parks and Open Spaces as a Multi-Functional Resource

Florian Hendrik Liedtke

Changing ecological and socio-economic circumstances ranging from global warming, economic decline or shifts in social compositions can pose risks to the viability and livability of the built environment. Urban Resilience describes the ability of a city's social and physical elements to withstand and recover from such disturbances (Meerow et al. 2016: 39). It is critically important in the face of the diverse risks posed by natural disasters. In cases like the Kobe earthquake of 1995, resilience in the sense of a return to normalcy, was only possible after an extended period of extreme social-spatial dislocation. In order to better understand this process of recovery and rebuilding, this chapter argues that space is one important, but little studied, resource for the creation of urban resilience. This study elaborates on the work of Carlow (2016), which treats space as a valuable resource for sustainable development. Carlow argues that space, like other natural resources, needs to be consciously planned for in urban development and needs to be shared equally between current and future generations (Carlow 2016: 153-157). The present study suggests that space plays a similarly crucial role as a resource in urban resilience. Space is, by its very nature, decentralized, and multifunctional. It is a latent resource that can be activated for different purposes. Space, in this analysis, is understood in its morphological sense as a three-dimensional entity which is bound to land and includes characteristic physical qualities such as topography, vegetation, and built structures. In this perspective, space should be viewed as a resource that is similar to building material, financing, and labor. In order to explore the significance of space as a resource, this study examines the case of Kobe's recovery from the Great Hanshin Earthquake in 1995, where the disaster impact was exceptionally high and available space was strictly limited by the surrounding topography.

This chapter specifically focuses on the way that parks and open spaces can contribute to urban resilience in the wake of natural disaster. It suggests that these spaces ought to be protected not just for their high value for urban life in normal times, but also because their intrinsic qualities can significantly enhance urban re-

silience in post-catastrophic scenarios. Parks and open spaces can mitigate disaster impacts and contribute to a wide spectrum of recovery tasks through their multi-functionality, their dispersal across cities, and their high integration into urban daily life. To be clear, space does not in itself create urban resilience. Rather, it is one of the resources that can be activated to mitigate the challenges – and enhance the efficiency of – emergency relief, recovery, and rebuilding.

Methodology

This case study uses a broad range of material such as reports, census data, and research conducted to a large part by the city of Kobe and Hyogo Prefecture. The current analysis builds on the theory of resourcing for recovery developed by Chang et al. (2010) and focuses on early and intermediate tasks in disaster recovery – tasks which correspond to the emergency and restoration recovery cycle phases described by Kates and Pijawka (1977: 1-2). According to Chang et al. (2010: 65-83), "resourcing" refers to the acquisition and activation of resources in order to fulfill key tasks in disaster recovery including sheltering, establishing support bases, and reconstructing the built environment. The problems in disaster recovery are often caused by resource shortages or bottlenecks in the resourcing process - shortages that are determined, in large part, by the scale of the disaster impact and attendant demand for relief and recovery services (Chang et al. 2010: 67). Chang et al. conclude that pre-disaster resourcing strategies and resource availability are decisive for recovery. They further argue that cooperation between stakeholders to make better use of existing resources – or to identify alternatives – are essential elements of disaster recovery (Chang et al. 2010: 77-78). Building on Chang et al.'s findings (2010: 73-76), the present study analyzes space as a resource in four distinct ways:

- Identifying the characteristics of different types of spaces and determining their suitability for discrete recovery tasks.
- Determining the accessibility of space, which is crucial for victims and supporting actors who are involved in tasks like sheltering, debris removal, and essential construction work.
- Understanding the legal frameworks that regulate the acquisition and use of space through legislation and policy.
- Analyzing the exchange of user rights and properties, which might impact recovery timelines.

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Kobe's Recovery from the Great Hanshin-Awaji Earthquake 1995

The city of Kobe, as part of Hyogo Prefecture, is located southwest of Osaka on Honshu, Japan's main island. Kobe is flanked to the south by Osaka Bay and to the north by the Rokko Mountains. This topography naturally limits the expansion of the city and contains the central urban area in a band between the sea and mountains that is roughly 2 to 4 km wide and 30 km long (Umesao et al. 1999: 78).

The earthquake struck Kobe on January 17, 1995 at 5:46 in the morning with a magnitude of 7.3 (City of Kobe 2014a: 1), originating from the epicenter near Awaji Island 30 km southwest of central Kobe. The most severe damage was caused on a small strip of land measuring roughly 5 by 20 km in the central city (EQE 1995: 1). The damage inflicted by the disaster was exceptional and constituted the most severe catastrophe in Japan since the 1923 Great Kanto Earthquake in Tokyo (City of Kobe 2000: 10). Damage to the inner city was caused both by the impact of the earthquake and by fires. To this day, unprotected gas storage tanks and heaters in urban areas that are densely built with wooden buildings pose a major fire risk in many Japanese cities (EQE 1995: 73). In total, 15 per cent of Kobe's houses were destroyed (City of Kobe 2010: 34) and traffic infrastructure, public facilities, and economic functionality were badly damaged (City of Kobe 2000: 10). The earthquake and the fires resulted in 4571 fatalities (City of Kobe 2014a: 4) and 230.000 people were forced to find accommodation in shelters (City of Kobe 1995: 212).

After the disaster, a diverse set of recovery tasks had to be accomplished. They included repairing the heavily damaged traffic and lifeline infrastructure, caring for the victims' mental health, providing emergency relief and shelter, and reconstructing housing (Yamori 1997: 119). However, a lack of funding hampered reconstruction, welfare provision, and the remediation of existing vulnerabilities in some parts of the damaged areas. Instead, recovery efforts were concentrated on prioritized public reconstruction areas (cf. City of Kobe 2011; City of Kobe 2014b). As a result, some of the most impacted areas lacked the resources necessary for adequate and timely reconstruction.

The Intrinsic Qualities of Open Space for Resilience: The Case of Evacuation Shelters

Parks and open spaces possess intrinsic qualities that can greatly mitigate disaster impacts, and that can be used to support a broad variety of recovery tasks. Planners and other stakeholders clearly recognize the value of green space as an urban amenity. However, the following case of emergency sheltering for disaster victims shows that open spaces need also to be recognized for their value as a flexible and spatially accessible resource for urban disaster resilience. They should be seen as

multifunctional resources that fulfill disaster recovery needs that dedicated shelters – purpose-built, spatially fixed, and limited in supply – are sometimes unable to do.

Immediately after the earthquake, many of Kobe's citizens escaped their destroyed or collapsing homes in order to seek refuge. On January 26, the number of evacuees had grown to about 230.000 citizens (City of Kobe 1995: 212) sheltering in 599 evacuation sites throughout the city (City of Kobe 2000: 10). Formally, the disaster prevention plan of Kobe indicated 364 evacuation sites comprised of public facilities and city owned schools. However, some of the designated evacuation sites were themselves damaged or destroyed. Most of the intact sites quickly became overcrowded, and others were inaccessible due to road blockages. The limited capacity of designated spaces for sheltering forced evacuees to use alternative spaces. This included public facilities like schools and assembly halls, as well as parks and open spaces (City of Kobe 1995: 212).

Designated shelters were designed as temporary facilities and did not have the sanitary facilities, electricity, or privacy to function as a long-term shelter for such a great number of users. Until 1995, evacuation sites in Japan were designed primarily to meet immediate survival needs, as can be seen from the fact that emergency shelters were provisioned with food and blankets adequate just for one or two days (Yamori 1997: 119-120). However, in the case of the 1995 earthquake, many evacuees were forced to live in shelters until water, electricity and infrastructure lifelines had been restored, transitional housing built, and homes restored or rebuilt (Horikiri/Odani 2000: 842-825). This resulted in an average accommodation time in shelters of 8.5 months (ibid: 25), making long-term recovery support necessary (Yamori 1997: 119-120).

The adequacy of shelters is, to some extent, a subjective matter that depends on the needs of users – in particular, their individual vulnerabilities and the duration of their displacement. Elderly people proved to be particularly vulnerable to the impact of the disaster, since they were typically less mobile and less equipped to rebuild their homes. Consequently, elderly people made up a large part of the long-term shelter inhabitants (Horikiri/Odani 2000: 821). They were also more impacted by the deficient sanitary facilities and insufficient heating of designated shelters. For the elderly and other vulnerable populations, upgrading of emergency facilities was vital in making their long-term use bearable. Ongoing spatial improvements of designated shelters included measures against the cold (e.g., the provision of stoves and insulated mats); the improvement of electric capacity of schools to meet the requirements of a high number of washing machines and fridges; and upgrading of inadequate sanitary facilities in schools through the installation of additional capacity. The lack of privacy in the crowded shelters was another major concern for many residents. Due to a lack of resources, this hardship could only be addressed at a very basic level, for example, by distributing cardboard room dividers to shel-

ters in schools (City of Kobe 1995: 213-214). Neither the capacity nor the design of designated evacuation sites was appropriate for use as mid to long-term shelter.

Designated shelters in the vicinity of residential areas could not accommodate all nearby evacuees and often proved difficult to access due to blocked roads and disrupted traffic infrastructure (City of Kobe 1995: 212). Faced with the spatial and material design failures of designated facilities, evacuees used a variety of alternative spaces. The 364 designated shelters were thus complemented by another 235 sites, many of them improvised by evacuees in parks and other open spaces. (City of Kobe 1995: 224). Because Kobe's parks and open spaces are spread throughout the city, they were easily accessible to residents of impacted areas, typically within ten minutes walking distance of victim's residences (Horikiri/Odani 2000: 823). Compared to designated shelters, these spaces offered a wider spread of locations in closer proximity to residential areas. Because of their distribution across cities, parks and open spaces are particularly well suited for evacuation sites and shelters.[1] The high number of evacuees in parks can also be linked to their proximity to public institutions such as schools, temples, churches, or ward offices (Ikeguchi 1995: 107). All of these sites are well-known to local residents, and typically offer basic sanitary and infrastructural capacity like bathrooms and running water. This again highlights a beneficial quality of parks and open spaces for emergency: their visibility in normal urban life is another feature which recommends their deployment during and after emergencies. Because local residents can easily plot their course to nearby parks and other well-known open spaces, they do not need emergency managers to direct them to evacuation or emergency sheltering sites.

The right to use these spaces for the purposes of emergency sheltering and support services was already well regulated through the disaster prevention plan mentioned earlier. The establishment of shelters also did not require any trade of user rights or land ownership, as most of these spaces were already publicly owned. All of this suggests why parks are such a rich latent resource. In times of crisis, these spaces are spatially available to be used as shelter, and because they are public lands, there are no legal barriers to their usage for evacuation and emergency relief.

There are however smaller physical barriers – for example fences and bushes – which impede easy access to parks (ibid: 110). While these elements of landscape architecture are important in peaceful times, they pose obstacles in the early and intermediate phases of a crisis. If parks are to be efficiently used as evacuation sites or spaces for temporary shelter, then physical barriers to access need to be limited and easily removable (ibid: 113-114).

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1   The spatial distribution of parks throughout cities is, of course, fairly typical, even in urban environments where access to green space mirrors larger urban inequalities. One might argue that it is in the spatialized nature of urban parks to be decentralized.

In general, three types of shelter organizations can be identified in Kobe's parks: 1) an orderly, dense camping formation of cars and tents regulated by the municipality and supported by the Self Defense Forces; 2) unstructured and sparse formations of cars and tents with less public regulation and support and 3) an agglomeration of tents or cars without any organization in formation. Evacuees based their selection of parks on a variety of factors, including individual preferences for supporting facilities, differences in density and resulting degree of privacy, and proximity to family or place of former residence (ibid: 113-114). This diversity of parks offered choices between different spatial qualities such as location, size, and degree of organization. This was a range of choices that was missing in designated shelters. Parks offer a way to address the individual needs of victims during the demanding post-disaster period.

Although parks provided sufficient capacity for sheltering, other characteristics (e.g., exposure to the weather and access to electricity and sanitary facilities) limited their usefulness for the purposes of long-term shelter. To mitigate these shortcomings, preexisting park features were adapted to meet essential needs for sheltering: fences, pergolas, and playgrounds, for example, were used as storage space for household goods and property (City of Kobe 1995: 107). Other structures like soccer goals, huts, and playground slides were used to build shelter-alternatives to tents (JILA 1995: 251), while sandboxes could serve as fire-pits. Evacuees mitigated the effects of rainfall and cold by constructing tents on top of wooden boards (Ikeguchi 1995: 113-114) and insulated and waterproof sheets (City of Kobe 1995: 214). Existing sanitary installations provided drinking water (Ikeguchi 1995: 107) until more extensive and efficient temporary sanitary facilities were constructed (Hyogo Prefecture 1997: 2). The essential qualities of parks, namely their decentralization, openness, and their integration into people's daily life proved to be a valuable resource for the task of sheltering in the days, weeks, and months after the earthquake. As easily accessible, multi-functional spaces that offered evacuees choices about their temporary homes, these spaces enhanced urban resilience by easing the transition between disaster and recovery. The substitution of undesignated parks and open spaces for designated shelters fulfilled an essential function during the initial phase of post-disaster recovery.

Open Space as a Flexible Resource for Diverse Recovery Tasks

Not only did parks provide valuable resources for emergency sheltering, but many of their intrinsic qualities proved to be useful for a broad range of recovery tasks. Just two weeks after the earthquake, the use of parks was expanded by the administration, volunteer groups, and the Self Defense Forces. Parks were used: 1) as sites of shelter; 2) staging grounds for recovery organizations providing medical goods,

water supply, bathing facilities or registration for temporary housing; 3) construction sites for temporary houses; 4) spaces for the storage of either rubble or relief goods (JILA 1995: 251). Moreover, the openness of parks provided a multi-functionality that could accommodate multiple recovery tasks simultaneously, as can be seen in figures 1 and 2.

Figure 1: Parallel uses of Susano-Park (0,4ha) clearly zoned into temporary housing > sheltering/ support > parking (Adapted from Nakase et al. 1996: 108). Figure 2: Parallel uses of Minato-Chou-Park (0,7ha) with merging functional zones (Adapted from Nakase et al. 1996: 108).
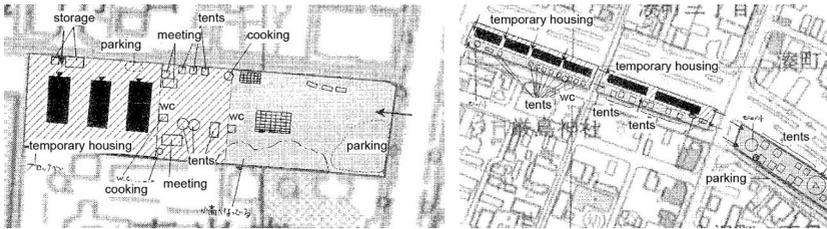
The use of parks and open spaces as sites for the disposal and treatment of huge amounts of disaster debris was important in the early disaster response and throughout the city's intermediate restoration. Since open spaces and parks provided storage space in close proximity to damaged areas, debris could be (more) efficiently moved from blocked roads to be prepared for further treatment. This was important to restore traffic infrastructure and prepare plots for reconstruction (Yamanaka/Nishimura 1999: 508). Parks and open spaces were a key site for the transition from immediate disaster response to the longer-term restoration of the built environment and everyday urban life. A whole range of park sizes accommodated the various uses, ranging from small parks under 1000 m² to bigger neighborhood and district parks (Ishikawa 2002: 837). Throughout the duration of emergency response and the following phase of restoration these different park sizes supplied space for sheltering, supporting activities, and temporary housing. The fact that parks simultaneously supported these different tasks (Nakase et al. 1996: 108) highlights their multifunctional value for disaster resilience.

Parks and other green or open spaces also played an important role in mitigating earthquake and fire damage. Various examples in Kobe show how tree lines in parks, along roads, or in front of buildings prevented fire from spreading (JILA 1995: 259). An example of this effective fire containment is the Sugaharadouri-Park in the heavily impacted ward of Nagata (Yamamoto et al. 1997: 18). The fire approa-

ching the Sugaharadouri-Park was stopped by fire-resistant plants which slowed the spread of fire, and further retarded by the open space in the middle of the park which functioned as a buffer zone. These green and open spaces effectively reduced the impact of post-earthquake fires and protected dense residential areas on the other side of the park (Yamamoto et al. 1997: 19). Green spaces in general, and trees in particular, also helped to stabilize collapsing buildings. Along major streets, roadside trees prevented collapsing buildings from falling on to street and thus helped to ensure the integrity of essential infrastructure (JILA 1995: 251). These examples show that green and open spaces functioned as barrier and buffer against fire and a shield against collapsing buildings. Because green spaces and trees are already existing features of the urban ecology, they proved to be ready and effective resources in increasing the city's resilience to the impact of the disaster.

Open Space as a Resource during the Restoration Phase: Temporary Housing

Given the inadequacy of shelters as a long-term living environment, the provision of long-term temporary housing for disaster victims became a main priority for the Kobe government (City of Kobe 1995: 300). In part because of their distribution throughout the inner city, parks were widely used for this important task. The availability of parks and other open spaces facilitated the rapid construction of temporary housing in extremely challenging circumstances (Baumann 1998: 15): just two months after the earthquake more than 20.000 units had been delivered, which were supplemented by an additional 8.800 units by the end of May. Various locations throughout the city were eventually used, comprising a total of 230 hectares and nearly 30.000units of different types and sizes (City of Kobe 1996: 20).

Despite the rapid installation of temporary housing, difficulties in reconstruction, and especially the timely provision of public housing forced victims to endure life in temporary facilities for as many as four years. By 1998, three years after the earthquake, approximately half of the evacuees were still living in temporary housing (Baumann 1998: 15-16). The last facilities were closed on December 20, 1999, five years after the earthquake (City of Kobe 2010: 74).

Japan's "Disaster Countermeasures Basic Act" formed the legal framework for the use of land by the city administration. The Basic Act stipulated that any plot, building or other structure could be used on a temporary basis to implement emergency measures, independent of ownership (National Land Agency 1997: 37). In theory, this created broad powers for the municipality to acquire land deemed necessary for rapid recovery. In practice, though, the acquisition of private property could be both costly and time-consuming: while the city could take land, they had to compensate property owners, and address potentially lengthy legal challenges.

The situation with parks and open spaces was different. While the involved public administrations had to pay for privately held property, publicly owned parks and open spaces were readily available and did not require additional funding (Hyogo Prefecture 2000: 17). The rapid construction of temporary housing and other essential construction was made possible in part by access to parks and open space that presented low legal or financial barriers.

By the time this construction phase concluded, the open spaces of parks and school grounds contained more than 30 per cent of Kobe's temporary housing units distributed across the city (City of Kobe 2000: 141). Four different types of temporary housing units were constructed in Kobe: 1) A two-room standard unit (JPA 1995: 33); 2) A smaller variation with one room (ibid: 37)**;** 3) A special shared housing type for elderly residents or those with disabilities (ibid: 45-46) as well as 4) Another shared housing type for all residents (City of Kobe 1995: 275–276). The varying sizes and locations of temporary housing compounds offered a diverse range of spatial qualities, enhancing the capacity to match user-preferences for either smaller or larger temporary housing complexes.

Initially, the Hyogo Prefecture administration constructed one-story standard units of 26 m² in Kobe. As the limitations on available land became clear, the 26 m² design was soon replaced by 20 m² single-story constructions. In order to quickly supply housing for the most vulnerable evacuees, and to meet the needs of elderly and disabled residents, larger two-story units were constructed in 21 parks in the inner-city, allowing residents to stay in their old neighborhoods (ibid: 275–276). Later, and again in response to the limited availability of space and the large number of evacuees, the city deployed another two-story shared type construction (City of Kobe 1996: 21). In the "Comprehensive Strategy for Recovery, 2010", the City of Kobe advised a more extensive use of shared-use type units for future recovery actions, noting that they could be rapidly deployed at low cost in relatively small spaces. As an added benefit, the Comprehensive Strategy noted that this type of housing promotes daily interactions between the residents, creating the conditions for the development of new communities (City of Kobe 2010: 72). While the standardized 26 m² units can be viewed as an effective way to quickly provide temporary housing space, the smaller 20 m² units and the two-story type were a more resource-conscious reaction to the depletion of suitable urban space in Kobe. The variety of unit types represents different approaches to the acquisition and improvement of space – approaches that focused either on quick supply or space saving construction.

The variations in unit types, compound sizes, and locations might have given evacuees greater choice between different kinds of communities and/or proximity to former neighborhoods, and this could have enhanced a feeling of normalcy and continuity for victims. However, the city missed the chance to take advantage of the spatial diversity of parks and open spaces when it launched a rehousing scheme that allotted residents to sites and units via a lottery (City of Kobe 1995: 298).

This reduced the potential for building solidarity which might result from choosing homes near places of former residency.

To summarize, Kobe's intense and diverse use of parks and open spaces is a sign of their value as a versatile resource for urban disaster resilience. These spaces are already socially and spatially well integrated into the urban system and their use is legally sanctioned. Parks and open spaces also have inherent qualities that allow for multi-functional usages; and a spatial flexibility that makes them well-suited to meet the individual needs of victims during disaster recovery.

Conclusion: Parks and Open Spaces as Effective and Multifunctional Resource

Open spaces in general, and parks in particular, proved to be a very useful resource for immediate and intermediate recovery tasks in Kobe. The fact that parks are valuable for urban resilience is already recognized in Japan and has been documented in technical manuals such as "Technical Notes and Guideline Proposal on Planning and Implementation of Disaster Prevention Parks" (Ministry of Construction 1999). This case study, however, uncovers the reasons for their usefulness by viewing space as a resource. It concludes that the resource-conscious use of open space can lead to a higher disaster resilience and an improved recovery process.

Figure 3: Use of open spaces around residential areas for different recovery tasks. (Author's Rendering).
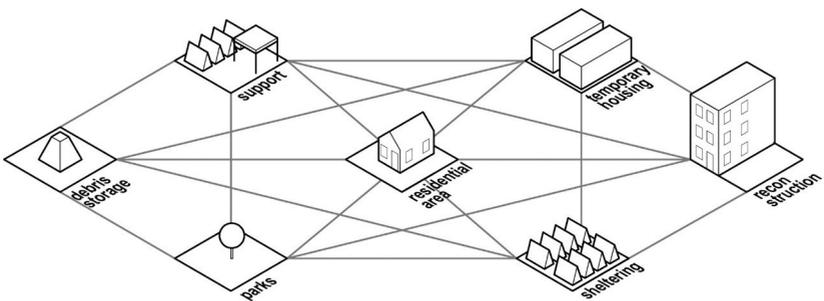
Parks and open spaces are important resources for urban disaster resilience, particularly for temporary uses during the phases of emergency and restoration. Because their acquisition and use by public actors and victims alike is legally uncontested, and because these spaces are familiar, well integrated elements of the urban

form, they are easily accessible from endangered residential areas. Their openness makes them well-suited to new construction or the adaptation of temporary structures to aid different tasks. In combination with the high number and variety of parks in Kobe, their multi-functional quality helped to mitigate limited space and changing circumstances through a highly flexible network of recovery actions, as depicted in figure 3. This included different forms of sheltering, supporting bases, temporary housing, and debris storage.

The findings of this study show that planners and policy makers should realize the value of parks and open spaces as a resource for urban disaster resilience. In conclusion, planners and municipal authorities should develop resilience strategies that include parks and open spaces before disasters such as the Hanshin Earthquake occur. This includes the maintenance of extensive and varied open spaces dispersed throughout the city. These spaces can potentially serve different functions during the disaster relief and recovery phases, and can create flexibility in responding to unanticipated problems. In the absence of disasters like the 1995 Hanshin Earthquake, these spaces serve as an important urban and ecological amenity that has been proven to improve quality of life for city residents.

References

Baumann, Catherine (1998): The Challenge of Land Use Planning after Urban Earthquakes: Observations from the Great Hanshin Earthquake of 1995, Oakland, California: Earthquake Engineering Research Institute.

Carlow, Vanessa M. (2016): Limits: Space as Resource, Berlin: Jovis.

Chang, Yan/Wilkinson, Suzanne/Seville, Erica/Potangaroa, Regan (2010): "Resourcing for a Resilient Post-Disaster Reconstruction Environment" In: International Journal of Disaster Resilience in the Built Environment, 1/1, pp. 65–83.

City of Kobe (1995): 阪神淡路大震災 神戸市記録 1995年 [Record of the Great Hanshin-Awaji Earthquake 1995], Kobe: Center for Counter Measures to the Great Hanshin-Awaji Earthquake.

City of Kobe (1996): 平成7年 兵庫県南部地震神戸市災害対策本部 民生部記録 [Records of the 1995 South-Hyogo Earthquake], Kobe: City of Kobe Public Welfare Agency.

City of Kobe (2000): 阪神 淡路大震災神戸復興誌 [The Great Hanshin-Awaji Earthquake - Kobe Reconstruction Journal], Kobe: Kobe City Reconstruction Head Office.

City of Kobe (2010): Comprehensive Strategy for Recovery from the Great Hanshin-Awaji Earthquake, Kobe: City of Kobe.

City of Kobe (2011): 協同参画; 安全安心快適暮 [Town Planning of Cooperation and Participation; Living Safe, Secure and Comfortable through Town Planning], Kobe: City Planning Agency.

City of Kobe (2014a): The Great Hanshin-Awaji Earthquake: Statistics and Restoration Progress, Kobe: City of Kobe.

City of Kobe (2014b): 人安心; 神戸市市街地再開発事業 [People-Friendly and Safe Town Planning, Kobe's Urban Redevelopment Projects], Kobe: City Planning Agency.

EQE (1995): The January 17, 1995 Kobe Earthquake, An EQE Summary Report, Houston: EQE International.

Horikiri, M./Odani, M. (2000): "阪神 淡路大震災後住民避難行動関分析" [Analysis of Residents Evacuation Behavior after the Great Hanshin-Awaji Earthquake] In: Infrastructure and Planning, No.17, pp. 819-826.

Hyogo Prefecture (1997): 阪神淡路大震災災害廃棄物処理 [Disposal of Disaster Debris of the Great Hanshin-Awaji Earthquake], Kobe: Hyogo-Prefecture Department for Life and Culture, Section for Environmental Maintenance

Hyogo Prefecture (2000): 阪神淡路大震災係応急仮設住宅記録 [Record of Temporary Housing after the Great Hanshin-Awaji Earthquake], Kobe: Hyogo Prefecture Land Development Department.

Ikeguchi, H. (1995): "神戸市兵庫区長田区須磨区内公園緑地阪神淡路大震災被害利用" [A Survey on Usage and Damage Regarding Open Space within Hyogo, Nagata and Suma Ward in Kobe City, following the 1995 South Hyogo Earthquake] In: Humans and Nature, No. 6, September 1995, pp. 101–115.

Ishikawa, Mikiko (2002): "Landscape Planning for a Safe City" In: Annals of Geophysics, 45/6, pp. 833-841.

JILA - The Japanese Institute of Landscape Architecture (1995): "阪神大震災調査特別委員会緊急報告" [Emergency Report of Special Research Committee on the Great Hanshin Earthquake] In: JILA, 58/3, pp. 250–262.

JPA - Japan Prefabricated Construction Suppliers and Manufacturers Association (1995): 応急仮設住宅建設記録写真集,平成7年兵庫県南部地震 [Photography Anthology of Temporary Housing, the 1995 South-Hyogo Earthquake], Tokyo: JPA.

Kates, Robert W./Pijawka, David (1977): "From Rubble to Monument: The Pace of Reconstruction." In: J. Eugene Haas/Robert W. Kates/Martyn J. Bowden (eds.) Reconstruction Following Disaster. Cambridge, MA: MIT Press.

Meerow, S. / Newell, J. P. / Stults, M. (2016): "Defining Urban Resilience: A Review" In: Landscape and Urban Planning, 147, pp. 38-49.

Ministry of Construction (1999): 土木研究所資料 第3663号: 防災公園計画設計関技術資料 - 防災公園計画設計関(案) [PWRI Notes No. 3663: Technical Notes

and Guideline Proposal on Planning and Implementation of Disaster Prevention Parks], Tokyo: Ministry of Construction.

Nakase, I./Kamihogi, A./Sawaki, M./Tahara, N. (1996): 阪神淡路大震災仮設住宅関調査研究，公園仮設住宅利用実態 [Research on the Great Hanshin-Awaji Earthquake, Condition of Temporary Housing Facilities in Parks], Kobe: Hyogo Creative Machizukuri Research Center.

National Land Agency of Japan (1997): Disaster Countermeasures Basic Act: Act No. 223, November 15, 1961 (Provisional Translation).

Umesao, T./Saito, H./Nishikawa, O./Masai, T. (1999): 日本地図帳 [Japan Atlas], Tokyo: Heibonsha Publishers.

Yamamoto, H./Hayakawa, S./Suzuki, Y. (1997): "神戸淡路大震災神戸市長田区須磨区樹木延焼防止機能事例調査‘自然-災害科CCC (2013): "Population Density Map 2013", August 7 2018学"[Survey on Fire Prevention Function of Trees in Nagata Ward and Suma Ward of Kobe City at the Great Hansin-Awaji Earthquake] In: Natural Disaster Science J.JSNDS, 16/1, pp. 15–25.

Yamanaka, K./Nishimura, T. (1999): "震災後瓦礫輸送処理仮置場計画" [On the Rubble Transportation and Disposal Yard Planning after Great Earthquakes] In: Proceedings of Infrastructure Planning and Management, 22/2, pp. 507–510.

Yamori, K. (1997): "阪神大震災　避難所運　営　—段階的変容—実験社会心理学研究" [Evacuation Management of the Great Hanshin Earthquake and its Stepwise Changing Process] In: The Japanese Journal of Experimental Social Psychology, 37/2, pp. 119–137.

Transportation as a Resilience Enhancing Tool
Urban Dualism and the Latin American City

Diego Silva Ardila

In the last decades, and with increasing intensity in recent years, resilience has become an important intervention framework for imagining the future of urban settlements (Zhang/Li 2018). Policy makers, politicians, bureaucrats, urban planners, academics, and others regularly advance the narrative that cities need to develop robust capacities to overcome diverse shocks. In Latin America, this concern with crisis is understandable. The cities explored in this essay have experienced environmental adversities, persistent urban violence, massive immigration flows and debilitating economic crises. Over the mid and long-term, though, these cities have continued to deliver urban services, economic prospects and collective goods that attract population, improve quality of life, and urban amenities. This seeming paradox – between crisis driven narratives and existing pertinacity– is one of the reasons that resilience as a concept, discourse, and practice has found such a receptive audience in Latin American urban policy frameworks. All of this, though, raises several questions. The first question pertains to the novelty of the resilience framework. Is 'resilience' really something new or is it rather part of the DNA of cities, as Vale and Campanella argue (2005)? Second, is resilience a quality or characteristic that develops organically over time, or is it possible to fabricate resilience within urban frameworks? If it is possible to 'create' resilience, what areas should planners and designers target? Too often, analysts, policy makers, politicians and private sector actors call for more resilient cities, without really questioning what it is they expect to create, and how that might be different from what already exists.

The failure to ask and answer these questions has a number of potentially negative consequences, not the least, that it opens up resilience frameworks to a variety of neoliberal actors and interests (e.g., transnational insurance companies and global financial markets (Evans/Sewell 2013; Lamont/Hall 2013)). This does not mean that resilience as an analytical framework should be excised from urban policy discussions, or that all resilience building projects are neoliberal. Rather, it suggests that an historically informed approach to contemporary urbanism debates can help us to distinguish between resilience narratives that are driven by a neoliberal agenda, and those that have the potential to create more just, equal, and accessible ci-

ties. In this chapter, I examine the differing roles of urban transportation in four Latin American cities in order to 1) identify urban resilience enhancement logics under specific urban social dynamics in the region and 2) understand tensions between private and public sector approaches to resilience building.

In the introduction to this work, Dorothee Brantz and Avi Sharma argue that recognizing the asymmetrical power relationships between the different actors is extremely important for understanding the dynamics of resilience in discourse and practice. This point should equally be made for research into dynamics of urban transportation, where powerful political and economic interest groups (dis)engage with the needs and demands of local populations. While these negotiations promise to meet the needs of the population as a whole, they tend to marginalize the voices of the most vulnerable citizens. Resultant gaps in service have generated a range of alternative interventions aimed at remediating this unequal access. Recent urban transportation interventions aimed at ameliorating the circumstances of marginalized persons can offer insights into efforts to build more inclusive resilience frameworks for Latin American cities.

By exploring transportation as an infrastructure for resilience enhancement, I hope to demonstrate that there are, in fact, two resilience processes that are simultaneously at work in many (Latin American) urban areas. On the one hand, one sees a wide range of urban planning and top-down actions that have developed over the longer history of cities as a way of managing disruption and mitigating shocks. On the other hand, there is an organically developed complex of resilience practices that citizens use in their everyday lives to navigate the city (Castillo de Herrera 2009). Researchers from a wide range of disciplines tend to define the first complex of practices as "formal" and second one as "informal", and many scholars argue that Latin American cities are the sum of a formal and an informal city (Amato 1970; Gilbert 1996; Castillo de Herrera, 2009). This has been a richly productive body of scholarship, but I want to approach the cases from a slightly different perspective to add a new dimension to debates about in/formality. I argue that these two tendencies – the formal and informal – are so historically entangled and so mutually constitutive that they must be seen not as distinct and discrete spaces, but as what may be conceptualized as an 'urban dualism' that is much more than the sum of its parts. By using the term 'urban dualism', I hope to advance an interpretation that emphasizes the constant co-creation of two allegedly distinctive spheres, and to show how power and vulnerability create the urban form through dynamic interaction.

Metropolitan Configurations in Latin America during the 20th Century

Across Latin America, the 19th century saw the end of more than three centuries of oppressive ties with the Spanish Empire (Castells 1973; Carmagnani 2004). In that period of new nation-state formation, the attendant social, political, legal and economic transformations dominated the discourses among political elites, most of whom were concentrated in former colonial political capitals (Almandoz 2002; Mejía Pavony 2013). These upheavals – and the military conflicts that were common in the last decades of the century – created some spaces for social mobility within urban environments. Because economic activity across the continent continued to be essentially focused on mining and agriculture, though, the period of decolonization saw rural areas change far more than urban ones (Cerrutti/Bertoncello 2003). Only in the 20th century did industrial manufacturing truly begin to draw the working poor to Latin American cities.

Of course, there were dramatic differences in the urbanization patterns of Latin American cities, with factors like geography, demography, and access to global markets shaping the temporalities of urbanization (Almandoz 2014). In general, though, it can be said that the leading cities in Latin America – among them Buenos Aires, São Paulo, Mexico City and Caracas – adopted innovations like electricity, railroad systems, radio, cinema, automobile, and other technologies earlier and more fully than elsewhere. Cities became attractive for populations who were able to afford the new urban lifestyle, but it also drew poor migrants from the countryside. Ideas about "modernity" came to dominate the minds of urban dwellers in Latin America, while modernization transformed the material fabric of urban landscapes (Almandoz 2002, 2013b, 2014; Mejía Pavony 2013).

While the first decades of 20th century saw relatively slow urban growth, the decades after World War II saw dramatic transformations. During these decades, urban growth accelerated to a level that overwhelmed cities' capacities to react, with new housing construction and infrastructure failing to meet dramatically increasing demands (CEPAL 1963; Greenfield 1994). It was at this moment of urban acceleration that dualism emerged as an attribute of large and rapidly growing cities in Latin America (Abramo 2003; Castillo de Herrera 2009; Mejía Pavony 2013). Explosive urban growth is not unique to Latin American cities – indeed, cities across the globe have experienced these kinds of transformations. What was, perhaps, unique was the way in which different actors in Latin American cities addressed the negative consequences of rapid urbanization. In cities like Bogotá, Mexico City, Lima or Caracas, low-income and elite urban dwellers developed an asymmetrical but still symbiotic relationship aimed at managing extreme housing scarcity and inadequate infrastructure (Mejía Pavony 2003; Almandoz 2014).

The most remarkable example of this process is the allocation of land for housing. Housing in fast growing Latin American cities was allocated and built by state actors, with market-based financing strategies playing a subsidiary role. In their capacity as landowners, capital holders and governmental actors played a crucial role in crafting these programs. During the second half of the 20th century, when experiencing urban massification, top-down strategies like publicly financed housing were important for managing housing scarcity. Other kinds of bottom-up strategies – land invasion and occupation, for example – also became common. These alternative housing strategies of the urban poor are widely thought to constitute the origins of the so-called informal city. Sometimes portrayed as a confrontation where new urban dwellers invaded vacant land to build homes, these processes were in fact typically aimed not just at securing space but bypassing urban building regulations. To be clear, it is essential to recognize that occupying space is not just about gaining access to land but evading the authority of restrictive regulatory regimes. The "informal" cities, contrary to the most common narratives, emerged in cities in Latin America with the consent of different elite actors.

Indeed, in many cases, elite groups facilitated the occupation process in order to enable building projects that would otherwise have been derailed by building or other regulations (Castillo de Herrera 2009; Almandoz 2014). When land occupation did in fact occur spontaneously, and when confrontation emerged, elites tried to recover their value by using legal practices to collect the money via governmental policies or via "formalization" strategies (Castillo de Herrera 2009). So, informal developments were not spontaneous and discrete phenomena separated from the rest of urban dynamics, but an entrenched and entangled process that involved economically and politically privileged urban actors.

Alan Gilbert has argued that traditional informal/formal approaches to Latin American cities treat the informal sector as "the sector of last resort, whose function is merely to help sustain those whose labor is not required in the capitalist sectors of the economy. It performs no effective economic role and contributes nothing to the modernization process" (Gilbert 1998: 16). Gilbert's analysis fails to capture the complexity of the "informal" economy and its role in society more generally. In fact, contrary to what Gilbert argues, informal sectors are critical dimensions of the economic and political organization of Latin American cities, underpinning both processes of modernization and modernity narratives. Indeed, Latin American cities were able to manage periods of explosive urbanization – and attendant pressures on urban services – precisely because new urban survival strategies that bypassed urban regulatory regimes operated parallel to and in tandem with institutional policy agendas (Almandoz 2014). The present chapter offers the concept of urban dualism as a way of understanding this symbiotic relationship of the formal and informal sectors and shows that this entanglement was part of the very

formation of Latin American urbanities. The enduring capacities of cities in Latin America to function in the absence of transparent, robust and comprehensive local governance is a consequence of urban dualism that creates capacities that function not as "best case scenarios," but second-best solutions. The emergence of what I have called urban dualism during the second half of the 20th century points to the active linking bonds between local elites and low-income inhabitants. Resilience should, in this sense, be observed and analyzed as a complex of social practices resulting from the interaction, bargaining and negotiations between ruling elites and low-income communities in cities in Latin America.

Urban Dualism and its Manifestations in Urban Transportation in Latin American Cities

Urban transportation solutions in Latin American cities grew in tandem with population growth and spatial expansion in the second half of the 20th century. By the 1950s, for example, only Buenos Aires had a developed underground metro system[1], while Mexico City inaugurated its subway system (Metro) only in 1969 as a project complementing large-scale investments in public works for the 1968 summer Olympics. São Paulo and Santiago implemented Metro services in the mid-1970s, with four other Brazilian cities, and Caracas in Venezuela following suit in the 1980s (Figueroa 2005). Overall, Metro systems were quite rare because they depended not only on substantial financial resources and coordinated government action, but also a steady commitment from national level governments (Almandoz 2013a).

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1   Buenos Aires is an exceptional case that opened its first subway line in 1913. By 1955, the city had five lines and developed a bus irrigation system that facilitated the mobility of thousands of urban dwellers. (Figueroa 2005).

Figure 1: Buenos Aires "Subterraneo" (Silva Ardila 2012).

In contrast to metro systems, which are still relatively rare, the most common transportation solution in Latin American cities was the urban bus (Almandoz 2013a; 2014). By the mid-20th century, urban growth put pressure on the existing transport systems, but it was politically complicated to increase fares. This, in turn, made the expansion of networks impossible. As Figueroa has shown, though, small companies that established bus routes provided an alternative to other transport services (Figueroa 2005: 112). This was a process that occurred spontaneously, largely without coordination by the urban authorities.

The principal advantage of the bus was its flexibility: companies could change their routes quickly and regularly extend their service to the edge of the city. So, by the 1950s large cities in Latin America had incorporated motorized bus systems that either replaced or ran parallel to already existing horse-drawn or electrical trams (Figueroa 2005; Almandoz 2002; Mejía Pavony 2013). Urban buses, typically owned either by a private company or individual owner-operators, provided transportation services that used organic route-design and profitability calculations to reach a maximum number of riders. Minimally regulated and using local government permits resulting from interaction between bus operators and local officials, the-

se buses supplemented inadequate transportation services, providing low-quality employment for drivers and ticket-takers, and generating profits for company owners (Figueroa 2005). Oscar Figueroa argues that, by the 1960s, "the bus systems in all of the cities (Buenos Aires, Mexico City, São Paulo, Rio de Janeiro and Lima) were run mainly by private companies." And while "the form of those companies differed widely… those differences reflect the different histories of transport development of each city" (ibid: 113). While urban buses added capacity to inadequate transportation infrastructure, they did not fully service the needs of residents of fast-growing Latin American cities: "under these circumstances, public transport has not fulfilled its social function and has become another source of congestion and disorganization. Most operators increasingly used smaller buses and too many bus companies run old buses, which contain large numbers of standing passengers, along routes crowded with other traffic" (ibid: 119).

Limited transportation and mobility solutions make urban dwellers more vulnerable in a whole range of ways: for economically vulnerable persons, for example, it can make access to work and urban amenities extremely time-consuming and costly (Figueroa 2005). This, in turn, can lead to higher levels of unemployment, lower levels of educational attainment, poor health and other negative outcomes – all of which have a direct impact on the levels of urban violence, economic capacities and social relations that affect urban resilience. In a direct response to the inadequate provision of public transportation, different spontaneous forms of urban mobility have evolved across Latin America. While these are sometimes viewed as isolated and ad hoc, they are deeply entangled with local economic powers. These ad hoc infrastructures show how vulnerable communities adapt to gaps in public service provision. This was not, however, simply a matter of vulnerable urban populations filling a gap in services left by elite actors. In fact, elite actors played an important role in facilitating these adaptations by providing resources and establishing alliances that defined and limited the possibilities of transportation solutions that appear to have emerged organically. Capital allocation, the creation of legal frameworks, policy design and implementation, police and juridical support are just a few of the areas where elites supported allegedly informal activities. (Silva Ardila 2020). The cases of Buenos Aires, Bogotá, Mexico City and Medellín highlight several elements that can illuminate issues of urban dualism, and resilience narratives and practices. The distinctive urban transportation cases presented in this chapter operated in different contexts, and with different assumptions and levels of regulation, that produced different solutions. As I hope to show, these outcomes do not easily correspond to specific economic, political, or ideological models. Instead, I hope to show that resilience is a collectively produced attribute of urban landscapes that is defined by contextual constraints.

Remises in Buenos Aires: Solutions for Individual Needs

By the end of the 1950s, Buenos Aires had a consolidated rail-based system and a solid network of buses servicing neighborhoods in the expanding metropolis, but taxi services were also widely used by growing upper-middle income inhabitants. Beginning in the early 1920s, taxi service was regulated by the municipality to protect drivers and passengers, with emphasis on reducing long working hours. Because the supply of drivers was not increased, though, this led to shortages in availability – particularly during the evening hours that saw high demand from an expanding middle class who wanted to use urban amenities like the theater, restaurants, and dance venues (Clichevsky 2000). As an expected market reaction, independent automobiles (privately owned, often unlicensed and unregulated) started offering services door-to-door from the central city to peripheral neighborhoods. These services – called *remise* from the French, and sometimes castilianized as *remís* – quickly grew in popularity, offering services from informally designated collection points during the evening and nighttime hours. During the 1960s spontaneous gathering areas in the city center transformed into permanent facilities known as *remiserías*. Similar little stations and offices popped up in the neighborhoods (Clichevsky 2000; Gutiérrez 2012).

Initially *remises* were similar in form and service to regulated taxi services, with well-maintained automobiles and elegantly dressed drivers providing the experience expected by sophisticated middle-income urbanites. However, despite steady growth, *remis* services were never regulated, instead functioning as an informal strategy of satisfying a specific urban demand. It is important to note that, at least in the 1950s and 60s *remis* services operated only at specific times of the day and were not, therefore, in competition with existing taxi services. In the 1970s, though, the growing *remis* system evolved in response to a more profound fragility of urban mobility in the city: identifying gaps in service provision to peripheral neighborhoods, the *remis* model generated strong incentives to invest in an alternative network that was designed to serve (and draw profit from) under-served areas of the city, Susana Kralich states that remis proliferation and explosive growth during the 1980s and especially 1990s responded to unemployment growth, self-employment entrepreneurship initiatives facing the economic crisis and the incremental demand growth caused by the deterioration of public transportation services (Kralich 2005: 1) Spontaneous allocation of neighborhood *remiserías* facilitated the provision of local short-distance trips covered neither by the inflexible metro system nor by the bus routes.

The expansion of the *remis* across the city generated several financial and other innovations, with groups of drivers pooling resources to invest in automobiles, facilities, and publicity. Pressures emanating principally from invested capital and resources forced *remises* operations to run on a 24-hour basis, and this expanded

service provision was facilitated by loose police oversight. It was not until the 1980s – when the system was ubiquitous in metropolitan Buenos Aires - that the *remis* was labeled as "private service of public interest" in order to initiate the much-needed regulatory intervention (Kralich 2005). The *remis* system was neither a centralized nor a planned solution, but an organically organized one that developed in response to inadequate service in a rapidly expanding urban marketplace. It is worth pointing out that, while this spontaneous and decentralized transportation intervention resulted from the identification of market failures – periods of no service, areas that were underserved – it was *also* critical in meeting the needs of vulnerable citizens living in peripheral neighborhoods. While solutions did not come from state actors, or even regulated private-sector actors, the *remis* did ultimately constitute a parallel infrastructure that provided low-cost transportation solutions to many people who were otherwise excluded.

The economic crisis of the 1990s saw thousands of unemployed factory workers find temporary employment in the *remises* (Gilbert 1996; Kralich 2005; Blanco 2010). Newly unemployed workers with some available capital invested into existing *remís* cooperatives, and while this generated intensive competition, it also allowed extremely precarious individuals and families to reach subsistence levels during the hardest years of the long-lasting economic turmoil (Kralich 2005).

Remises moved from discretionary and sporadic trips to a more frequently used service within the city, particularly due to the competitive prices. And when tourism (mainly due to the attractiveness of exchange rate advantages) sky-rocketed, the *remises* became a good source of dollars access in an economy that had limited access to foreign currencies. This is not, in any way, a normative argument about whether spontaneously evolved, under-regulated, market-driven alternative transportation infrastructures should be a solution to mobility gaps in fast growing cities. It is not, in other words, my purpose to argue that this is a 'good' model or a 'bad' one. Rather it is an attempt to show how these alternative mobility infrastructures developed, functioned, and ultimately stabilized mobility gaps and economic livelihoods in the context of a rapidly expanding urbanity. The case of Bogotá, explored directly below, offers different insights.

Bogotá and the Struggle for Public Regulation in Highly Privatized Transportation Contexts

In 1948 in Bogotá, a young presidential candidate named Jorge Eliécer Gaitán – openly opposed traditional elites and with a high likelihood of victory – was murdered in the streets when leaving his office for lunch. In less than twelve hours of rioting, still remembered as the *Bogotazo*, substantial parts of the city's core were badly damaged by angry supporters (de Urbina González/Zambrano 2009). What

happened next was perhaps more surprising. Over the next several days, as documented by de Urbina González and Zambrano (2009), unscrupulous real estate owners and developers took the opportunity to demolish dozens of buildings that were protected by historical preservation regulations (Aprile-Gniset 1992; de Urbina González/Zambrano 2009; Niño Murcia/Reina Mendoza 2010: 78).

On the April 9, 1948 protesters destroyed a publicly owned tramway connecting downtown with some of the urban expansion areas in the north and west sections of the city. Three years later, Mayor Fernando Mazuera decided – without consultation with the tramway company's governing board (Mazuera 1972) – that the tram line was no longer needed. He ordered public works employees to cover the tracks with asphalt, paving the way for a privately owned and operated bus service to expand operations. In Bogotá, private interests ruled urban transportation services during the next five decades.

This privileging of private transportation providers in the 1950s and 60s is one reason why unregulated bus service gradually replaced the publicly owned tramway company, but these networks also grew because they filled a genuine need for connectivity to new neighborhoods during the peak years of urban expansion. In Bogotá, every neighborhood had an urban transportation provider that was focused on connections with the downtown area, which was primarily a commercial district (Acevedo 1990). During the 1980s each company created a small geographical monopoly, functioning as the sole service provider for captive neighborhoods. Monopoly attributes implied that companies could reduce their service standards without fear of customers choosing alternative transportation providers (Acevedo 1990; Ardila Gómez 2004; Figueroa 2005). Service was provided using a franchise scheme that was commonly labeled as "*Guerra del Centavo*" (war of the pennies), which described the aggressive and sometimes violent competition. During this period, bus operators essentially "rented" the right to sell their services on designated routes from a small number of private companies who owned official permits that allowed them to provide bus service. It is important to emphasize that these companies did not own buses. They owned the right to provide service along designated routes, and then sold these rights on a concessionary basis. This complex transactional network was extremely profitable for the companies holding permits; it could be profitable for bus owners. For bus drivers, though, it contributed to terrible working conditions, with low wages, long hours, and extreme pressure to fill passenger quotas.

The poor quality of service caused anger among riders, but it was the chaotic and often dangerous traffic in congested urban areas that drew public attention (Silva Ardila 2016). While there was public pressure to resolve the situation, powerful stakeholders – including bus operators, permit owners, and local politicians and public servants – involved in these quasi-monopolistic franchises had an incentive to maintain the status quo, as it offered a steady income stream. The problem of

concessionary bus transportation was discussed publicly for more than three decades, but reforms were consistently obstructed by elites who were profiting from the high demand for transportation solutions to everyday needs. Public policy was constantly obstructed by elite groups who were profiting from the public's basic need for transportation services (Silva Ardila 2016).

In 1991, the landscape of transportation services began to change, in large part due to transformational political events: in that year, a newly ratified Constitution modified the territorial organization of Colombian provinces, granting increased autonomy to municipalities. In this new scenario, local governments – increasingly exposed to public scrutiny – experienced intense pressure to reform mobility infrastructures. Owners of transportation concessions also recognized that, if they hoped to retain access to profitable routes, they would have to accept new forms of service allocation (Ardila Gómez 2004). In this case, political transformations created the conditions for new constellations of transportation policies. The political changes did not, however, immediately displace vested interests (Silva Ardila 2016). Instead, political and economic elites turned to techno-infrastructural solutions to address two of the primary areas causing popular anger: badly outdated buses and congested arterial roads in downtown areas.

Resulting from more than a decade of debate about design and policy, and inaugurated in December 1999, *Transmilenio*[2] is a trunk-based bus system[3] functioning with articulated buses that increase operating capacity. Using dedicated lanes that reduce overall congestion, *Transmilenio* dramatically improved average commuting times in the city. While the design innovations – trunk-based systems and dedicated transit lanes – are globally recognized transportation models, perhaps the most important improvement was the upgrading of a large proportion of the urban bus fleet, which won widespread approval from local citizens. The World Bank reported this labeled "best practice" as "following pioneering experiences in Curitiba and São Paulo and a recent successful implementation of the *Transmilenio* system in Bogotá, Colombia, the bus based rapid transit (BRT) mode has emerged as a great hope for cities interested in high-quality public transport services at a moderate level of capital and operating costs (Hidalgo/Graftieaux n.d.). In Bogotá, this widely implemented techno-infrastructural approach solved existing problems of congestion, pollution, and ease of access *without* taking control away from the private companies who were largely responsible for the mess in the first place

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2   *Transmilenio* officially designates the publicly owned regulatory agency of Bogotá, but it is commonly used to mean the whole transportation system, which includes both the material infrastructure (which is public) and the private bus operators.

3   A Bus Rapid Transit (BRT) or a trunk-based system uses large scale buses – sometimes bi-articulated or tri-articulated – with a dedicated right-of-way and off-boarding fare collection system similar to metro systems. BRT sometimes use a platform level boarding system that forces the use of stations to board the buses.

(Ardila Gómez 2004). While existing permit and concession owners had to adjust their business model, they could retain control of their companies. The new urban transportation system replaced large parts of the previously existing material infrastructure. It was, however, built upon the already existing networks of actors and stakeholders. *Transmilenio* may not have addressed the issue of the influence of special interests on politics at all scales, but it did largely resolve the most pressing mobility challenges facing residents of this city of more than seven million residents.[4]

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4   *Transmilenio* ultimately modified but did not replace the business model that allowed the majority of previous owners to retain their control public transportation. It did, however, also create a new institutional capacity via the creation of a publicly owned regulatory, planning and management company. While this new urban transportation system discarded most of the previously existing material infrastructure, it was constructed on top of existing networks of actors and stakeholders. This was a solution that was adequate in terms of time, context and interests and constraints, but not an ideal solution.

Figure 2: Transmilenio at a downtown intersection where tramways were asphalted in the 1950 (Silva Ardila).

Initially, at least, it appeared that Transmilenio's impact would be relatively limited in scope, constrained by the influence of other interests. The policy superficially transformed the transportation service by substantially improving service quality for a more engaged citizenship while retaining most of the economic structures that had contributed to monopolistic control of urban transportation.

Nevertheless, the developments in the last 20 years suggest that large scale centralized planning strategies have the potential to generate systemic disruptions which profoundly transform deeply entrenched and organically developed infrastructures: the success of the single bifurcated service line triggered continual expansion, with seven lines now servicing once peripheral neighborhoods and after years of negotiations with remaining "traditional system" providers, a comprehensive system was created under the label of SITP (Sistema Integrado de Transporte Público) (Hidalgo/King 2014). The professionalization of urban planning and transportation policy in Bogotá can be directly traced to the success of Transmilenio. But this innovative system also modified behavioral patterns in the city in ways that have led to a reorganization of the urban mobility patterns that service the new bus rapid corridors: novel forms of transportation such as pedicabs, mototaxis, and collective taxis or vans emerged in different nodes of the urban landscape to facilitate access to the central transportation corridors (Mejía-Dugand et al. 2013). These adaptations were entirely unanticipated by transportation designers, but they are another manifestation of the urban dualism that is shaping cities like Bogotá over the long-term. Urban dualism is defined by continual adaptations of the urban form. As such, it serves to create urban resilience, while also being evidence of the resilience of the urban form.

Mexico City: David vs. Goliath

When Mexico City inaugurated its rail-based Metro system in 1969, it represented a huge investment in the potential for transportation infrastructure to generate urban transformation. Metro service, though, was never enough to satisfy the mobility needs of the city's rapidly growing population, and even as the municipal authorities attempted to expand services, alternative transportation solutions – the ubiquitous VW Beatle taxi, an expanded network of private buses, and private automobiles – grew across the city. By the 2000s, Mexico City was a huge urban agglomeration with a wide range of transportation alternatives, but it was still facing a profound urban mobility crisis (Gilbert 1996; Montoya 2006).

The geographies of mobility in Mexico City also, though, very clearly marked the city's extreme economic inequalities. City residents literally moved across space in two distinct vertical planes. Low-income groups and vulnerable urban dwellers travelled on the surface on buses and underground in the Metro, while those who could afford private cars traversed the city using the stunning urban elevated Periférico Highway – a "*segundo piso*" or "second floor" constructed since 2003 that allowed them to use a 23 kilometer second story highway on top of a surface highway to travel high above the congested surface arteries. In the 1980s, urban transportation systems in Mexico City became a visible manifestation of the historical divisions

between rich and poor (Rodríguez López/Navarro Benítez 1999). Two examples suggest how transportation in this emerging mega-city can help us to understand the dynamic processes that underpin urban dualism: Bus Rapid Transit (BRT) and bicycle infrastructure. While it is not possible to discuss these examples in depth in the present chapter, I do want to briefly discuss a couple of elements that show how allegedly distinct formal and informal infrastructures and practices in fact emerge in tandem.

The implementation of a BRT in Mexico City is a clear example of the way that policy diffusion works: because of the triumphal narratives emerging out of Bogotá, BRT-policies rapidly achieved a worldwide recognition as an urban best-practice that could be easily replicated in diverse global settings (Wood 2015; Silva Ardila 2016, 2020; Montero 2017). In Mexico City, *Metrobus* adapted the "Bogotá model" by using the BRT corridors as a complement to, and feeder for, the existing metro lines. Rather than functioning as primary arteries across the city, the *Metrobus* provided enhanced access to the Metro in a way that was similar to the ways that alternative transportation services like collective taxis brought riders to the *Transmilenio* in Bogotá. Results varied during the following years and the model slowly adapted to the conditions of Mexico City. But for the purposes of this chapter, I want to highlight one unexpected product of the new system which emerged when the construction of BRT corridors created new segregation spaces for urban mobility.

The premise of the BRT system is a simple one – create dedicated lanes for buses which stop at regular loading platforms at scheduled times in order to take on passengers in the most efficient way. The advantages of the BRT are many. The dedicated lanes reduce braking times which grow asymptotically according to the number of vehicles, mitigate "bunching", and minimize lane changing. The relative simplicity of BRT is one of the reasons it is so easy to replicate and is so effective at speeding transit times and reducing traffic congestion. And as transportation engineers have demonstrated through congestion studies, BRT does in substantial measure realize these goals (Mejía Dugand et al. 2013).

What is surprising, though, is the way that the transport ecology adapted to reduced congestion. Those without cars take the metro if it goes near their destination, but otherwise rely on buses or collective taxis. In Mexico City, though, middle and upper-income individuals who owned or could afford to purchase a car responded to reduced congestion by driving more. In other words, more efficient public transit in Mexico City incentivized a substantial segment of individual users – those with the financial means to own cars – to drive in increasing numbers. Now heavily congested avenues provided specific lanes to the use of public transport, thereby creating spaces for more individual automobiles in the remaining lanes. This increased the average speed in the corridors but diminishes the irrigation possibility of the system which at the end affects the most vulnerable

making their commute more expensive due to the financial and physical cost of reaching the corridors. The real problem in Mexico City was rising car ownership. And as Rowland and Gordon have shown, when "people own a car, they use it" (1996: 112). Congestion and pollution remain at increased levels despite more sustainable transportation alternatives.

Increased car traffic also made it more difficult for pedestrians to navigate an increasingly car-centered urban environment: more cars traveling at higher speeds now meant that pedestrians had to cross at designated crossings rather than finding a path through slow moving autos and buses. This problem was amplified by the fact that dedicated bus lanes are separated from other traffic by a concrete barrier, which means that pedestrians either have to cross streets at designated crossing points or climb over a small wall. In some cities – Berlin or Munich, for example – this might not have changed mobility in any noticeable way. But in Latin American cities, where pedestrians regularly share roads with cars, motorcycles, trucks and buses, this constituted a major change in urban rhythms. BRT in Mexico City was a public solution based on global best practices, but it generated a host of place-specific problems. These problems, in turn, led to another major public intervention, this one, aimed at transit on two wheels.

Figure 3: Contesting urban transportation spaces (Silva Ardila).

Cycling is hardly new to Latin American cities and has long been a means of transportation for the urban poor, and a cheap way of moving goods around the

city. During the early 2000s – as city planners were introducing the BRT system – urban policy designers simultaneously adopted an ambitious policy to enhance biking infrastructure. However, with a vast increase in bike lanes across the city during the last ten years – and a public relations campaign aimed at highlighting the health, environmental, and aesthetic benefits of cyclo-mobility – bicycling has become an increasingly popular way for some middle and upper-middle class urbanites to travel the city. Of course, this is part of a larger global trend towards a certain brand of metropolitan citizenship. Because it is relatively new in Mexico City, though, "bicycle culture" has generated tensions between drivers who are used to "owning the road", and cyclists who are staking claims to urban space. As the city introduced bike lanes onto major arterial roads, neighborhood ways, and boulevards, these spaces became a new topography of conflict between combustion-based commuters and human-powered alternatives.

These conflicts take on a particular dynamic in the present case because, unlike projects in cities like New York, which was championed by Citibank, or the for-profit bike-sharing ventures of companies like Jump (owned by Uber), the Mexico City ECOBICI initiative does not focus on profitability nor does it target exclusively privileged areas. Mexico City's comprehensive plan means that sharing the road with bicyclists is not a predictable "inconvenience" confined to hip neighborhoods or tourist districts. It includes most of the metropolitan region, and affects most urban citizens, if only by changing customary ways of using the road. While the bike initiative may generate conflicts based on customary and new usages in the short term, there are good reasons to think that it will adapt and adjust in the future for better functionality. The inclusion of a large public asset (the bike fleet and the required technological equipment) and the creation of incentives for cyclo-mobility in the form of a state organized, publicly funded bike-share system, should be understood as adaptations to the unintended consequences of the BRT. In this case, ECOBICI complements the BRT by providing mobility access to the consolidated transportation corridors. And while these twin metropolitan strategies are clearly informed by urban managers' desire to provide a globally recognized brand of urban amenity, it is also very intentionally focused on reducing the vulnerability of low-income populations who have been isolated by changing urban spatial practices.

All the urban adaptations to mobility poverty we have seen so far – the "private" solutions in Buenos Aires; the public strategy that left private interests in place in Bogotá; and the public-public approach to transit in Mexico City – can be seen to produce ancillary challenges which, in turn, force adaptation. In the case of Medellín, directly below, we see an extremely interesting alternative – one in which the politics and land use practices of urban elites *follows from and builds upon* the spatial appropriations of the most vulnerable citizens. While the danger of "capture" by purely economic interests is possible, as shown by Marcela López's chapter in this

volume, my own research suggests that, if the rights of access to urban space of the city's most vulnerable residents can be protected by legal mechanisms, this need not become a case of the rich taking over spaces that were urbanized by the poor.

Medellín: Wiring the Fragmented City

As we have already seen in Marcela López's contribution to this volume, Medellín has come to symbolize urban resilience on a global stage. Indeed, the UN Hub associated with urban resilience is now called the Medellín Collaboration for Urban Resilience (MCUR) (UN-Habitat n.d). Some critics suggest that this resilience narrative is simply good branding, pointing out that violence and inequality persist in spite of the fact that Medellín is one of Colombia's richest and globally networked cities. These objections are not without merit, but it is worth remembering that – despite a small uptick in violence in recent years – homicide rates are down more than 95 per cent from their peak in the 1990s, and that economic development has generated upward mobility for hundreds of thousands of people. The Medellín case offers us a dramatic view not just of tensions within resilience discourse, but also of the urban dualism that is an important characteristic of the cities explored in this chapter. From almost any vantage point in this city that sprawls across a steep valley, it is possible to observe the ways that the "formal" and "informal" city co-produce the urban form. Indeed, the city as it exists today was shaped in powerful ways by the internal violence – drug cartel violence, paramilitary organizations, rebel armies – that displaced so many of the Colombians who eventually moved to Medellín. It is understandable, then, that advocates of resilience-based development point to Medellín as a city that experienced and, in many ways, overcame a profound urban crisis. By focusing on the urban dualism, we can better see *how* the city and its residents have managed to "be(come) resilient" in the face of enormous challenges.[5] What follows is a brief discussion of a set of innovative transportation policies centered on the aerial cable cars, and the ways that these have shaped social and economic relations in the city, enhanced many of those attributes that are associated with urban resilience, and created an easily replicated best-practices model for urban integration.

The aerial cable cars were part of larger strategy that aimed to use municipal financial resources and institutions to reduce violence and create economic opportunities. Here, state intervention was seen as the key to reaching urban locations

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5   Without romanticizing Medellín's transformation in recent decades – one that can be traced to constitutional reforms in 1991 – it is clear that the city is less violent, better prepared for environmental disruptions, and more accessible to its most vulnerable citizens.

and populations that had never before been the target of public, collective, or government initiatives. As in the case of the *Transmilenio* in Bogotá, new political forces that were empowered by the constitutional reform of 1991 began to manifest themselves in metropolitan politics in the early 2000s. In the case of Medellín, though, new democratic initiatives and transparent programs directly challenged entrenched corruption and vested interests in ways that, in Bogotá, they were unable to do. Later these successful policies were theoretically framed under the concept of Social Urbanism (Montoya Restrepo 2014; Leite et al. 2020). Multiple projects were designed and implemented attempting to use public resources to enhance the social fabric in a fragmented city. In Medellín, the fragmented materiality of the city was the result not of a catastrophe or an economic or social crisis, but a slow historical process that has seen elites fracturing urban space to create enclaves and zones of distinction. Indeed, local elites have been building their segregated spaces since the 19th century, when massification happened without control, regulation, or political contestation (González 2010). In Medellín, fragmentation existed by default.

In Medellín, low-income urban dwellers, mostly displaced rural populations, learned urban life on their own. They built their own houses, created their own public spaces, connected illicitly to public utilities networks, and created their own transportation systems. During the 1950s and 60s, the Medellín of the vulnerable was built at their own risk with little if any state intervention. In this context – rapid population expansion with little state involvement in planning or infrastructure development – resilience capacities developed on an individual basis that was slowly integrated into the city as part of a long-term process of urban consolidation. Here, the topography represented a particular challenge: because steep hillsides that were difficult to access were the only available land near the urban center, they were a predictable – and predictably difficult – site for land occupation by vulnerable groups. In many of these areas, "walking home" could better be described as hiking. And due to a lack of transportation service providers and limited financial resources, residents of these neighborhoods found themselves challenged not just by their social and economic marginality, but the urban topography. Ad hoc solutions did, of course, emerge, including motorcycles, private vehicles for collective use, and vans and small buses. In a vacuum left by municipal inaction, citizens had to find ways to navigate the steep slopes that separated their homes from places of employment, everyday consumption, and leisure (Dávila 2013).

Figure 4: First cable line in Medellín. San Antonio. The city has built five additional lines in the coming year (Silva Ardila).

During the first yeas of the 20th century, new political relationships between metropolitan elites and vulnerable citizens began to emerge, and in this context, urban managers turned to an existing technology – used primarily for winter sports or summer tourism – to connect peripheral urban dwellers with core urban localities. Medellín hung wires across its mountains to connect these vulnerable citizens with a Metro system that traversed the city center. This was not, however, just a transportation infrastructure. Indeed, each cable car station was designed to connect with newly built urban amenities like public libraries or parks. Because

of the spatial logic of this aerial infrastructure, these new institutions were built on the urban peripheries. Designed, in many cases, by internationally recognized architects, these stations function as points in a changing urban geography – one where the city's most vulnerable residents are able to access the same public resources as more privileged residents of the urban core. Enhancing mobility and reducing the cost of accessing urban goods, this new transportation model has mitigated some of the many vulnerabilities of Medellín's poorest residents. First slums, next public infrastructure (cable cars, libraries, parks), and later tourists and selfies – this process highlights how a symbiotic relationship between the poor and elites has defined the urban cartography.

Final thoughts

Resilience narratives and practices in cities in Latin America are defined by their local contexts and the specific configurations of urban landscapes. The World Bank report titled "Cities in Transition" stated that "in many rapidly growing cities in the poorest countries, weak local governments have been unable to perform even minimal functions, so that households and informal institutions have become the main providers of infrastructure, housing, and social services. While this solution meets some essential needs, it has also resulted in fragmented urban economies" (World Bank 2000: 7). From many urbanists, the fragmented urban realities have been viewed through an analytical framework that is structured by a binary understanding of distinct kinds of urban space. This analytic can be referred to as the formal/informal model.

The model suggests that there is a spatial segregation within cities, and in most cases, this is easy to observe. Wealthy urban areas often offer a stark contrast to precarious dwellings and neighborhoods. This model also, though, tends to suggest that the social and economic processes of exclusion mean that formal and informal processes occur independently of – and with little connection to – one another. In some cases, this has led to the mistaken view that the "informal economy" is a parallel economy that has little to contribute to the social and commercial development of Latin American cities. In this chapter, I have tried to advance an alternative view. By using the concept of Urban Dualism, I try to show that these two allegedly distinctive spheres are in fact deeply entangled and mutually dependent. This does not, in any way, diminish the fact that there are extreme inequalities in Latin American urban landscapes. It is simply to show that, while these inequalities may create spaces of exclusion, they are unable to stop the dynamic process of interaction between different urban actors – including those who are the most precarious. Long-term historical processes have created a symbiotic (though often unhealthy) relationship between different sets of urban actors who despite their

differences, depend on one another. In this view, so-called informal economic and social practices are not independent from the formal city. Instead, they are a fundamental element of the city, and must be part of any attempt to understand urban dynamics.

Urban dualism has profoundly shaped the governance and political culture of cities in Latin America, and ones of the reasons it is so deeply embedded is because it contributes to a plasticity that tends to generate social or economic mechanisms that help to stabilize a system that is experiencing hazards or risks. To a certain extent, Latin American cities combine both sides of Ash Amin´s coin: technologies and governmental action on one side, and active citizens on the other. In this chapter I argued that urban dualism of cities in Latin America can provide a theoretical framework to better understand why urban areas in the region display such strong resilience capacities despite the weaknesses of their institutional architecture and governance structure. For all the direct and indirect complications that this dualism creates, the discussion of urban transportation solutions in four Latin American cities shows how urban dualism materializes different possibilities for resilience in the face of large and small hazards.

Transportation systems that facilitate the daily movements of people and things in the city depend both on technical and material infrastructures, but I would suggest that designing, planning and developing effective mobility solutions is not possible without a good understanding of the urban dualism of Latin American metropoles. Contrary to the widely held view, urban dualism shows that formal and informal systems are not possible to separate: instead, they are profoundly intermingled, adapting to one another according to needs and demands, but also to the interests and power capacities of different urban actors. Formal systems such as rail-based metro systems, Bus Rapid Transit systems, Bike-sharing systems or cable car lines interact with the untidy emergence of informal means such as "remises", bus services or motorcycle and bike taxis. This interaction is a clear form of dualism and a relevant case for the study of transportation and its relation with urban resilience. The central argument is that these informal responses have worked as a buffer for risks in urban areas in Latin America, not only with regard to transportation but many dimensions of urban life.

References

Abramo, Pedro (2003): A Cidade da Informalidade. O Desafio das Cidades Latina-Americanas, Rio de Janeiro: Sete Letras.

Acevedo, J. (1990): „Una Política Integral de Transporte para Bogotá." In: Coyuntura Social 2, mayo, pp. 117-128.

Almandoz, Arturo (2002): "Urbanization and Urbanism in Latin America: From Haussmann to CIAM." In: Id. (ed.), Planning Latin America's Capital Cities, 1850-1950, London: Routledge, pp. 13-44.

Almandoz, Arturo (2013a): Modernización Urbana en América Latina. De las Grandes Aldeas a las Metrópolis Masificadas,. Santiago: Instituto de Estudios Urbanos y Territoriales (IEUT), Pontificia Universidad Católica (PUC) de Chile.

Almandoz, Arturo (2013b): "Industrialización, Urbanización y Modernización sin Desarrollo en la Latinoamérica del siglo XX". In: Isabel Duque Franco (ed.), Historiografía y Planificación Urbana en América Latina, Bogotá: Universidad Nacional de Colombia (UNC), Facultad de Ciencias Humanas, Departamento de Geografía, pp. 47–72.

Almandoz, Arturo (2014): Modernization, Urbanization and Development in Latin America, 1900s - 2000s, London: Routledge.

Amato, Peter W. (1970): "Elitism and Settlement Patterns in the Latin American City." In: Journal of the American Institute of Planners 36/2, pp. 96–105.

Amin, Ash (2014): "Epilogue: The Machinery of Urban Resilience." In: Social Sciences 3/3, pp. 308–13.

Aprile-Gniset, Jacques (1992): La Ciudad Colombiana: Siglo XIX y Siglo XX (Vol. 2), Bogotá: Banco Popular.

Ardila Gómez, Arturo (2004): Transit Planning in Curitiba and Bogotá: Roles in Interaction, Risk, and Change. Unpublished Ph.D. Dissertation, Massachusetts Institute of Technology.

Blanco, Jorge (2010): "Notas sobre la relación transporte-territorio: implicancias para la planificación y una propuesta de agenda." In: Revista Transporte y Territorio 3, pp. 172-190.

Caldeira, Teresa (1996): "Fortified Enclaves: The New Urban Segregation." In: Public Culture 8/2, pp. 303-328.

Caldeira, Teresa (2017): "Peripheral Urbanization: Autoconstruction, Transversal Logics, and Politics in Cities of the Global South." In: Environment and Planning D – Society and Space, 35/1: pp. 3-20.

Carmagnani, Marcello (2004): El otro Occidente. América Latina desde la invasión europea hasta la globalización, México: El Colegio de México, Fideicomiso Historia de las Américas, Fondo de Cultura Económica (FCE).

Castells, Manuel (ed.) (1973): Imperialismo y urbanización en América Latina, Barcelona: Gustavo Gili.

Castillo de Herrera, Mercedes (ed.) (2009): Procesos Urbanos Informales y Territorio: Ensayos en Torno a la Construcción de Sociedad, Territorio y Ciudad, Bogotá: Universidad Nacional de Colombia.

Cerrutti, Marcela/Bertoncello, Rodolfo (2003): Urbanization and Internal Migration Patterns in Latin America. Johannesburg: Centro de Estudios de Población Argentin.

CEPAL (Economic Commision for Latin America and the Caribbean) (1963): La urbanización en América Latina. Resultados de un trabajo sobre el terreno acerca de las condiciones de vida de un sector urbano, Mar del Plata, Argentina: Cepal.

Clichevsky, Nora (2000): Informalidad y Segregación Urbana en América Latina: Una Aproximación, Santiago de Chile: CEPAL.

Dávila, Julio D. (ed.) (2013): Urban Mobility and Poverty: Lessons from Medellín and Soacha, Colombia, London: DPU, UCL and Universidad Nacional de Colombia.

Davis, Diane (1994): Urban Leviathan: Mexico City in the Twentieth Century, Philadelphia, PA: Temple University Press.

de Urbina González, Amparo/Zambrano Pantoja, Fabio (2009): „Impacto de "El Bogotazo" en las Actividades Residenciales y los Servicios de Alto Rango en el Centro Histórico de Bogotá: Estudio de Caso." In: Dearq. Revista de Arquitectura, 5, pp. 152-165.

Evans, Peter/Sewell Jr., William H. (2013): "Neoliberalism: Policy Regimes, International Regimes, and Social Effects." In: Michèle Lamont/Peter A.Hall (eds.) (2013), Social Resilience in the Neoliberal Era, Cambridge: Cambridge University Press.

Figueroa, Oscar (2005): "Transporte Urbano y Globalización: Políticas y Efectos En América Latina." In: EURE (Santiago) 31/94, pp. 41–53.

Gilbert, Alan (ed.) (1996): The Mega-City in Latin America, Tokyo/New York/Paris: United Nations University Press.

Gilbert, Alan. (1998): The Latin American City, New York: Monthly Review Press.

Greenfield, Gerald Michael (1994): Latin American Urbanization: Historical Profile of Major Cities, Santa Barbara: ABC-Clio.

González, Luis Fernando (2010): Ciudad y Arquitectura Urbana en Colombia 1980-2010, Medellín: Universidad de Antioquia.

Gutiérrez, Andrea (2012): „Gestión Metropolitana del Transporte Colectivo en Buenos Aires: Falsos Dilemas y Perspectivas." In: Revista Iberoamericana de Urbanismo 8, pp. 89-103.

Hidalgo, Dario/Graftieaux, Pierre (n.d.): "A Critical Look at Major Bus Improvements in Latin America and Asia: Case Study TransMileno, Bogotá, Colombia". Washington D.C.: World Bank (http://siteresources.worldbank.org/INTURBANTRANSPORT/Resources/Hidalgo-Graftieaux-BOGOTA.pdf).

Hidalgo, Dario/King, Robin (2014): „Public Transport Integration in Bogotá and Cali, Colombia: Facing Transition From Semi-Deregulated Services to Full Regulation Citywide." In: Research in Transportation Economics 48, pp. 166-175.

Kralich, Susana (2005): „Crisis Urbana y Transporte Alternativo: La Opción Remise." In: Scripta Nova: Revista Electrónica de Geografía y Ciencias Sociales 9.

Lamont, Michèle/Hall, Peter A. (eds.) (2013): Social Resilience in the Neoliberal Era, Cambridge: Cambridge University Press.

Leite, Carlos/Acosta, Claudia/Militelli, Fernanda/Jajamovich, Guillermo/Wilderom, Mariana/Bonduki, Nabil/Somekh, Nadia/Herling, Tereza (2020): "Social Urbanism in Latin America. Innovative Experiences in Latin American Cities". In: Id. (eds), Social Urbanism in Latin America, Cham: Springer, pp. 3-21.

Mazuera, Fernando (1972): Cuento mi Vida, Bogotá: Canal Ramírez-Antares.

Mejía-Dugand, Santiago/Hielm, Olof/Baas, Leo/ Rios, Ramiro Alberto (2013): "Lessons from the Spread of Bus Rapid Transit in Latin America." In: Journal of Cleaner Production 50, pp. 82–90.

Mejía Pavony, Germán (2013): La Aventura Urbana de América Latina, London: Taurus.

Montero, Sergio (2017): "Study Tours and Inter-City Policy Learning: Mobilizing Bogotá's Transportation Policies in Guadalajara." In: Environment and Planning A 49/2, pp. 332–350.

Montoya, Jhon Williams (2006): Cambio Urbano y Evolución Discursiva en el Análisis de la Ciudad Latinoamericana: De la Dependencia a la Globalización, Bogotá: Universidad Nacional de Colombia (UNC).

Montoya Restrepo, Nataly (2014): "Urbanismo Social en Medellín: Una Aproximación a Partir de la Utilización Estratégica de los Derechos." In: Estudios Políticos 45, pp. 205-222.

Niño Murcia, Carlos/Reina Mendoza, Sandra (2010): La Carrera de la Modernidad: Construcción de La Carrera Décima, Bogotá, 1945-1960, Bogotá: Instituto Distrital de Patrimonio Cultural.

Rodríguez López, Jesús/Navarro Ramirez, Bernando (1999): El Transporte Urbano de Pasajeros de la Ciudad de México en el Siglo XX, Ciudad de México: Universidad Nacional Autónoma de México.

Rowland, Allison/Gordon, Peter (1996): "Mexico City: No Longer a Leviathan?" In: Alan Gilbert (ed), The Mega-City in Latin America, Tokyo/New York/Paris: United Nations University Press.

Roy, Ananya (2009): „Why India Cannot Plan Its Cities: Informality, Insurgence and the Idiom of Urbanization." In: Planning Theory 8/1, pp. 76-87.

Silva Ardila, Diego (2016): Policy Mobilities and Urban Change: The Case of Bus Rapid Transit in Colombia. Doctoral Thesis. Chicago: University of Illinois.

Silva Ardila, Diego (2020): "Global Policies for Moving Cities: The Role of Think Tanks in the Proliferation of Bus Rapid Transit Systems in Latin America and Worldwide." In: Policy and Society 39, pp. 70–90.

UN-Habitat (n.d.): "Medellín Collaboration for Urban Resilience" (http://urbanresiliencehub.org/medellin-colaboration/)

Vale, Lawrence/Campanella, Thomas J. (eds.) (2005); The Resilient City: How Modern Cities Recover from Disaster, Oxford: Oxford University Press.

Wood, Astrid (2015): "The Politics of Policy Circulation: Unpacking the Relationship between South African and South American Cities in the Adoption of Bus Rapid Transit." In: Antipode 47/4, pp. 1062–1079.

World Bank (2000): Cities in Transition: World Bank Urban and Local Government Strategy, Washington D.C.: self published.

Zhang, Xiaoling/Li, Huan (2018): "Urban Resilience and Urban Sustainability: What We Know and What Do Not Know?" In: Cities 72/A, pp. 141–148.

IV)
Epilogue

Urban Resilience Has a History – And a Future

Timothy Moss

As I compose the epilogue to this volume, in late January 2020, the world is steeling itself for a global epidemic of the Corona virus. What originated just a few weeks earlier in a food market in the city of Wuhan, China, has already spread across continents on the coattails of globalized travel. People in Wuhan, a megacity of 11 million inhabitants, are not permitted to leave, with all transport links suspended. They are effectively being held in collective quarantine in a drastic effort to stem the spread of the disease. Meanwhile, in other countries around the world, health officials and politicians are reassuring their citizens that contingency plans are in place to deal with a potential pandemic. All the same, they are calling on people to be vigilant and take the necessary precautionary measures to minimize the risk of contagion. The Corona virus hit the news headlines just a fortnight after these were dominated by scenes from some of the worst bushfires ever experienced by Australia. Extending over an area of some 10 million hectares, these fires have devastated forests, wildlife and homes, especially in the states of New South Wales and Victoria. The smoke from the fires made Canberra and Sydney temporarily the most air-polluted cities in the world. Reporting in the media focused on the heroism of the fire-fighters, the resilience of local communities and criticism of the prime minister's nonchalant response. The crisis confronting the emergency services in Australia was compounded subsequently by torrential rainfall and major flooding in many of the areas damaged by fire.

These two life-threatening events, happening so close together in time, can tell us a lot about the practices, policies and discourses of resilience that have come to characterize our responses to vulnerabilities today. Such crises, we are being told by experts, are likely to become more frequent, more intense, more widespread and more unpredictable in the future. Climate change will make extreme weather events – such as flooding, bushfires and drought – increasingly common, occurring in places rarely affected in the past. Pandemics will spread faster, following the highly mobile human race into any corner of the globe. Terrorist attacks are targeting not only major transport hubs, but also pubs, concert venues, places of worship and open streets. The message, in essence, is that no place on the planet is free from the risk of some kind of shock event. The consequence is that we all –

citizens, local communities, businesses and governments – need to accept this risk as the 'new normal', taking precautions to minimize the occurrence and damage of such an event whilst acknowledging that no level of preparation will ever be able to eradicate the possibility of one happening. What both the Chinese and Australian cases illustrate is that citizens cannot rely on the state to address these challenges, but are being expected to develop resilience responses of their own, whether individually or collectively.

In the public debate on crisis resilience, cities are treated as prominent entities. On the one hand, cities are seen as especially vulnerable to shocks and stresses. By virtue of their population density and high level of interpersonal contact, they face heightened risks from infectious diseases. Their built infrastructures, being extensive and costly, are particularly vulnerable to damage from extreme weather events. Places where many people come together to enjoy urban life are favored sites for terrorist attacks. On the other hand, cities are more likely to possess the human capacity, financial resources and local expertise required to avert or mitigate a crisis. They may well have units dedicated to crisis management, are likely to be a high priority in national contingency plans for critical infrastructures and generally have public health services better than the national average. For these reasons, cities are regarded as a pioneer locale of resilience thinking and action. The resilient cities programs of the Bloomberg and Rockefeller Foundations, the World Bank and other development organizations are testimony to the significance accorded to cities in the global response to crises.

Many urban planners, managers and architects are rising to the challenge and designing strategies, scenarios and buildings that are meant to render cities more resilient to disturbance or disaster. As several chapters in this book illustrate, resilience has a powerful appeal to practitioners and academics dedicated to organizing and structuring urban society. For urban planners, frustrated with their limited ability to shape a city in our globalized, market-driven world, planning for potential crises can lend a new purpose to the profession. Architects and civil engineers have, in resilience thinking, a novel rationale for reordering the city in its myriad material forms. Building flood-proof homes or providing back-ups for a power outage are examples of the 'can-do' attitude that pervades much of this technical-managerial expertise.

The confident manner in which resilience has been embraced by many urban managers has alarmed other commentators. The literature on urban resilience is rife with critiques of the concept and the practice, as many chapters in this volume testify. For some critics, resilience is an instrument of neo-liberalism, generating a permanent sense of crisis to justify measures designed to keep the existing system of market-based governance operative. The resilience debate, from this perspective, deflects attention away from deeper, systemic crises of the capitalist political economy. Others have pointed out how vulnerability to crises affects different people

in different ways, often exacerbating inequalities of geography, social class, race or gender. Vulnerabilities, they argue, rarely come alone. An environmental crisis, such as a drought event, will often compound the existing economic and social vulnerabilities of disadvantaged communities.

This critical literature has been hugely valuable in unpacking the normative meanings, market logics, techno-managerial solutionism and elitist thinking underpinning so many urban resilience programs. In deconstructing the concept and the practice, this body of scholarship has proven highly effective, at least within the academy. It has proven less effective, however, in offering ways forward in dealing with the very real challenges encountered by cities today. Beyond calls for a radical overhaul of neo-liberal urbanism, critics of resilience offer little in the way of orientation for urban citizens, communities and governments struggling to cope with their real and perceived vulnerability to multiple threats.

This volume makes the case for revaluing urban resilience. Whilst it acknowledges and, indeed, embraces many of the criticisms voiced above, the general tenor of the book is not to dismiss the concept of resilience, but to explore new ways of interpreting it that can provide both critical reflection and constructive orientation. The chapters in this book investigate the multiple histories, varied geographies and contested politics of urban resilience in order to reveal how far resilience does, or can, work as an urban practice as well as a development discourse.

Real-Life Urban Resilience in Past and Present

Looking across the chapters of this book, key messages emerge that contribute to this critical, yet constructive reappraisal of urban resilience. They all point to the value to be derived from taking a closer look at resilience practices, strategies and discourses at work in particular spatial-temporal contexts. Although strongly empirical in orientation, they all to some degree question the way resilience is conceptualized in the literature. In doing so, they make a powerful case for the value of inductive approaches to resilience research.

The most striking contribution of the book is, undoubtedly, to historicize urban resilience. Revealing how resilience has a history – as an urban strategy, as well as an everyday practice – is illuminating for a debate where it is widely regarded as a very contemporary phenomenon. The rich selection of historical cases in this volume challenge the narrow 'presentist' perspective of much resilience research. As Sönke Kunkel argues in his chapter, resilience may be a modern buzzword, but it is not a new way of thinking. He traces the historical roots of the resilience discourse well beyond awareness of global ecological crises to the logics of cold war risk management. These, he argues, were reproduced in strategies of urban disaster prevention that reflected the techno-scientific responses of the 1960s. Other aut-

hors look to the aftermath of wartime devastation as a source of resilience planning and practice. Koenraad Danneels, Bruno Notteboom and Greet De Block describe how the destruction of Belgian cities during the First World War inspired landscape architects to reimagine the city as an ecosystem in order to render it more resilient to crisis events. The use of socio-biological metaphors then and throughout the twentieth century points to interesting predecessors of the more familiar social-ecological framing of resilience today, as well as the influence of natural science perspectives on urban reconstruction. Ann Maudsley's chapter demonstrates how a different nature-based utopia inspired urban design in postwar Swedish towns within the Arctic Circle. Constructing buildings to withstand the shocks of extreme weather was an innovative plan that nevertheless failed, intriguingly owing to the involvement of Swedish oil companies. As Avi Sharma argues, resilience has a past not only as urban policy, but also as everyday practice. He uses the case of Berlin after the Second World War to describe personal strategies of survival and self-help in the face of food deprivation, housing shortage and inadequate clothing, interpreting these as forms of individual resilience in a crisis situation.

Besides histories of urban resilience, this book highlights the multiple geographies it can entail. On a straightforward level, the chapters cover a huge range of spatial contexts, with cases studies of cities in New Zealand, Germany, Colombia, Sweden and Belgium. Collectively, these pieces emphasize the huge importance of place in urban resilience. What counts as vulnerability in one locale may be treated very differently in another. Many of the chapters address unsung spaces of resilience. It is not the control rooms of urban operating systems or the hubs of critical infrastructures that feature in this book, but rather spaces where resilience emerges through close analysis. Some of the resilient practices documented – such as at community gardens in Christchurch after the earthquake or over car-washing in Medellín – are not even termed as such by those involved, but can nevertheless reveal a lot about coping under duress and uncertainty. What is also striking about the cases, from a spatial perspective, is the interaction of physical, political and social geographies. Each chapter addresses, explicitly or implicitly, socio-material associations that are distinctive of a particular urban setting. This is especially apparent in Marcela Lopez' piece on institutionalizing informal car-washing practices on the streets of Medellín, in which human and non-human elements are assembled to create resilience for the city's water supply, public water utility and car washers. Taking a spatially sensitive approach to resilience can also reveal overlapping crises in a single locale. This is evidenced in the chapters on post-war Berlin, where residents had to cope with physical, economic and political disruptions alike, and on Belgian cities, where wartime destruction combined to exacerbate existing challenges of urbanization and environmental degradation. As several of the chapters argue, it is the promise of resilience to tackle multiple vulnerabilities that contributes to its appeal today. At the same time, many of the

measures devised to enhance resilience reveal a degree of selectivity that belies this message of inclusivity. A case in point is the use of maps and urban plans to circumscribe the vulnerable, identifying – and thereby maligning – 'problem areas' of a city requiring remedial action.

The politics of urban resilience is a third dimension that emerges powerfully from many chapters of this book. Whose resilience is at stake is a question that always needs asking. This is a crucial point already familiar from critical research into urban resilience. We are now sensitive to the enrolment strategies underpinning many resilient cities programs and urban resilience strategies around the world, which claim commonality in policies and practices whilst privileging certain interests and approaches over others. What several chapters in this book suggest, though, is that dismissing urban resilience as a neoliberal ploy overlooks the empowerment that, in certain circumstances, can emerge through practices of resilience. Two examples stand out. The first is the Medellín case, in which the formalization of car-washing practices by the local water utility, in providing the car washers with contractual documentation, has helped strengthen their rights to employment and public services. The second is Andreas Wesener's piece on Christchurch, where community gardens became, after the earthquake, sites of post-trauma therapy offering mutual support for those affected. As this example illustrates, ancillary benefits of this kind often only become apparent in the longer term, once the immediate crisis has passed. At the same time, many authors of this book are keen to highlight the limits to resilience strategies. As the editors point out, some crises overwhelm the capacity of governments or communities to respond. We should never assume that resilience can be an effective response to every potential danger or uncertainty.

Futures for Urban Resilience Research

To conclude this epilogue, I make the case that resilience has not only a past worth exploring, but also a promising future in urban research. Reflecting on the contributions within this book and the wider debate on urban resilience, I draw out four pointers for a research agenda that takes contemporary debates forward – with the help of historical analysis.

Beyond 'presentism': The relative novelty of the term resilience implies that the phenomenon, too, is a feature of the contemporary world only. Much of the literature on resilience, whether supportive or critical, emphasizes the exceptionalism of modern crises. This 'presentist' focus discourages ventures into the history of resilience. There is no denying the specificity of temporal contexts or the particular severity of today's social-ecological crises. However, this is no reason to dismiss history as irrelevant to contemporary understandings of resilience. Looking to the

past can trace the roots and legacies of modern-day resilience. It can draw attention to the importance of spatial-temporal contexts in analyzing resilience. It can offer a corrective to simplistic trajectories of resilient thinking. It can reveal past forms of resilient thinking and action that, by virtue of their differences to the modern world, challenge our preconceptions. The first plea, therefore, is to do more to historicize resilience research.

Beyond 'eventism': Resilience research tends to focus on real or potential crisis events. It is the devastating flash-floods, large-scale fires, destructive terrorist attacks or sudden electricity grid failures that capture the attention of the media, governments and scientists alike. Resilience research, as a consequence, has a pronounced tendency towards 'eventism'. What is needed is more attention to the less visible, but no less impactful, vulnerabilities experienced as a result of structural or compounded disadvantages. These can be everyday existential challenges, such as securing a livelihood under duress, localized conflicts that fail to attract wide attention or alternatives to mainstream resilience strategies. Although often mundane and small in scale, these phenomena are widespread, making their overall impact profound. The second aspiration, therefore, is for more work on 'real-life' resilience happening below the radar of globally mediated crises.

Beyond 'essentialism': Resilience is not a given. Nor, for that matter, is vulnerability. Indeed, one person's resilience can be someone else's vulnerability. A dam built to redirect water to an urban water network – and thus render the city more resilient to drought events – could endanger the livelihood of farmers downstream dependent on that water for agricultural production. This example illustrates how measures introduced to improve the resilience of one aspect can reduce the resilience of another. This highlights the importance of treating resilience not only in a context-specific way, but also as a relational phenomenon. Resilience involves complex assemblages of human and non-human elements which are brought together – or fall apart – in particular spatial-temporal circumstances. Understanding how these diverse elements interact to create, destabilize or re-stabilize specific resilience configurations is key to getting beyond simplistic, normative notions of resilience as a desirable, benign status. The third strand of my proposed research agenda is, thus, about unpacking the relationality of urban resilience.

Beyond 'disciplining': This all calls for us to embrace multiple perspectives on resilience. Resilience can mean very different things in the hands (and minds) of different actors. We should not underestimate the degree to which resilience is socially constructed to conform to particular interests or assumptions. Resilience can also look very different depending on whether it is studied as a concept, as a policy or as a practice. The process of translating a resilience policy into urban practice can reveal major disjunctions, just as everyday forms of resilience can go unobserved by urban managers intent on making their city more resilient. As researchers, we need to be wary of interpretations of resilience – whether in the literature or in

the field – that claim to be universal. Wittingly or not, they represent an attempt to discipline us along a particular line of reasoning that, when analyzed closely, is often revealed to be selective. Consequently, we need to study who gets to determine meanings and measures of resilience in particular spatial-temporal settings. We need to explore ways in which those conventionally excluded or disregarded in debates on resilience can be included or considered, for they are often the most vulnerable groups in society. Finally, we need to unpack the disciplining work performed by academic disciplines. This means investigating how the natural sciences have framed the resilience discourse, how engineering sciences have given resilience material form and how the social sciences have focused on critique. Revealing some of these disciplinary divides and their legacies for research and policy could go a long way towards reinvigorating a concept and a practice that, given the state of the planet, are unlikely to go away in the foreseeable future.

Author Bios

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Liedtke, Florian, is a PhD candidate at the Institute for Sustainable Urbanism, Technische Universität Braunschweig, and holds degrees in architecture and historical urbanism. His academic work focuses on disaster resilience and urban reconstruction in Japan as well as on the urban morphology of Tokyo and Seoul. Since 2016, Florian has served as chairperson of the NGO German – Japanese Synergy Forum, which co-sponsors multidisciplinary summer schools in Japan, with a special focus on urban disaster resilience.

López, Marcela, is a geographer with an interdisciplinary background in urban and environmental studies, and an affiliated researcher at the Center for Metropolitan Studies. She received her PhD in geography at the Freie Universität Berlin (2016). Her research explores how social and ecological inequalities can be productively conceptualized and explained through contestations that emerge over the control and access over water resources. López is the founder of Contested Urban Waterscapes (contestedurbanwaterscapes.net), a platform, which promotes public dialogue and interdisciplinary exchange between scholars, social movements and public service providers to search for alternatives to reduce inequalities in access to water.

Maudsley, Ann, is a built environment researcher at ArkDes, Sweden's National Centre for Architecture and Design. She received her PhD in urban planning from the University of Melbourne (2015). Maudsley's research focuses on how attributes of urban form react to change. This research includes examining the imagined plans and designs of Arctic settlements, and the factors that have affected their sustainability and resilience. Maudsley's experience in research is coupled with teaching and work in practice in built environment fields. She has worked in the academic, public, cultural and non-profit sectors in Melbourne, London and Stockholm.

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Notteboom, Bruno, is an Associate Professor at the Faculty of Architecture of KU Leuven. His current research deals with the relationship between design, (ecolog-

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Sharma, Avi, is a Senior Research Fellow and Assistant Professor at the Center for Metropolitan Studies at the Technische Universität Berlin, where he works on topics in urban environmental history, migration and forced migration among other topics. Sharma is the author of numerous articles on topics including public health in Germany; the UN SDGs in historical context; postwar urban history; and urban environmental history. He is currently working on an urban environmental history of (refugee) camps as part of a DFG funded project (with Dorothee Brantz) on urban seasonality.

Silva Ardila, Diego, is a Professor of Urban Studies at the Universidad del Rosario, Bogotá, Colombia. Silva is the former deputy director of the Colombian National Statistical Office (DANE) and board president of the Colombian National Geographic Institute (IGAC). He is also an advisor for the Development Plan of Bucaramanga, a consultant for UN-Habitat, the Inter-American Development Bank, and the policy think-tank CEPEI. His current research interests focus on urban policy mobilities and metropolitan governance in Latin America.

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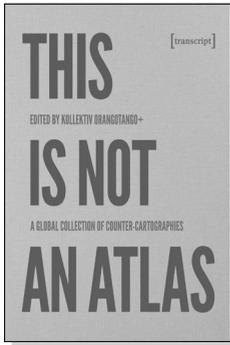
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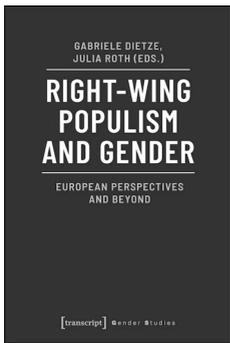
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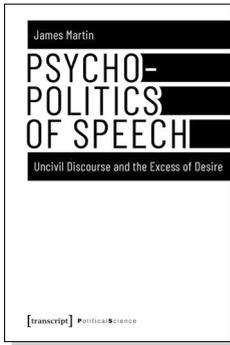
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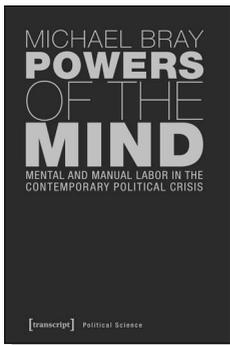
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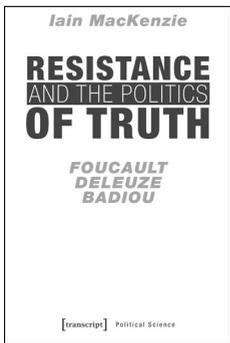
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