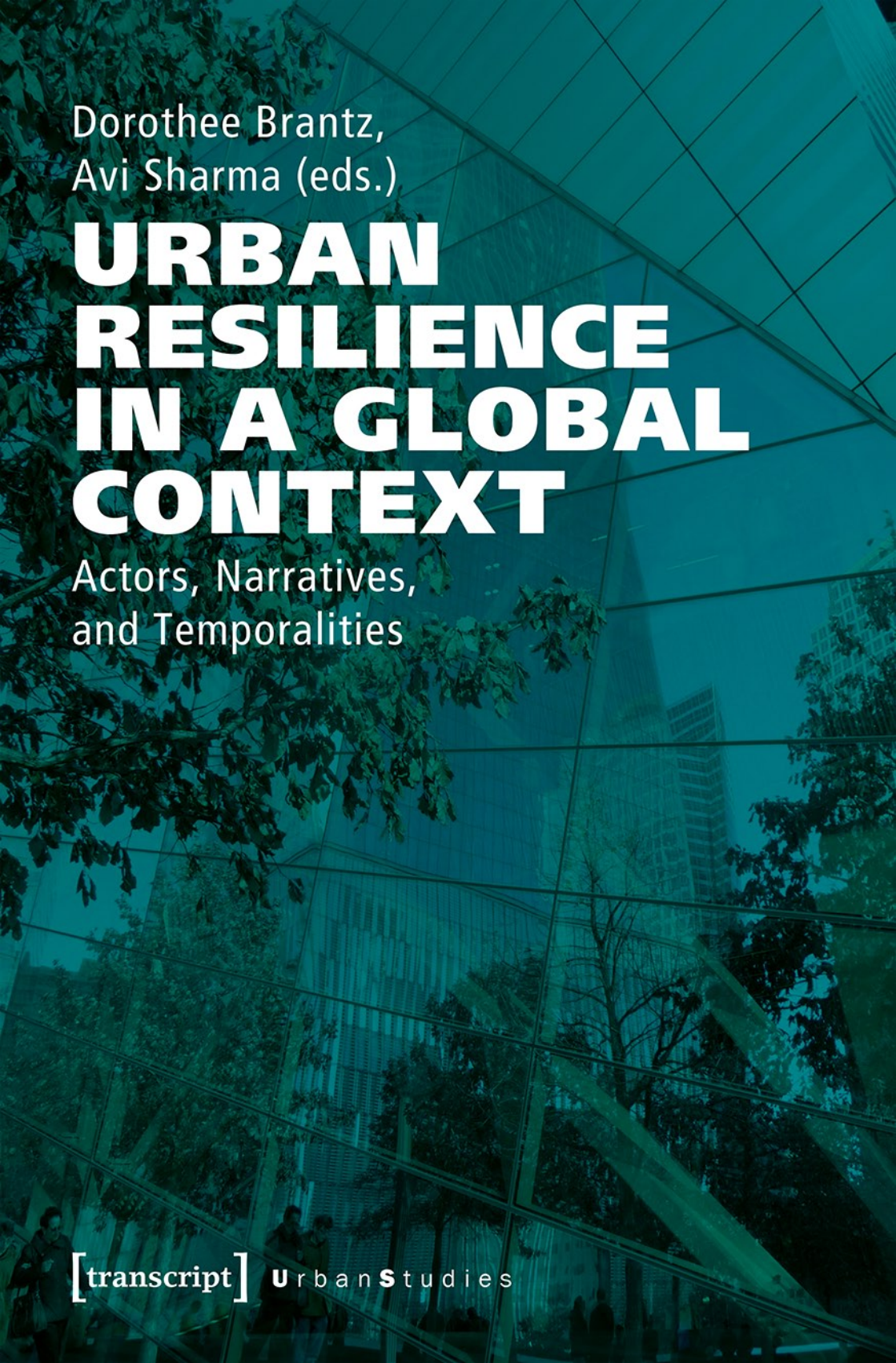

Dorothee Brantz,
Avi Sharma (eds.)
URBAN RESILIENCE IN A GLOBAL CONTEXT
Actors, Narratives, and Temporalities
[transcript] UrbanStudies

Dorothee Brantz, Avi Sharma (eds.)
Urban Resilience in a Global Context

Urban Studies

For Anika and Felix

Dorothee Brantz is a professor of urban environmental history and the director of the Center for Metropolitan Studies at the Technische Universität Berlin. Her research interests include urban environmental history, the history of war and peace, and the different temporalities of the urban.

Avi Sharma is a senior research fellow and assistant professor at the Center for Metropolitan Studies at the Technische Universität Berlin. Sharma is particularly interested in irregular migration, urban and environmental histories. His ongoing work explores urban cases in postwar Germany and post-Partition South Asia.

Dorothee Brantz, Avi Sharma (eds.)

Urban Resilience in a Global Context

Actors, Narratives, and Temporalities

[transcript]

CENTER FOR METROPOLITAN STUDIES

berlin

DFG Deutsche Forschungsgemeinschaft

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de

Cover layout: Maria Arndt, Bielefeld
Cover illustration: Dorothee Brantz
Printed by Majuskel Medienproduktion GmbH, Wetzlar
Print-ISBN 978-3-8376-5018-1
PDF-ISBN 978-3-8394-5018-5
https://doi.org/10.14361/9783839450185

Printed on permanent acid-free text paper.

Contents

III)
Infrastructures of Resilience

IV)
Epilogue

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).

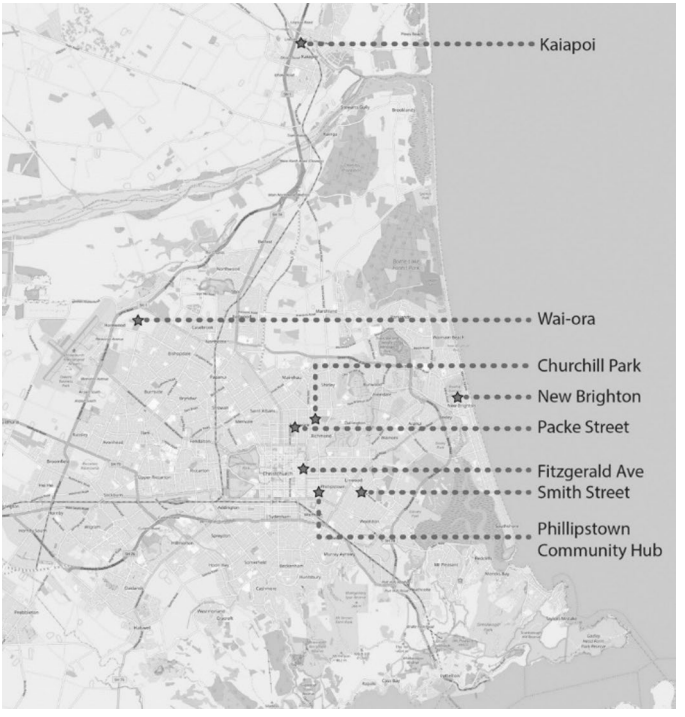
Findings

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 opposite 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.